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A CATALOG OF THE E-FLAT TUBAS IN THE ARNE B. LARSON COLLECTION AT THE UNIVERSITY OF SOUTH DAKOTA

By

John Joseph Swain

A DISSERTATION

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ABSTRACT

A CATALOG OF THE E-FLAT TUBAS
IN THE ARNE B. LARSON COLLECTION
AT THE UNIVERSITY OF SOUTH DAKOTA

By

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The Arne B. Larson Collection in the Shrine to Music Museum at the University of South Dakota contains approximately three thousand musical instruments plus assorted musical memorabilia. Approximately one hundred fifty E-flat tubas are part of this large collection, and these tubas represent a period of instrument manufacture from the middle of the nineteenth century to the middle of the twentieth century. Major European and American manufacturers are represented in the collection, and a number of smaller companies and individual craftsmen are represented as well.

The document outlines the development of the bass wind instrument from the sixteenth century to the twentieth century and presents a brief discussion of the use of the E-flat tuba in the United States. The major thrust of the paper is centered on a detailed study of the E-flat tubas in the Larson Collection. Measurements of bore diameter, valve slide lengths, bell diameter, weight, and height are given for individual instruments and compared to other like instruments. Valve slide arrangements, valve placement, and

other details of construction are discussed and compared. Photographs of ten special instruments illustrate some of the unusual techniques of construction. Historical information about the manufacturers and agents represented in the collection is documented, and manufacturing information for York and some of the larger manufacturers is presented as well.

Conclusions drawn from the research support and amplify existing documents concerning the physical development of the tuba from about 1850 to the present. The poor quality of construction of many instruments, and intonation problems caused by valve limitations and pitch modifications to existing instruments, are cited as primary reasons for the decline in use of the E-flat tuba.

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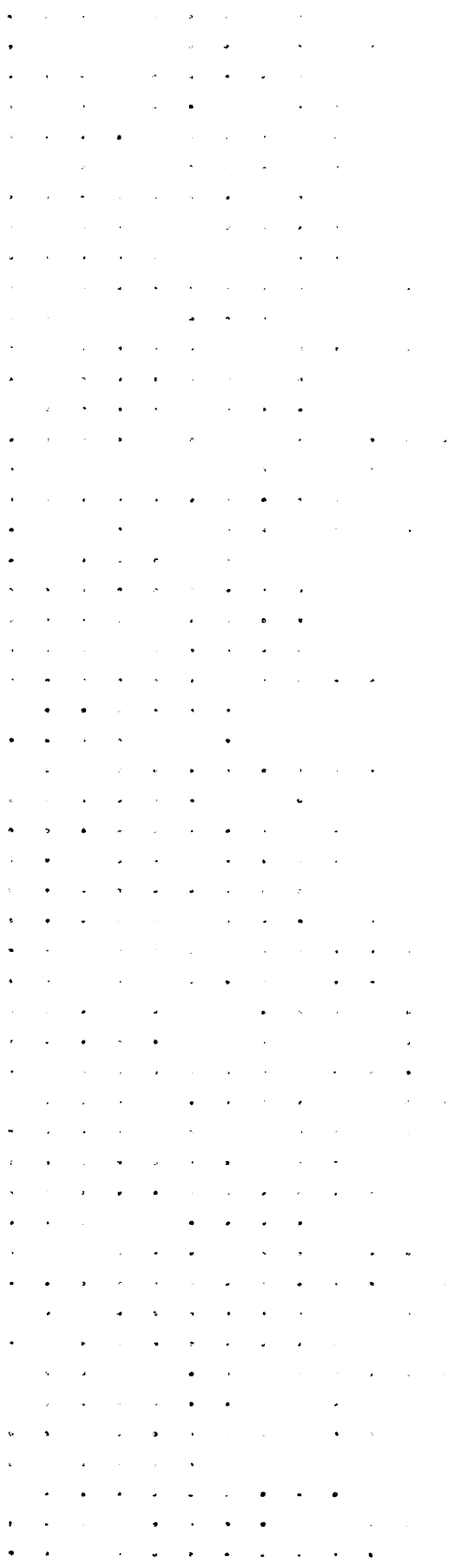

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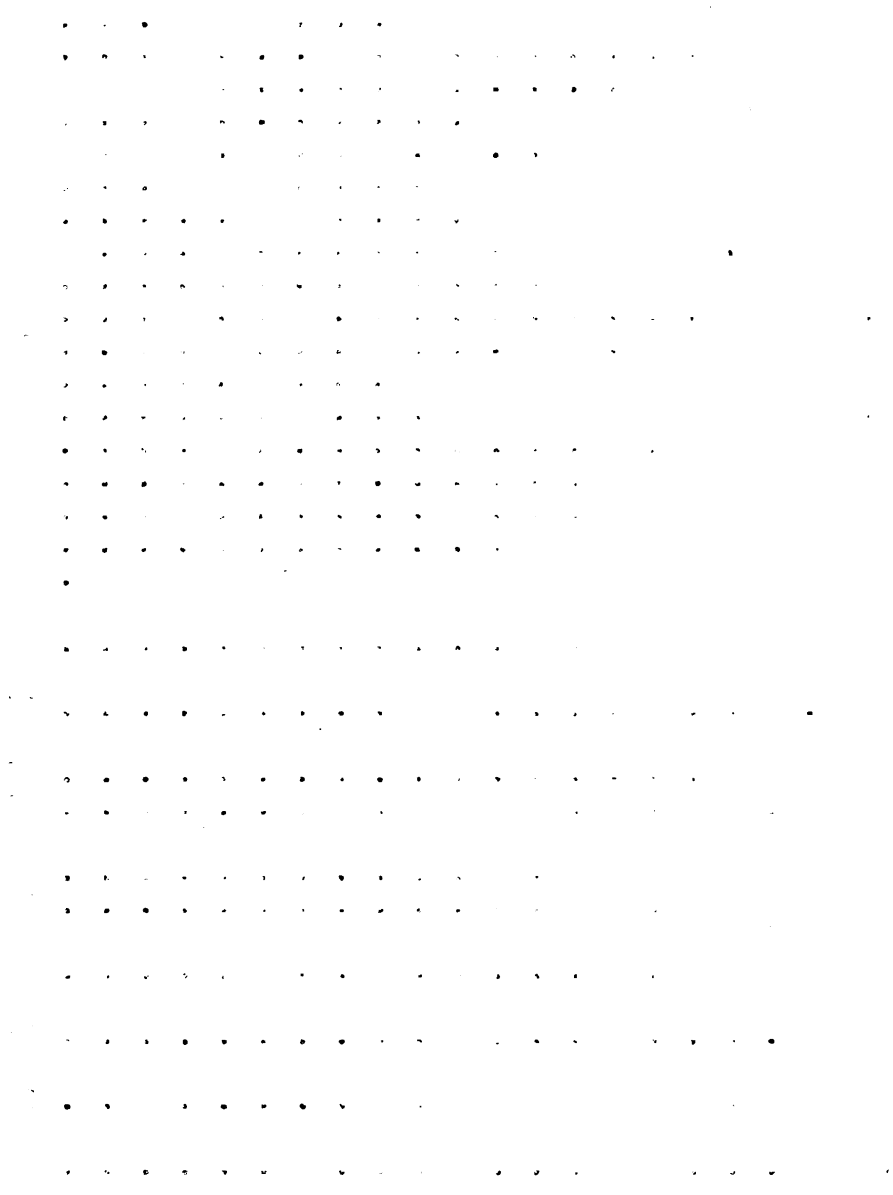

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INTRODUCTION

Collections of rare or valuable musical instruments have received the greatest amount of attention from scholars in recent times. However, studies of large homogeneous groups of more modern musical instruments are now becoming a matter of interest to researchers. Until quite recently, there were no major collections with enough modern instruments to serve as the basis for any kind of large-scale statistical research.

Arne B. Larson, founder of the Arne B. Larson Collection in the Shrine to Music Museum at the University of South Dakota, began his collection of musical instruments about sixty years ago, and since that time his collection has grown into one of the most significant musical instrument collections in the world. Especially significant for this research are the numerous band instruments in the collection which were made within the last one hundred years. It is this collection that the present writer has chosen for a study of the E-flat tuba.

The project started as a search to discover an instrument which had been much maligned in the last forty years. It existed, but it was used little during this period.

Perhaps five years ago the instrument was rediscovered by professional musicians in this country. It is now used primarily by players who wish to expand their facility, although, before 1940, it was used a great deal by players of all ages. Thus, it was the desire to discover what happened to the E-flat tuba in the intervening time that led to the research.

The present catalog of the tuba collection serves two basic needs. It serves the needs of the museum, which must eventually have a complete written record of all the instruments in its entire collection, of which the E-flat tubas represent a small part. It also serves as the basis for a statistical study of how instrument design has changed over the years, and it may help to determine whether the quality of construction of the earlier instruments had anything to do with the decline in use of the E-flat tuba. Since no such data has been available, even from the larger manufacturers, a thorough examination of the instruments was the only alternative.

Approximately one hundred and fifty E-flat tubas were examined as part of this research. Each was measured and photographed. Details of construction and the information engraved on the instruments were recorded as part of the process of making the catalog. Statistics were sorted and compared by instrument type, and the backgrounds of the manufacturers and agents represented were researched in

some detail. This information was collated and used to compare and date instruments. A history of the tuba was researched, and an oral history of the use and construction of the E-flat tuba in the United States was compiled.

This document will help fill a void in musical instrument research in several ways. It is the first large-scale documentation of a group of tubas; it is one of the few existing databases for comparison of a large group of like musical instruments; it is one of just a few existing documents which detail changes of construction within a specific group of musical instruments manufactured within a relatively brief period of time; it is one of a small number of papers which provide basic historical information about a number of American musical instrument manufacturers; and, it is one of a handful of papers which details, through an examination of musical instruments, the rich European and American heritage in the construction of brass wind instruments. It is hoped that the catalog will serve both the museum and the interested researcher with a relatively complete record of the E-flat tuba in the United States during the period 1850 to 1930.

CHAPTER I

A BRIEF HISTORY OF THE TUBA

Development of the Modern Instrument

The development of the modern valved tuba began in the first decade of the nineteenth century, and most of the major innovations and improvements had been completed by about 1860. A survey of most of the standard literature reveals that it was especially the period between 1820 and 1860 in which the greatest amount of activity took place.

The tuba belongs to that class of instruments now commonly called the valved bugle-horns, and the heritage of these instruments can be traced back to the very earliest lip-vibrated instruments. Animal horns and conch shells were among this early group. Curt Sachs points out that early shell instruments were either end-blown or side-blown (transverse) with the mouth hole bored in the side of the shell, and that animal horn end-blown instruments existed as early as 1250 B.C. in Sumeria.[1]

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[1]Curt Sachs, The History of Musical Instruments (New York: W. W. Norton, 1940), pp. 48 and 73.

It would be interesting to survey the development of the primitive instruments, but only two characteristics relate them to modern brass instruments--method of tone production and conical bore. Even the longest of these instruments would not be of the length required to call them true bass instruments.

Musicians were not struck with the need to create a diatonic lip-vibrated instrument until about 700 A.D. The earliest known representation of an animal horn bored with finger holes appears on a silver dish from Persia. This type of instrument was replaced by a wood or ivory model, perhaps in the early Renaissance.[1] Like their natural counterparts, these instruments, the cornetts, were conical in bore, straight or curved in construction, and sometimes fitted with a separate mouthpiece, often of ivory. A lack of upper harmonics in their sound produced a darker, more subdued tone than that of a modern brass instrument, which made these instruments ideal for supporting the human voice.[2] It was characteristic of the cornetts that, although they had finger holes, pitch change was as much a result of change in lip vibration frequency as it was of change in finger position.

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[1]Sachs, History of Musical Instruments, pp. 323-4.

[2]Ibid., p. 324.

It was the invention of the serpent, attributed to Canon Guillaume of Auxerre in 1590, that signaled one of the first attempts to create a chromatic lip-vibrated bass instrument.[1] This relative of the cornett earned its distinctive name because of the "S" shape of the tube, necessary because the length of the straight tube would have made the reach to the bored finger holes too long. Mersenne, writing about 1635, stated:

> Musicians have invented many instruments to mingle with voices and to make up for the defect of those who perform bass and treble, since the singers who have low bass voices are very rare. This is why the bassoon is used, and the sackbutt and the serpent, just as the cornett is used to supplement those of the treble who are not usually good. Now this instrument is called the serpent, because of its shape, which has the coils of the animal which bears this name, in that the length it would have if it were straight is not inconvenient. For it is at least six feet long, and the one from which the figure was taken is six feet thirteen lines in length. Now it can be made of brass and of all other sorts of metal, although it is ordinarily made of walnut, which is only half a line in thickness, or some other suitable wood. And then it is covered with leather, like the cornet, to strengthen it.[2]

Mersenne then illustrates a serpent and describes its construction in detail.

---

[1]Ulrich Daubney, Orchestral Wind Instruments (London: William Reeves, 1919), p. 110.

[2]Marin Mersenne, Harmonie Universelle, trans. Roger Chapman (The Hague: Martinus Nijhoff, 1957), pp. 349-350.

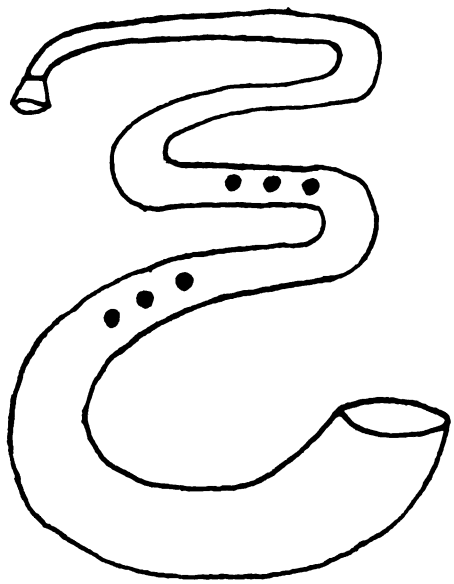

Figure 1. Serpent.

The serpent was a conical bore instrument of a length somewhere between the modern cornet and baritone, yet its accoustical construction allowed it to be played chromatically from e^1 down to Great C.[1] The drawbacks of performing on the serpent were much the same as those of the cornett, but the instrument remained quite popular. Band parts for the serpent began appearing as early as 1777, and improvements and modifications to the instrument continued to be made and patented up to the 1840s, long after the bass horns, ophicleides, and newer valved tubas had staked claim to the bass register.[2]

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[1]Clifford Bevan, The Tuba Family (London: Faber and Faber, 1978), p. 49.

[2]Ibid, p. 53.

The Russian bassoon, sometimes called the ophibaryton, appeared in the late 1740s as an alternative to the serpent. The invention of the first such instrument was credited to the musician Regibo, an Italian who lived in France. It was similar to the serpent except that the tubing was coiled back on itself in bassoon fashion. This new construction technique led to what Sachs refers to as the English basshorn, first constructed about 1800 by the Frenchman Alexander Frichot and the English maker J. Astor.[1] The basshorn was conical, like the Russian bassoon, and had six finger holes plus optional keys.

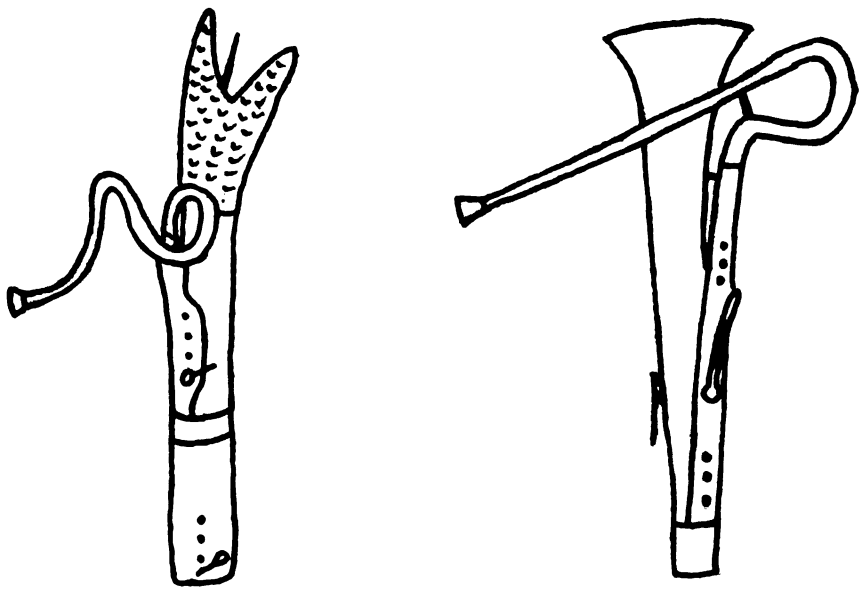

Figure 2. Russian bassoon and basshorn.

Sachs is unfortunately unclear and perhaps incorrect as to the true nature of the basshorn. Based on an examination

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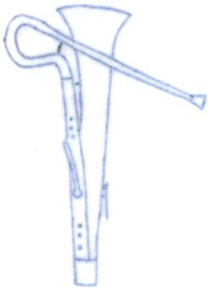
[1]Sachs, History of Musical Instruments, p. 422.



of other sources, there seem to be three different types of instruments which are somewhat similar in construction. The first is the serpent coiled in tuba form, which Sachs illustrates as an instrument with one tube coiled back on itself in the manner of the modern tuba main coil. This instrument was likely made of metal. The second type, which Sachs identifies as the basshorn, and which Clifford Bevan and others identify as the Russian bassoon, has a butt joint made of a single piece of wood, a middle section which resembles a bassoon, and a large, serpent-headed bell. The mouthpiece crook is larger than a bassoon bocal, but it enters the "tenor joint" in much the same fashion as the bocal enters the bassoon tenor joint. This is the Russian bassoon. The true basshorn, or at least the English basshorn, is a metal instrument consisting of what appear to be two tubes set in a "V" shape and capped at the butt. This instrument has six finger holes and three keys. There is a conventional brass instrument bell, and a long crook which is coiled once before the formation of the mouthpiece receiver.[1]

There is little doubt that a variety of these three types were made. Some were of wood, some were of brass, and some were of copper or another metal, but each type served the same purpose--to support or supplant the serpent as the

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[1]Bevan, The Tuba Family, plate III.

bass voice in the instrumental ensemble. This type of instrument was improved once again, as Streitwolf's "Chromatisches Basshorn" of 1820, which had a bigger bore, ten keys, and only two open holes.[1] This improved model was made some ten years after the invention of the ophicleide, the most sophisticated of the lip-vibrated, keyed bass instruments.

It was a common practice beginning as early as the Renaissance to build instruments of a given type in a wide range of pitches. The ophicleide represented the attempt to expand the family of keyed bugles into the bass register, and it was constructed soon after the first keyed bugle had been patented by Joseph Halliday of London in 1810.[2]

The ophicleide was the subject of a patent taken by Jean Hilare Asté (Halary) in March, 1821. This instrument was soon joined by an apparently little-used monster ophicleide in F or E-flat.[3] The range of the most commonly used ophicleide in C was from c^1 down to contra B (BB)--similar to that of the serpent, which it frequently replaced--and its rich tone was admired and used by composers throughout much of the nineteenth century, even after the modern tuba had become established in the orchestra.[4]

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[1]Sachs, History of Musical Instruments, p. 422.

[2]Ibid.

[3]Anthony Baines, The Brass Instruments, (London: Faber and Faber, 1976), p. 198.

[4]Bevan, The Tuba Family, p. 60.

Most sources credit the first use of the instrument in an orchestra to Gaspare Spontini in his Olympie, which was premiered at the Paris Opera in 1819. Subsequent use of the ophicleide by Berlioz and other composers is well documented. It was used in French bands up to the mid-1880s, and there are sporadic reports of its use into the last years of the nineteenth century.

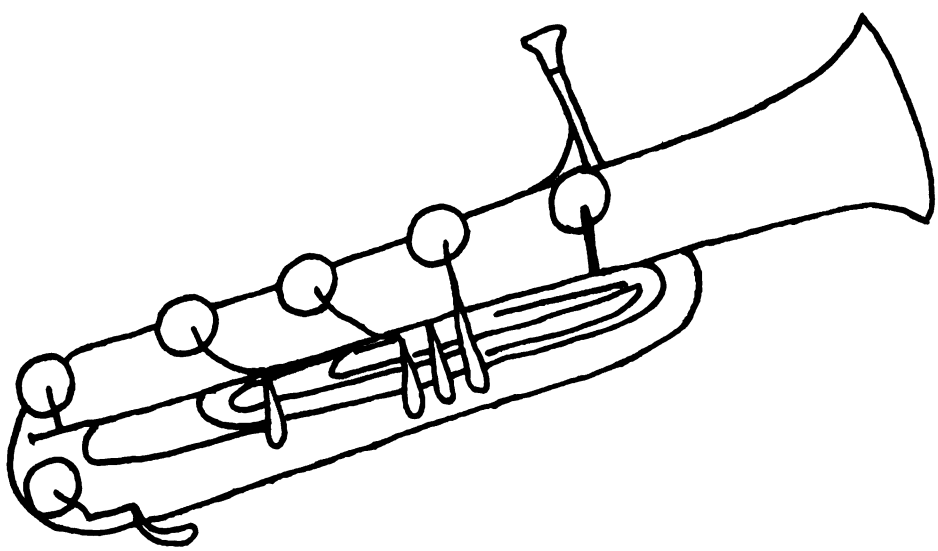

Fig. 3. Ophicleide.

The distinct advantage of the conical ophicleide was that all of the holes were covered and operated by key mechanisms; this could permit the correct acoustical placement of the holes while eliminating the problem of having to accurately cover open holes with the fingers while playing. A survey of the keyed instruments in the Arne B. Larson Collection shows that all of the ophicleides are of the same basic construction: a tube folded back on itself quite

closely, nine or eleven keys, and a coiled or "U" shaped crook ending in the mouthpiece receiver. (Bevan notes that some ten-keyed instruments were made as well.) The seven instruments in the Larson Collection are made of brass, although some very beautiful and unique wooden models were also made.[1] The ophicleide represented the last stage in the development of the lip-vibrated, keyed instrument. It was soon to be displaced by an instrument based on a new concept--the valve.

All of the numerous valve designs of the first decades of the nineteenth century were created to do the same thing --make it possible for a brass instrument to play chromatically without shortening the tube length by boring holes into the tube. While the keyed bugle types subtracted from the fundamental length of the instruments, the valved instruments added tubing to the fundamental length. The vale mechanism, when set in action, would route the air stream from the main tube through a secondary tube or tubes before allowing the air to pass through the remaining length of main tubing. In 1788, the Irish musician Charles Clagget attempted to put two natural instruments of different pitches together to be played through the same mouthpiece in order to create a chromatic instrument, and in so doing he created what may have been the first crude valve system.[2]

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[1]Robert Eliason, "A Pictorial History of the Tuba and Its Predecessors," T.U.B.A. Journal 11 (1984): 36-7.

[2]Baines, The Brass Instruments, p. 207.

The exact circumstances surrounding the invention of the first practical valve are still somewhat of a mystery. Various sources attribute the invention to either Heinrich Stoelzel, a German horn player, or to Stoelzel and Friederich Blühmel, a member of a miners' band in upper Silesia. There are also accounts which suggest that Blühmel invented the valve, and that its pattern was stolen by Stoelzel. Anthony Baines, author of The Brass Instruments, has translated an interview with the maker William Wieprecht, done for the Berliner Musikalisches Zeitung in 1845, in which Wieprecht stated that subsequent quarreling by the two men (Stoelzel and Blühmel) made it impossible to tell who constructed the first valve mechanism.[1] The few existing documents concerning this matter are of some help in separating fact from conjecture.

In 1815, the Allgemeine Musikalische Zeitung printed a letter by the director of the theater at Breslau which credited Stoelzel with having invented a valve mechanism, which other, secondary sources suggest may have been made as early as 1813.[2] This may have been what was generally called the Stoelzel valve, a simple piston mechanism in which the bottom of the piston kept the air stream within the main tubing when the piston was at rest, but which, by means of a horizontal hole bored in the piston, deflected

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[1]Baines, The Brass Instruments, p. 206.

[2]Ibid.

the air stream through an extra tube when the valve was depressed. A principal disadvantage of this design was that the construction required the air stream to turn at right angles through the tubing.

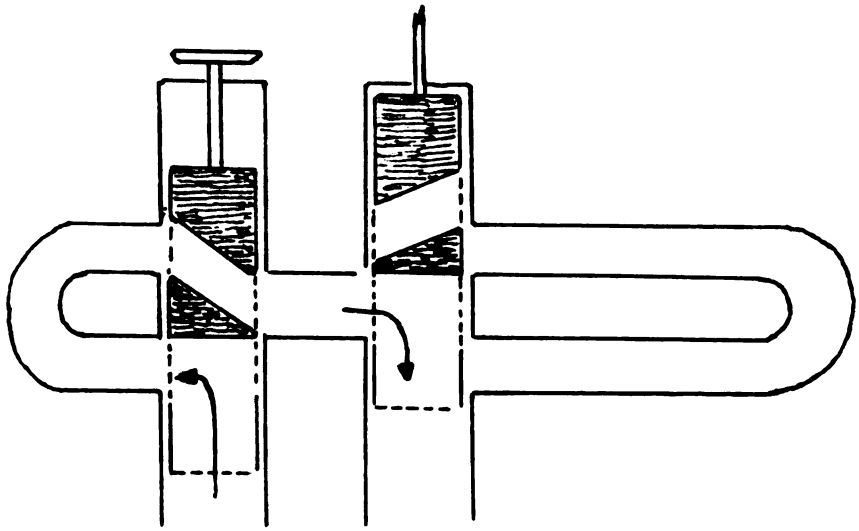


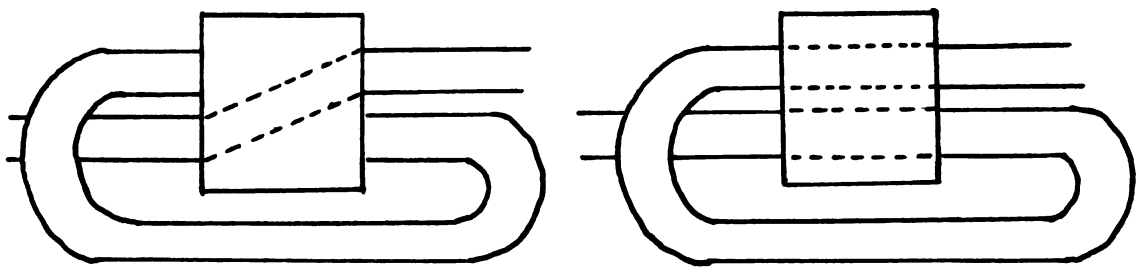
Fig. 4. Stoelzel valve.

It should be noted at this point that the Stoelzel valve pattern discussed and shown above was taken from a later group of instruments; the earlier valve design may have been either fundamentally different from this later valve or a cruder version of the later design. Further clouding the picture is the fact that Stoelzel and Blühmel took a joint patent for an entirely different valve mechanism in 1818. One argument in favor of considering the later Stoelzel design as a refined version of his earliest design is that the mechanism, despite the restricted windways, would have produced an overall tone superior to the then common method of hand-stopping to produce pitches other

than overtones. The later Stoelzel design was used on brass instruments as late as 1919.[1]

Stoelzel approached the Berlin firm of Greissling and Schlott about 1815 to have them manufacture his new mechanism. The instruments made during this period probably had only two valves, because there are records which describe performances by Stoelzel on two-valve instruments--one specifically in Leipzig during December of 1817--but no records describing performances on three-valve instruments during the same time.[2]

In April of 1818, Stoelzel and Blühmel took a ten-year Prussian patent for a box valve mechanism which did not restrict the airways, but which had the disadvantage of being somewhat slow and difficult to manipulate.[3]



Top view

At rest Engaged

Fig. 5. Box valve.

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[1]The New Grove Dictionary of Music, 1980 ed., s.v. "Valves," by Phillip Bate.

[2]Bevan, The Tuba Family, pp. 72-73.

[3]Ibid., p. 73.

Around 1828, Blühmel attempted to take a new patent for a "Conisches Drebuchsenventil," which Baines claims was a rotary valve (despite his own evidence to the contrary), but which probably was, as Phillip Bate suggests, a somewhat improved model of the earlier Stoelzel valve, with curved tubing to eliminate the sharp turns in the windways.[1] The patent was not granted.

In 1821, the Allgemeine Musikalische Zeitung illustrated an instrument constructed by the German maker Sattler. This instrument used as a valve mechanism an early version of the Vienna twin-piston valve, a mechanism which is still in use in Austria. This valve was constructed so that the air flow was direct with the piston at rest. The air stream still had to move at a right angle both in and out of the valve tubing, but there was less turbulence because of a curve in the piston's windway. Bombardons with three Vienna valves were made in the mid-nineteenth century and can be found in collections today, but some early instruments, especially the trumpets, commonly had just two valves.[2] The twin piston system was further improved by Uhlmann of Vienna and was patented in 1830.[3]

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[1]The New Grove Dictionary of Music, 1980 ed., s.v. "Valves," by Phillip Bate.

[2]Baines, The Brass Instruments, p. 210.

[3]Bevan, The Tuba Family, p. 74.

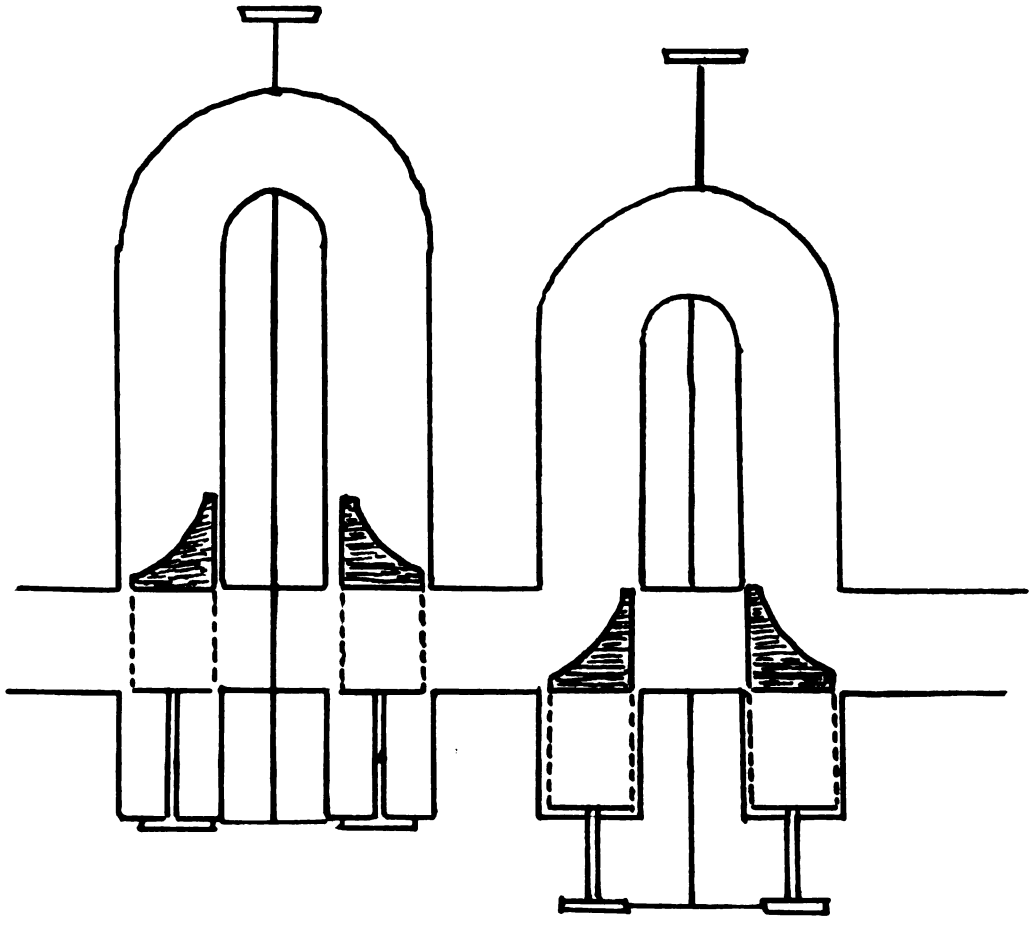

Fig. 6. Vienna twin-piston valve.

William Wieprecht and the German maker J. G. Moritz were granted a patent in 1835 for what turned out to be the prototype of the modern piston valve. Their "Berliner-Pumpen" valve had a large diameter which allowed curved windways, thus eliminating both the right angle turns of the earlier piston valves and the sluggish action of the more direct box valves.

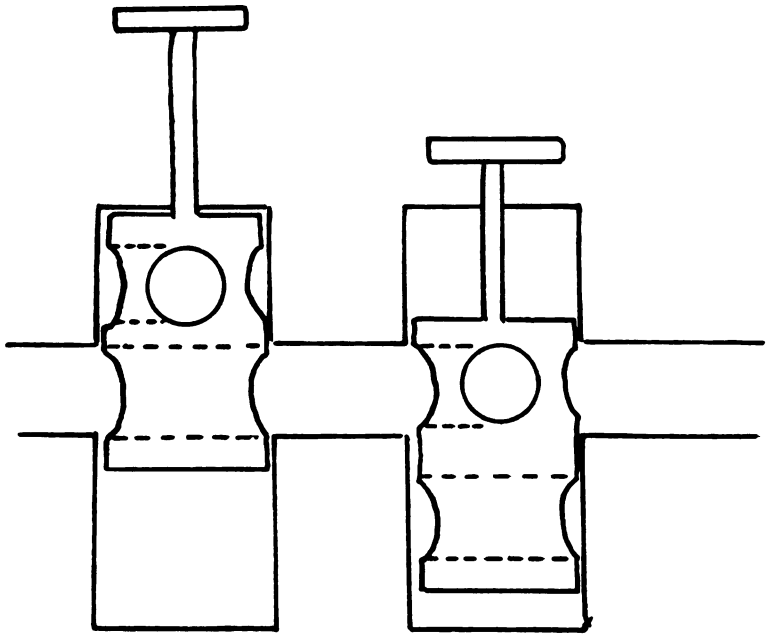

Fig. 7. "Berliner-Pumpen" valve.

This was evidently the design refined and patented by the French maker Etienne Pĕrinet in 1838, which became the basic design used most frequently on piston valve instruments made after that time.[1] Thus, the evolution of the modern piston valve took no more than perhaps twenty-five years. The rotary valve took even less time to develop.

Contributions by American inventors have been conspicuously absent up to this point. Perhaps this is because the early American makers seem to have concentrated much of their effort on the invention and improvement of the rotary valve system. It is quite possible that the first rotary valve was not made in Europe but in the United States,

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[1]Bevan, The Tuba Family, p. 76.

probably by Nathan Adams, a bandmaster and instrument maker from Lowell, Massachusetts.

An instrument called a "Permutation Trumpet," dated 1825, and now part of the frigate Constitution, bears the inscription "invented and made by Nathan Adams." The extraordinarily simple valve mechanism of the instrument consists of a lever which operates two vanes inside the windway which, when raised, route the air stream through the valve tubing in much the same way as the Vienna twin piston valve does. However, the fact that Nathan Adams, an American bandmaster, made the instrument is as significant as the valve design itself, because the Permutation Trumpet is remarkably similar in detail to an unsigned instrument made perhaps one or two years earlier, which may be the earliest true rotary-valve instrument.[1]

Robert Eliason of the Henry Ford Museum makes a very strong argument to support the claim that the trumpet mentioned, now in the Essig Collection, was made by Adams before he made the Permutation Trumpet. The valve construction is somewhat crude and probably did not work very well, and this may have led Adams to design a new system (i.e., the Permutation system, according to Eliason).[2] In any case, the American instrument probably predated the

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[1]Robert Eliason, "Early American Valves for Brass Instruments," Galpin Society Journal 23 (1970): 89-90.

[2]Ibid., p. 91.

invention of the standard European rotary valve patented by Joseph Reidl, a German maker, in 1832.[1]

The Reidl valve immediately became popular in Germany. (Many German players still prefer the rotary valve system.) His valve design and actuating mechanism were used, apparently unchanged, by German manufacturers, but a number of American craftsmen set about to make changes in the rotary system. One of those craftsmen was Thomas Paine, an instrument maker of Smithfield, Rhode Island.

In 1848, Thomas Paine patented a rotary valve which required only a forty-five degree rather than a ninety degree turn of the rotor to route the air stream through the valve tubing.[2] His three-passage valve had a hollow center which allowed the air to pass through it, rather than around it, as with a more conventional valve. This made it necessary for the valve tubing to be placed on opposite sides of the valve, giving Paine instruments a rather distinctive appearance, as demonstrated on a tuba in F by Paine, now in the Henry Ford Museum.[3]

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[1]Lyndsay Langwill, An Index of Musical Wind Instrument Makers, 3d ed. (Edinburg: Lyndsay and Company, 1972) pp. 131-32.

[2]Eliason, "Early American Valves for Brass Instruments," p. 91.

[3]Robert Eliason, Early American Brass Makers, (Nashville: Brass Press, 1979), p. 9.

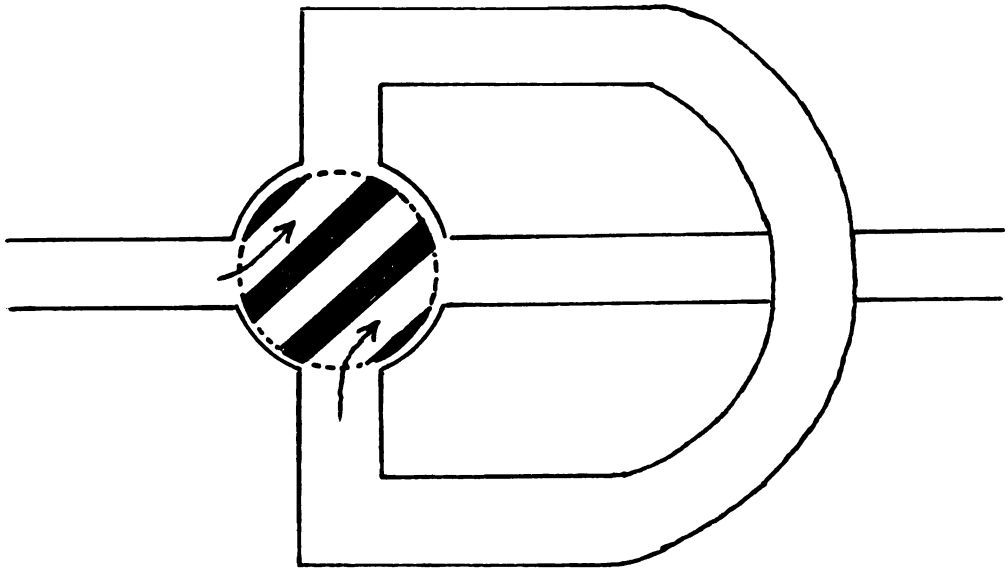

Fig. 8. Paine rotary valve.

One of the advantages of the Paine system was that the windway was not distorted as it entered and exited the valve casing. This was not the case with the design introduced by the American maker J. Lathrop Allen in about 1850. Allen's design, called the flat-windway rotary valve, may be seen on an instrument by Hall and Quinby in the Larson Collection. Allen's valve was made with a much smaller diameter than conventional rotary valves, because the windway was flattened and widened as it entered the valve so that no air volume was lost. The valve's travel was shorter, and it was, therefore, easier to manipulate. The design was used by Allen as well as other American makers, including Hall and Quinby. A spatula attached to the valve by a string served

as the actuating mechanism.[1]

String linkage was an American contribution to rotary valve system design. The first United States patent to mention string linkage is dated 1855, but the technique was used long before that time.[2] Reidl's valve used a mechanical linkage which was probably noisy and would have required a heavier mechanical assembly. String linkage, on the other hand, is remarkably quiet, and the effort required to move the valve is less than on even a modern mechanical linkage. The resilience of the string allows for some margin of error in the quality of the machined parts, since there is more flexibility and less chance of the linkage freezing and holding the valve in either the open or closed position. This author has played on bell-over-the-shoulder instruments from the Civil War era which are less well built than many modern instruments, but which have valve actions superior or equal to valve actions of many modern rotary valve tubas. The actuating mechanism on the Civil War instruments is somewhat different than modern string rotary action, but it is easily as efficient. String linkage is used today on French horns primarily, but it is also used on tubas and on trombone trigger valves.

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[1]Eliason, Early American Valves for Brass Instruments," p. 93.

[2]Eliason, Early American Brass Makers, p. 5.

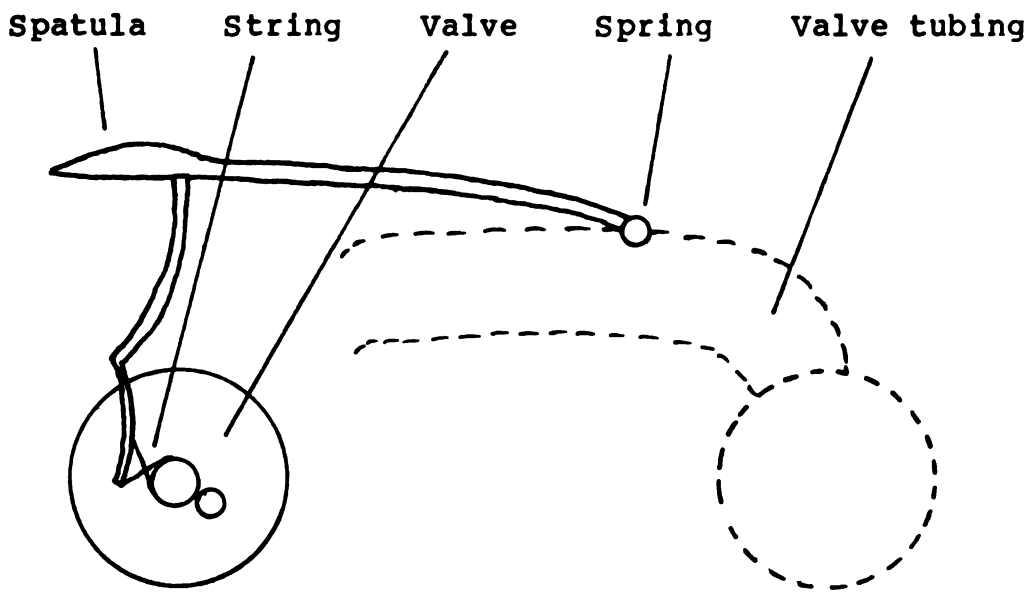

Fig. 9. American string rotary actuating mechanism.

The foregoing discussion of valves concentrates on what were perhaps the most significant improvements in valve construction. There were certainly many other varieties of piston, box, and rotary valve mechanisms patented, but most of those mechanisms were less successful, and even some of the more successful improvements may have been problematic for the tuba because of the large bore of the instrument.

In 1910, Rudall, Carte and Company of London patented a short-action Pĕrinet valve.[1] The system was designed with elliptical valve ports so that the valves could be made somewhat shorter than conventional piston valves; this would

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[1]Kathleen Schlesinger, Modern Orchestral Instruments, 2 vols. (London: William Reeves, 1910), 1:63.

have been an advantage for a larger-bore instrument. The idea must not have been generally accepted at the time, judging from the collection, but the same idea was used with more success on American sousaphones and piston-valve tubas beginning perhaps fifty years later. This concept was quite similar to the solution found by Allen for his rotary valves sixty years earlier than the Rudall-Carte patent.

Once the first practical valve systems had been developed, it was not long before makers began to use the mechanisms on the larger-bore instruments. (Some have speculated that the early valve systems, especially the piston valve systems, were too large to be used on anything else.) On 12 September 1835, Wieprecht and Moritz patented a bass tuba in F with five "Berliner-Pumpen" valves.[1] The prototype tuba was made of brass with German silver ferrules and fittings, and it had a relatively narrow bore and a small bell.[2]

A similar Wieprecht and Moritz tuba, made perhaps three to five years after the patent, is pictured in Bevan's The Tuba Family.[3] This instrument is fundamentally different from the ophicleide in conception, but it has many features inherited from that instrument, including a relatively narrow width and a small bell (19.3 centimeters in dia-

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[1]Adam Carse, Musical Wind Instruments (London: McMillan and Company, 1939), p. 303.

[2]Bevan, The Tuba Family, pp. 84-5.

[3]Ibid., plate V.

meter). The narrow height of the instrument (84.1 cm) is not too much different from the height of many of the uprights in the collection, but its narrow width betrays the clear physical relationship of this instrument to the earlier basshorns and ophicleides. All of the valves are side action--three for the right hand and two for the left --and they are the "Berliner-Pumpen" type mentioned earlier. The bell is quite close to the second bow and would be very near the player's head in playing position. The bore expansion appears to be quite even after the valves. The slides cannot be pulled to adjust the valves individually for intonation.

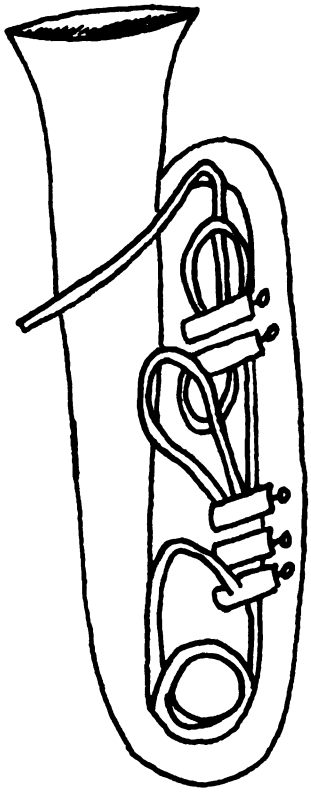

Fig. 10. Wieprecht and Moritz tuba.

The new tuba was used in the Second Infantry Guard Regiment band in Berlin as early as 1835. Wieprecht made another tuba in F with a wider bore later that same year, but he called this instrument a bombardon. (This name was also used by makers of the ophicleide, and that accounts for some of the confusion over the true nature of many of the early instruments.)[1] The Wieprecht and Moritz tuba was adopted by the Prussian army bands quite soon after 1835, and makers in Berlin, Paris, Prague, Potsdam, and other European cities began making the new valved tubas both in F and E-flat with three to six valves.[2]

The Wieprecht and Moritz tuba was not the first valved bass instrument, but it was apparently the first bass instrument to be constructed with a bore expansion and valve system more like that of the modern tuba. Stoelzel had advertised a "Basshorn oder Basstrompete in F oder Es" in 1828, and bombardons earlier than Wieprecht's may have been introduced into the Prussian bands as early as 1831, but few of the earlier instruments appear to have survived, and many of the survivors cannot be dated with accuracy.[3] The terminology is of little help in written descriptions, since names like bass-tuba, bombardon, or ophicleide often were not used with real regard for the kind of instrument being described.

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[1]Bevan, The Tuba Family, p. 86.

[2]Carse, Musical Wind Instruments, p. 304.

[3]Bevan, The Tuba Family, pp. 85-6.

It might prove instructive at this point to see what impact the new bass tuba had on a prominent composer of the period. Berlioz, writing in 1844, had this to say about the bass tuba, which he called the "double-bass of the wood-wind":

> This is a kind of bombardon, whose mechanism has been improved by Herr Wieprecht, director of all music bands of the Royal Prussian guard regiments. The bass tuba, which is is now widely used in northern Germany, especially in Berlin, possesses important advantages over all other low wind instruments. Its tone, incomparably more noble than that of the ophicleides, bombardons and serpents, has something of the vibrant timbre of the trombones. It is less agile, but more powerful than the ophicleides, and its range extends lower than that of any other instrument in the orchestra. Its tube, like that of the bombardon, produces tones of the F-major chord; A. Sax now also makes tubas in E-flat. Notwithstanding this difference, they are all treated in Germany as non-transposing instruments. The bass tuba has five cylinders, and its range is four octaves. (These instruments have been introduced in France some years ago, where they are written as transposing instruments--like the horns and trumpets). . . . With the aid of the cylinders, a few notes can be added above and even below this scale. [Berlioz illustrates the range from AAA to a.[1]] Extremely high tones are very risky and extremely low ones hardly distinguishable. The tones marked * (A, Bb, C) are clearly audible only if doubled in the higher octave by another bass tuba, which imparts more sonority to these tones, and is in turn simultaneously reinforced by them.
>
> Of course, this instrument is as unsuited to trills and rapid passages as the bombardon. It can play certain broad and slowly moving melodies. The effect of a great number of bass tubas in a large military band is beyond imagination. They sound like a combination of trombones and organ.[1]

Berlioz credits Wieprecht for the improvement of the tuba, but he clearly implies that other similar instruments

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[1]Hector Berlioz and Richard Strauss, Treatise on Instrumentation, trans. Theodore Fodor (New York: Kalmus, 1948), p. 339.

existed before 1835, even if they were inferior. His comments on the unsatisfactory low range may reflect on the somewhat narrow bore of these early instruments, but he seems to be talking only about the extreme low register. Berlioz mentions that the tubas "have been introduced in France some years ago," which would indicate that the new instrument became popular in Europe quite soon after its invention. Finally, he mentions the Sax instruments, which would not have been available for more than two years, since Sax opened his Paris shop in 1842.[1]

Adolph Sax' main contribution to brass making was that he created a complete set of well-crafted conical bore brass instruments. His success was due in part to his business acumen as well as his ability to be in the right place at the right time. Sax patented the seven instruments of his Saxhorn family in 1843, and he was almost immediately involved in supplying his new family of instruments to the French army bands, then being reorganized by Spontini.[2]

Nearly every source on Sax indicates that he became embroiled in legal action over his instruments because his patent did not really represent any new technology. Sax apparently used the Wieprecht and Moritz tuba as a model for his early instruments, including the "Berliner-Pumpen" valves, although he later used Périnet or rotary valves for

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[1]Bevan, The Tuba Family, p. 89.

[2]Carse, Musical Wind Instruments, p. 303.

some instruments.[1] He was fortunate enough to be in the good graces of Berlioz, who was a lobbyist in his behalf at the 1851 London Exposition, and Sax was able to supply the French military bands with new instruments once again when the French pitch reform took place in the beginning of the next decade.[2]

Fig. 11. Saxhorn.

The same year that Sax set up shop in Paris, the German firm of V. F. Cerveny was established.[3] Cerveny immediately began to experiment with the larger-bore instruments,

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[1]Carse, Musical Wind Instruments, p. 311.

[2]The New Grove Dictionary of Music, 1980 ed., s.v. "Pitch," by J. J. K. Rhodes and W. R. Thomas.

[3]Bevan, The Tuba Family, p. 153.

and in 1845, he brought out the first large-bore CC and BB-flat tubas.[1] Cerveny contributed further to the development of the tuba by creating an almost completely conical-bore instrument in which bore expansion took place through the valves.[2] About 1882, Cerveny produced a line of large-bore "Kaiser" instruments, of which the "Kaiser-bass" has remained one of the more popular.[3] Virtually all of Cerveny's tubas were made with rotary valves.

This paper will not attempt to outline each invention and modification that was made during this period of rapid development. It is pertinent here, though, to discuss some of the instrument configurations which began to appear after 1835, because the different instrument types of the period are similar to the tubas in the Larson Collection.

One of the interesting design features of the Wieprecht and Moritz tuba was that it had side-action piston valves. Side-action valves, whether piston or rotary, were generally placed vertically on the instrument, so that the player had to face the bell to the left in order to have the valve assembly in the most comfortable playing position. The left-facing bell was, and is, characteristic of the rotary valve instruments, but it was not characteristic of some of the other early piston-valve tubas.

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[1]Musical Instruments Through the Ages, ed. Anthony Baines (London: Faber and Faber, 1961), p. 283.

[2]Baines, The Brass Instruments, p. 261.

[3]Bevan, The Tuba Family, p. 113.

The appearance of the first tuba with a right-facing bell was not discussed in any of the sources consulted, perhaps because models for such a construction already existed among some of the smaller instruments. However, all available engravings and photographs of saxhorns with piston valves clearly show a horizontal valve mechanism, which would necessitate a right-facing bell. It is, therefore, quite possible that Sax was one of the first to use this method of construction on the bass instrument. The distinct advantage to the nineteenth-century manufacturer in this type of construction was that a minimum number of bends in the tubing would have been required, provided the valve assembly was placed high enough within the main coil. As will be seen later, a significant number of the E-flat upright tubas in the Larson Collection were made in just such a fashion.

The two basic configurations of upright tubas were established by about 1850. The upright instrument was difficult to march with, however, so instrument makers in the middle of the nineteenth century began to experiment with designs for marching instruments. Attempts to make instruments suitable for use on the march resulted in two instrument designs.

The bell-over-the-shoulder instruments were designed so that the bell would point to the rear (over the player's left shoulder) in order to project the sound to the column of troops marching behind the band. These instruments were

made in a variety of sizes from E-flat soprano to E-flat bass. They were all made with a relatively small main coil and a long bell section, probably for balance, which projected from about four inches to as much as two and one-half feet behind the player's head, as in the case of the E-flat tuba. (This writer has performed in ensemble on such instruments and found that it was quite difficult to adjust for ensemble balance and intonation. The effect is somewhat like having the sound come out in a separate room.) Valve systems for these instruments were almost all rotary, as far as can be determined. The mouthpiece was constructed to lie over the top of the second bow in the middle, or to the right of, the main coil.

Bell-over-the-shoulder instruments were made in Vienna and exported to the United States as early as 1838, at which time they were patented by the American bandmaster Charles Dodsworth.[1] These instruments were also made in the United States by various makers and were used in American brass bands from the 1830s onward as well as in the Civil War military bands. The somewhat narrow bore and small bell of the bell-over-the-shoulder instruments show a clear relationship to earlier tubas, especially the saxhorns.

The helicon tuba, probably of Russian design, was introduced to Vienna by the maker Stowasser in 1849.[2] It was designed to be used as a marching instrument, and it was

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[1]Carse, Musical Wind Instruments, pp. 314-15.

[2]Baines, The Brass Instruments, p. 260.

first of the modern type wrap-around tubas to be invented. Helicons were built with a circular rather than an elliptical main coil, so that the player's body could be inside the body of the instrument; the valve assembly was constructed so that the player's fingers rested comfortably on the valve spatulas with the right forearm placed horizontally across the body. The need to adjust the mouthpiece for the player's comfort was important because the tuba rested on the shoulder, as the modern sousaphone does, and so instrument positioning was somewhat inflexible.

Early helicons were made with a curved mouthpipe, placed in what would perhaps be the most comfortable position for the average player. A pair of curved mouthpiece bits, each approximately four to seven centimeters long, were added to the end of the curved mouthpipe sometime in the later nineteenth century, and they were used to adjust the mouthpiece for the comfort of the performer. An adjustable leadpipe with a ninety-degree curve, now commonly called a gooseneck, was added probably in the early twentieth century to replace approximately the first twenty centimeters of the fixed mouthpipe.

The bell of the helicon faced forward at a slight upward angle when the instrument was held in playing position. In the 1890s, John Phillip Sousa had an instrument built to his specifications which had the helicon coil with the bell pointing upward in the manner of an upright tuba in order to avoid a directional sound. These instruments came

to be known as sousaphones, and the first one was supposed to have been built by J. W. Pepper, the Philadelphia manufacturer, in 1892, although the Conn company subsequently claimed credit for having built the first sousaphone in 1898. Around 1908, Conn built a sousaphone with a forward-facing bell, similar to the modern design, which Sousa never used because of the directional bell.[1]

There were a number of other innovations in instrument design as the century progressed, and instruments like the Sudrephones and the Cornophones were typical of those short-lived inventions. As the nineteenth century closed, however, makers began to concentrate on the helicons and the upright instruments of more modern design. Sousaphones were made in greater numbers after the turn of the century, and they coexisted with the helicons as marching instruments for at least three decades.

A survey of the available literature reveals that four basic instrument configurations were being manufactured at the beginning of the twentieth century: (1) upright with right-facing bell, (2) upright with left-facing bell, (3) helicon, and (4) sousaphone. The literature also suggests that specific design features were stabilized by that time, and that the stabilization process began in the last quarter of the nineteenth century. It remains to be seen whether the analysis of the catalog confirms this, but the following

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[1]Paul Beirly, John Phillip Sousa, an American Phenomenon (Englewood Cliffs: Prentice-Hall, 1973), p. 16.

comments will serve as introductory material to the study of the catalog in any case.

The increase in the conical properties of the tuba bore, begun by Cerveny and others, appears to be more pronounced in instruments made during the later nineteenth century. The saxhorns and instruments of that type seem to be less conical than the more modern uprights. Later instruments also exhibit another feature of some acoustical importance--a wider bell flare. The size and shape of the bell can affect intonation because the acoustical length of a brass instrument is greater than the actual length, and this difference can be reduced by increasing the bell diameter. The bell also amplifies the tone, acts as a radiator for the sound, and creates a clearer and more directional sound. The radiating properties of the bell increase as the bell diameter increases (up to a certain point), so a larger bell could conceivably be of some help to a small-bore instrument.[1] Late nineteenth-century manufacturers must have begun to realize these facts.

Another feature which appears in comparing photographs and engravings is that later upright instruments tend to have a wider coil, a feature which may have been necessary because of the increased conical properties of the later instruments. A less predictable shift occurs in the relationship of the bell section to the main coil of the

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[1]Bevan, The Tuba Family, pp. 42-3.

upright instrument. The bell of the Wieprecht and Moritz tuba illustrated in Bevan is quite close to the second bow of the instrument, almost as if the bell rests on the second bow, while the saxhorns and other instruments of that type generally seem to have longer bell sections, with a greater distance between the bell and the main coil. This distance seems to diminish somewhat on later instruments, although that visual effect could be due to increased bell sizes.

The properties discussed above help to distinguish two basic types of upright instruments made from about the mid-nineteenth century to the beginning of the twentieth century. The first is the saxhorn or bombardon type with a narrower width, smaller bell, greater bell section length and narrower bore. The second is the modern tuba type with a wider bell flare, wider bow, shorter bell section and more conical bore. Since the instruments surveyed represent a period of tuba manufacturing from about 1860 to 1945, it should prove interesting to see if gradual changes in the patterns can be observed.

The Modern Tubas

It is probably safe to say that there are more configurations of tubas available today than there are of any other brass instrument. This seems to be especially true in the United States, where the manufacturers have created a multitude of configurations from which to choose. A modern player not only selects pitch, valve type, valve number, and

bell configuration among the available upright instruments, but must also make choices about materials of manufacture and basic configurations among the marching instruments. Modern upright tubas are manufactured in four different pitches--F, E-flat, CC and BB-flat--and all four pitch models have been in existence since at least 1845. The fundamental pitches are illustrated below.

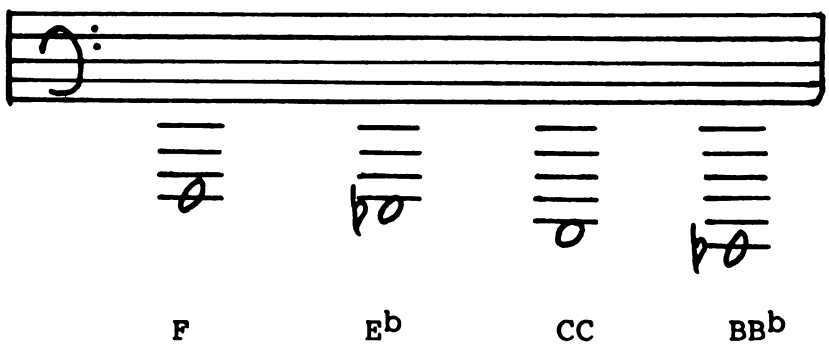

Fig. 12. Fundamental pitches for modern tubas

F and CC tubas have traditionally been used in orchestras, and E-flat and BB-flat tubas used in bands in the United States, although some American symphony players are now using the E-flat on a regular basis. Since World War II, the English have also used the four-valve E-flat tuba in orchestras.[1] The French have a smaller tuba, pitched in C with six valves, which is primarily an orchestral instrument. The smaller-bore tenor tuba in B-flat is the same instrument as the euphonium, at least in the United States. Tuba parts in this country are non-transposing,

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[1]Bevan, The Tuba Family, p. 168.

so a player switching from one pitch of instrument to another must learn a new set of fingerings, yet it is not uncommon to find players who can perform on at least two pitches of instruments.

Players in this country have a choice of bell-up or bell-forward instruments. The bell-forward upright instrument, often referred to as the recording-bell bass, was developed in the 1920s for the purpose of making phonograph recordings, because neither the string bass nor the upright tuba with bell-up was capable of the directional projection necessary for the sound to be recorded with the early recording equipment.[1] The Mirafone Corporation has, in recent years, made rotary valve instruments with detachable bells, either upright or recording bell available.

Valves on modern tubas can be piston, mechanical rotary, or string rotary. Piston-valve instruments can be found with either top-action (horizontal) or side-action valves. (The side-action piston valve instrument was patented in this country by Conn in the latter part of the nineteenth century.)[2] The moderately-priced school instruments of most American manufacturers have traditionally been equipped with three piston valves, but, in the 1970s, the Yamaha Corporation made a moderately-priced instrument with four piston valves, and the same company has

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[1]The New Grove Dictionary of Music, 1980 ed., s.v. "Tuba," by Clifford Bevan.

[2]H.W. Schwartz, The Story of Musical Instruments (Freeport, New York: Books for Libraries Press, 1970), p. 251.

more recently taken the initiative to manufacture moderately-priced tubas with four rotary valves. Currently, the maximum number of piston valves found on most tubas is four, but rotary-valve tubas are manufactured with four and also commonly five valves. The fifth valve is operated by the right thumb or the left index finger, depending on valve placement on the instrument. Most of the five-valve instruments are imported and sold by agents in the United States.[1]

The standard three-valve arrangement on tubas manufactured in the United States adds enough tubing to lower the fundamental pitch of the instrument one step, one-half step, and one and one-half steps respectively, and the fourth valve is usually constructed to lower the fundamental by two and one-half steps. The action of the fifth valve is variable, depending on the manufacturer. Some Meinl-Weston CC tubas, for example, have a fifth valve which can lower the fundamental pitch one step or two steps, or convert the instrument to BB-flat with the fifth valve held down, depending on the tubing arrangement, while the Mirafone fifth valve lowers the fundamental pitch by two steps.[2]

There are also tubas available which have an automatic compensating system in order to help correct the intonation problems caused when valves are used in combination. The modern system is much the same as that invented by the

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[1]Bevan, The Tuba Family, p. 258.

[2]Ibid., p. 83.

English acoustician David Blaikley in 1874.[1]

Contemporary American sousaphones are virtually all three-valve instruments pitched in BB-flat and are made either of brass or of a significantly lighter-weight fiberglass compound. The fiberglass sousaphone was introduced in the mid-1960s and hailed as a breakthrough for marching band tubists, but, unfortunately, many such instruments were purchased by schools unable to afford both marching and concert tubas. The fiberglass sousaphone is much lighter than comparable brass sousaphones, but the lack of resonance and poor tone focus make such instruments unsuitable for concert use. Meinl-Weston Corporation and, more recently, DEG Music Products have marketed upright piston-valve tubas with convertible leadpipes so that such instruments can be used either in concert or on the march.

The E-Flat Tuba in the United States

E-flat tubas were made and used in the United States beginning around the middle of the nineteenth century, and the large number of twentieth century E-flat instruments in the Larson Collection indicates that a continued growth in the use of the instrument in American school and town bands must have taken place. Most of the instruments in the Larson Collection were made before 1930, however, and the research done to date indicates that a dramatic decline in the use of the E-flat tuba took place somewhere around the

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[1]Bevan, The Tuba Family, p. 82.

middle of this century.

The National Committee on Instrumental Affairs of the Music Supervisor's National Conference, meeting in 1924, set about to establish a standard instrumentation for band contests. The document produced at that convention suggested that the standard concert band should have two E-flat and three BB-flat tubas. This trend continued until at least 1943, when the suggested contest instrumentation included two E-flat and four BB-flat instruments.[1] Likewise, the 1943 Festivals Manual of the National School Band Association recommended the following tuba instrumentation:

TABLE 1

1943 NATIONAL SCHOOL BAND ASSOCIATION RECOMMENDED TUBA INSTRUMENTATION

Size of Band	E-flat Tubas	BB-flat Tubas
20	0	1
30	1	1
40	1	2
56	1	2
68	2	3
80	2	4

Source: Joseph Leeder and William Haynie, Music Education in the High School (Englewood Cliffs: Prentice-Hall, 1958), p. 107.

A survey of a number of college brass method books and

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[1]Kenneth Berger, The Band in the United States, (Kent, Ohio: Band Associates Incorporated, 1961), p. 26.

elementary band books published between 1960 and 1984 revealed that, in the majority of cases, fingerings were given for both BB-flat and E-flat tuba, and in only two instances --both college method books--were fingerings given for the CC instrument. As late as 1979, Donald Bollinger, a successful high school band director and author, noted that:

> If the size of your student is a problem in the lower grades use the E-flat tubas. . . . The smaller instrument fingers like the trumpet if the student thinks treble clef when reading a tuba part and changes key signatures by subtracting three flats or adding three sharps. An extra trumpet player can be switched to tuba for instrumentation purposes in this manner. Another way to overcome the size problem is to start the young student on baritone with a tuba method book and switch him when he is physically big enough to handle the B-flat tuba.[1]

The evidence presented so far would seem to suggest that the E-flat tuba enjoyed a long and healthy life in the United States well into the 1970s. Actual practice suggests something quite different. The noted band conductor, composer, and author Edwin Franko Goldman, writing in 1918, was one of the first to notice the decline:

> The F bass is scarcely used in this country. In bands where two or more basses are used, it would be a good idea to have one in E-flat and one in BB-flat. There are many bandmasters, however, who desire only BB-flat basses.[2]

A similar thought, but one that also speaks to the use of

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[1]Donald Bollinger, Band Director's Complete Handbook (West Nyack, New York: Parker, 1979), p. 204.

[2]Edwin Franko Goldman, The Amateur Band Guide and Aid to Leaders (New York: Carl Fischer, 1916), p. 28.

the E-flat by young players, was expressed by professional tubist Clement Rowe in 1934:

> The tuba by far the most frequently played in the U. S. is that in BB-flat. Symphony players sometimes prefer the CC or F tuba and young players often find that the E-flat tuba requires less effort.[1]

A review of programs from the 1950s by Kenneth Berger, author of The Band in the United States, revealed that a ratio of four or five BB-flat tubas to one E-flat tuba was a common instrumentation for that time; this is somewhat different from the four to two ratio suggested by the National School Band Association during the same period.[2] The overall number of E-flat instruments could have been significantly fewer, though, because many programs reviewed did not list the tubas by pitch.

Perhaps the most direct evidence of the decline is found in the conversations this author had with band directors who had practical experience in working with the E-flat tuba. Dr. Leonard Falcone, Director Emeritus of the Michigan State University bands, had three E-flat and three BB-flat tubas in his first bands after he arrived at Michigan State University in 1927. He stopped using E-flat tubas by about 1940.[3]

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[1]Clement Rowe, "The Tuba," Etude Music Magazine 52 (1934): 405.

[2]Berger, The Band in the United States, p. 42.

[3]Interview with Dr. Leonard Falcone, Michigan State University, East Lansing, Michigan, 3 January 1984.

Likewise Dr. William Revelli, who began his teaching career in Hobart, Indiana, in 1925, used E-flat tubas there and at the University of Michigan, but he found it difficult to find E-flat tuba players by the mid to late 1940s.[1] Dr. Harry Begian, Director Emeritus of the University of Illinois bands, began his teaching career in 1942, but he recalled only a limited use of the instrument when he taught at Cass Technical High School in Detroit. Dr. Begian stated that he rarely used E-flat tubas in his college bands.[2]

This pattern continued in numerous incidental conversations with high school and college band directors in the midwest, some of whom were now retired after having begun teaching careers as early as the 1940s. At the same time, many of these individuals recalled that E-flat tubas were used in their elementary and junior high school bands when they began playing. There is certainly no evidence to suggest that the E-flat instrument disappeared entirely, but, after about 1940, its use may have been confined to elementary and junior high school bands as a starter instrument, since it was apparently little used by more advanced players.

Dr. Mark Hindsley of the University of Illinois offered one reason for the decline in use of the E-flat tuba:

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[1]Telephone interview with Dr. William Revelli, University of Michigan, Ann Arbor, Michigan, 4 January 1984.

[2]Telephone interview with Dr. Harry Begian, University of Illinois, Champaign, Illinois, 4 January 1984.

> Experience has shown. . . . that the combination of one E-flat to two BB-flats is an impractical one from an intonation standpoint. . . . The BB-flat instrument . . . . can accomplish all usually expected of the E-flat, and more.[1]

Dr. William Revelli echoed this sentiment when he indicated that the instrument went out of vogue because students were more naturally inclined toward the BB-flat instrument, and because the E-flat instrument was very difficult to play in tune.[2]

James Winter, Professor of Music at Fresno State College, also alluded to the intonation problem when he wrote the following in his book, The Brass Instruments:

> The argument that the BB-flat and E-flat tubas cannot play together with accurate intonation is not valid, if directors and players are willing to exert a reasonable effort.[3]

Winter also made reference to the practice of doubling the E-flat and BB-flat tubas in octaves, indicating that this is generally a satisfactory arrangement. This "satisfactory arrangement" may not have been convenient for band composers, because both Dr. Begian and Dr. Revelli spoke of a decline in octave-doubled parts for the tubas beginning in the 1940s.

The previous discussion indicates that there are

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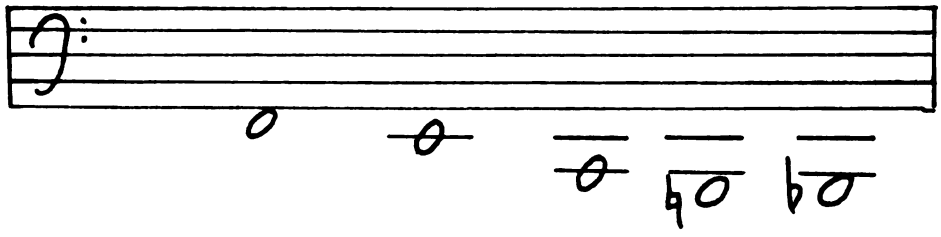
[1]Berger, The Band in the United States, p. 42.

[2]Telephone interview with Dr. William Revelli, University of Michigan, Ann Arbor, Michigan, 4 January 1984.

[3]James H. Winter, The Brass Instruments (Boston: Allyn and Bacon, 1964), p. 87.

intonation problems with the E-flat instrument. Moreover, these intonation problems are magnified when E-flat and BB-flat tubas are used together. This is quite true in certain areas of the tuba register, especially the mid to lower register for both instruments.

It is an acoustical fact that a three-valve instrument will play sharp as valves are used in combination if the individual valves are tuned to accurately effect a pitch change of one step, one-half step and one and one-half steps respectively. This rise in pitch becomes more dramatic as longer tubing combinations are used; the 1-3 and 1-2-3 valve combinations are quite sharp, while the 1-2 and 2-3 valve combinations are moderately sharp. (Individual valves will presumably be in tune if the instrument is in tune and the valve slides have been set properly.) A player must either "lip" the pitch downward by dropping the jaw or use some other means of lowering the pitch on the sharp valve combinations. This may be accomplished by pulling slides while playing or by using alternate fingerings. On four-valve instruments, the fourth valve can be used in place of the 1-3 combination, and 2-4 can be used in place of 1-2-3, but no such alternatives are available on instruments with only three valves. It would follow, then, that if instruments of different fundamental pitches play the same notes, the resulting difference in fingerings could create intonation problems, even if the open instruments are in tune with each other. The following diagram illustrates this point.



E-flat Fingering:	1-3	1-2-3	1-2	2-3	1-3
BB-flat Fingering:	0	2	1-3	1-2-3	0

Fig. 13. Low register fingerings for E-flat and BB-flat tubas.

It should be evident that intonation problems will arise if these pitches are played in unison by players on both E-flat and BB-flat tubas. These pitches are in fact often written in unison on tuba parts. Even when parts are divided in octaves, the point of division often does not include the F or E-natural, and these are two of the notes with the greatest potential for differences in intonation between the two pitches of tubas. Further, the common use of flat keys in band literature frequently requires that the low B-flat and C be played in unison as well. It is easy to see how inexperienced players on both pitches of instruments could have difficulty playing in tune.

Much of the difficulty could be eliminated if the E-flat instrument was equipped with a fourth valve, as are many English E-flat tubas. However, the BB-flat instrument does have certain other advantages over the E-flat. The BB-flat tuba has a lower playing register, and the larger

bore produces a bigger tone in that register. Also, BB-flat tuba players have become more and more capable of playing at the top of the E-flat instrument's range, albeit with a less satisfactory resulting tone. Professor Jay Zorn of the University of Southern California offers one more explanation:

> The E-flat upright-bell tuba is a smaller higher-pitched version of the BB-flat upright-bell tuba. It was once a very popular school instrument. It has lost its popularity because instrument makers have produced superior BB-flat upright-bell tubas, just as light as the E-flat, but with a better tone quality and the added lower register.[1]

Not one source denigrated the tone of the E-flat tuba in its most characteristic register. If overall range and intonation deficiencies were the major problems with the E-flat, then perhaps the lack of additional valves or poor quality of construction were to blame for the demise of the instrument. An examination of the instruments in the catalog will help to provide an explanation.

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[1]Jay Zorn, Brass Ensemble Method for Music Educators (Belmont, California: Wadsworth, 1977), p. 132.

CHAPTER II

CATALOG OF THE COLLECTION

The E-flat tubas in the Larson collection were divided into four general categories for the purposes of this study: (1) upright tubas, (2) sousaphones, (3) helicons, and (4) special instruments. The last category includes the bell-over-the-shoulder tubas, the raincatcher sousaphones, and other instruments which were deemed too unusual to be placed in one of the other three groups. Each instrument was examined in detail, measured, and photographed for the collection, but, because of expense, only photographs of some of the special instruments will appear in this document.

Dr. André Larson, director of the museum, and Gary M. Stewart, conservator of the collection, were consulted concerning the kinds of measurements which would be most useful for the museum records. The needs of this particular study were also considered in the consultations.

Most of the instruments have a catalog number which was assigned by the museum. A number preceded by the letter "S" indicates that the instrument was not tagged, and so a

number was assigned by this writer based upon the order in which the instruments were first examined.

Each instrument was assigned to one of the following specific categories for the purpose of the catalog: (1) upright with right-facing bell, (2) upright with left-facing bell, (3) upright with recording bell or bell-front, (4) helicon, (5) sousaphone, (6) raincatcher sousaphone, (7) bell-over-the-shoulder tuba, or (8) coiled bombardon. This information is recorded under the word "Type" in the catalog information on each instrument.

The text appearing on the outward side of the bell on the uprights (instrument in playing position) and the back of the bell on the sousaphones and helicons is the signature. All information from each signature was recorded on the first catalog sheet for each instrument, along with a rough sketch of the lettering and the signature decoration. Comments on the signature decorations are not included in this catalog, but the information was used in comparing instruments by the same maker. Likewise, any other markings on the instrument were recorded and used in the research. Markings were most often found either on the valve casings or on the leadpipe.

The manufacturer's serial number, usually found only on American instruments, was often useful in determining the age of the instrument. The serial number usually consists of a four to six digit number, sometimes prefixed with a letter or letters. This number is normally located on the

first or second valve casing, but it could be found on the bell under the signature.

Since most American manufacturers were able to provide dates if records were available, serial numbers were useful in many cases in determining the approximate date of manufacture. Dates for the York instruments were estimated based on a production curve constructed by this writer, and instruments without serial numbers were dated based on all available information, including dates of use, comparison photographs and engravings, type, quality of construction, and comparison with other instruments in the collection. Many of the European instruments were difficult to date with certainty because so little information about the manufacturers was available.

The name of the maker or agent is discussed in the catalog only if it is not apparent from the signature. In some cases, the signature does not accurately reflect the maker or the agent, and this is so noted. An agent is defined as a seller only, not one directly involved with the manufacture of the instrument.

The common material of manufacture for most of these instruments is brass. Many of the instruments are plain brass, but a number of instruments are either silver-plated, nickel-plated, or lacquered. Additionally, there are some instruments which have German silver fittings, and this information is in the catalog. The number, type, and location of the valves are also recorded. Most of the

instruments have three valves, but a few four-valve instruments are in the collection. Piston valves are most common, although a few exceptional instruments have rotary valves. The location of the valves is specified with the upright instruments as either top-action or side-action. No such specification is necessary with the helicons and sousaphones because the valve assembly location is fairly standard on those instruments.

The bore diameter measurement was taken with a caliper at the valves on each instrument. Some of the slides could not be removed in order to take an accurate measurement so an outside measurement was taken, and one millimeter was subtracted from the measurement to arrive at an estimate. An estimated bore diameter could vary by as much as .05 cm, and thus should not be considered an accurate measurement in those circumstances.

The bell diameter measurement is accurate only as long as the bell of the instrument measured is not flattened or otherwise damaged. The same may be said for the height measurement, in that bell damage or damage to the main bow could alter the height. Each instrument among the uprights was rested on the bell and measured to the top of the main bow using a square. Sousaphones and helicons were rested on the main coil and measured to the top of the bell, also using a square. The measurements of the helicons and sousaphones may vary by as much as one or two centimeters, since this was an awkward measurement to take.

Each instrument was weighed with accessories, so instrument weight for comparison may be accurate within about .3 kg. Some instruments are missing slides or other parts as well, and this alters the weight measurement. The measurement of the bow diameter on sousaphones and helicons is perhaps the least accurate of all the measurements, in that each was measured across the main coil at a position estimated to be perpendicular to the player's body. The measurement was taken on a flat surface with a square, but, because of the estimate involved, the distance could vary by as much as 3 centimeters. This was not intended to be a precise measurement.

First valve and third valve slide measurements were taken in order to assist in determining the pitch of the individual tubas. Each measurement was taken from the estimated center of the slide at point of entry into the valve casing. Measurements are accurate to approximately .5 cm, because some of the slide tubes were less accessible and difficult to measure accurately. Also, some instruments were missing parts of slides. These measurements were taken in inches and converted to centimeters using the formula: 1 inch = 2.54 cm.

The pitch of each instrument was estimated based on slide lengths, date of manufacture, and any other information provided by the museum. High-pitch instruments were constructed to approximately A-446, while low-pitch instruments were constructed to A-440. Some instruments

were built to be played at both pitch standards by either manipulating slides or adding extra tubing to the tuning slide. Other instruments were modified by the owners to convert them to low pitch, and this is so noted. It was difficult to determine a pitch standard for many of the instruments, so the pitch statements in the catalog are qualified in some cases.

The main tuning slide is placed either before or after the valve assembly on a brass instrument. This information serves both to identify the instrument and, in some cases, the location of the maker. An instrument with a tuning slide before the valve assembly has the potential for a less even expansion of the bore, because there is less room to expand after the valve assembly. An instrument with the tuning slide placed after the valve assembly may expand more evenly, if expansion takes place within the tuning slide.

The positions of the valve slides may be recorded, and that information used to identify the instrument, if no photograph is available. It also serves to identify the maker in some cases. Slide positions for sousaphones and helicons were examined to determine if the valve slides and tuning slide lay principally on top of the inner coils (instrument resting on the main coil--valves up) or under other tubing. The upright instruments were examined to see if the slides were in front of the inner coils, behind the inner coils, or in front of the inner coils but behind other slides. (The rear of the upright is that part of the

instrument which faces the player when the instrument is in playing position.)

The letter "F" is used in the catalog when the slide is on the front of the upright instrument, and the lower case equivalent is used when the slide is on the front of the instrument but behind another slide. "R" indicates a slide on the rear of an upright; "T" indicates a slide on top of the sousaphone or helicon, and "B" indicates a slide on the bottom of a sousaphone or helicon. The valves are listed in numerical order in the catalog, and the tuning slide is always listed last. For example, F-F-R-f would indicate an upright instrument with the first and second valve slides on the front of the instrument, the third valve slide in the rear, and the tuning slide in the front but under other tubing.

Measurements and slide positions were not the only details examined on the instruments. A number of other aspects of construction were examined in some detail, and this information used to compare instruments of unknown origin with instruments for which the maker was known.

The ferrules are the bands placed on brass instruments to cover and reinforce tubing joints. They are normally found between the bell section and the first or main bow, and they are also found at other locations on the main coil of the instrument. The bows of the valve slides and the tuning slide also have small ferrules. Ferrules were examined for width, location, and decoration.

The main bow and often the second bow of an upright instrument, and the main coil of a sousaphone or helicon, are commonly reinforced with an extra plate to prevent damage. The location, number, length, and cut of the plates can be examined, and this information used to compare instruments. The spine is a bar or ball which varies in height, width, design and decoration, and which is often placed on the main bow of an upright instrument, usually for additional protection. Not all of the instruments in the collection have spines, but the spine is often a distinctive feature of those instruments that do have them.

Some of the instruments in the collection have extra crooks in the valve slides to save space, and some slides are rather unusual in the way in which they enter and exit the valve casings. The slide tubing construction is sometimes a mark of a particular manufacturer, and this information can be used to discover the makers of unsigned instruments.

Large brass instruments require a significant number of braces to hold the tubing in place. The location of the braces and the size, shape, and decoration of the braces can be examined, and that information used in comparing instruments. It is also possible to compare the design of the valve buttons and caps between instruments as well as to compare such details as purfling. (Purfling on brass instruments is the edging on valve caps and buttons which provides a gripping surface.) The design of the actuating

mechanism on rotary valves is also a detail to consider. The clockwork spring mechanism found on some instruments in the collection is an example of such a detail.

The location of the bell and the length of the bell section in relation to the second bow are two details which are useful in comparing instruments. The silhouette of an instrument can also be compared with that of another instrument in order to determine if both were made by the same maker. Neither the location of the bell nor the silhouette can be used by itself to determine the origin of an instrument, but each can provide important clues.

Basic information is provided about each of the instruments in the catalog, and this is followed by a short commentary section. The comments vary in length, depending upon the nature of the instrument being discussed. Unsigned instruments have been examined in order to attempt to discover the maker, and these comments are recorded. Instruments which are unusual also receive some special attention in the commentary. No attempt has been made to judge the value of any of the tubas in the collection. Appendix C has been provided for those readers who wish to review instrument nomenclature before proceeding to the catalog.

Lecomte, Number 643

Type	coiled bombardon
Signature	11 - A. L. & Co. / A. Lecomte & Cie. / Paris
Date of manufacture	ca. 1892
Materials	nickel-plated brass
Valves	three piston
Bore diameter	1.45 cm
Bell diameter	27.6 cm
Height	71.5 cm
Weight	3.815 kg
Bow diameter	46 cm
First slide length	45.72 cm
Third slide length	82.55 cm
Tuning slide	before valve assembly
Pitch	probably high
Slide placement	F-F-F-F

This tuba is representative of an attempt to make an instrument of smaller dimensions. The close coil allows for an even expansion of the bore, even though the tuning slide is before the valve assembly. The instrument was evidently designed to be held and played like a baritone or euphonium, despite the fact that the outline is more like that of a French horn. It could have been used as a marching instrument, but it would have been much less directional than a helicon.

Arsènné-Zoe Lecomte died in 1892, and this E-flat was almost certainly made before that time because his successors kept the firm name but ceased to sell instruments.[1] A similar instrument, called a coiled bombardon, is found in the Spencer Collection, Royal Pavillion Museum, and is

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 92.

listed as having been made in Bohemia around 1880.[1] The third valve slide on the Spencer tuba is different, but otherwise the instruments are quite similar.

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[1]Graham Melvin-Mason, editor, An Exhibition of European Musical Instruments, Edinburg International Festival (Edinburg: Lorimer and Chalmers, 1969), p. 51.

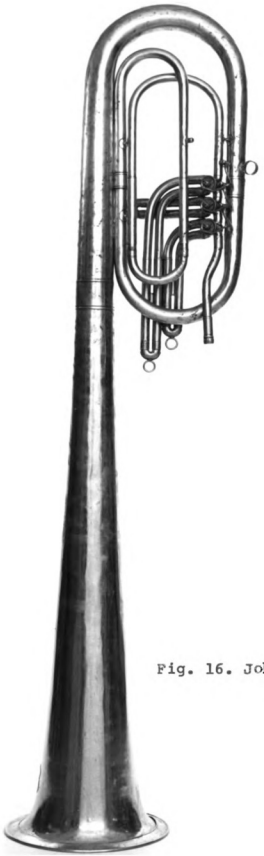

Fig. 16. John F. Stratton, Number 316.

Holton, Number 297

Type	upright with bell-forward
Signature	Made by Frank Holton & Co. / Elkhorn, Wis.
Serial number	103511
Date of manufacture	1929
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.7 cm
Bell diameter	45.2 cm
Height	98 cm
Weight	7.055 kg
First slide length	55.25 cm
Third slide length	91.44 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	F-F-F-R

This instrument was obtained at Lake Benton, Minnesota, in 1971. It is the only E-flat upright with bell-forward in the collection, and it is the only upright with a detachable bell. The basic construction is similar to the other Holton tubas in the group of E-flats, so it is quite likely that the Holton Company used the same top action design for both the bell-up and the bell-forward instruments. This tuba is similar to the other Holtons in dimensions, although the third valve slide is somewhat longer. The date was provided by the LeBlanc Company which now owns Holton, and their records indicated that No. 297 was sold as a medium E-flat recording bass.

A mouthpiece marked "20" was found with the instrument at the time of initial inspection.

Hall and Quinby, Number 247

Type	upright with left-facing bell
Signature	Made by Hall & Quinby / Boston
Date of manufacture	ca. 1866-1875
Materials	nickel-plated brass
Valves	three rotary with American string actuating mechanism
Bore diameter	estimated 1.7 cm
Bell diameter	28.3 cm
Height	106.4 cm
Weight	3.395 kg
First slide length	47.63 cm
Third slide length	80.65 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The American firm of Hall and Quinby is represented by only one instrument in the group of E-flats, but it is clearly one of the more unusual tubas in the collection. Number 247 is the only E-flat with the Allen flat-windway rotary valves. These valves were quite popular in the United States between 1850 and 1875 because of their short action, simple construction, and quiet operation.[1] Allen designed the valve system sometime between 1847 and 1852, and he began producing instruments with Allen valves about that time.[2] David Hall worked for Allen in the 1850s, and he later went into business with Benjamin Quinby of Boston, where they produced instruments with Allen valves as well.

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[1]Eliason, Early American Brass Makers, p. 15.

[2]Ibid., p. 21.

The valve assembly on this tuba is placed in the fashion of top-action instruments, but the curve in the actuating mechanism and the placement of the spatulas require that the instrument be held with the bell facing to the left in order to achieve the most comfortable right-hand position. The actuating mechanism is American string rotary, but one of a somewhat different design than that illustrated in Chapter I. The instrument is quite tall with a narrow main coil and small bell, so it is clearly closer to the bombardons or saxhorns in design than to the modern tubas. This is also evident in the relatively narrow bore. This tuba is well-crafted and in excellent condition.

Fig. 15. Quinby and Hall, Number 247.

F. Seltman, Number 310

Type	bell-over-the-shoulder
Signature	F. Seltman - Maker / Philadelphia
Date of manufacture	ca. 1860-1865
Materials	brass with German silver garland, valve spatulas and trim
Valves	three rotary with American string actuating mechanism
Bore diameter	1.525 cm
Bell diameter	30.9 cm
Height	137.8 cm
Weight	3.745 kg
First slide length	48.26 cm
Third slide length	74.93 cm
Pitch	high
Tuning slide	after valve assembly
Slide placement	R-R-R-F

Number 310 is similar in construction to No. 317, a Slater and Martin instrument. There is a prominent, decorative spine to protect the main bow and a small garland to protect the bell. The ferrules are decorative but not wide. The actuating mechanism is angled for the player's comfort, although the placement demands that the player reach across the coil to manipulate the valves as with the Slater and Martin instrument. This tuba is in good condition.

John F. Stratton, Number 316

Type	bell-over-the-shoulder
Signature	John F. Stratton / New York
Date of manufacture	ca. 1860-1865
Materials	nickel-plated brass
Valves	three rotary with American string actuating mechanism
Bore diameter	1.5 cm
Bell diameter	28.5 cm
Height	143.4 cm
Weight	3.225 kg
First slide length	48.26 cm
Third slide length	73.03 cm
Pitch	high
Tuning slide	after valve assembly
Slide placement	R-R-R-F

Number 316 is one of two bell-over-the-shoulder E-flats in the collection which were definitely made by John Stratton of New York. It is also in the best condition of the five bell-over-the-shoulder instruments.

The inner coil arrangement on this tuba and the placement of the valves appear to be characteristic of the Stratton instruments. The actuating mechanism is set to the side rather than angled. This would seem at first to create hand position problems for the player, but, when the bell is resting on the shoulder and the mouthpiece raised to the lips, the hand position is actually quite comfortable. The placement of the valve slides is similar to that of the other bell-over-the-shoulder instruments, and the mouthpipe is placed more to the right than the center of the second bow. There is a brass bell garland.

This instrument was obtained from a Mr. Fulton in Ballston Spa, New York in 1954.

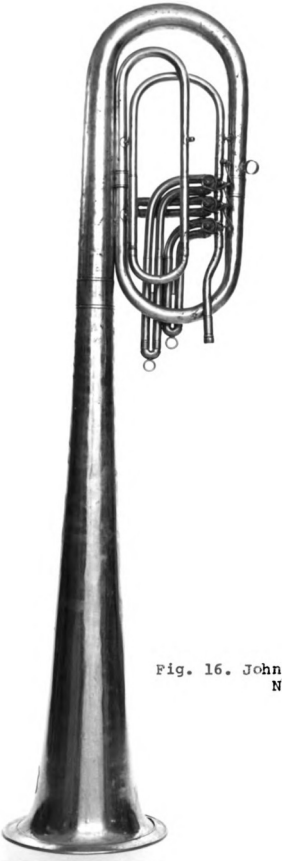


Fig. 16. John F. Stratton, Number 316.

Slater and Martin, Number 317

Type	bell-over-the-shoulder
Signature	Slater & Martin / N. Y.
Date of manufacture	ca. 1860-1865
Materials	nickel-plated brass
Valves	three rotary with American string actuating mechanism
Bore diameter	1.7 cm
Bell diameter	30.6 cm
Height	134.8 cm
Weight	4.41 kg
First slide length	50.8 cm
Third slide length	75.57 cm
Pitch	high
Tuning slide	after valve assembly
Slide placement	R-R-R-F

This is the only Slater and Martin bell-over-the-shoulder instrument in the group, but it is somewhat similar to the tuba made by Seltman of Philadelphia. The actuating mechanism on No. 317 is angled for the player's comfort. The main tuning slide is easily accessible. The quality of workmanship appears to be good. The ferrules are decorative but not particularly wide, and there is a garland to help protect the bell.

The first valve actuating mechanism has been replaced on this instrument. There is also a large dent in the tubing between the first and second bow. An unmarked, silver-plated mouthpiece is the only accessory.

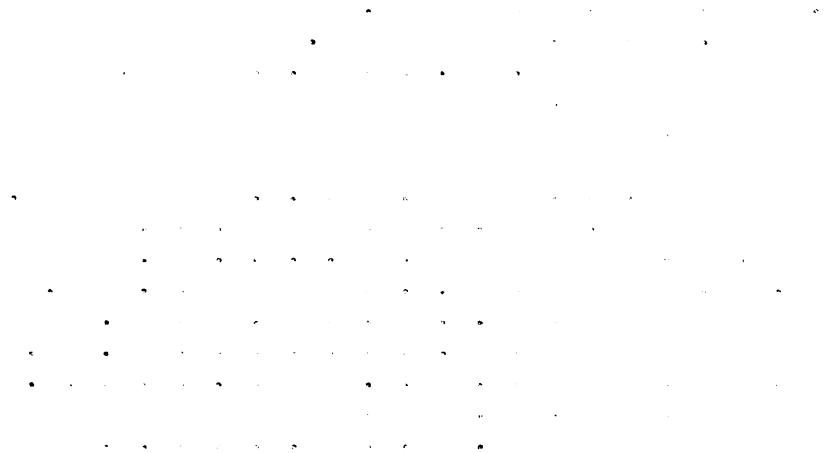
This instrument was used in the 7th Cavalry Band.

John F. Stratton, Number 1427

Type	bell-over-the-shoulder
Signature	John F. Stratton / New York
Date of manufacture	ca. 1860-1865
Materials	brass with brass garland
Valves	three rotary with American string actuating mechanism
Bore diameter	estimated 1.4 cm
Bell diameter	27 cm
Height	128.7 cm
Weight	3.115 kg
First slide length	50.8 cm
Third slide length	71.12 cm
Pitch	high
Tuning slide	after valve assembly
Slide placement	R-R-R-F

This tuba is generally in good condition despite the finish discoloration. It is missing the second valve actuating mechanism, and the second valve is separated from the valve tubing. The bore diameter was estimated from an outside measurement.

Number 1427 is quite similar to, though somewhat smaller than, No. 316, the other Stratton bell-over-the-shoulder tuba. The actuating mechanism is set to the side, as it is on the other Stratton instrument, and the inner coil and valve slide tubing arrangement are the same as those of No. 316. Each valve slide is equipped with a finger ring. There is no bell garland.



Unsigned, Number 841

Type	bell-over-the-shoulder
Signature	none
Date of manufacture	ca. 1860-1865
Materials	brass
Valves	three rotary with American string actuating mechanism
Bore diameter	estimated 1.5 cm
Bell diameter	25.3 cm
Height	129.2 cm
Weight	2.875 kg
First slide length	52.71 cm
Third slide length	76.20 cm
Pitch	high
Tuning slide	after valve assembly
Slide placement	R-R-R-F

There is no signature on this tuba, but the techniques of construction are quite similar to those of the instruments made by John Stratton of New York. The actuating mechanism is set to the side, and the valve slide tubing is set quite close together as with the Stratton instruments. There is also a clear similarity between the arrangements of the tuning slide and the inner coil. The valve slides of this instrument do not have pull rings. There is a rather small spine, unlike that of No. 1427, which this instrument most closely resembles.

Most of the actuating mechanism is missing on this tuba, and there are several bad cracks in the bell and bell section as well as a number of large dents. The plain brass surface is also quite discolored.

King, Number 341

Type	raincatcher sousaphone
Signature	King / Made by the H. N. White Co. / Cleveland, Ohio
Serial number	29017
Date of manufacture	ca. 1910
Materials	lacquered brass
Valves	three piston
Bore diameter	1.4 cm
Bell diameter	51 cm
Height	114 cm
Weight	7.825 kg
Bow diameter	64 cm
First slide length	53.34 cm
Third slide length	80.01 cm
Pitch	possibly low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

Number 341 appears to be in the best condition of the four bell-up or raincatcher type sousaphones in the collection. The King Corporation indicated that this tuba was made between 1893 and 1915, but the date of 1910 provided by the museum is perhaps more accurate because the instrument was probably not made before the twentieth century.

The construction of the main coil on this tuba is quite similar to that of the King bell-front helicons and the other King raincatcher sousaphone in that nonfunctional tubing is used to complete the coil. Valve assembly and slide construction are also similar between the King tubas, so it is possible that the company used the same basic body with both the helicons and the bell-up sousaphones. The bell-front King E-flat sousaphones are not similar in coil

construction. This instrument has a gooseneck but no mouthpiece bits. The length of the gooseneck would indicate that bits are not necessary for this instrument.

The words "King -- made by H. N. White -- Cleveland, O." are stamped on the rear of the second valve casing.

King, Number 308

Type	raincatcher sousaphone
Signature	King / Made by the H. N. White Co. / Cleveland, Ohio
Serial number	47127
Date of manufacture	ca. 1915
Materials	brass
Valves	three piston
Bore diameter	estimated 1.75 cm
Bell diameter	50.0 cm
Height	120 cm
Weight	8.035 kg
Bow diameter	.63.7 cm
First slide length	54.61 cm
Third slide length	83.82 cm
Pitch	probably low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

This raincatcher was built somewhat later than King, No. 341, but the details of construction are very similar. Unlike the York instrument, both of the King bell-up instruments and the Conn raincatcher have bells which detach at the second bell joint. There are several dents in the main coil of this tuba, and the gooseneck is missing. "King -- made by H. N. White -- Clev'd, O." appears on the rear of the first valve casing.

York, Number 372

Type	raincatcher sousaphone
Signature	J. W. York & Sons / Grand Rapids, Michigan
Serial number	66872
Date of manufacture	ca. 1917-1922
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.75 cm
Bell diameter	.49.4 cm
Height	126 cm
Weight	8.36 kg
Bow diameter	67 cm
First slide length	55.25 cm
Third slide length	84.46 cm
Pitch	high converted to low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

Number 372, a York raincatcher, was used in the Black Hills College Band in Spearfish, South Dakota, and in the Southern State (Southern Normal) College Band in Springfield, South Dakota. This instrument does not have the additional bit of nonfunctional tubing used to complete the main coil, as is the case with most of the E-flat helicons and sousaphones, but instead it has a solid shoulder rest and an additional brace between the bell section and the second bow. The design is really quite unusual.

The tuning slide is quite long because extra tubing has been added to convert the instrument to low pitch. It is missing all three valve buttons and the gooseneck.

Fig. 17. York, Number 372.

Conn, Number 364

Type	raincatcher sousaphone
Signature	Made by C. G. Conn Ltd. / Elkhart, Ind. / USA
Serial number	238345
Date of manufacture	ca. 1926
Materials	lacquered brass
Valves	three piston
Bore diameter	estimated 1.725 cm
Bell diameter	51 cm
Height	128 cm
Weight	9.785 kg
Bow diameter	68.5 cm
First slide length	50.8 cm
Third slide length	83.82 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

This raincatcher was acquired in Clear Lake, South Dakota, in 1955 by Arne Larson. There are some broken solder points, and the third valve stem, button, and cap are missing. This instrument is in good condition despite the missing valve parts.

Number 364 is the only Conn bell-up E-flat sousaphone in the collection, but the body and slide arrangement are similar to those of the other Conn sousaphones and helicons, although the valve and slide assembly appear to be set somewhat differently than that of other Conn instruments. The difference is even more dramatic between this tuba and the other raincatchers. The valve assembly is almost parallel to the ground, while the assemblies of the other bell-up instruments appear to be set between 30 and 45 degrees. There is, therefore, more space for the body of the player inside the coil of the Conn.

A silver-plated mouthpiece stamped "Conn Giant" is found with the instrument.

Unsigned, Number 309

Type	upright with right-facing bell
Signature	none
Date of manufacture	ca. 1850
Materials	brass with brass bell garland
Valves	three rotary with American string actuating mechanism
Bore diameter	1.5 cm
Bell diameter	25.6 cm
Height	60.5 cm
Weight	3.08 kg
First slide length	53.34 cm
Third slide length	83.19 cm
Pitch	probably high
Tuning slide	after valve assembly
Slide placement	F-F-F-R

Professor Arne Larson purchased this tuba in Providence, Rhode Island in 1950. The information concerning the date and manufacturer was taken from an earlier catalog sheet and may be inaccurate.

There are some similarities between this tuba and No. 247, which was made by Hall and Quinby. Both instruments have the same kind of bracing between the sets of valve slide tubes, and both have slide pull rings. The inner coil arrangment is also similar, but No. 309 has more tubing braces than the other tuba. The size and decoration of the ferrules are different between the instruments, and No. 247 has a spine to protect the main bow while this E-flat does not.

The actuating mechanism is similar to mechanisms found on the bell-over-the-shoulder tubas, but the top-action placement makes this instrument quite interesting. The

small bell and the tall, narrow body place this tuba in the earlier saxhorn or bombardon group, rather than the modern tuba group.

Part of the third valve actuating mechanism is missing. The valves are not strung.

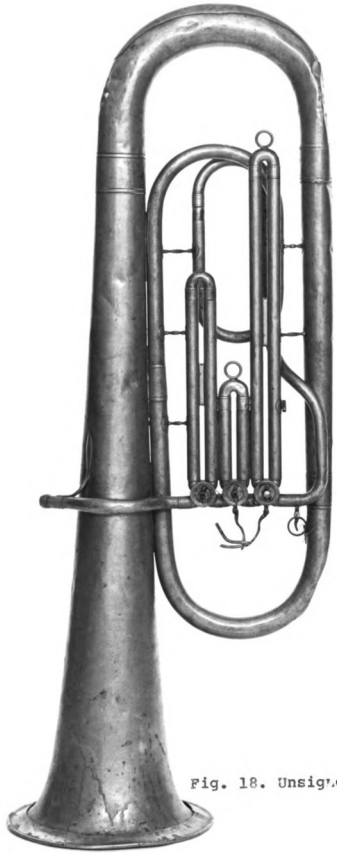


Fig. 18. Unsigned, Number 309.

Gretsch, Number 305

Type	helicon
Signature	Gretsch American
Date of manufacture	ca. 1900
Materials	silver-plated brass
Valves	three piston
Bore diameter	estimated 1.775 cm
Bell diameter	40.6 cm
Height	119.1 cm
Weight	7.57 kg
Bow diameter	65 cm
First slide length	58.42 cm
Third slide length	87.63 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The bore diameter of this helicon was estimated from an outside measurement. The gooseneck is missing. This instrument was acquired from the Pine Ridge, South Dakota Indian Reservation in 1971.

There are a number of similarities in construction between this tuba and No. 146, a King tuba, and No. S-99, also a King. The "Gretsch American" signature might indicate that the tuba was made in the United States rather than imported. The Gretsch Company was only a distributor of brass instruments, according to Langwill, so it is likely that Gretsch purchased this instrument from an American manufacturer and put the company signature on it. "Serial 1978 -- U.S.M.C." is stamped on the bell, and so the fact that this tuba was purchased by the United States Marine Corps makes it even more likely that No. 305 is an American instrument, whether made by Gretsch or not.

The date was provided by Arne Larson, but it could be incorrect since the slide length indicates an instrument of probable low pitch.

Malecki, Number 143

Type	helicon
Signature	Louis B. Malecki & Co. / Majestic / Chicago, Illinois
Date of manufacture	early twentieth century
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.45 cm
Bell diameter	40.7 cm
Height	104 cm
Weight	4.535 kg
Bow diameter	.60.5 cm
First slide length	49.53 cm
Third slide length	77.47 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	T-T-B-T

James Malecki, son of Louis Malecki, was reasonably certain that most of the Malecki tubas were made by York, but this helicon is clearly not a York instrument. The construction is like the German sousaphones in that the main tubing completes a full circle but doubles back once it reaches the bell section. The valve slide arrangement is also typical of the German sousaphones, and so it is quite likely that Malecki imported this instrument and stenciled it.

The date could only be estimated based on valve tubing length, but this tuba was almost certainly made before 1915, because Malecki moved to Grand Rapids about that time. The third valve button is missing and the first valve cap is incorrect. The gooseneck is cracked. An unmarked brass mouthpiece is found with the instrument.

Dyer, Number 145

Type	helicon
Signature	Dyers Improved Model
Date of manufacture	early twentieth century
Materials	lacquered brass
Valves	three piston
Bore diameter	1.5 cm
Bell diameter	38.4 cm
Height	104 cm
Weight	4.965 kg
Bow diameter	66 cm
First slide length	47.63 cm
Third slide length	86.36 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	T-T-B-T

This helicon is similar in all respects to No. 143, presumably a German instrument. W. J. Dyer is listed in Woodcock as a maker of stringed instruments, but the Dyer Company is not listed in the standard references of wind instrument makers.[1] It is almost certain that this tuba was not made by Dyer, but it was probably imported and stenciled. A date of manufacture cannot be established with certainty, but this appears to be a high-pitch tuba, so it was probably made before 1920.

An extension has been added to the tuning slide to convert the instrument to low pitch. There is no gooseneck.

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[1]C. Woodcock and Henley, Universal Dictionary of Violin and Bow Makers (Brighton: Amati Publishing, 1969), 7:42.

Buescher, Number 113

Type	helicon
Signature	The Buescher / Elkhart, Indiana
Serial number	25586
Date of manufacture	ca. 1915
Materials	lacquered brass
Valves	three piston
Bore diameter	1.675 cm
Bell diameter	48.4 cm
Height	100.8 cm
Weight	6.83 kg
Bow diameter	.62.6 cm
First slide length	48.26 cm
Third slide length	81.28 cm
Pitch	probably high and low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The Buescher helicons, like the King sousaphones, are constructed so that the coil completes one and one-half circles before entering the valves; however, the valve slides on this instrument are not placed the same way as the valve slides on the Buescher helicons. The distance between the slide tubes is quite small, so the valve slides appear quite long. They also appear to be less well-protected than slides on other helicons.

Lloyd Filio, brass technical director for Bach (Selmer), provided information concerning the date. The marking "Union Label MPBPB USWU," which appears on the third valve casing of this instrument was not used on Buescher tubas until 1915, according to Mr. Filio.

An extra piece of tubing has been added to the tuning slide to convert this tuba to low pitch. "Trutone -- Trademark Registered" is stamped on the first valve casing.

Buescher, Number 304

Type	helicon
Signature	The Buescher / Elkhart, Indiana
Serial number	7441
Date of manufacture	ca. 1910
Materials	silver-plated brass
Valves	four piston
Bore diameter	estimated 1.55 cm
Bell diameter	40.7 cm
Height	93.5 cm
Weight	6.29 kg
Bow diameter	55.9 cm
First slide length	53.98 cm
Third slide length	87 cm
Pitch	probably high and low
Tuning slide	before valve assembly
Slide placement	B-T-B-B-T

The date of manufacture for No. 304 was estimated based on information provided by Mr. Lloyd Filio of the Bach Corporation. The bore diameter was estimated from an outside measurement. The fourth valve is missing. The instrument appears to have been converted to low pitch through the addition of tubing to the tuning slide. Arne Larson acquired this tuba in Redwood Falls, Minnesota in 1952.

The added fourth valve makes this instrument special among the helicons in the collection. The inner coil is constructed like that of No. 113, another Buescher, but the valve tubing arrangements, tuning slide position and valve assembly angle are not similar. It is, therefore, reasonable to assume that Buescher created an entirely new valve design for the four-valve instrument. This tuba has an unmarked, silver-plated mouthpiece.

King, Number 146

Type	helicon
Signature	King / Made by H. N. White Company / Clev'd, O.
Serial number	5165
Date of manufacture	ca. 1895-1915
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.75 cm
Bell diameter	50.6 cm
Height	120 cm
Weight	7.38 kg
Bow diameter	65 cm
First slide length	54.61 cm
Third slide length	81.28 cm
Pitch	possibly high and low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

The King helicons, unlike the King sousaphones, are constructed with nonfunctional tubing to complete the main coil. The other details of construction on this instrument are similar, but not identical, to those of the other King helicons. The valve slides of this tuba have markings which may be used as guides in converting the instrument to low pitch, indicating that the instrument was made probably in the first decade of the twentieth century.

The second and third valves, the first valve cap, the second valve slide, and the gooseneck are missing from this instrument. The first valve casing bears the inscription "King -- Made by H. N. White -- Clev'd. O." A silver-plated mouthpiece marked "Buescher Tru-tone 25" is with the instrument. The estimated date of manufacturer was provided by the King Musical Instrument Company.

Holton, Number 351

Type	helicon
Signature	Made by Frank Holton & Co. / Chicago
Serial number	34750
Date of manufacture	ca. 1917
Materials	silver-plated brass
Valves	three piston
Bore diameter	estimated 1.75 cm
Bell diameter	51 cm
Height	118 cm
Weight	8.39 kg
Bow diameter	66.6 cm
First slide length	58.42 cm
Third slide length	91.44 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	B-T-B-T

Arne Larson acquired this helicon in 1958 at Clark, South Dakota. The Holton Company indicated that No. 351 was sold as a "monster" bass. Their records also indicated that the instrument was made on May 21, 1917, and that it was sold to the War Department, a fact confirmed by the "USQMC" stamped on the bell and the "USQMC -- Frank Holton -- Chicago" on the second valve casing. The inner coil is similar in construction to the inner coils of the King and Conn helicons, but unlike those instruments, the second valve tubing faces away from the bell. The bore diameter was estimated from an outside measurement.

York, Number 158

Type	helicon
Signature	Made by J. W. York & Son / Grand Rapids, Mich.
Serial number	51507
Date of manufacture	ca. 1913-1917
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.675 cm
Bell diameter	49.4 cm
Height	114 cm
Weight	7.245 kg
Bow diameter	61.3 cm
First slide length	54.61 cm
Third slide length	85.09 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

An unusual feature of the York tubas built around 1910 is the mechanism used to convert a high-pitch instrument to low pitch. It consists of an elliptical coil of tubing which has a removable slide, one end of which can be inserted into one side of the outer tuning slide tubing. One side of the inner tuning slide tubing is then inserted into the other half of the extra tubing to add the length of the extra tubing into the length of the tuning slide.

The coil construction of this helicon is similar to that of the other York helicons and to that of the Buescher helicons, since it does not double back near the bell, but follows the curve of the coil all the way around to its point of entry into the valve assembly.

The first valve button is missing on this instrument. The gooseneck has been soldered. A silver-plated

mouthpiece marked "York & Sons 19" is with this tuba. The date of manufacture is based on an estimated production curve for York instruments.

Martin, Number 142

Type	helicon
Signature	The Martin Band Instrument Company / Elkhart, Indiana
Serial number	1423
Date of manufacture	early twentieth century
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.6 cm
Bell diameter	50.5 cm
Height	113 cm
Weight	6.385 kg
Bow diameter	64.9 cm
First slide length	54.61 cm
Third slide length	82.55 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The leadpipe to the first valve is missing on this instrument, and the third valve slide has been patched. The valve slide arrangement is somewhat similar to the slide arrangements of the Conn and Pertin instruments, but not similar enough to assume that this helicon was made by someone other than Martin. Number 142 is similar but not identical in dimension and detail to the other Martin helicon, No. 901. The first valve slide on this instrument extends past the main coil, and it could easily be damaged, as could the tuning slide if extended. The main coil is completed with nonfunctional tubing.

Conn, Number 150

Type	helicon
Signature	Made by C. G. Conn / Elkhart, Ind.
Serial number	162227
Date of manufacture	ca. 1918
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.75 cm
Bell diameter	48.7 cm
Height	125.5 cm
Weight	7.9 kg
Bow diameter	68.5 cm
First slide length	55.88 cm
Third slide length	88.9 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

This is one of three Conn helicons in the collection. Like all of the American helicons, except for the Bueschers, there is a prominent bell brace connecting the bell to the main bow, and the main bow is completed with a nonfunctional piece of tubing. The instrument most closely resembles Conn, No. 147, which is similar in dimensions. The gooseneck is missing.

King, Number S-99

Type	helicon
Signature	King / Made by H. N. White Co. / Cleveland, O.
Serial number	5103
Date of manufacture	ca. 1893-1915
Materials	brass
Valves	three piston
Bore diameter	estimated 1.75 cm
Bell diameter	.50.7 cm
Height	113.7 cm
Weight	.6.79 kg
Bow diameter	67 cm
First slide length	52.07 cm
Third slide length	83.82 cm
Pitch	.probably high
Tuning slide	before valve assembly
Slide placement	B-T-B-T

The date of manufacture for this instrument was estimated by Mr. Sal Cardello of King Musical Instruments. The serial number is low enough to make it fairly certain that this tuba was manufactured before 1900. The construction is virtually the same as the other King helicons, although there are some differences in the ferrules. An extra nonfunctional piece of tubing is used to complete the main bow, and the rather prominent shoulder rest helps to strengthen the tubing.

Unfortunately, the tuning slide and the gooseneck are missing from this tuba, and it is broken apart at the main bow. Both ferrules are missing at the break points. The bore diameter had to be estimated from an outside measurement. The first valve casing is stamped with the inscription "King -- made by H. N. White Co. -- Clev'd. O."

York, Number 360

Type	helicon
Signature	Made by J. W. York & Sons / Grand Rapids, Mich.
Serial number	31293
Date of manufacture	ca. 1905-1911
Materials	brass
Valves	three piston
Bore diameter	estimated 1.7 cm
Bell diameter	49.4 cm
Height	112 cm
Weight	7.365 kg
Bow diameter	65 cm
First slide length	53.34 cm
Third slide length	83.82 cm
Pitch	possibly high and low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

Number 360 is almost identical in proportion to the other York helicon, No. 158. This instrument was built about seven years earlier, but, like the other York, it has the extra "doughnut" of tubing to convert from high pitch to low pitch. The gooseneck, the main bell brace, and the valve buttons are missing, but the tuba is in generally good condition. The helicon was used in the Oakland, Nebraska city band, and it was acquired by Arne Larson in 1972. A "York & Sons 18" silver-plated mouthpiece is with this instrument. The bore diameter was estimated from an outside measurement.

Pertin, Number 1169

Type	helicon
Signature	Pertin American / Chicago USA
Serial number	49245
Date of manufacture	early twentieth century
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.775 cm
Bell diameter	.50.7 cm
Height	126 cm
Weight	8.63 kg
Bow diameter	67.7 cm
First slide length	53.34 cm
Third slide length	83.82 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

This is the only Pertin instrument in the E-flat collection. The arrangement of the valve slides and the main coil tubing on this instrument are quite similar to the slides and tubing of a Conn helicon, No. 150, although the bell brace is significantly shorter than the brace on the Conn tuba. Except for the valve slide lengths, dimensions are also quite similar. There is very little decoration, and even the ferrules are quite plain.

Little information is available about the Pertin company, so it is not known for certain if Pertin manufactured this instrument. It may have been made by Conn for Pertin, but it is an American made instrument.

Girardi, Number 313

Type	helicon
Signature	Girardi Strumenti Musicali / Corso Garibaldi, Napoli / 100
Date of manufacture	late nineteenth or early twentieth century
Materials	brass with German silver garland, ferrules and brace pads
Valves	three rotary with clockwork spring mechanism
Bore diameter	1.95 cm
Bell diameter	27.7 cm
Height	108.5 cm
Weight	5.21 kg
Bow diameter	70 cm
First slide length	58.42 cm
Third slide length	92.71 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-B-B

Very little is known about the origin of this instrument other than the information given on the signature which translates "Girardi Musical Instruments - Garibaldi Street - Naples." This instrument is probably the most unusual helicon in the collection, however, and it is the only helicon with any significant amount of decoration. It is also one of only two helicons with clockwork mechanism rotary valves.

The construction of this tuba is also unusual in that the main coil does not form a complete circle. One side of the coil is flat, and the second bow is connected to the bell section. The main tuning slide is exposed, and the valve slide construction is unusual because of the rotary valves. The leadpipe is braced, but it is also very exposed. The dimensions of this instrument appear to be

smaller, probably because the bell does not flare, but the bore is the largest of the helicons. The German silver valve mechanism is decorated with floral patterns, and the linkage is also quite ornate. All of the ferrules and brace pads are German silver.

The quality of workmanship would indicate that No. 313 was made in the later nineteenth or early twentieth century, but comparison is difficult since it is the only Italian E-flat instrument in the collection. An unmarked silver-plated mouthpiece is with this tuba.

Conn, Number 680

Type	helicon
Signature	Made by Conn / Worcester, Mass.
Serial number	19243
Date of manufacture	ca. 1890
Materials	brass
Valves	three piston
Bore diameter	1.65 cm
Bell diameter	36.8 cm
Height	106.4 cm
Weight	.4.99 kg
Bow diameter	65 cm
First slide length	53.34 cm
Third slide length	81.28 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	B-B-B-T

Number 680 is a much smaller instrument in dimensions than are the other Conn helicons, and there are some differences in construction as well, most notably in the valve tubing arrangement. The main coil of this tuba is completed with nonfunctional tubing as with the other Conns, but No. 680 also has a prominent shoulder rest similar to the shoulder rests on the Holton and King helicons. This tuba weighs almost half as much as the other Conns, and the bore is significantly smaller as well. It is almost certainly a high-pitch instrument because of the date of manufacture, although the valve slides are quite long for a high-pitch instrument.

Fig. 19. Conn, Number 680.

Edmund Paulus, Number 683

Type	helicon
Signature	Edmund Paulus / Markneukirken / Sachsen
Date of manufacture	ca. 1878-1898
Materials	nickel-plated brass
Valves	three rotary with clockwork spring mechanism
Bore diameter	1.85 cm
Bell diameter	33.9 cm
Height	102.8 cm
Weight	5.245 kg
Bow diameter	61.5 cm
First slide length	52.07 cm
Third slide length	73.03 cm
Pitch	probably high
Tuning slide	after valve assembly
Slide placement	T-T-B-B

This is the only instrument in the group of E-flats to have been made by the German maker Edmund Paulus. The tubing arrangement is quite similar to that of No. 313, the Girardi helicon, but the construction appears to be more solid, though less ornate. The inner coil and the valve slides are more tightly grouped on this tuba, and the Paulus instrument has more bell flare than the Girardi, but, like the Girardi helicon, this instrument has three rotary valves with the clockwork spring actuating mechanism. The quality of construction is quite good except for the tuning slide, which was modified by an amateur to convert the instrument to low pitch. The date of manufacture was estimated based on the dates between which Paulus was known to have manufactured instruments.

Unsigned, Number 105

Type	helicon
Signature	none
Date of manufacture	ca. 1870
Materials	nickel-plated brass
Valves	three piston
Bore diameter	1.5 cm
Bell diameter	30.9 cm
Height	91.5 cm
Weight	4.525 kg
Bow diameter	62 cm
First slide length	45.72 cm
Third slide length	76.20 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	T-T-B-B

Both the date and place of manufacture listed on the catalog sheet were provided by Arne Larson. He acquired this helicon in 1970 from Mr. Harry Schwab of Aberdeen, South Dakota. The second valve cap and all the valve buttons are missing.

Number 105 is an instrument of relatively small dimensions compared to the rest of the helicons. The valve tubing arrangement is quite like that of No. 682, an instrument by Henri Gunkel, but the angle of placement, the bracing, and the tuning slide position are different. This tuba also has much in common with the Jaubert helicon, as well as with the Malecki and Dyer imports, which indicates that it was probably manufactured in either Germany or France. The main coil is entirely functional and similar in construction to the French instruments. This tuba is well-crafted but very plain.

Henry Gunkel, Number 682

Type	helicon
Signature	Henry Gunkel / Paris / Lyon & Healy / Chicago / Sole Agents
Date of manufacture	late nineteenth century
Materials	brass, spray painted gold
Valves	three piston
Bore diameter	1.75 cm
Bell diameter	36.6 cm
Height	96.6 cm
Weight	5.3 kg
Bow diameter	66 cm
First slide length	50.8 cm
Third slide length	88.9 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	T-T-T-B

The leadpipe of this tuba goes to the third valve rather than to the first valve as is more common. The tuning slide, perhaps to make the tubing more compact, doubles back on itself before entering the third valve casing. Like many of the imported instruments, the quality of workmanship is solid but not of the highest caliber. The main coil is completely functional like those of the Buescher and Jaubert instruments, but there is no bell brace, and only one large brace stabilizes the valve and slide assembly.

This instrument was probably made in the nineteenth century and is likely high pitch, although the third valve slide is quite long. Some European instruments are built with a third valve which lowers the pitch two rather than one and one-half steps, but that is unlikely in this case because No. 682 was evidently built to be sold in the United States. The gooseneck is missing.

King, Number 252

Type	helicon
Signature	King / Made by the H. N. White Co. / Clev'd, O.
Serial number	61616
Date of manufacture	ca. 1915-1925
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.75 cm
Bell diameter	50.6 cm
Height	120 cm
Weight	8.235 kg
Bow diameter	69.5 cm
First slide length	58.42 cm
Third slide length	85.09 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

The information about the date of manufacture was provided by Mr. Sal Cardello of King Musical Instruments, although the King records indicated this serial number was for an upright rather than a helicon tuba. The date is probably correct in either case.

The dimensions and weight of this instrument are quite similar to those of No. 146, also a King, and the construction is similar, even though No. 146 was evidently made much earlier. The main difference is that the valve slide lengths are longer for this tuba because it is a low pitch instrument. It was used in Platte, South Dakota, between 1920 and 1950.

Conn, Number 147

Type	helicon
Signature	Made by C. G. Conn Ltd. / Elkhart, Indiana / USA
Serial number	249173
Date of manufacture	ca. 1927
Materials	brass
Valves	three piston
Bore diameter	1.775 cm
Bell diameter	50.4 cm
Height	126.5 cm
Weight	8.98 kg
Bow diameter	68.8 cm
First slide length	55.88 cm
Third slide length	85.09 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

This instrument, because of the date of manufacture, represents what may have been one of the last generation of Conn helicon tubas. That cannot be verified, because the Conn records were destroyed by fire, but Mr. Howard Sandberg of the Conn Corporation indicated that Conn probably made its last helicons sometime in the 1930s, and this tuba was made in 1927. The details of construction and the dimensions of this instrument are almost identical to those of No. 150, another Conn helicon. Nonfunctional tubing is used to complete the main coil. The third valve button is not original.

F. Jaubert, Number 2726

Type	helicon
Signature	F. Jaubert & Cie Paris / Lyon and Healy / Chicago / Sole Agents
Date of manufacture	late nineteenth century
Materials	brass
Valves	three piston
Bore diameter	estimated 1.525 cm
Bell diameter	31.2 cm
Height	90 cm
Weight	4.32 kg
Bow diameter	62 cm
First slide length	45.72 cm
Third slide length	76.20 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	B-T-T-B

The valve tubing arrangement on this helicon is very similar to that of other European instruments. The second valve slide and the third valve slide encircle the valve assembly. The main coil is completely functional, and the main brace for the valve assembly is also functional. The workmanship is adequate, and the instrument is quite plain.

The second and third valve buttons are missing, and the leadpipe and main brace are detached from the body of the instrument. The leadpipe goes to the third valve rather than to the first. The bore diameter was estimated from an outside measurement.

Buescher, Number 1508

Type	helicon
Signature	The Buescher / Elkhart, Indiana
Date of manufacture	1888-1900
Materials	silver-plated brass
Valves	three piston
Bore diameter	estimated 1.55 cm
Bell diameter	48.9 cm
Height	103.4 cm
Weight	6.13 kg
Bow diameter	63 cm
First slide length	48.26 cm
Third slide length	81.28 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	B-T-T-T

Number 1508 has the most unusual valve slide arrangement of any of the American made helicons. All of the slides face to the rear, and the whole valve assembly appears to be very open and prone to damage, although the bracing does seem to be quite solid. All of the tubing is functional, and, in many respects, this instrument is very much the same as the other Buescher helicons, but the quality of construction would indicate that No. 1508 was made somewhat earlier. The bell has been flattened, so it is difficult to gauge the flare.

The bore diameter was estimated from an outside measurement. The gooseneck has been broken and soldered. The date of manufacture was estimate based on information provided by Mr. Lloyd Filio of Selmer.

Martin, Number 901

Type	helicon
Signature	The Martin Band Instrument Co. / Elkhart, Ind.
Date of manufacture	twentieth century
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.6 cm
Bell diameter	50.7 cm
Height	109.5 cm
Weight	6.54 kg
Bow diameter	.66.5 cm
First slide length	52.07 cm
Third slide length	87.63 cm
Pitch	possibly high
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The lack of detailed information about the Martin company makes it difficult to date the Martin band instruments. Martin was established in the early twentieth century, so it is reasonable to assume that this tuba was made between 1900 and 1920. The number "233" on the second valve casing could be a serial number, but that seems unlikely.

The details of construction are remarkably similar to those of Conn instruments, even though the dimensions are dissimilar. The valve assembly is constructed the same way, but the tuning slide on the Martin instrument appears to be wider. Both groups of instruments use nonfunctional tubing to complete the main coil. The decoration on the ferrules of this tuba is not inconsistent with the ferrule decoration on the Conn instruments. Number 901, like the other Martin helicon, appears to have the first valve slide protruding beyond the main coil where it would be more apt to be damaged.

Pan American, Number 373

Type	sousaphone
Signature	Pan American / Made in Elkhart, Ind. USA
Serial number	67215
Date of manufacture	ca. 1920
Materials	silver-plated brass with gold plated bell
Valves	three piston
Bore diameter	estimated 1.65 cm
Bell diameter	60.7 cm
Height	128 cm
Weight	8.93 kg
Bow diameter	67 cm
First slide length	54.61 cm
Third slide length	83.82 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The bore diameter of this instrument was estimated from an outside measurement. Information concerning the date of manufacture was provided by Mr. Charles Gorby. Number 373 was obtained in Rapid City, South Dakota, in 1974 from James Cutlin. The third valve button, gooseneck, and tuning slide are missing.

Number 373 is similar in all respect to the other Pan American sousaphones in the group. The valve assembly construction is similar to that of many of the American instruments. Nonfunctional tubing is used to complete the main coil.

King, Number 320

Type	sousaphone
Signature	King / Made by the H. N. White Co. / Cleveland, O.
Serial number	212565
Date of manufacture	ca. 1935-1940
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.775 cm
Bell diameter	60.7 cm
Height	119 cm
Weight	9.28 kg
Bow diameter	62 cm
First slide length	53.34 cm
Third slide length	86.36 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

This sousaphone was obtained in 1971 from the Brandon Music Company in Duluth, Minnesota. The valve buttons, bell screws, gooseneck, and receiver have been removed.

The King sousaphones are very much like many other American instruments in construction, but the Kings have the second, smaller coil rather than the nonfunctional tubing found on many of the other American instruments. This gives the instrument one and one-half coils before the tubing enters the valve assembly.

The date of manufacture was provided by Mr. Sal Cardello of King Musical Instruments. The marking "King -- made by the H. N. White Co. -- Clev'd, O." appears on the rear of the first valve casing.

Anton Bach, Number 156

Type	sousaphone
Signature	Anton Bach / Grazlitz
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston
Bore diameter	estimated 1.4 cm
Bell diameter	60.7 cm
Height	126.5 cm
Weight	7.045 kg
Bow diameter	61 cm
First slide length	50.8 cm
Third slide length	80.01 cm
Pitch	possibly high
Tuning slide	before valve assembly
Slide placement	T-T-B-T

Anton Bach is not listed as an instrument maker in the standard references, so it is difficult to pinpoint a date of manufacture for this sousaphone. However, this tuba is virtually identical in construction to No. 347, a Bohland and Fuchs E-flat, even to the valve slide arrangements, coil construction, and bracing. The dimensions are similar as well. Anton Bach may have been an employee of Bohland and Fuchs who either started his own small shop or put his name on Bohland and Fuchs instruments.

The construction of the main coil seems to be the same among all European instruments. The main coil is completed with functional tubing, but it immediately doubles back on itself once it reaches the bell section. The bell of this sousaphone is quite wrinkled, and two bell screws are missing, but otherwise the tuba is in good condition. The bore diameter was estimated from an outside measurement.

Conn, Number 1222

Type	sousaphone
Signature	Sousaphone / Made by C. G. Conn Ltd. / Elkhart, Ind. / USA
Serial number	239279
Date of manufacture	ca. 1926
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.775 cm
Bell diameter	58.5 cm
Height	130 cm
Weight	11.13 kg
Bow diameter	68.2 cm
First slide length	54.61 cm
Third slide length	85.09 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

Arne Larson obtained this sousaphone from Stan Fritts, a musical instrument dealer in Yankton, South Dakota. The gooseneck is missing.

All of the Conn sousaphones are very similar in construction. All have nonfunctional tubing to complete the main coil, and this nonfunctional tubing serves as a shoulder rest for the player. Number 1222 is different from some of the other Conns in that a wider shoulder rest is soldered to the tubing, so that the instrument weight can be distributed more evenly on the player's shoulder. The shoulder rest is nothing more than a flat strip of metal, perhaps twice as wide as the tubing to which it is anchored. Only three of the Conn sousaphones, including No. 1222, have this shoulder rest.

Martin, Number 369

Type	sousaphone
Signature	The Martin / Elkhart, Ind. USA
Serial number	177282
Date of manufacture	ca. 1930
Materials	silver-plated brass with gold-plated bell
Valves	three piston
Bore diameter	1.75 cm
Bell diameter	61.2 cm
Height	126.5 cm
Weight	10.97 kg
Bow diameter	68 cm
First slide length	54.61 cm
Third slide length	86.36 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The "U.S." stamped under the signature on this instrument indicates that it was probably used in the military, although it was obtained from the Emery, South Dakota high school in 1974. The tubing arrangement is typical of that of many of the American sousaphones, and nonfunctional tubing is used to complete the main coil. This tuba is quite well built, as are most of the Martin instruments in the collection, but the valve assembly is loose, and several braces are missing because of years of abuse. There is also a foam shoulder rest attached to the instrument. The date of manufacture was provided by Arne Larson.

Conn, Number 1463

Type	sousaphone
Signature	Made by C. G. Conn Ltd. / Elkhart, Ind. USA
Serial number	218210
Date of manufacture	ca. 1924
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.675 cm
Bell diameter	58.8 cm
Height	126.5 cm
Weight	11.26 kg
Bow diameter	58 cm
First slide length	52.07 cm
Third slide length	85.09 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

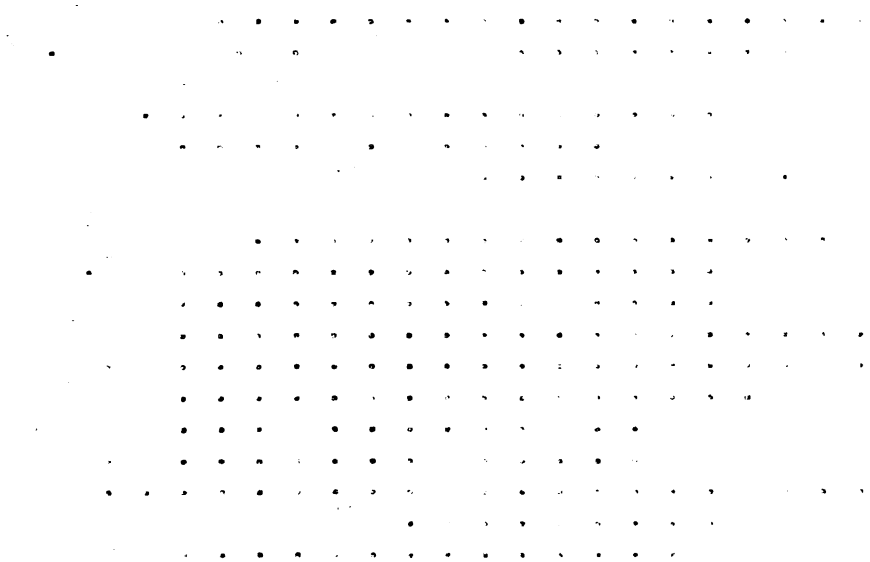
Arne Larson acquired this sousaphone at Grand Forks, North Dakota in 1971. The construction is similar to that of the other Conn instruments in this group. Nonfunctional tubing is used to complete the main coil, but this tuba does not have the shoulder rest found on some of the other Conns. The first valve slide is missing.

Conn, Number 326

Type	sousaphone
Signature	Made by C. G. Conn Ltd. / Elkhart, Ind. USA
Serial number	214084
Date of manufacture	ca. 1924
Materials	silver-plated brass with gold-plated bell
Valves	three piston
Bore diameter	1.8 cm
Bell diameter	58 cm
Height	121 cm
Weight	11.27 kg
Bow diameter	68 cm
First slide length	55.25 cm
Third slide length	85.09 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

Number 326 was made about the same time as Conn, No. 1463, and the two instruments look alike, but the dimensions are not similar. This sousaphone has a much larger bore and longer valve slides than the other instrument. Nonfunctional tubing is used to complete the main coil, and there is no shoulder rest.

The gooseneck, second valve button, and water key are missing from this tuba, and the first valve button is not original. There is also some bell damage. This sousaphone was obtained from the high school in Wakonda, South Dakota in 1971.



Concertone, Number 1228

Type	sousaphone
Signature	Concertone
Date of manufacture	ca. 1910-1920
Materials	lacquered brass
Valves	three piston
Bore diameter	estimated 1.725 cm
Bell diameter	60.7 cm
Height	121 cm
Weight	9.045 kg
Bow diameter	61 cm
First slide length	48.26 cm
Third slide length	76.2 cm
Pitch	probably high
Tuning slide	after valve assembly
Slide placement	T-T-T-B

This instrument has two rather long, weak braces which support the valve assembly and the leadpipe. The valve slide assembly is also unusual in that all the valve slides face to the rear, as with some of the European instrument valve assemblies. Nonfunctional tubing is used to complete the main coil, but the joint is different than that of the American instruments with nonfunctional tubing. No. 1228 resembles No. 375 in slide construction and No. 340 in dimensions and construction of ferrules. This sousaphone is most likely an import, as were many of the Concertone instruments sold by Montgomery Ward and Company.

The bell of this tuba has been badly damaged. The bore diameter had to be estimated from an outside measurement because the slides would not move. An unmarked, silver-plated mouthpiece is with the instrument.

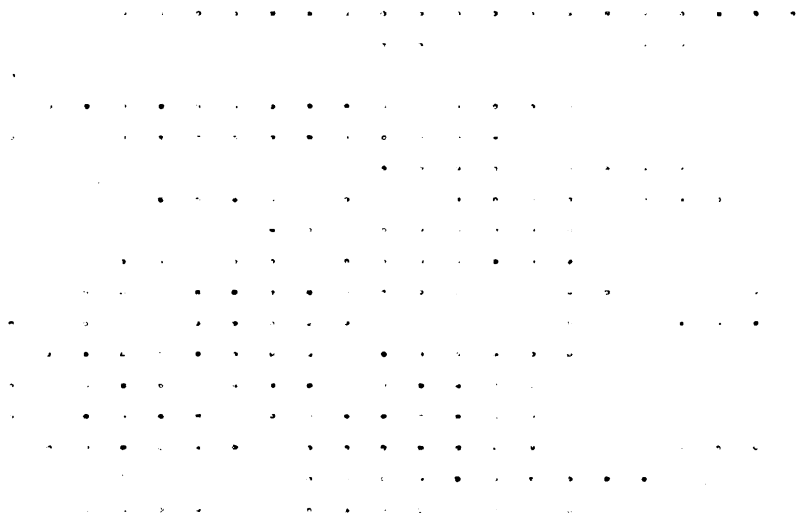
Conn, Number 2670

Type	sousaphone
Signature	Made by C. G. Conn / Elkhart, Ind. USA
Serial number	298694
Date of manufacture	ca. 1932
Materials	silver-plated brass
Valves	four piston
Bore diameter	estimated 1.75 cm
Bell diameter	61 cm
Height	132 cm
Weight	11.77 kg
Bow diameter	.69.5 cm
First slide length	53.98 cm
Third slide length	83.82 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	.T-T-T-B-B

The additional marking under the signature, "USQMC," indicates that No. 2670 was purchased by, and perhaps built for, the United States Quartermaster Corps, the supply branch of the United States Army. This sousaphone and one other four-valve sousaphone were purchased by the government, so it is reasonable to assume that government specifications at the time required four-valve E-flat instruments.

The addition of the fourth valve does not appear to alter the basic valve arrangement common to the Conn sousaphones. The fourth valve tubing is unusual, in that it follows the curve of the main tubing for at least part of its length. Number 2670 has the same kind of shoulder rest found on Conn, No. 1222 and others, and nonfunctional tubing is used to complete the main coil.

The bore diameter of this instrument was estimated from an outside measurement. The gooseneck and the fourth valve are missing.

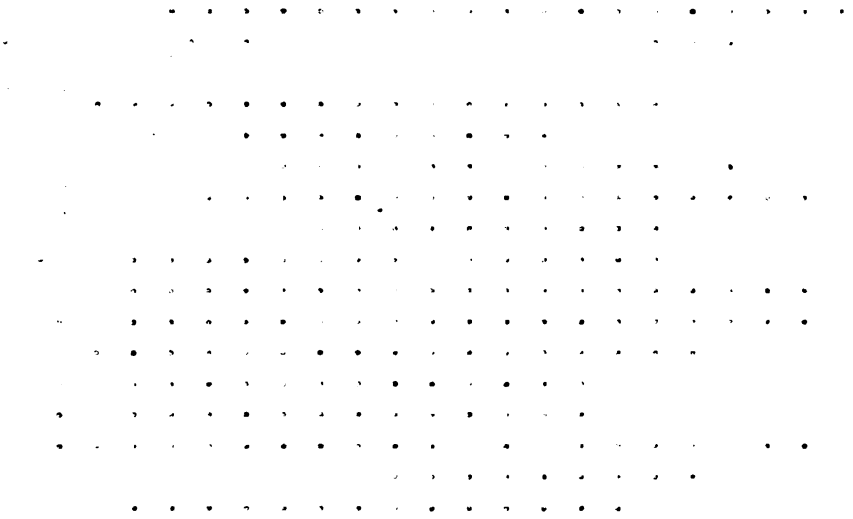


King, Number 1210

Type	sousaphone
Signature	King / Made by the H. N. White Co. / Cleveland, Ohio
Serial number	248185
Date of manufacture	ca. 1940-1945
Materials	lacquered brass
Valves	three piston
Bore diameter	estimated 1.725 cm
Bell diameter	60.5 cm
Height	119 cm
Weight	8.99 kg
Bow diameter	51 cm
First slide length	53.34 cm
Third slide length	89.53 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

The bore diameter of this sousaphone was estimated from an outside measurement. The gooseneck is missing. Information on the date of manufacture was provided by Mr. Sal Cardello of King Musical Instruments. "King -- Made by H. N. White -- Clev'd, O." is stamped on the first valve casing.

The main coil of No. 1210 is fully functional, as it is on the other King sousaphones, so there are one and one-half coils in the instrument before the tubing enters the valve assembly. This instrument is constructed very much like King, No. 320 in all details.



Elkhart, Number 322

Type	sousaphone
Signature	The Elkhart Band Instrument Co. / Elkhart, Indiana, USA
Serial number	115263
Date of manufacture	ca. 1930
Materials	lacquered brass
Valves	three piston
Bore diameter	estimated 1.6 cm
Bell diameter	60.9 cm
Height	132 cm
Weight	8.485 kg
Bow diameter	69 cm
First slide length	55.88 cm
Third slide length	83.82 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

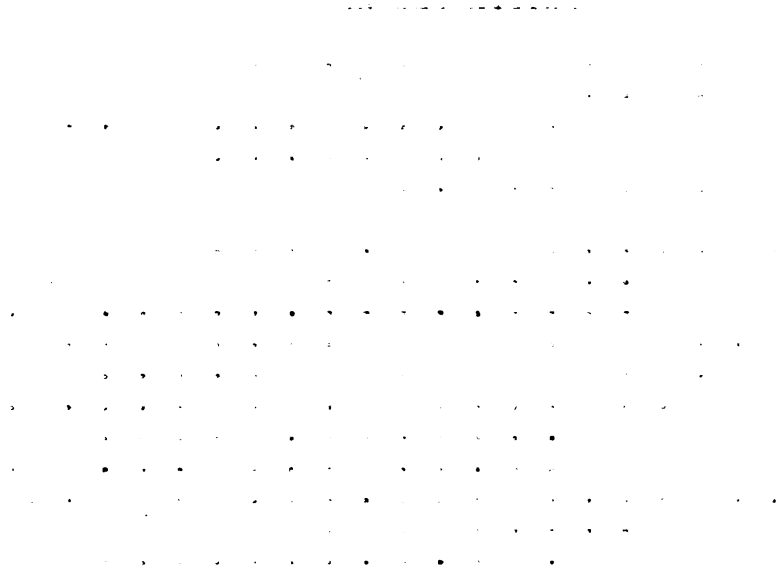
Arne Larson acquired this sousaphone from the Brookings Music Store in Verdi, Minnesota in 1968. Dr. Larson provided two dates of manufacture for No. 33: 1918 and 1930. The latter date seems more likely because the tuba is clearly low pitch. The construction of No. 322 is much like many of the other American made sousaphones, but the quality suggests that it was designed to be sold as a moderately-priced instrument. According to Mr. Lloyd Filio, Conn and Buescher co-built some Elkhart Band Instrument tubas after Conn purchased the company, so this sousaphone may well be one of those instruments, since they were evidently built to be sold more cheaply. Nonfunctional tubing is used to complete the main coil. The valve assembly is much like that of the Conn sousaphones. The bore diameter was estimated from an outside measurement. The gooseneck is missing.

York, Number 1229

Type	sousaphone
Signature	York / Grand Rapids, Michigan
Serial number	79736
Date of manufacture	ca. 1920-1925
Materials	silver-plated brass with gold-plated bell
Valves	four piston
Bore diameter	estimated 1.675 cm
Bell diameter	66.5 cm
Height	127 cm
Weight	10.26 kg
Bow diameter	69.5 cm
First slide length	55.88 cm
Third slide length	88.9 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B-B

Number 1229 is the most unusual of the four-valve sousaphones in the collection. The nonfunctional tubing used to complete the main coil on many instruments is not found here. Instead, there is a rather prominent shoulder rest which completes the first coil. It is attached between the end of the main bow and the small coil going to the valve assembly. The valve assembly and slide tubing are set at a very high angle compared to most of the other sousaphones, and the fourth valve tubing follows the curve of the main coil for part of its length. This is quite different from the four-valve Conn instrument. No. 1229 could have been made for a government contract, but there are no markings on it to indicate that it was purchased by the government.

This sousaphone was obtained from Stan Fritts, a musical instrument dealer in Yankton, South Dakota in 1975. The gooseneck is missing. Some repair work has been done. The bore diameter was estimated from an outside measurement.



American Standard, Number 154

Type	sousaphone
Signature	American Standard High Grade / Made by Cleveland Musical Instrument Company / Cleveland, O.
Serial number	23706
Date of manufacture	ca. 1930
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.775 cm
Bell diameter	55.6 cm
Height	116 cm
Weight	8.73 kg
Bow diameter	59.3 cm
First slide length	53.34 cm
Third slide length	83.82 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

The details of construction of No. 154 are very much the same as the details of the King sousaphones in the group, although there are differences in the angle of placement of the valve and slide assembly and in the length of the third valve slide. The coil is fully functional.

It is reasonable to assume that No. 154 was made after the Cleveland Musical Instrument Company was purchased by King, and that this sousaphone was designed to be a moderately priced instrument. The ferrules on this tuba are plain, but the quality of construction is generally good, yet not quite as good as the King sousaphones.

"Presented to Aberdeen High by Class 1930" has been engraved under the signature, and the date of manufacture was estimated based on this information. A silver-plated mouthpiece stamped "35" is with this tuba.

Pan American, Number 900

Type	sousaphone
Signature	Pan American / Made in Elkhart Ind. USA
Serial number	P61059
Date of manufacture	ca. 1920
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.6 cm
Bell diameter	60.7 cm
Height	126 cm
Weight	9.095 kg
Bow diameter	68 cm
First slide length	56.51 cm
Third slide length	84.46 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The date for this sousaphone was provided by Mr. Charles Gorby, a musical instrument dealer and collector. Number 900 is like the other Pan American sousaphones in that nonfunctional tubing is used to complete the main coil, and the valve assembly is similar to valve assemblies commonly found on many of the American instruments.

Number 900 is equipped with a padded shoulder rest. Two of the three bell screws are missing, but it is otherwise complete and has an unmarked nickel-plated mouthpiece. The finish has deteriorated, but the instrument is in good condition.

Concertone, Number 340

Type	sousaphone
Signature	Concertone
Date of manufacture	early twentieth century
Materials	lacquered brass
Valves	three piston
Bore diameter	1.65 cm
Bell diameter	60 cm
Height	130 cm
Weight	9.11 kg
Bow diameter	67 cm
First slide length	49.5 cm
Third slide length	78.74 cm
Pitch	probably high
Tuning slide	after valve assembly
Slide placement	T-T-T-B

Information about the date and place of manufacture for this tuba were provided by Dr. Arne Larson. Many of the Concertone band instruments sold by Montgomery Ward were made in Europe, and this sousaphone does not appear to be an exception. It is most similar to No. 375, an unsigned instrument, and it shares certain features with other instruments presumed to be of European origin, most especially in the construction of the valve slides. Like No. 375, this instrument has some very long, rather weak braces to secure the valve and slide assembly to the body of the instrument. It also has the nonfunctional tubing to complete the main coil, as well as the unusual brass ball at the bottom of the main coil.

There is some bell damage, but No. 340 is in generally good condition. A silver-plated mouthpiece marked "H. N. White Equa-true 25" is with this instrument.

Pan American, Number 358

Type	sousaphone
Signature	Pan American / Elkhart, Ind. USA
Serial number	97564
Date of manufacture	ca. 1922
Materials	silver-plated brass
Valves	three piston
Bore diameter	estimated 1.6 cm
Bell diameter	60.8 cm
Height	126 cm
Weight	8.695 kg
Bow diameter	68 cm
First slide length	56.51 cm
Third slide length	84.46 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The date for this instrument was provided by Mr. Charles Gorby. The bore diameter was estimated from an outside measurement. Number 358 is missing the gooseneck, but it is in good condition. Arne Larson acquired it for the collection in 1950.

All four of the Pan American sousaphones in the group were made about the same time and are very much alike in basic construction, however, some of the braces on this instrument are different. A few of the braces between the slide tubes are curved rather than straight, and the ferrules of this tuba appear to be more decorative. This is perhaps one of the newest of the Pan American instruments, and so there could have been some minor design changes in the later models.

Keefer, Number 1225

Type	sousaphone
Signature	Keefer
Serial number	24180
Date of manufacture	ca. 1939
Materials	silver-plated brass
Valves	three piston
Bore diameter	estimated 1.775 cm
Bell diameter	59 cm
Height	146 cm
Weight	8.23 kg
Bow diameter	68 cm
First slide length	58.42 cm
Third slide length	89.54 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-B-T

The valve tubing and tuning slide arrangement of this tuba is the most unusual of any of the E-flat sousaphones in the collection. The valve slides point upward toward the bell and lay almost on top of one another, rather than being grouped together below the valve assembly. The tuning slide is in the usual position, but it is completely exposed, and the bore expansion into the main coil is quite evident. This arrangement is the most visually interesting, but perhaps it is the most prone to damage. The main coil is completed with nonfunctional tubing, and this is protected and strengthened by a prominent brace/shoulder rest.

The date for this instrument was established based on information provided by Mr. Lloyd Farrar, and knowledge of its existence has helped to verify manufacturing figures estimated by Mr. Farrar. It was acquired in 1973 from the Alcester, South Dakota public schools. The bore diameter was estimated from an outside measurement.

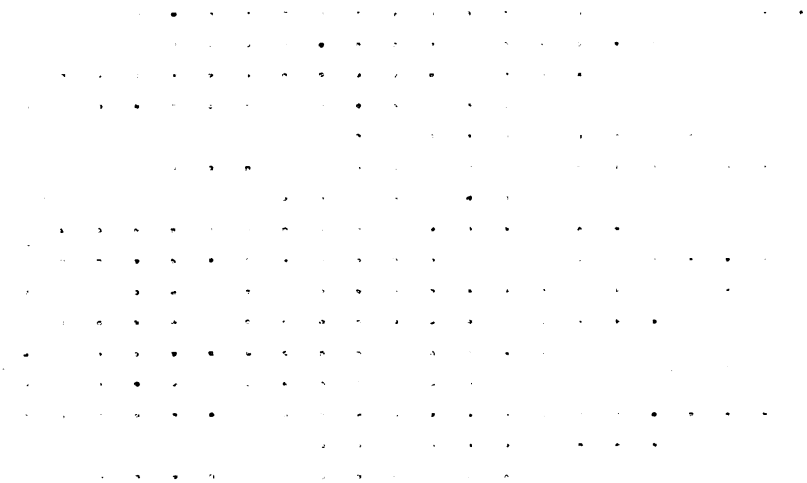


Fig. 20. Keefer, Number 1225.

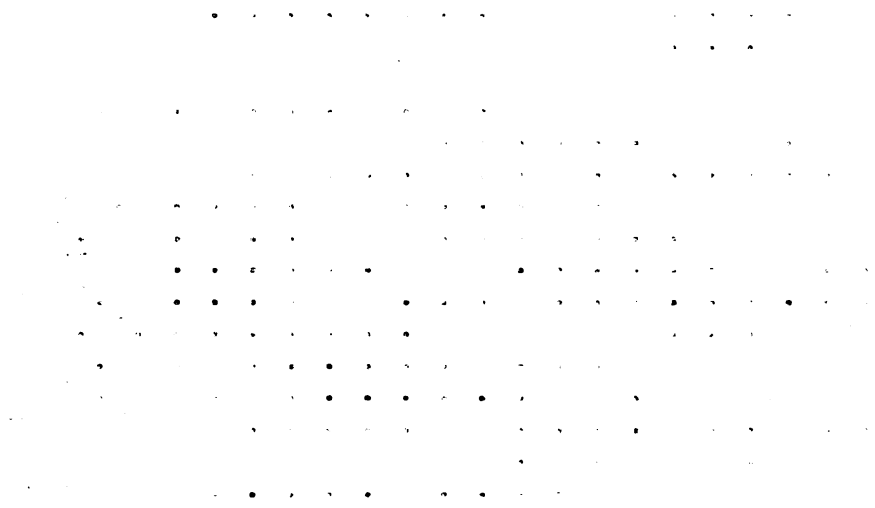
American Educator, Number 141

Type	sousaphone
Signature	American Educator Band Instrument Company / Chicago
Date of manufacture	ca. 1920
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.625 cm
Bell diameter	60.5 cm
Height	117 cm
Weight	8.84 kg
Bow diameter	.58.4 cm
First slide length	49.53 cm
Third slide length	90.17 cm
Pitch	probably low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

The bell section of No. 141 had been switched with the bell section of No. 152, so this instrument was mislabeled initially. The correct bell is marked "4B." Some extra tubing has been soldered to the leadpipe, possibly to convert the instrument to low pitch.

This instrument is almost the same as a sousaphone offered for sale in the 1925-26 Montgomery Ward catalog. Only the brass ball is missing on the bottom of the coil. Either this tuba was made in Chicago--contrary to the statement in the catalog--or the American Educator company imported some of its instruments.

The leadpipe tubing enters the third valve and exits at the first valve. It then curves and goes straight back across the main coil of the instrument. A bit of false tubing is attached just after the point where the tubing exits the first valve, so this length of tubing acts like a large brace for the instrument. There are no other



sousaphones in the collection constructed in this fashion. The date of manufacture for this instrument is based on the Ward's catalog date.

Bohland and Fuchs, Number 347

Type	sousaphone
Signature	Bohland & Fuchs / Grazlitz
Date of manufacture	early twentieth century
Materials	brass
Valves	three piston
Bore diameter	estimated 1.425 cm
Bell diameter	61.4 cm
Height	124 cm
Weight	7.28 kg
Bow diameter	61 cm
First slide length	50.8 cm
Third slide length	78.74 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	T-T-B-T

A tag on the back of this instrument reads: "Southern State Normal - G. Schlick," indicating that No. 347 was probably used at Southern State College, Springfield, South Dakota. Information concerning the date of manufacture was provided by Arne Larson.

This is one of the few European sousaphones in the collection for which the manufacturer can be easily identified. The construction is very similar to the other European sousaphones in the valve assembly and in the arrangement of the main coil, which completes the circle and then doubles back. The third valve slide encircles the valve assembly, and there is a brace which connects the end of the first valve slide to the main coil of the instrument. This tuba is similar in many respects to the Anton Bach sousaphone, and it is possible that the Bach instrument was made at the Bohland and Fuchs factory, or that the parts were made at the factory. (Bach may have been an employee of

Bohland and Fuchs who bought parts and assembled instruments at home as a kind of cottage industry.)

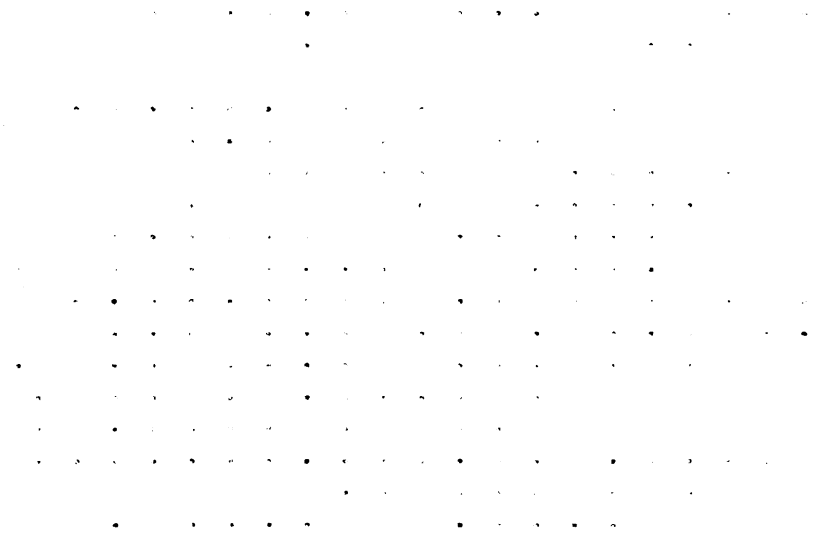
The bore diameter was estimated from an outside measurement. The valve buttons are missing; the gooseneck is broken, and the instrument has suffered some bell damage as well. It also has an unplated brass mouthpiece.

Conn, Number 371

Type	sousaphone
Signature	Made by C. G. Conn / Elkhart, Indiana USA
Serial number	323782
Date of manufacture	ca. 1938
Materials	lacquered brass
Valves	three piston
Bore diameter	1.775 cm
Bell diameter	61.2 cm
Height	127 cm
Weight	10.56 kg
Bow diameter	67.7 cm
First slide length	52.07 cm
Third slide length	82.55 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

The Marion, South Dakota school band used this sousaphone before donating it to the Shrine to Music Museum in 1974. This particular tuba is a model 26-K, according to Dr. Arne Larson.

Number 371 has the standard valve and slide assembly arrangement common to the Conn sousaphones, as well as the nonfunctional tubing to complete the main coil. There is also a shoulder rest like that found on some of the other Conn sousaphones. This instrument is in good condition, although the gooseneck is missing.



Pan American, Number 3164

Type	sousaphone
Signature	Pan American / Made in Elkhart, Ind. USA
Serial number	87664
Date of manufacture	ca. 1922
Materials	silver-plated brass
Valves	three piston
Bore diameter	1.6 cm
Bell diameter	61 cm
Height	123 cm
Weight	8.665 kg
Bow diameter	70.1 cm
First slide length	53.98 cm
Third slide length	83.82 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

Information concerning the date of manufacture of this instrument was provided by Mr. Charles H. Gorby. There is nothing significant or different about this sousaphone compared to the other Pan American instruments. It is clearly not of top quality when compared to some of the other American made tubas. Nonfunctional tubing is used to complete the main bow, and the valve assembly is of the same type found on most American made instruments. There is a minor amount of bell damage, but No. 3164 is basically in good condition.

Holton, Number 1223

Type	sousaphone
Signature	Made by Frank Holton & Co. / Elkhorn, Wis.
Serial number	102914
Date of manufacture	1929
Materials	silver-plated brass
Valves	four piston
Bore diameter	1.75 cm
Bell diameter	60.7 cm
Height	126 cm
Weight	11.19 kg
Bow diameter	65.8 cm
First slide length	53.34 cm
Third slide length	82.55 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	T-T-T-B-B

The Holton Company called this sousaphone a "monster E-flat four-valve" instrument. According to Arne Larson, No. 1223 was obtained from the United States Quartermaster Corps, but there is no marking on the instrument to validate such a statement.

This tuba is somewhat similar to No. 339, another Holton. Both have the nonfunctional tubing and the prominent brace/shoulder rest, but the third valve slide construction is different between the instruments. Also, the valve and slide assembly appears to be set differently on this tuba, perhaps because of the added fourth valve. The fourth valve tubing follows the curve of the main coil and small bow in a manner somewhat like that of the Conn four-valve tuba, No. 2670. Both of the Holton instruments have plain ferrules. (This seems to be true of the Holton tubas in general.)

"Frank Holton -- Elkhorn, Wis." is stamped on the second valve casing. There is also a silver-plated mouthpiece marked "Frank Holton, #47."

Reverie, Number 3168

Type	sousaphone
Signature	Reverie / U. S. Zone / Germany
Date of manufacture	ca. 1945-49
Materials	lacquered brass
Valves	three piston
Bore diameter	1.625 cm
Bell diameter	61.3 cm
Height	127 cm
Weight	8.11 kg
Bow diameter	61 cm
First slide length	51.44 cm
Third slide length	76.2 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	T-T-T-T

The marking "U. S. Zone - Germany" was used as the basis for dating this instrument. The years 1945 to 1949 were the only years in which a United States zone was established in Germany, according to Dr. Joel Epstein, Professor of European History at Olivet College. Further, Berlin was the only part of Germany in which a United States zone was established. The lacquered finish is also the mark of a later instrument.

All of the slides on this sousaphone are set sideways, and all are equally accessible. The coil construction is the same as that of some of the other European instruments, in that the tubing doubles back immediately after making a complete coil. The quality of construction indicates that No. 3168 was made quite cheaply. The valve and slide assembly appear to be very delicate and prone to damage as well. There is no other sousaphone built this way in the group of E-flat instruments. This tuba has suffered a moderate amount of bell and main coil damage.

Unsigned, Number 375

Type	sousaphone
Signature	none
Date of manufacture	ca. 1920
Materials	brass
Valves	three piston
Bore diameter	estimated 1.63 cm
Bell diameter	60.4 cm
Height	125.5 cm
Weight	9.19 kg
Bow diameter	62 cm
First slide length	50.8 cm
Third slide length	85.08 cm
Pitch	possibly low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

According to Dr. Arne Larson, this instrument was used in the Rumpus Ridge, South Dakota Community Band between 1920 and 1960. It was obtained for the collection in 1974. Dr. Larson also provided the information concerning date of manufacture, and he noted that this tuba was probably made in Czechoslovakia and sold by Montgomery Ward.

Number 373 is like the Concertone instrument, No. 340, in many respects. Both tubas have a small brass ball at the bottom of the main coil, and the valve and slide assemblies are somewhat similar. The rather weak bracing on No. 375 is almost the same as that found on No. 1228, another Concertone instrument. It may be accurate to assume that this sousaphone was made by the same firm that made No. 340 and No. 1228, but it may not be accurate to say that Montgomery Ward was the agent, since there is no signature of any kind.

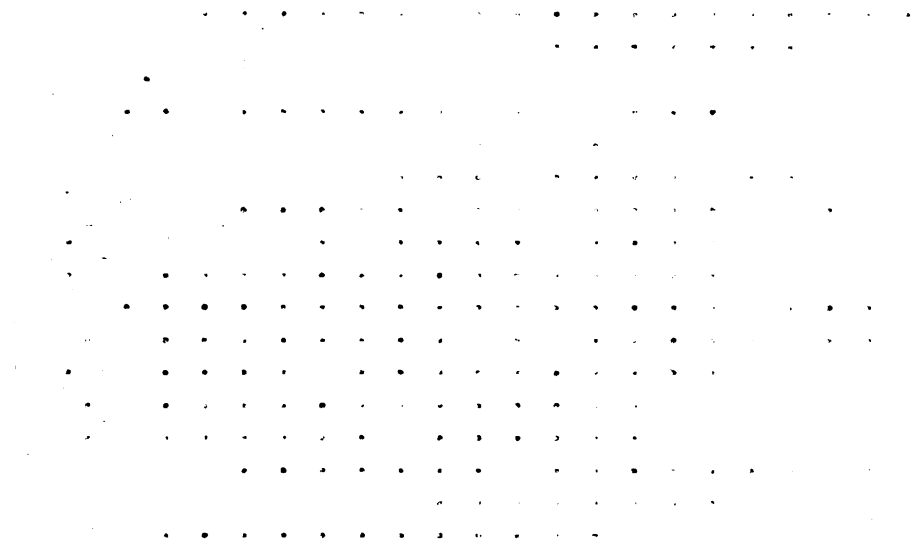
The bore diameter was estimated from an outside measurement. The gooseneck is broken. The finish of this sousaphone is quite tarnished. An unplated brass mouthpiece is with the instrument.

Cleveland, Number 152

Type	sousaphone
Signature	Cleveland Musical Instrument Co. / Clev'd, O.
Serial number	C31520
Date of manufacture	early twentieth century
Materials	silver-plated brass
Valves	three piston
Bore diameter	estimated 1.8 cm
Bell diameter	55.9 cm
Height	114 cm
Weight	8.87 kg
Bow diameter	64.5 cm
First slide length	49.53 cm
Third slide length	85.09 cm
Pitch	possibly low
Tuning slide	before valve assembly
Slide placement	T-T-T-B

It is quite likely that No. 152 was made by King after they purchased the Cleveland Musical Instrument Company. This sousaphone is very similar to the King instruments with only a few minor differences. The ferrules on No. 152 are quite plain compared to the ferrules on the King instruments, and there are some differences in dimensions. The "C" prefix before the serial number may also be an indication that this is a King second-line tuba. The coil is wholly functional, and it completes one and one-half turns before entering the valve assembly.

The bore diameter was estimated from an outside measurement. The bell of No. 152 had been exchanged with the bell of No. 141, so there was some confusion initially about the origin of both instruments. This instrument has a silver-plated mouthpiece marked "25."



Holton, Number 339

Type	sousaphone
Signature	Made by Holton / Elkhorn, Wisconsin
Serial number	79563
Date of manufacture	1923
Materials	silver-plated brass with gold-plated bell
Valves	three piston
Bore diameter	estimated 1.68 cm
Bell diameter	64 cm
Height	139 cm
Weight	11.02 kg
Bow diameter	68.5 cm
First slide length	52.07 cm
Third slide length	81.28 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	T-T-T-B

According to Arne Larson, the bell of this sousaphone was reconstructed from a bell-up sousaphone. The Holton Company records indicated, however, that No. 339 was made as a helicon tuba. It is probably safe to assume that at least some kind of reconstruction work was done on this instrument. The construction of this tuba, except for the bell section, is very similar to that of Holton No. 351, a helicon tuba. Nonfunctional tubing is used to complete the coil, and there is a rather prominent brace/shoulder rest on both instruments. Number 351 has the tuning slide before the valve assembly, but the valve slides are the same on both tubas. The only other Holton sousaphone in the collection is a four-valve instrument, and it is also similar to No. 339, except for the fourth valve.

This sousaphone was acquired in 1967, and it is in good condition except for some broken braces. The bore diameter was estimated from an outside measurement. A nickel-plated mouthpiece marked "Herco Professional" is with this instrument.

Cerveny, Number S-9

Type	upright with left-facing bell
Signature	.F. Cerveny & Fils / premieres recompenses Paris 1889 / Chicago 1893
Date of manufacture	ca. 1910
Materials	brass with German silver garland, bow plates, ferrules, and valve caps
Valves	three rotary with clockwork spring mechanism
Bore diameter	estimated 1.8 cm
Bell diameter	31.6 cm
Height	98.6 cm
Weight	4.92 kg
First slide length	55.25 cm
Third slide length	87.63 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	F-F-R-F

Professor Larson provided information about the date of manufacture for this instrument. It could not have been built before 1893, according to the signature.

The construction is typical of the European and more modern American rotary-valve tubas, since the Cerveny instruments likely served as a model for many manufacturers. The ferrules are not as wide as ones found on more modern instruments, and there is a minimum amount of bracing to hold the inner workings in place. Number S-9 only has three valves, and so the inner coil appears to be quite open. The bulk of the valve assembly is set quite low in the inner coil, but this was done for the comfort of the player. The return springs are enclosed, unlike the springs on many modern rotary valve tubas, and they are clock springs rather than wire springs.

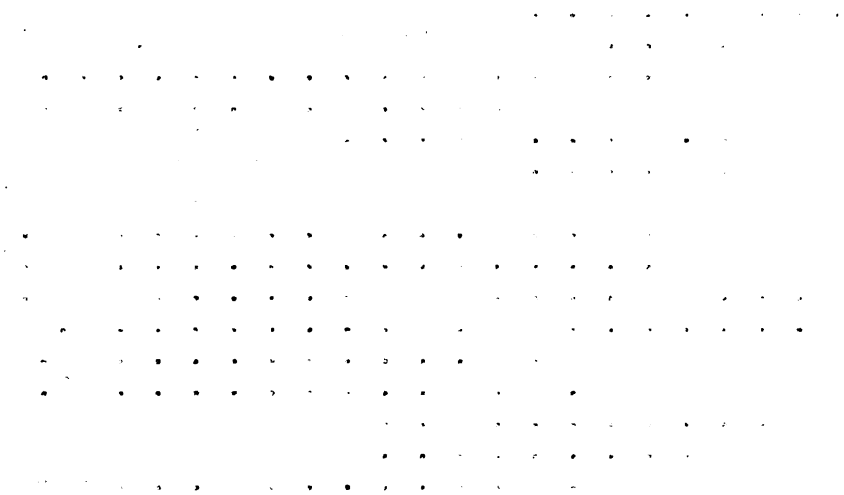
The finish is quite tarnished, but No. S-9 seems to be in good condition otherwise. There are two embossed medallions for the Chicago and Paris expositions within the signature, and the instrument also has an unmarked brass mouthpiece. Number S-9 was obtained from Myron Russell of the Cedar Falls (Iowa) College concert band in 1940.

Holton, Number 280

Type	upright with right-facing bell
Signature	Made by Frank Holton Co. / Chicago
Serial number	7778
Date of manufacture	ca. 1909
Materials	silver-plated brass
Valves	three piston, top-action and one piston, side-action
Bore diameter	1.7 cm
Bell diameter	48.6 cm
Height	82.7 cm
Weight	8.345 kg
First slide length	52.71 cm
Third slide length	87.63 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	.F-F-F-f-f

Number 280 is only one of two four-valve upright E-flat tubas in the collection. It is likely high pitch with the possibility of converting to low by pulling the slides, given the date of manufacture. Unlike the Conn four-valve instruments made about the same time, this tuba has the fourth valve placed to the side to be operated with the left hand, leaving little option for holding position. The fourth valve does provide extended range, and its use offers a considerable improvement in intonation, especially on the second octave E-natural and F.

The fourth-valve slide follows the coil of the instrument in the same manner as the Martin fourth-valve slide, but the overall construction is not similar to that of the Martin tuba. Number 280 has a bore diameter larger than most of the other uprights in the collection, which tends to give this tuba a much richer lower register, much like that of a BB-flat instrument. The details of construction



except for the fourth valve, are much the same as those of the other Holton and the York large-bore instruments.

According to the Holton Company, this tuba was sold as a "monster bass" to the Culon Mosher Music House. Arne Larson acquired it in 1970 at Aberdeen, South Dakota. The second and third valve buttons are not original, but the tuba is in excellent condition. This instrument has an unmarked silver-plated mouthpiece. "Frank Holton -- Chicago" is stamped on the back of the second valve casing.

Martin, Number 115

Type	upright with right-facing bell
Signature	The Martin Band Instrument Co. / Elkhart, Ind.
Serial number	16219
Date of manufacture	early twentieth century
Materials	silver-plated brass
Valves	three piston, top-action and one piston, side-action
Bore diameter	1.6 cm
Bell diameter	44 cm
Height	82.1 cm
Weight	6.68 kg
First slide length	54.6 cm
Third slide length	88.9 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	.F-F-F-f-f

This upright is one of the more interesting tubas in the upright group. It is a four-valve instrument, like Holton, No. 280, and the fourth valve is placed to the side of the instrument, rather than at the top next to the other valves. It must be operated with the left hand and could be somewhat uncomfortable, because the player is required to reach across the front of the instrument to manipulate it. The fourth valve slide follows the main tubing from after the main bow to a point halfway between the second and third bows, which offers some protection for the slide. The second coil is constructed in the manner of many of the American instruments, especially the Conns, in that it returns more closely to the main bow than do the inner coils of many of the European tubas.

This instrument is almost certainly low pitch, and would have been made after about 1910, but an exact date

cannot be determined, because no records are available for the Martin band instruments. A high degree of craftsmanship is evident in the construction of this tuba, and it has been kept in excellent condition.

Fig. 21. Martin, Number 115.

Conn, Number 2526

Type	upright with left-facing bell
Signature	Made by C. G. Conn / Elkhart, Ind. / Worcester, Mass.
Serial number	17793
Date of manufacture	ca. 1889
Materials	lacquered brass
Valves	three piston, side-action
Bore diameter	1.525 cm
Bell diameter	36.4 cm
Height	73.1 cm
Weight	4.49 kg
First slide length	52.07 cm
Third slide length	78.11 cm
Pitch	high
Tuning slide	after valve assembly
Slide placement	F-F-F-f

It is most unusual to see a lacquered instrument of this age, since the usual finishes were plain brass, nickel-plated or silver-plated. It is reasonable to assume that No. 2526 was refinished at a later date. This tuba is similar in all respects to No. 254, another Conn of about the same age, even to the peculiar sag in the body. That is, the main coil of the tuba appears to sag toward the bell, perhaps because second bow is attached directly to the bell section of the instrument. The second bow is also very close to the bell, as on No. 254.

This early Conn instrument has suffered some minor damage, but it is in generally good condition. A plated mouthpiece marked "Besson 13" is with the instrument.

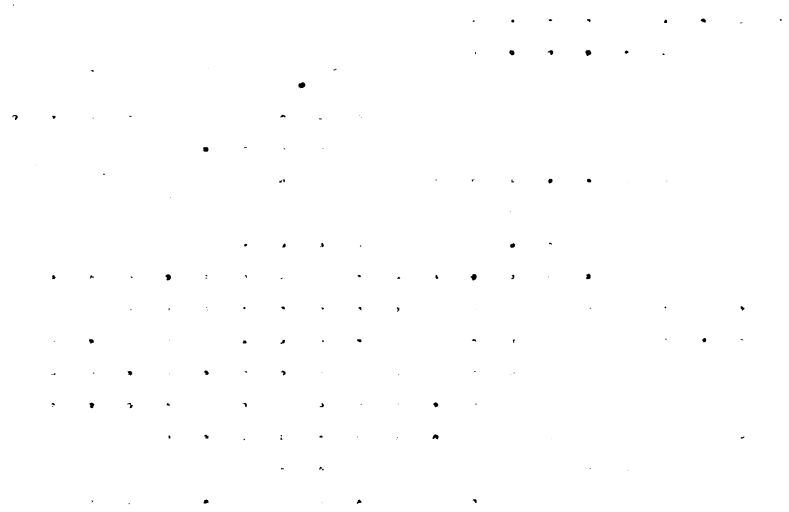
King, Number 349

Type	upright with left-facing bell
Signature	King / Made by the H. N. White Co. / Clev'd O.
Serial number	35400
Date of manufacture	ca. 1893-1915
Materials	silver-plated brass
Valves	three piston, side action
Bore diameter	estimated 1.575 cm
Bell diameter	38.1 cm
Height	77.3 cm
Weight	6.09 kg
First slide length	53.34 cm
Third slide length	85.09 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The date for this instrument was estimated based on information provided by Mr. Sal Cardello of King Musical Instruments. The most likely date of manufacture is between 1910 and 1915, because of the high serial number. The tuning slide of this tuba appears to be quite long, and it may have been modified to bring the instrument to low pitch.

This is the only King instrument with a left-facing bell, but it is very similar in construction to some of the other King uprights. The basic design of both types may have been the same, and the body of the instrument simply rotated to the other side of the bell to accommodate the side-action valve assembly. The valve and tuning slide arrangement of No. 349 is almost the same as that found on the Conn left-facing uprights.

Arne Larson obtained this upright from the Lawton-Bronson (Iowa) public school in 1969. The bore size was estimated from an outside measurement. There are a



number of dents between the bell and the end of the main bow. The second valve casing bears the stamp "King -- made by the H. N. White Co. -- Clev'd, O."

Conn, Number 106

Type	upright with left-facing bell
Signature	Made by C. G. Conn / Elkhart, Indiana / New York
Serial number	51856
Date of manufacture	ca. 1898
Materials	silver-plated brass
Valves	three piston, side-action
Bore diameter	1.6 cm
Bell diameter	35.7 cm
Height	77.7 cm
Weight	5.19 kg
First slide length	52.07 cm
Third slide length	81.28 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

Number 106 is similar in almost all respects to the other left-facing Conns made about the same time, especially to Conn No. 120, which was made about four years later than this tuba. Like that instrument, the second bow and bell are not as close together as they are on earlier Conns with left-facing bells.

Arne Larson acquired this tuba from the Winnebago, Minnesota public schools in 1971. The first and second valve buttons are missing, and there is some damage just after the first bow, but otherwise the instrument is in good condition. A brass mouthpiece marked "Conn Standard" is with this instrument.

Unsigned, Number 259

Type	upright with left-facing bell
Signature	none
Serial number	68573
Date of manufacture	ca. 1901
Materials	brass
Valves	three piston, side-action
Bore diameter	1.6 cm
Bell diameter	35.6 cm
Height	79.3 cm
Weight	5.08 kg
First slide length	53.34 cm
Third slide length	83.82 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

This tuba has no signature, but it has much in common with Conn, No. 106. The dimensions, except for the valve lengths, are virtually identical, as are all other aspects of construction, including slide position and construction, ferrule placement and decoration, and general tubing arrangement. The only differences between the instruments are a slightly different first valve slide construction and a difference in the placement of the brace between the bell section and the second coil. The valve slide dimensions are very much the same as those of other Conn instruments made about the same time. The presence of a serial number is added evidence that No. 259 is almost certainly an American made instruments, and very likely a Conn.

If this is a Conn tuba, there are some possible explanations as to why there is no signature. The signature may have been removed, although this is unlikely, or the instrument could have been purchased at the factory before

the signature was added. A third, and most probable, explanation is that Conn made this instrument to be resold by a dealer or maker, and the tuba was purchased before it was stenciled. Several sources have confirmed this as a fairly common practice among the instrument manufacturers.

The date for this instrument has been estimated based on the Conn serial number list. The first and second valve buttons are not original, but the instrument appears to be in good condition.

Buescher, Number 344

Type	upright with left-facing bell
Signature	The Buescher / Elkhart, Ind. / Pat. Oct 29. 07
Serial number	9874
Date of manufacture	ca. 1910-1915
Materials	silver-plated brass
Valves	three piston, side-action
Bore diameter	estimated 1.6 cm
Bell diameter	43.4 cm
Height	80.2 cm
Weight	6.48 kg
First slide length	52.07 cm
Third slide length	81.92 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The date of manufacture for this instrument was estimated based on information provided by Mr. Lloyd Filio of the Selmer Corporation, a former employee of Buescher. This is the only left-facing bell Buescher in the group, so comparison is difficult. The most striking feature of this tuba is the "U" shaped tuning slide, which is much like that of Conn, No. 120 and Holton, No. 136. It is constructed in this manner probably to keep the extended tuning slide protected by the main coil of the instrument. The valve slide construction is also similar to the Conn left-facing instruments, but the body of this tuba is wider than that of any of the Conns of about the same age, and the bell is larger. This tuba also has a greater number of braces to stabilize the inner coils. The bell size and body width of this instrument make it look very much like the York and Holton uprights.

Professor Larson obtained this tuba in 1970 at Sioux City, Iowa. The third valve button is missing. The bore diameter was estimated from an outside measurement because the slides would not pull. The bell is flattened somewhat, and there is some minor damage on the main bow and between the main and second bows. "MPU/PIU (our label) Factory 3" is stamped on the second valve casing.

Concetone, Number S-29

Type	upright with right-facing bell
Signature	Concetone
Date of manufacture	late nineteenth or early twentieth century
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.45 cm
Bell diameter	33 cm
Height	71.3 cm
Weight	3.975 kg
First slide length	46.99 cm
Third slide length	81.28 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The Concertone band instruments (misspelled here as Concetone) were sold by the Montgomery Ward Company, and they were almost all imported instruments. This tuba is not unlike many of the European instruments in the construction of the inner coils and the placement of the tuning slide. There is no other signed instrument in the collection which is the same in construction and dimension. The quality does appear to be better than that of most of the European tubas, especially the French instruments.

Number S-29 appears to have suffered little damage, although the first valve button is missing. The valves are numbered 109, 110, and 111; this convention was used for the benefit of the individual making the final valve assembly since valves were frequently made in a separate department. An unmarked, silver-plated mouthpiece is with this instrument.

Fischer, Number 264

Type	upright with right-facing bell
Signature	Carl Fischer's Reliable / New York
Date of manufacture	late nineteenth or early twentieth century
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	37.9 cm
Height	73.9 cm
Weight	4.075 kg
First slide length	52.71 cm
Third slide length	81.28 cm
Pitch	high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Very little information is available about the Carl Fischer Company, and it is difficult to determine age or place of manufacture for the Carl Fischer instruments. This tuba could have been manufactured in the United States, but there is no serial number which would assist in dating it. The other instruments in the collection which are most similar to No. 264 are Smith and Co., No. 277, LePiere, No. 266, (to which this horn is almost identical in dimensions), and Pepper, No. 285, all of which represent different countries and different manufacturers. The other Fischer instrument, No. 251, is a larger tuba, which is similar in inner tubing design, but too dissimilar otherwise to compare effectively. Fischer was an agent for Besson, but this does not seem to be a Besson instrument.

The main tuning slide of No. 264 has a low-pitch extension, indicating that the tuba was made probably in the early twentieth century. There is also a retainer system

on the valves which appears to act as a valve stop. The valves are numbered in sequence, beginning with twenty-two. A five also appears on the second valve casing. This instrument is in good condition.

Conn, Number 126

Type	upright with right-facing bell
Signature	Made by C. G. Conn Ltd. / Elkhart, Ind.
Serial number	163855
Date of manufacture	ca. 1918
Materials	silver-plated brass with gold-plated bell
Valves	three piston, top-action
Bore diameter	1.775 cm
Bell diameter	51 cm
Height	90.4 cm
Weight	7.945 kg
First slide length	52.71 cm
Third slide length	86.36 cm
Pitch	probably low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This is one of a number of Conn instruments in the collection with a rather special valve slide tubing arrangement. The tubing for the first and third valves begins by ascending toward the top of the valves, and then it doubles back down. This is a space-saving arrangement which allows the third valve slide especially to be protected by the main coil. This is a large-bore instrument, perhaps a "monster E-flat bass."

Like many of the Conns, but unlike a great percentage of American instruments, the tuning slide precedes the valve assembly. There is also a very small third coil, and it is smaller in diameter than similar coils found on the other Conn upright instruments in the group. The word "Patented" on the rear of the second valve casing may refer to the valve slide arrangement. Conn, No. 126 has suffered some bell damage.

Conn, Number 348

Type	upright with right-facing bell
Signature	Made by C. G. Conn / Elkhart, Ind.
Serial number	173734
Date of manufacture	ca. 1920
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.625 cm
Bell diameter	46.3 cm
Height	84 cm
Weight	6.81 kg
First slide length	54.61 cm
Third slide length	87 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Arne Larson acquired this tuba in 1972 from Stan Fritts, a musical instrument dealer in Yankton, South Dakota. It is very much like Conn, No. 126, which was made perhaps a year earlier, but there are some design changes. The first and third valve slides are constructed the same way as on No. 126, but the inner coil of this instrument is somewhat longer and larger, while the tuning slide is shorter. This would provide the opportunity for a more even expansion of the bore in this case. Conn apparently made a significant number of design changes throughout the years, because it is difficult to find two instruments which are alike in every detail.

Supertone, Number 2629

Type	upright with right-facing bell
Signature	Supertone / Made in USA
Serial number	P28954
Date of manufacture	ca. 1917-1925
Materials	brass
Valves	three piston, top-action
Bore diameter	1.6 cm
Bell diameter	38.1 cm
Height	78.5 cm
Weight	5.17 kg
First slide length	52.07 cm
Third slide length	83.82 cm
Pitch	probably low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Sears, Roebuck and Company was the agent for Supertone band instruments. Advertisements of this trade name appear in the Sears catalogs from 1917 to 1925, and so this instrument was probably made during that time. This tuba was almost certainly made in the United States, but the manufacturer is unknown. The prefix "P" found before the serial number of No. 2629 can also be found before some of the serial numbers of the Pan American instruments, and the Pan American serial number schedule would place the manufacture date of this tuba about 1917, if indeed it was made by Pan American. There are no Pan American uprights clearly marked as such in the collection, so it is difficult to make a comparison. However, certain of the design features of this tuba are similar to design features of instruments of the same vintage. Conn and Pan American were both located in Elkhart, Indiana, and Conn purchased the Pan American company sometime in the early part of the century.

This instrument is well-built with extensive bracing and wide ferrules, and it is in good condition. The third valve button is missing. An unmarked, nickel-plated mouthpiece is with this tuba.

York, Number 292

Type	upright with right-facing bell
Signature	Made by J. W. York & Sons / Grand Rapids, Mich.
Serial number	19385
Date of manufacture	ca. 1900-1907
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	38.3 cm
Height	71.8 cm
Weight	5.365 kg
First slide length	50.8 cm
Third slide length	80.65 cm
Pitch	high
Tuning slide	after valve assembly
Slide placement	F-F-F-f

This York tuba closely resembles the York Model 30 shown in the Oliver Ditson Guidebook No. 2 which was published in the 1920s. Number 292 was made much earlier, so it is likely that York experimented very little with design changes, at least in the early part of the century. The prominent curve in the tuning slide found on the larger-bore Yorks is not evident on this instrument, and the dimensions of No. 292 are smaller than dimensions of many of the other York uprights. This tuba does not have the patented extra "doughnut" of conversion tubing found on some of the York instruments, and so it is likely high pitch.

Professor Larson obtained this instrument in 1971 from the Java, South Dakota public schools. It has suffered some damage at the main bow, and the second valve button is missing. A silver-plated mouthpiece marked "York & Son 18" is with this instrument.

Wurlitzer, Number S-66

Type	upright with right-facing bell
Signature	The Rudolph Wurlitzer Co. / Manufacturers / Chicago USA
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.4 cm
Bell diameter	33.1 cm
Height	74.3 cm
Weight	2.965 kg
First slide length	50.8 cm
Third slide length	78.1 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Number S-66 is one of the smallest instruments in the group of uprights. The expansion of the bore is quite limited, and that fact gives No. S-66 a relatively bright sound. The construction is typical of the more cheaply made European tubas, with little in the way of decoration. There is a prominent spine, but little else to distinguish this instrument from tubas made by any number of European manufacturers.

Wurlitzer did have a musical instrument factory in the United States, and the signature would seem to suggest that the instrument was made here, but there is no serial number. There is a retainer on the tuning slide to make pre-set adjustments, but it is also very cheaply made. The third coil extends beyond the third valve slide, and this is typical of many of the European uprights in general, and of French instruments in particular.

Number S-66 was made after 1890, because the company was known as Wurlitzer and Brother before that time. There is some minor bell damage on this instrument. The first and third valves, the second valve button, and the second valve slide are missing. The valves are numbered 25, 26, and 27.

Unsigned, Number 258

Type	upright with right-facing bell
Signature	none
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.45 cm
Bell diameter	29.3 cm
Height	72 cm
Weight	3.195 kg
First slide length	50.8 cm
Third slide length	83.19 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The design and dimensions of No. 258 are typical of a number of cheaply-made imported instruments in the collection. The small third coil extends out past the third valve slide as with many of the imported tubas, and there is a prominent spine of about the same dimension as Fischer, No. 264, which is probably an import. The valve markings are also similar to those found on imported instruments, and the bell is relatively small, like the bells found on some of the Jaubert tubas. Number 258 is almost certainly an imported instrument.

Some solder work has been done on the valve slides, and the main tuning slide appears to have been altered to convert this upright to low pitch. There are also a number of small dents. The valves are numbered sequentially, beginning with twenty-five, and a five is also stamped on the second valve casing. There is a silver-plated mouthpiece with this instrument.

Jaubert, Number 357

Type	upright with right-facing bell
Signature	F. Jaubert & Cie / Paris / Lyon & Healy / Sole Agents / Chicago
Date of manufacture	1865-1890
Materials	brass
Valves	three piston, top-action
Bore diameter	1.45 cm
Bell diameter	29.6 cm
Height	71.8 cm
Weight	3.5 kg
First slide length	46.9 cm
Third slide length	76.2 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Professor Larson acquired this instrument from Olson Music Company in Duluth, Minnesota in 1950. Lyon and Healy began manufacturing instruments about 1890, so it is likely that No. 357 was imported and sold before that time. This upright has a very short tuning slide and relatively small dimensions. The construction of the slide tubing and inner coils is consistent with the other French instruments, but the third coil does not extend past the third valve slide, as it does on many of the other French tubas.

Jaubert and Company is not listed in Langwill as having won any awards, and this is not surprising since the quality of workmanship and materials used are adequate at best. There is extensive bell damage, and there are a number of dents after the main bow.

Wurlitzer, Number 278

Type	upright with right-facing bell
Signature	The Rudolph Wurlitzer Co. / Manufacturers / Chicago, USA
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.4 cm
Bell diameter	35.8 cm
Height	75.5 cm
Weight	3.975 kg
First slide length	51.44 cm
Third slide length	82.55 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Number 278 was probably made after 1890, given the available information about the Wurlitzer Company. The construction of this tuba is almost the same as the construction of Wurlitzer, No. S-66, except that it has a water key but no retainer on the tuning slide, and the ports in the second valve appear to be reversed. The dimensions and weight of this tuba are also slightly greater. The signatures of the two instruments are virtually identical.

Wurlitzer did manufacture band instruments, but this instrument, like No. S-66, may be a stenciled import, given the technique of construction. Number 278 does not seem to have suffered much damage, although the third valve slide is nickel-plated and is probably not original to the instrument. There is a silver-plated mouthpiece. The valves are stamped "L," "1" and "H."

Conn, Number 356

Type	upright with right-facing bell
Signature	Made by C. G. Conn / Elkhart, Ind. / Worcester, Mass.
Date of manufacture	1886-1900
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.675 cm
Bell diameter	36.5 cm
Height	74 cm
Weight	4.675 kg
First slide length	52.07 cm
Third slide length	81.28 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

It is most unusual to find a Conn instrument without a serial number. The first date for this tuba was established by the marking "Pat. June 19, 1886," which appears on the second valve casing, and the second date was established based on the fact that no Conn instrument in the collection made after 1900 bears the Worcester mark. Also, No. 356 is almost identical in construction to Conn, No. 276, an instrument dated 1887. The tuning slide of this tuba is longer, but it appears to have been modified to convert the tuba to low pitch. The tuning slide placed before the valve assembly is a mark of many of the Conn instruments.

The bore diameter was estimated from an outside measurement. There is some bell damage. Arne Larson found this instrument in Duluth, Minnesota in 1951.

Unsigned, Number 282

Type	upright with right-facing bell
Signature	none
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.55 cm
Bell diameter	34.5 cm
Height	75 cm
Weight	3.775 kg
First slide length	53.34 cm
Third slide length	82.55 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Arne Larson dated this instrument at 1876 and indicated that it was made in Austria. It does appear to be of European manufacture, but verifying place and date is difficult without corroborating evidence. The somewhat unusual diamond-shaped bowplate and the spine are similar to those features of the Wurlitzer instruments, while other techniques of construction are typical of many of the European made instruments. The quality of craftsmanship is also typical of the cheaper imports. The valve slide length would seem to indicate a low-pitch instrument, and so the date of manufacture was probably sometime in the early twentieth century.

This tuba was acquired in 1948 at New Prague, Minnesota. The leadpipe is loose. The first valve button is not original. There are also a number of small dents as well as some minor bell damage. The valves are numbered in sequence beginning with 151.

Conn, Number 254

Type	upright with left-facing bell
Signature	Made by C. G. Conn / Elkhart, Ind. / Worcester, Mass.
Serial number	18616
Date of manufacture	ca. 1890
Materials	brass
Valves	three piston, side-action
Bore diameter	1.55 cm
Bell diameter	36.7 cm
Height	71.9 cm
Weight	4.735 kg
First slide length	52.07 cm
Third slide length	81.28 cm
Pitch	high
Tuning slide	after valve assembly
Slide placement	F-F-F-f

According to Dr. André Larson, this instrument was acquired in Colorado. It is very much the same in construction and dimension as No. 2565, another Conn with left-facing bell built about one year earlier. Both of these instruments have the second bow very near the bell. This construction seems to be common to all the early Conn instruments regardless of the valve configuration. This tuba has suffered some bell damage, and there are a number of dents in the leadpipe and in the main coil.

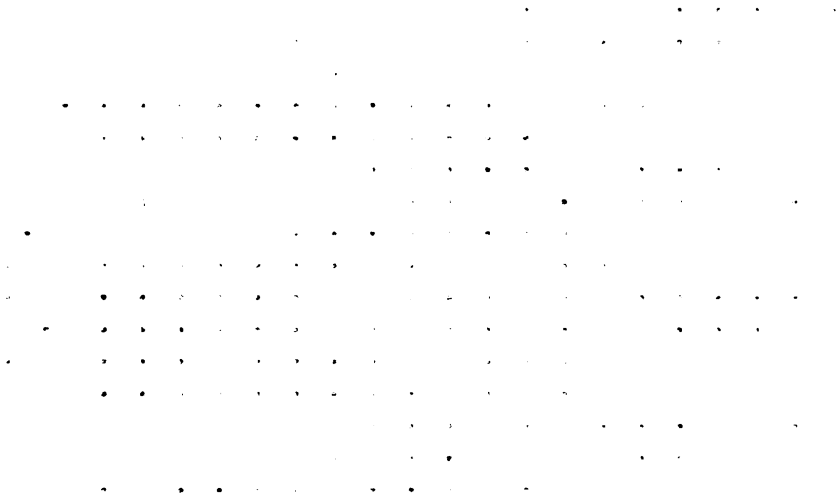
Conn, Number 129

Type	upright with right-facing bell
Signature	Made by C. G. Conn / Elkhart, Ind.
Serial number	70393
Date of manufacture	ca. 1901
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.55 cm
Bell diameter	35.9 cm
Height	77.6 cm
Weight	5.105 kg
First slide length	54.6 cm
Third slide length	87 cm
Pitch	probably high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

Professor Larson identified this tuba as being both high and low pitch. This is likely true given the date of manufacture and the slide lengths. There also appears to be extra tubing added to the tuning slide.

Number 129 is one of only two Conn instruments with right-facing bells to have the tuning slide placed after the valve assembly. Number 270 is the other. The two instruments are quite similar, especially in the construction of the first and third valve slides, which are of the space-saving type. Both instruments were made in the same year, and the dimensions are virtually identical.

The bore diameter was estimated from an outside measurement. The third valve button is missing. The bell of this upright has suffered some damage, and there are a number of small dents in the main coil. "Pat. June 15, 1886" is stamped on the second valve casing.



Henri Marchand, Number 851

Type	upright with right-facing bell
Signature	Henri Marchand / Paris / First Class / H. B. McMillin / Sole U. S. Agt. Cleveland, O.
Serial number	possibly 6009
Date of manufacture	ca. 1914
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	38.4 cm
Height	73.5 cm
Weight	4.315 kg
First slide length	52.70 cm
Third slide length	83.82 cm
Pitch	probably high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The date of manufacture and pitch were provided by Professor Arne Larson. This instrument was used in bands at New Paris, Indiana, by Jacob Histema, and it was given to the collection in 1974 by his daughter, Mrs. Jacob W. Hannah.

There is very little about this instrument that is special, except for the rather prominent spine and the bore expansion toward the end of the tuba, which seems to be somewhat greater than that of most French instruments in the group of uprights. Number 851 resembles the Bohland and Fuchs instruments in this respect.

The quality of construction is adequate and typical of many of the imported instruments. Almost no information was available about the Marchand Company, so it is reasonable to assume that Marchand was one of a number of small Parisian

manufacturers whose primary goal was the manufacture of cheap instruments for export.

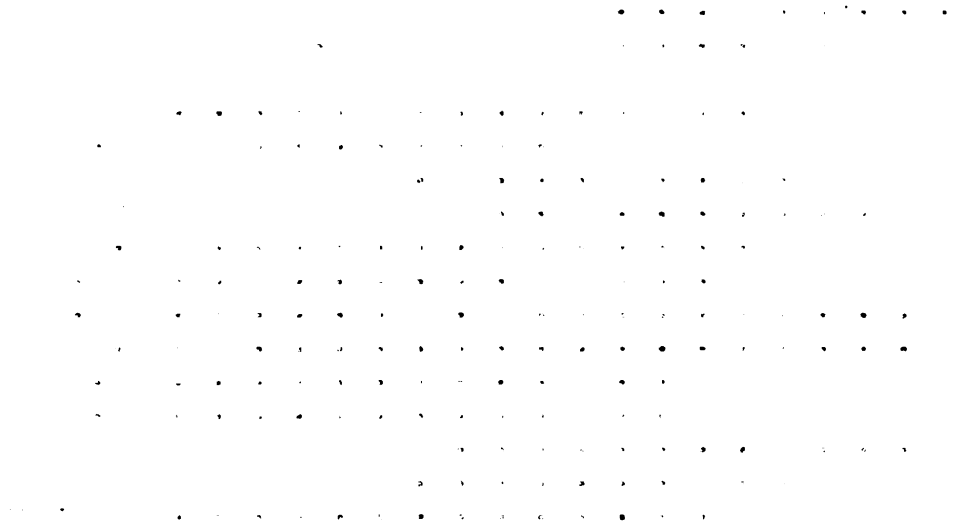
This tuba has suffered a moderate amount of damage, especially around the main bow, but it is complete and in fair condition otherwise. The meaning of "Exchange for New Buescher - Elkhart, Ind 6009" below the signature is not known. It may have been to indicate a used instrument. There is a silver-plated mouthpiece with this tuba.

Conn, Number 270

Type	upright with right-facing bell
Signature	Made by C. G. Conn / Elkhart, Ind. and New York
Serial number	68905
Date of manufacture	ca. 1901
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.575 cm
Bell diameter	35.8 cm
Height	78.5 cm
Weight	5.245 kg
First slide length	54.61 cm
Third slide length	83.82 cm
Pitch	probably high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The date of this tuba is probably accurate, because Conn has been able to reconstruct manufacturing information from old records, and the valve slide lengths and construction of No. 270 are almost identical to No. 129, an instrument made in the same year, even to the space-saving construction of the first and third valve slides. The slides run both above and below the valve ports, thus keeping the extended third valve slide from damage because it is protected by the main coil. Like No. 129, this tuba appears to have extra tubing in the main tuning slide to convert it to low pitch. This extra tubing quite likely consists of two sleeves which can be inserted in the tuning slide.

This instrument appears to be in good condition except for some dents around the main bow. The second valve casing bears the marking "Patent June 13, 1886," which may refer to the unusual slide construction.



Boston, Number 272

Type	upright with right-facing bell
Signature	Made by the Boston Musical Instrument Manufy.
Serial number	10766
Date of manufacture	ca. 1870-1900
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.675 cm
Bell diameter	33.6 cm
Height	84.3 cm
Weight	5.055 kg
First slide length	53.34 cm
Third slide length	estimated 81.92 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Number 272 was used in an early Minnesota pioneer band, according to Arne Larson, who obtained it for his collection in 1944. Professor Larson estimated that this tuba was made in 1871, but that date is perhaps a little early; the firm did not begin operation until 1869 or 1870, and the serial number seems too high for the estimated date.

The proportions of No. 272 reflect the influence of the older bombardon construction, because the bell is quite small and the body is rather tall and thin. The length of the body allows for a single inner coil rather than the double coil found on many upright instruments. The rather long tuning slide also takes some of the length normally reserved for a third coil on instruments with the tuning slide before the valve assembly. The lack of a third coil gives this upright a rather unusual appearance.

There is a spine to protect the main bow. The third valve tubing bow is missing. The bore diameter was estimated from an outside measurement. There is some bell damage, and there are a few minor dents.

Conn, Number 120

Type	upright with left-facing bell
Signature	Made by C. G. Conn / Elkhart, Ind. and New York.
Serial number	71782
Date of manufacture	ca. 1902
Materials	silver-plated brass
Valves	three piston, side-action
Bore diameter	1.6 cm
Bell diameter	36 cm
Height	79.2 cm
Weight	5.39 kg
First slide length	50.8 cm
Third slide length	82.55 cm
Pitch	probably high
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The Conn instruments in the collection include some of the few side-action tubas. The side-action construction is preferred by many players, because of the more comfortable and natural right hand position used in playing the instrument. The valve assembly of this tuba is different than that of the Conn top-action instruments, but the remainder of the construction is similar to that of the top-action tubas.

Number 120 is very similar in construction and dimensions to No. 106, another side-action Conn made about three years earlier. Both of these instruments have a greater distance between the second bow and bell than do some of the earlier Conns. This instrument appears to be in very good condition.

Buescher, Number 135

Type	upright with right-facing bell
Signature	The Buescher / Elkhart, Indiana
Serial number	6758
Date of manufacture	ca. 1910-1912
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.671 cm
Bell diameter	43.3 cm
Height	80.1 cm
Weight	6.3 kg
First slide length	54.61 cm
Third slide length	85.09 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	F-F-F-F

The date of manufacture for No. 135 was estimated based on information provided by Mr. Lloyd Filio of Selmer. The estimate may be high if the Buescher Company started with the serial number 3000 in 1903, as Mr. Filio has indicated, but it was almost certainly made before 1915, because no union label appears on the valve casing of this instrument.

Buescher evidently experimented a great deal with design because no two Buescher uprights in the collection are the same. This particular instrument has a fairly wide bell, and a main tuning slide which is constructed to be at the same plane as the valve slides, even though the point of origin is behind the valve assembly. Perhaps this arrangement was tried in order to make the tuning slide more accessible than it is on other instruments with the tuning slide after the valve assembly.

There is a very small but decorative spine to protect the main bow. There are a number of large dents in the main coil. The third valve button is missing. A nickel-plated mouthpiece marked "All-Star BB-Bass" is found with this instrument.

Smith, Number 277

Type	upright with right-facing bell
Signature	Smith & Co. / London
Date of manufacture	ca. 1880-1890
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	37.8 cm
Height	73.3 cm
Weight	4.015 kg
First slide length	52.71 cm
Third slide length	83.82 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The basic construction of this tuba is not much different than that of most of the other European uprights, especially the instruments of somewhat cheaper construction. This instrument seems to have a somewhat wider bore than some of the imported instruments. There is a small spine to protect the main bow.

The water key and the third valve button are missing from this instrument, and there is some bell damage, including a large dent just before the end of the bell section. The date of manufacture was estimated based on information about the manufacturer as found in the standard references. The valves are stamped 82, 83, and 84.

Higham, Number 281

Type	upright with right-facing bell
Signature	Patent Clair / / Exhibition Prize Medal / Awarded London 1862 and Dublin 1865 to J. Higham, Maker / 151 GT. Ducie st. d 2 Victoria St. / Manchester 10651
Serial number	probably 10651
Date of manufacture	late nineteenth century
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.625 cm
Bell diameter	32.7 cm
Height	75 cm
Weight	4.28 kg
First slide length	50.8 cm
Third slide length	85.09 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Arne Larson obtained this instrument from the Olson Music Company of Duluth, Minnesota in 1952. Tubing has been added to the tuning slide to convert the tuba to low pitch. The signature decoration consists of a medallion with two lions and a crest, and there is also some modest decoration on the lyre holder.

This is the only Higham instrument among the uprights, so there are no signatures to compare, although Langwill lists Higham's address as shown on the signature to have been occupied between 1865 and 1923. The pitch, construction and quality of workmanship would seem to indicate that No. 281 was made either in the late nineteenth century or the early twentieth century. There is a very small spine to protect the main bow. There is also a curved brace between

the first and third valve slides which is the same as braces found on No. 108, a Thibouville-Lamy tuba, and the instrument by M. Claton, No. 248. This instrument appears to be in good condition except for some very minor bell damage.

Pepper, Number 416

Type	upright with right-facing bell
Signature	J. W. Pepper Importer / Philadelphia / 37029
Serial number	37029
Date of manufacture	ca. 1903
Materials	brass
Valves	three piston, top-action
Bore diameter	estimated 1.525 cm
Bell diameter	29.9 cm
Height	76.6 cm
Weight	3.735 kg
First slide length	53.02 cm
Third slide length	78.74 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

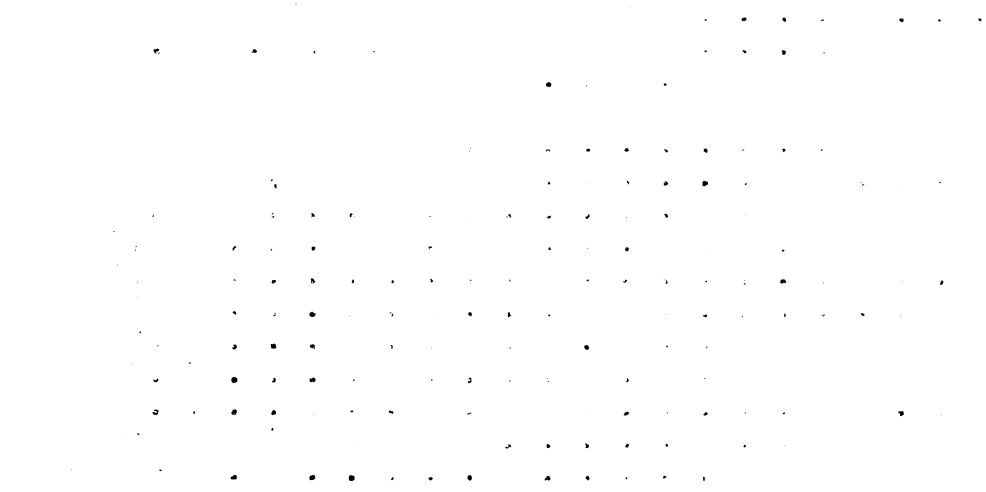
The bore diameter was estimated from an outside measurement. Information about the date of manufacture was provided by Mr. Lloyd Farrar. This tuba could have been made by either C. A. Mouchel of Paris or M. Brisson and Company of Paris, according to information supplied by Mr. Farrar.

Number 416 is very similar in construction to many of the lower quality imported instruments in the collection. There appears to be limited expansion of the bore, yet the bore diameter of this instrument is not extremely small. This characteristic is also common to some of the Wurlitzer instruments which have been examined. There is a prominent spine to protect the main bow.

Symphony, Number 306

Type	upright with right-facing bell
Signature	Symphony / Reg. U. S. Pat. Off.
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.45 cm
Bell diameter	35.4 cm
Height	74.9 cm
Weight	4.210 kg
First slide length	48.26 cm
Third slide length	78.71 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The brand name "Symphony" was apparently registered to the Wurlitzer Company in Chicago, because an extract from a 1913 Wurlitzer catalog clearly shows an E-flat tuba with this marking. The marking "France" stamped on the receiver would indicate that No. 306 was made in Europe, imported, and stenciled by Wurlitzer. This instrument is quite similar to the tuba illustrated in the Wurlitzer catalog. It has a longer tuning slide than the tuba in the illustration, but it is likely that the tuning slide in No. 306 is a low-pitch slide. The high-pitch slide was probably lost or abandoned when low pitch became firmly established. The inner coil arrangement of this tuba is similar to that of many of the other European instruments, although the quality of construction appears to be somewhat better. The ferrules are wider and more decorative than those found on most European tubas.



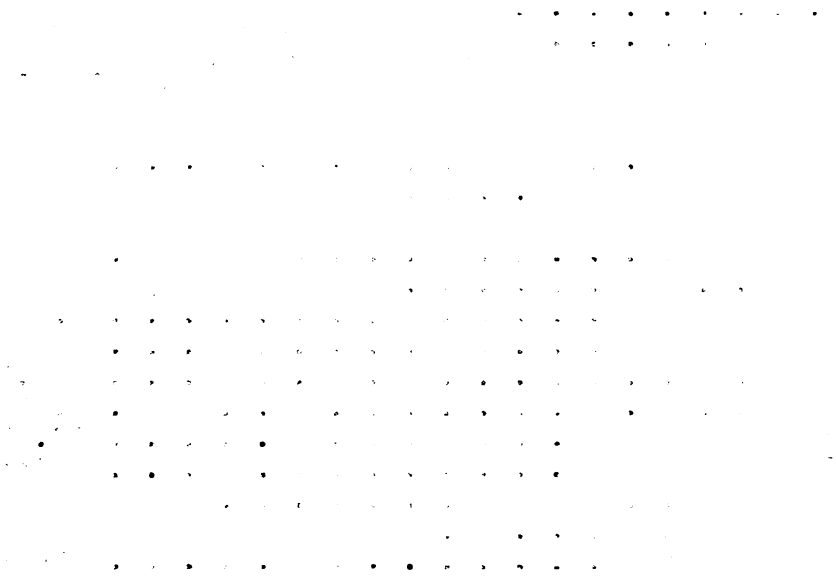
Number 306 has some bell damage, and there are a number of dents in the body of the instrument. The marking "BE" is stamped on the second valve casing and may have some bearing on the identification of the manufacturer.

Thibouville-Lamy, Number 108

Type	upright with right-facing bell
Signature	Jerome Thibouville-Lamy / F / / 1' Armie / Brevete s.g.d.g. / 68 Rue Reaumer / Paris / New York / A 116330
Serial number	116330
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.575 cm
Bell diameter	33.9 cm
Height	75.1 cm
Weight	5.015 kg
First slide length	52.07 cm
Third slide length	missing
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

It is difficult to ascertain the date of manufacture for No. 108, despite the amount of information contained on the signature, but pitch and construction suggest late nineteenth century. Many of the details of construction of this tuba are similar to those of No. 281, an instrument made by Joseph Higham of London. The most obvious similar detail is the curved brace between the first and third valve slides of both instruments. This kind of bracing also appears on a tuba by M. Claton of New York. The dimensions of No. 108 and No. 218 are alike but not identical, and the tuning slide of this tuba is longer than that of the Higham instrument.

There are five nested medallions near the signature, one of which reads "Dulcis & Fortis JTL." A banner marked



"Legion d' honneur" is also found near the signature, and "JTL QTE Supas" is stamped on the second valve casing.

The third valve button, two water keys, and the third valve slide are missing from this instrument. It has also suffered a significant amount of damage, especially around the main bow.

Le Piere, Number 266

Type	upright with right-facing bell
Signature	Le Piere / Paris
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	38.4 cm
Height	74 cm
Weight	4.1 kg
First slide length	53.34 cm
Third slide length	81.28 cm
Pitch	possibly high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The details of construction and the dimensions of this instrument are quite similar to the details and dimensions of No. 264, a Carl Fischer instrument. These details are too similar to be ignored. It is possible that the Fischer instrument is also a Le Piere tuba stenciled with the Fischer name. Le Piere is not listed in the standard references as a maker of brass instruments, so the company was probably one of many small firms in Paris producing musical instruments for export. Number 266 is clearly a lower-priced instrument.

The bell of this tuba has been flattened. There are a number of dents, especially around the main bow area. The valve casings are numbered 40, 41, and 42, and a 5 also appears on the second valve casing.

Pepper, Number 285

Type	upright with right-facing bell
Signature	J. W. Pepper & Sons / Standard / Philadelphia
Serial number	63585
Date of manufacture	ca. 1912
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.45 cm
Bell diameter	38.4 cm
Height	76.1 cm
Weight	4.62 kg
First slide length	52.71 cm
Third slide length	83.82 cm
Pitch	possibly high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

According to Mr. Lloyd Farrar, the brand name "Standard" was used on a line of instruments made by Pepper in the United States during the first part of the twentieth century. Professor Larson's notes indicate that Bohland and Fuchs of Grazlitz made this instrument, although there are no markings on the body to verify this statement.

The design of No. 285 is typical of the European instruments, and the quality of construction indicates a moderately priced instrument. The ferrules are quite plain, and there is a small spine but no other decoration. This instrument is very similar in all respects to No. 2893, an import made probably by Bohland and Fuchs, so it is probable that No. 285 is an import as well, despite the signature.

The bore diameter was estimated from an outside measurement. There is bell damage, and there are a large

number of dents, especially near the main bow. This instrument was obtained at Chamberlain, South Dakota in 1970.

Penzel and Miller, Number 2893

Type	upright with right-facing bell
Signature	G. L. Penzel & Miller / New York
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	37.9 cm
Height	72.5 cm
Weight	3.925 kg
First slide length	52.07 cm
Third slide length	83.82 cm
Pitch	probably high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This instrument is quite similar in construction and dimensions to No. 285, a Pepper instrument made about 1912. There is some difference in tuning slide length between the two instruments, but the other dimensions are almost identical. The marking "B & F" on the second valve casing is almost certainly the mark of Bohland and Fuchs of Grazlitz. This upright is quite similar in construction to many of the European uprights. The workmanship is solid, but the instrument is very plain. It was likely made in the first part of the twentieth century.

The valves are numbered 73, 74, and 75. The number five is also marked on the second valve casing. A gold-plated mouthpiece marked "Conn Standard" is with this instrument. Number 2893 is in very good condition.

Tourville, Number 117

Type	upright with right-facing bell
Signature	Tourville & Cie / Paris
Date of manufacture	ca. 1880
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.925 cm
Bell diameter	38.2 cm
Height	78.1 cm
Weight	5.755 kg
First slide length	52.07 cm
Third slide length	82.55 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Number 117 was used in Collinsville, Illinois, from 1880 to 1920, and it has been used in the Golden Age Band at the University of South Dakota. This is a very beautiful instrument with a design similar to many of the European tubas. The quality of workmanship is very good. Number 117 is the only upright in the collection with any significant amount of decoration. There are very ornate floral patterns on all the ferrules (even the slide ferrules), and the brace pads and main bow plate are decorated as well. Even the spine is ornate. Two curved braces hold the valve assembly in place, and both the second and third coils are relatively small and of approximately the same size, unlike the coils of many of the other imported instruments. The expansion of the bore is quite dramatic, and the bore diameter at the valves is the largest of any of the E-flat instruments in the collection.

The valves are numbered 1, 2, and 3, and "RID" is stamped on the second valve casing. There is a silver-plated mouthpiece marked "N3" with this tuba. This is a beautiful instrument in excellent condition. The Sears and Roebuck catalog of 1904-5 shows a Tourville instrument almost identical to No. 117 for the price of $43.25.

Fig. 22. Tourville, Number 117.

Pepper, Number 262

Type	upright with right-facing bell
Signature	J. W. Pepper & Sons / Perfected / Philadelphia / 66866
Serial number	66866
Date of manufacture	ca. 1913-1914
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.625 cm
Bell diameter	41.2 cm
Height	74.8 cm
Weight	5.565 kg
First slide length	53.34 cm
Third slide length	83.82 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The date for this instrument was estimated based on information provided by Mr. Lloyd Farrar. The term "Perfected" was used by Pepper for a line of imported band instruments which were purchased in either France or Austria. The "Perfected" line proved to be more popular than Pepper's own more expensive make.[1] An examination of this tuba shows that it is almost identical in construction and dimension to No. 681, an H. N. White import made by Bohland and Fuchs. It is almost certain that No. 263 is a Bohland and Fuchs instrument, since Bohland and Fuchs was a supplier for Pepper.

Like No. 681, this tuba has an unusually small curve in

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[1]Lloyd Farrar, "Chronologies and a Survey of Serial Numbers, unpublished materials relating to Henry J. Distin, Henry Distin Manufacturing Company, J. W. Pepper and J. W. Pepper and Sons, and Brua C. Keefer Manufacturing Company," Silver Spring, Maryland, (mimeographed)

the tuning slide just as it exits the third valve. The workmanship on this tuba is very good, and the ferrules are decorated in much the same fashion as those of American-made instruments.

The bore diameter was estimated from an outside measurement. The first valve and the buttons for the second and third valve are missing. This instrument has suffered a minor amount of damage, especially in the bell section.

Unsigned, Number 114

Type	upright with right-facing bell
Signature	none
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	35.7 cm
Height	77.4 cm
Weight	4.525 kg
First slide length	50.8 cm
Third slide length	81.92 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Often there are very few clues to give away the identity of an unknown instrument. There were so many instruments imported and stenciled during the first part of the century, that it is difficult to determine a maker if no information is available. This tuba is remarkably close in construction and dimensions to No. 131, an instrument made by LeBaron of Paris. Both instruments have a distinctive curved spine covering much of the main bow, and the construction and placement of the ferrules is the same. It seems quite likely that No. 114 was made by LeBaron. It is almost certainly of European origin.

There are some dents in the main coil, but the instrument seems generally to be in good condition. The valves are numbered 34, 35, and 36. An unmarked, nickel-plated mouthpiece is with this instrument.

Grand Rapids, Number 291

Type	upright with right-facing bell
Signature	USA Line / Grand Rapids Band Instrument Company /Grand Rapids, Mich. USA
Serial number	25583
Date of manufacture	ca. 1902-1908
Materials	lacquered brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	38.3 cm
Height	72 cm
Weight	5.255 kg
First slide length	48.9 cm
Third slide length	81.92 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Extra tubing has been added to the leadpipe to convert No. 291 to low pitch, a fact which would verify the estimated date of manufacture. The date for this instrument is based on the York estimates, because the Grand Rapids Band Instrument Company was a subsidiary of York.

This tuba seems to be the small bore version of No. 267, since the basic construction is very similar. Both instruments have tuning slides before the valve assembly, unlike the York tubas, and both have the same inner coil construction. Since it was unusual for instruments of this period to have been lacquered, it is reasonable to assume that the lacquering was done at a later date.

Number 291 is a very solid instrument. It has suffered some damage around the main bow, but it is generally in very good condition. A plated mouthpiece marked "Fo Reg 8" is with this instrument.

Lyon and Healy, Number 275

Type	upright with right-facing bell
Signature	Lyon & Healy / Silver Piston / Chicago
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	estimated 1.525 cm
Bell diameter	30.9 cm
Height	71.2 cm
Weight	3.415 kg
First slide length	48.9 cm
Third slide length	missing
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This tuba appears to be an import stamped with the Lyon and Healy trademark. Its design and dimensions are close to those of the Jaubert-Healy tuba (No. 357) and the Marceau-Sears instrument. Number 275 is also very similar to No. 251, another Lyon and Healy instrument. Lyon and Healy was an American agent for both Jaubert of Paris and Gunkel of Paris, and this tuba could have been made by either of the two firms. Number 275 does not compare favorably with No. 250, which is a Lyon and Healy instrument with the "Own Make" signature.

The bore diameter was estimated from an outside measurement. This upright has a number of large dents, and the bell appears to have been badly crinkled at one time. Arne Larson indicated that this instrument was made in 1896. The valves are numbered 46, 47, and 48. The second valve is also stamped with the number five.

York, Number 268

Type	upright with right-facing bell
Signature	J. W. York & Sons / Grand Rapids, Mich.
Serial number	62915
Date of manufacture	ca. 1917-1921
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.525 cm
Bell diameter	38.2 cm
Height	83.5 cm
Weight	6.305 kg
First slide length	55.88 cm
Third slide length	90.17 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

Number 268 is a York tuba of a somewhat different design from most of the other York uprights, and even the signature decoration is different. The style of this instrument does not correspond with the Yorks shown in the Oliver Ditson catalog, so it is not a Model 30, nor is it a large bore "monster" tuba. The inner coil construction is, however, somewhat similar to that of the York Model 30.

The quality of construction is quite good, and the tuba is in very good condition, except for the penny-whistle which is soldered to the side of the main coil. This is clearly a low-pitch instrument, because the valve slides are fairly long, and there is no extra "doughnut" of tubing as there is on some of the earlier Yorks. The second valve button is not original.

A. K. Hüttl, Number 294

Type	upright with right-facing bell
Signature	A. K. Hüttl / Grazlitz
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	estimated 1.45 cm
Bell diameter	38.2 cm
Height	73.3 cm
Weight	4.47 kg
First slide length	49.21 cm
Third slide length	83.82 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Arne Larson dated this instrument at 1920, but that date seems unlikely, because the valve slide length clearly suggests a high-pitch instrument. Also, the import of musical instruments during and immediately after World War I was greatly curtailed. The design of No. 294 is much like that of the other imported uprights, although the somewhat larger bell found on this tuba seems to be characteristic of the German imports. Many of the French imports have smaller bells. The tuba is quite solid with wide ferrules, solid braces, and large diamond-shaped brace pads.

Professor Larson acquired this instrument in 1971 from the Leola, South Dakota town band. The bore diameter was estimated from an outside measurement. It is in very good condition except for some minor dents in the leadpipe and at the main bow. The valves are numbered 37, 38, and 39.

Lyon and Healy, Number 273

Type	upright with right-facing bell
Signature	Lyon & Healy / Silver Piston / Chicago
Date of manufacture	late nineteenth or early twentieth century
Materials	brass painted with aluminum
Valves	three piston, top-action
Bore diameter	1.425 cm
Bell diameter	28.5 cm
Height	70.2 cm
Weight	3.395 kg
First slide length	49.53 cm
Third slide length	79.38 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This tuba is similar in construction and dimensions to No. 275, another Lyon and Healy instrument, and it is also similar to the Marceau-Sears tuba. Number 273 is almost certainly an import stamped with the Lyon and Healy signature.

There is enough difference in detail to be reasonably certain that No. 275 and No. 283 were not made by the same maker. Markings on the valves are similar, but certain features of the bracing and the placement of the ferrules are not the same. Lyon and Healy was an American agent for both Henry Gunkel and F. Jaubert of Paris, so this tuba could have been made by one of those manufacturers.

This tuba was obtained in Canistota, South Dakota in 1965. The third valve button is missing, but the tuba appears to be in good condition otherwise. The valves are numbered 7, 8, and 9. The second valve casing is also marked with the number five.

Jenkins, Number 332

Type	upright with right-facing bell
Signature	The New Jenkins Special
Date of manufacture	early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	48.6 cm
Height	77 cm
Weight	4.715 kg
First slide length	55.25 cm
Third slide length	87 cm
Pitch	low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This instrument has a bell which seems to be clearly out of proportion with the bore expansion. The bell appears to have been flattened somewhat, but it is still a good ten centimeteres larger than that of any other instrument of similar dimensions. It is almost as if the bell of a large-bore upright had been grafted onto a small-bore upright. The construction of the inner coils, the slide arrangement, the spine and the valve markings all resemble the same details found on many of the European instruments. Number 332 is especially close in construction and dimension to No. 266, a Le Piere instrument. This is, therefore, probably an imported instrument made to Jenkins' specifications.

Arne Larson provided a date of 1923 for this upright. The date is probably accurate because the instrument is clearly low-pitch. It appears to be in good condition, although the bell has been flattened slightly, and the third

valve button is missing. A silver-plated mouthpiece is with this instrument. The valves are numbered 34, 35, and 36. The second valve is also stamped with the number three. Arne Larson found this tuba in Sioux City, Iowa in 1969.

Holton, Number 136

Type	upright with right-facing bell
Signature	Made by Frank Holton & Co. / Chicago
Serial number	38604
Date of manufacture	1917
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.725 cm
Bell diameter	48.6 cm
Height	82 cm
Weight	4.105 kg
First slide length	52.07 cm
Third slide length	86.36 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The date of manufacture for this tuba was provided by the G. LeBlanc Corporation, which now owns the Holton Company. Number 136 has an unusual tuning slide, like that of York, No. 300, in that the moveable part of the slide doubles back on itself in a "U" shape, perhaps to save space. This instrument also shares a number of other common features with the York tuba. The valve slide construction and the bow plates of both tubas are the same, as is the curve in the tuning slide, but there are some differences in bracing, dimensions, and ferrule construction.

According to Mr. Gene Pilzuk, a former employee of York, Holton bought York instruments and stenciled the Holton name on them. This may be true; there is no evidence to suggest that Holton manufactured instruments in Chicago. This tuba and No. 280, another Holton, are similar in construction, and both have "Made by Frank Holton" stamped

on the bell. This does not appear on Holton, No. 134, which is a York copy that may have been manufactured by York. It cannot be denied that many of the features of this Holton and York, No. 300 are the same, but it seems likely that this instrument is a true Holton tuba which copied the York design. "Frank Holton Co." is stamped on the second valve casing.

Grand Rapids, Number 132

Type	upright with right-facing bell
Signature	Grand Rapids Band Instrument Company / Grand Rapids, Mich.
Serial number	25330
Date of manufacture	ca. 1902-1909
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.675 cm
Bell diameter	49.5 cm
Height	80.3 cm
Weight	7.13 kg
First slide length	52.71 cm
Third slide length	86.36 cm
Pitch	possibly high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The Grand Rapids Band Instrument Company was a subsidiary of York, and so the date of manufacture for this instrument was estimated based on the York production curve. The general features of this tuba correspond to those of the York large-bore E-flat bass, except for the position of the tuning slide. Number 132 is very similar in detail and dimensions to another Grand Rapids large-bore instrument, No. 267. Like No. 267, the inner coils of this tuba are arranged in a manner similar to the European instruments' coils. This particular characteristic seems to be a trademark of the second line domestic instruments as well. The placement of the tuning slide before the valve assembly generally results in this type of inner coil arrangement, and so this kind of placement may have been a cost saving method for the manufacturers. Despite the coil construction

and other differences, it is possible to see the relationship between the Grand Rapids instrument and the York instruments.

This upright is well-built, but it is clearly not the top of the line. The ferrules are decorated, but they are rather small, unlike the ferrules of the York instruments. There is some minor bell damage, and there are some dents around the main bow, but generally the instrument appears to be in good condition.

King, Number 367

Type	upright with right-facing bell
Signature	King / Made by H. N. White Co. / Clev'd, O.
Serial number	36737
Date of manufacture	ca. 1893-1915
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.725 cm
Bell diameter	51.1 cm
Height	82.3 cm
Weight	7.92 kg
First slide length	53.34 cm
Third slide length	85.09 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

This tuba has suffered a great deal of damage, especially around the bell. The bore diameter was estimated from an outside measurement. Arne Larson acquired this instrument in 1974 at Emory, South Dakota.

This is the only large-bore King in the group of uprights. It appears, however, to be very similar to the other "monster" basses made by American manufacturers. The tuning slide curves as it leaves the third valve casing, and it curves again in order to pass behind the leadpipe as it begins the inner coil. This appears to be the only special feature about this instrument. The main coil construction is very much like that of the York and Holton tubas. A silver-plated mouthpiece marked "Besson 12" is with this upright, and "King -- made by H. N. White Co. -- Clev'd O" is stamped on the second valve casing.

York, Number 300

Type	upright with right-facing bell
Signature	Made by J. W. York & Son / Grand Rapids, Mich.
Serial number	16008
Date of manufacture	ca. 1899-1906
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.675 cm
Bell diameter	49.8 cm
Height	80.5 cm
Weight	7.94 kg
First slide length	53.98 cm
Third slide length	86.36 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

Arne Larson provided a date of manufacture of 1923 for this instrument, but the estimated production curve for the York instruments places the date of manufacture somewhat earlier. Number 300 is fairly typical of the York instruments, except that the tuning slide, like that of Holton, No. 136, doubles back on itself in a "U" shape. This must have been done to avoid having the extended tuning slide go past the main bow of the instrument. The tuning slide is also curved at the point where it exits the third valve, and it curves again at the corresponding position on the other side of the instrument.

The construction is quite solid, and it shows a high degree of craftsmanship. The valve slide length would suggest that No. 300 is low pitch, but its measurements are not out of line with other York tubas made about the same time.

The bore diameter was estimated from an outside measurement. The valve slide assembly has been separated from the body of the instrument. The bell has been flattened somewhat, and there are some other dents as well.

This tuba was obtained from the Bryant, South Dakota high school in 1958. It has a silver-plated mouthpiece marked "York & Sons 18 (MOORL)."

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Unsigned, Number 1459

Type	upright with right-facing bell
Signature	none
Serial number	P18530
Date of manufacture	possibly 1910-1920
Materials	brass
Valves	three piston, top-action
Bore diameter	estimated 1.85 cm
Bell diameter	51.4 cm
Height	90.8 cm
Weight	7.04 kg
First slide length	53.34 cm
Third slide length	85.71 cm
Pitch	possibly low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

This is almost certainly an American made instrument, but the manufacturer is unknown. Number 1459 is a large-bore tuba. The inner tubing and slide construction is typical of many American uprights. The way in which the tuning slide is curved is similar to the curve found on other American instruments, notably Buescher, No. 135, but the method used is not the same. Perhaps the most important clue is the way in which the second valve slide is constructed. This instrument and the Sears "Supertone" tuba both have the longer slide section on the right (bell down) side, unlike any other American upright except for Conn, No. 345. The Sears tuba may have been made by Pan American.

The "P" prefix before the serial number on this tuba is the same as that found on the Sears "Supertone" instrument and on some of the other instruments made by Pan American. It is possible, then, that No. 1459 is a Pan American instrument, but a different model than the "Supertone" tuba.

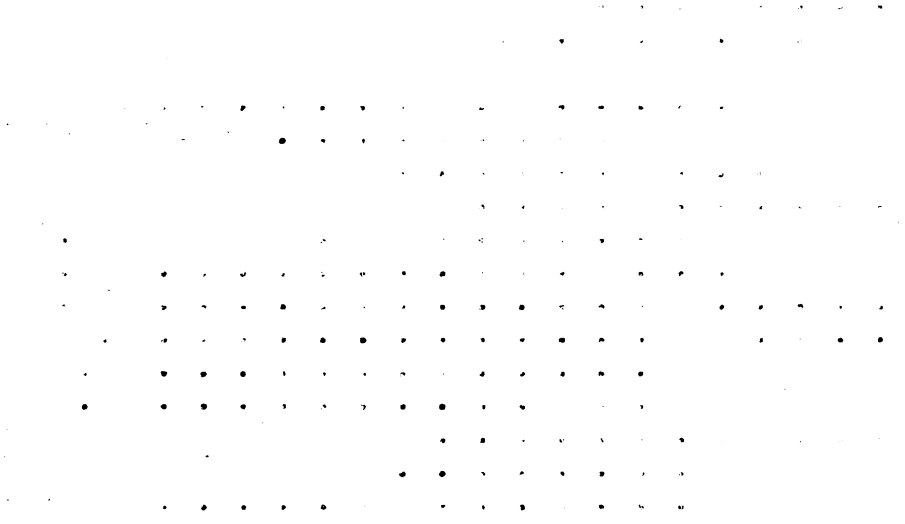
This tuba was acquired in Canby, South Dakota in 1975. The bore diameter was estimated from an outside measurement. The first valve slide, the water key, and the first and third valve buttons are missing. There are also some large dents between the main bow and the second bow. The leadpipe is missing as well.

Pepper, Number 295

Type	upright with right-facing bell
Signature	J. W. Pepper & Sons Perfected / Philadelphia 66043
Serial number	66043
Date of manufacture	ca. 1913-1914
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.6 cm
Bell diameter	48.7 cm
Height	75.3 cm
Weight	6.345 kg
First slide length	52.07 cm
Third slide length	85.09 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

It is reasonable to assume that No. 295 was made by Bohland and Fuchs of Austria. The "Perfected" on the signature indicates an imported instrument, and the details of construction of this tuba compare favorably with other Bohland and Fuchs instruments. This tuba is most like No. 681, a Bohland and Fuchs tuba imported and sold by H. N. White, although this upright is somewhat larger in dimensions. The most significant feature of both instruments is the curve in the tuning slide as it exits the third valve. Bracing and ferrules are also similar between the uprights.

According to Arne Larson, the high pitch slide for this tuba is missing, which would mean that it was built to play both high and low pitch. There are some dents in the main coil, and the bell has been damaged. The third valve cap is missing as well. The valves are numbered 53, 53, and 54. This instrument was obtained in 1951 from an individual in Astoria, South Dakota.



York, Number 110

Type	upright with right-facing bell
Signature	Made by J. W. York & Sons / Grand Rapids, Mich.
Serial number	46658
Date of manufacture	ca. 1910-1916
Materials	brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	38.7 cm
Height	71.3 cm
Weight	5.54 kg
First slide length	50.17 cm
Third slide length	80.65 cm
Pitch	high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

York, No. 110 compares favorably to the York Model 30 illustrated in the Oliver Ditson Guidebook No. 2, which was published in about the 1920s, although No. 110 is an earlier instrument. The most interesting feature of this tuba is the extra circle of tubing near the bottom of the tuning slide, which can be used to convert the instrument from high to low pitch. It is inscribed with "Pat. -- July 12, 1910," which is helpful in verifying the date of manufacture.

A carrying strap, perhaps for marching, has been attached to one of the strap hooks. There is minor bell damage and a great deal of damage at the main bow, as well as minor dents elsewhere on the instrument. A silver-plated mouthpiece marked "York & Son 19" is with this tuba.

Holton, Number 130

Type	upright with right-facing bell
Signature	Made by Frank Holton / Chicago
Serial number	12003
Date of manufacture	ca. 1910-1917
Materials	brass
Valves	three piston, top-action
Bore diameter	1.7 cm
Bell diameter	49 cm
Height	79.9 cm
Weight	7.555 kg
First slide length	53.34 cm
Third slide length	87 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The bore diameter of No. 130 is one of the largest of any of the upright instruments, and the rest of the dimensions would certainly qualify this as a "monster" E-flat tuba. The design of this instrument is clearly modeled after the York instruments (see Holton, No. 136 for a more detailed discussion), and may even be a York, although the signature does indicate that it was made by Frank Holton. Virtually all of the design features and the details of construction correspond to those of the York large-bore tuba illustrated in the Ditson catalog. Also, the Holton Company seems to have no records for this particular tuba as they did for all of the other Holton instruments, and the details of construction of the other instruments stamped "Made by Frank Holton" are not the same as those found on this tuba. It is possible that No. 130 was one of the early instruments which Holton bought from York and stamped with the Holton signature.

The third valve slide of this tuba is separated from the valve, and the leadpipe has separated from the instrument as well. The bell has been damaged, and there are a number of dents in the body.

Tonk, Number 1170

Type	upright with right-facing bell
Signature	Tonk / Chicago
Date of manufacture	late nineteenth or early twentieth century
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.65 cm
Bell diameter	41.7 cm
Height	75.4 cm
Weight	5.49 kg
First slide length	52.07 cm
Third slide length	83.82 cm
Pitch	probably high
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The markings and construction of this tuba are clearly similar to details of No. 681 and No. 295, which were manufactured by Bohland and Fuchs of Grazlitz. The curve in the tuning slide as it exits the third valve is clearly apparent, and the bracing and ferrules are almost the same as those found on No. 681 and No. 295. Also, there is no evidence to suggest that the Tonk Manufacturing Company ever made brass instruments, so this is almost certainly an imported instrument.

The tuning slide of this tuba has a retaining mechanism to keep the slide from shifting, or perhaps to serve as a preset for low pitch playing. This is a high quality instrument in very good condition. The valves are numbered 34, 35, and 36.

Grand Rapids, Number 279

Type	upright with right-facing bell
Signature	Grand Rapids Band Instrument Company
Serial number	2981
Date of manufacture	early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.675 cm
Bell diameter	49.6 cm
Height	79.2 cm
Weight	7.025 kg
First slide length	53.66 cm
Third slide length	86.36 cm
Pitch	possibly high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The three large-bore E-flat tubas manufactured by the Grand Rapids Band Instrument Company (York) all show similar techniques of construction. The serial number of this instrument indicates that it is the earliest of the three, and there do appear to be minor differences, especially in the width of the tuning slide. The ferrules on this tuba are quite plain in comparison to the ferrules on the other two instruments.

Number 279 was probably the low-priced equivalent of the York "monster bass" in E-flat because of its dimensions. The date of manufacture is based on the estimated production curve of York band instruments, and it is much earlier than the 1916 date provided by Arne Larson. No evidence has been found to date, however, which would suggest that the Grand Rapids serial number sequence was different than the York sequence.

This tuba is in good condition except for some bell damage and some minor dents around the main bow. Number 279 was obtained in 1970 at Sioux City, Iowa.

Conn, Number 276

Type	upright with right-facing bell
Signature	C. G. Conn / Elkhart, Ind. and Worcester, Mass.
Serial number	13280
Date of manufacture	ca. 1887
Materials	brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	36.5 cm
Height	73.9 cm
Weight	4.93 kg
First slide length	50.80 cm
Third slide length	80.01 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This particular Conn instrument is in very good condition despite its age. The only real damage is a large dent around the area of the main bow. The first valve button is also not original. Arne Larson obtained this tuba in 1954 at Hazel, South Dakota.

Number 276 is similar in all respects to the other medium-bore Conn instruments made about the same time. The tuning slide is before the valve assembly, unlike that of many other American tubas, but the quality of construction is very good, and the bore expansion appears to be quite even throughout most of the length of the instrument. The bell of this tuba is quite close to the main coil, and this too seems to be a characteristic of the earlier Conn uprights.

Lyon and Healy, Number 257

Type	upright with right-facing bell
Signature	Lyon & Healy / Silver Piston / Chicago
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	31.4 cm
Height	71.8 cm
Weight	3.765 kg
First slide length	45.93 cm
Third slide length	77.47 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This Lyon and Healy "Silver Piston" upright is much the same in construction as two of the "Silver Piston" tubas already examined, and it is very close to No. 275 in dimensions. The quality is typical of the cheaper European instruments, and it is reasonable to assume that this tuba is an import. It does not resemble the American made Lyon and Healy instrument. Lyon and Healy was a domestic agent for both F. Jaubert and Henry Gunkel of Paris, so either could have manufactured this tuba. The rather small bell appears to be characteristic of the French instruments.

Number 257 has some bell damage, and there are some dents near the main bow. The third valve slide assembly has been detached. The valves are numbered 25, 26, and 27. The second valve is stamped with the number five.

Dyer, Number 274

Type	upright with right-facing bell
Signature	Diamond / W. J. Dyer & Bro.
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.45 cm
Bell diameter	29.1 cm
Height	72.4 cm
Weight	3.32 kg
First slide length	52.07 cm
Third slide length	86.36 cm
Pitch	possibly high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The W. J. Dyer Company was known for making stringed instruments, but there is no evidence to support a claim that the company made wind instruments. This small-bore tuba resembles many of the cheaper imports in the collection, and so it is probably an import as well. The main bow plate and spine resemble those found on Bohland and Fuchs instruments, but there seem to be no other features of construction by which a maker could easily be identified. The markings on the valves resemble similar markings on the Lyon and Healy tubas, but such markings also do not provide clear evidence of the maker. Number 274 resembles No. 258, an instrument of unknown origin.

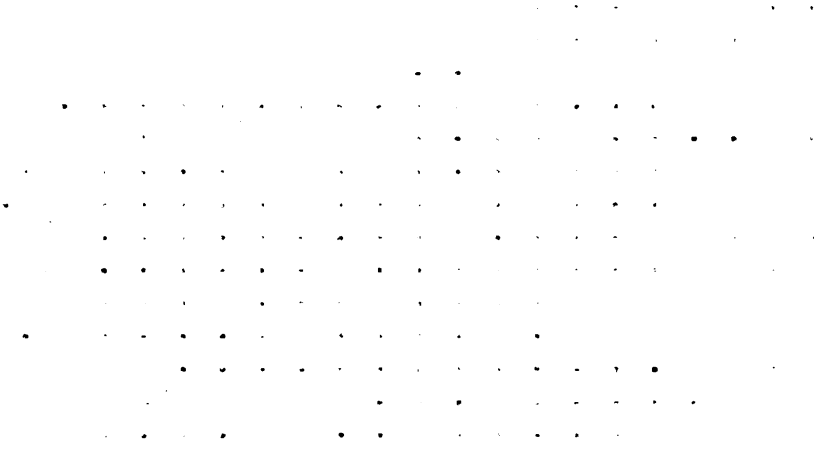
This upright is badly damaged. The leadpipe is twisted, and there are a number of large dents in the main coil. The second valve stem and button are missing. The valves are numbered 46, 47, and 48. The second valve is stamped with the number five. Arne Larson found this instrument in Rochester, Minnesota in 1955.

X-Ray, Number 288

Type	upright with right-facing bell
Signature	X-Ray / Made in USA
Date of manufacture	early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.45 cm
Bell diameter	35.4 cm
Height	72.6 cm
Weight	4.715 kg
First slide length	53.34 cm
Third slide length	86.36 cm
Pitch	high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Attempts to discover the maker of this instrument and the origin of the trademark have proven fruitless. Arne Larson indicated in a telephone conversation that the tuba was sold by Hallmark, which he believed was the name of a music store, but this company is not listed in the standard references. The marking "48" which appears on the first valve casing could be a serial number, but is more likely a valve number. The date of manufacture provided by Arne Larson of 1916 seems to be accurate because of the set of low-pitch sleeves which are with the tuba.

This appears to be a good quality instrument, and it bears a certain resemblance to some of the Conn tubas, although this is clearly not a Conn. There is also some resemblance to the Jenkins-Harwood import, but not enough to suggest that No. 288 was made by Harwood. The closest instrument in construction to No. 288 is clearly the Fillmore solo instrument. Almost all details of construction--size and placement of ferrules, placement of



braces, valve slide length, inner coil arrangement--are similar between the two instruments. These two instruments are not identical, but they are close enough to speculate that they were made by the same manufacturer.

Since some of the details of construction are also similar to the details of the King instruments, it may be reasonable to assume that these tubas were made as second-line Kings, perhaps under the Cleveland Band Instrument Company name. Unfortunately, there are no uprights in the E-flat group that bear the Cleveland Band Instrument Company trademark, so no comparison can be made.

Professor Larson acquired this instrument from the Bryant, South Dakota city band in 1944. The receiver and the first and third valve buttons are missing, but it is in good condition otherwise.

R. Wunderlich, Number 271

Type	upright with right-facing bell
Signature	R. Wunderlich / Maker / Chicago
Date of manufacture	early twentieth century
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.675 cm
Bell diameter	35.5 cm
Height	75.3 cm
Weight	4.795 kg
First slide length	49.53 cm
Third slide length	77.47 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Langwill's Index of Musical Wind Instrument Makers lists an R. Wunderlich operating in Chicago about 1914. This instrument is probably high pitch and would have been built about that time. The quality of construction is quite good, although there is little decoration. The bracing is very solid. Wunderlich is credited with having built at least one prototype instrument for the hornist Sansone, so it is very likely that he built this tuba. The bore is relatively large like many of the American instruments, and the construction is similar to the American made Fischer instrument.

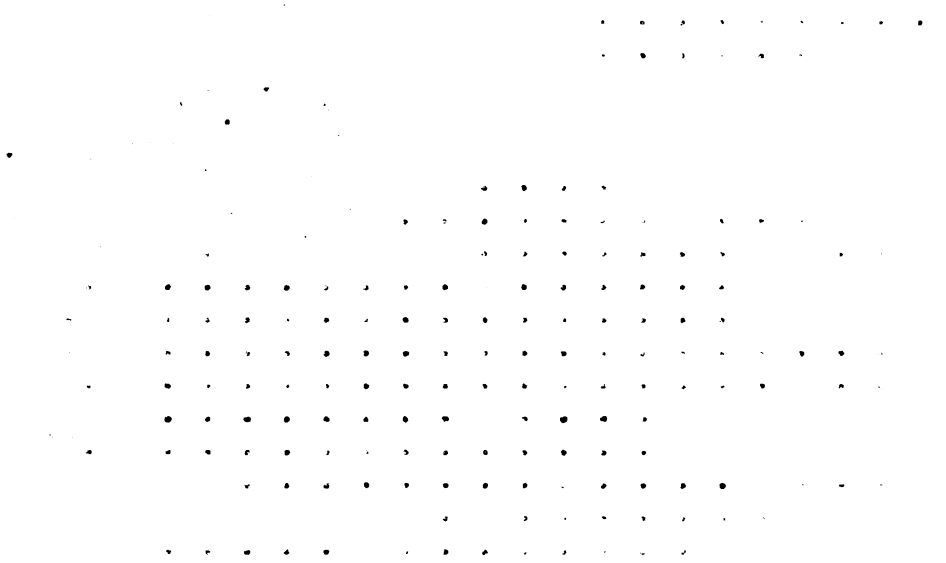
Number 271 appears to be in good condition apart from some dents around the main bow and second bow. Professor Larson found this upright in Duluth, Minnesota in 1951. The valves are numbered 4, 5, and 6.

Heinel, Number 284

Type	upright with right-facing bell
Signature	Genuine August Heinel Superior Quality / J. W. Jenkins, Sons Music Co. / Sole Agents / Kansas City, Mo.
Date of manufacture	early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.45 cm
Bell diameter	33.4 cm
Height	73.6 cm
Weight	3.87 kg
First slide length	51.44 cm
Third slide length	81.28 cm
Pitch	high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This tuba can be converted to low pitch by pulling the slides to marks etched on the inner slides, so it was probably made in the early twentieth century, perhaps before 1920. The design is much the same as that of many imports in the collection, and the quality of workmanship is typical of lower-priced tubas. The distinguishing feature of No. 284 is the curved bracing which supports the valve assembly. The only other upright with this type of bracing is the large-bore Tourville instrument, No. 117. This tuba has a long spine to protect the main bow. The ferrules are plain and relatively narrow.

Number 284 was found in Mankato, Minnesota in 1959. It has suffered some bell damage, and there are some small dents near the main bow. An unmarked, silver-plated mouthpiece is with the instrument. The valves are numbered 34, 35, and 36.



Buescher, Number 112

Type	upright with right-facing bell
Signature	The Buescher / Pat. Oct 29, 07 / Elkhart, Indiana
Serial number	15223
Date of manufacture	ca. 1907-14
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.5 cm
Bell diameter	37.9 cm
Height	78 cm
Weight	5.685 kg
First slide length	55.88 cm
Third slide length	86.36 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

None of the Buescher uprights in the collection are constructed in the same way, even though all three were made within a very few years of one another. This tuba has the most interesting valve construction of any of the uprights. The leadpipe goes to the second valve rather than to the first valve, and there is an extra bit of tubing between the first and third valves. Also, the first and third valve slides enter and exit at the rear of the valves, and the second valve slide enters and exits at the side of the valve. The air stream is routed 2-3-1 rather than 1-2-3. The rest of the inner coil arrangement is similar to that of many American instruments.

Number 112 has a decorative spine. It also has two braces placed quite close together between the bell section and the second coil. The valve design creates a somewhat unorthodox profile. The quality of construction is quite good.

Information about the date of manufacture was estimated based on information provided by Mr. Lloyd Filio, former employee of Buescher. This tuba was obtained in 1972 in Oakland, Nebraska. The bore diameter was estimated from an outside measurement. There are some bell dents and some dents just after the main bow, but it is in good condition. "Pat, MCH 19 1901" is stamped on the rear of the second valve casing. A silver-plated mouthpiece marked "Buescher Tru Tone 24" is with this upright.

Lyon and Healy, Number S-8

Type	upright with right-facing bell
Signature	Silver Piston / Chicago
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	30 cm
Height	74 cm
Weight	3.595 kg
First slide length	48.26 cm
Third slide length	73.66 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The valve assembly of this tuba has been torn away, and extra tubing has been added at the receiver to convert it to low pitch, so it is difficult to compare No. S-8 with some of the other Lyon and Healy tubas. The design is like that of many of the imported instruments, and this tuba does resemble the other Lyon and Healy imports. Number S-8 could have been made by either Henry Gunkel of Paris or Jaubert of Paris, since Lyon and Healy was the American agent for their instruments.

This is a cheaply-made instrument despite the large number of braces. The bore does not appear to expand greatly, and this makes the inner coils look rather open. There are a number of dents near the main bow, and there is a minor amount of bell damage. The valves are numbered 13, 14, and 15. According to Arne Larson, this upright was used in the early city band at Mobridge, South Dakota.

Conn, Number 2637

Type	upright with right-facing bell
Signature	Made by C. G. Conn Ltd. / Elkhart, Ind. USA
Serial number	I83987
Date of manufacture	ca. 1904
Materials	lacquered brass
Valves	three piston, top-action
Bore diameter	1.575 cm
Bell diameter	41 cm
Height	77.5 cm
Weight	5.575 kg
First slide length	53.98 cm
Third slide length	87 cm
Pitch	probably low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The bell has been flattened on No. 2637, so some of the measurements may not be completely accurate. The arrangement of the first and third valve tubing is similar to the space-saving arrangement found on at least two other Conn uprights. This instrument also appears to have a greater distance between the bell and the second bow than do many other of the uprights in the group. The lacquering may have been done at a later date.

The prefix "I" before the serial number does not appear on any other of the Conn E-flat tubas in the collection. It could indicate a place of manufacture if this instrument had been manufactured in one of Conn's subsidiary factories, or it could be a 1 rather than an I, in which case the date of manufacture would be around 1921 rather than 1904. The valve slide lengths compare favorably with the same measurements on Conn, No. 129 made in 1901, but this tuba also has other dimensions which are similar to a Conn tuba

made in 1920. The word "Patented" which appears on the second valve casing may refer to the style of instrument, or it may refer to the valve slide construction.

Number 2637 has some minor dents, but it is in generally good condition. A plated mouthpiece marked "Conn L" is with this instrument.

LeBaron, Number 131

Type	upright with right-facing bell
Signature	Frederick LeBaron / Paris
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.5 cm
Bell diameter	35.4 cm
Height	74.8 cm
Weight	4.485 kg
First slide length	51.44 cm
Third slide length	81.28 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

A sleeve has been added to the tuning slide of No. 131 to convert it to low pitch. There is a rather prominent spine. This appears to be a low-priced instrument with a design similar to many of the cheaper imported instruments. The absence of valve sequence numbers is somewhat unusual among the French instruments, which might indicate that LeBaron was a very small operation. The company is not listed in any of the standard references, and this may be a further indication that the LeBaron company was something of a cottage industry.

The bore diameter was estimated from an outside measurement. The first valve stem is missing, and the third valve cap and button are missing. There are a number of dents in the bell and in the main coil of the instrument.

Fischer, Number 251

Type	upright with right-facing bell
Signature	Carl Fischer's Professional Grade / New York
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.525 cm
Bell diameter	38.5 cm
Height	74.5 cm
Weight	4.57 kg
First slide length	51.44 cm
Third slide length	81.28 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

Carl Fischer did manufacture musical instruments, and this could be an American made instrument, although there is no serial number or markings on the signature to indicate that it was made in the United States. The construction and dimensions are close enough to those of No. 851 to suggest that No. 251 may have been made by Henry Marchand of Paris, but there is a difference in slide lengths. The tuning slide bracing, the type and location of the ferrules and braces and the spine are all similar to those features on No. 851. If this tuba was made in the United States, then it was almost certainly patterned after a European design. The quality of construction is good for a moderately-priced medium-bore instrument.

Number 251 is in very good condition except for the tarnish on the finish. This tuba was used at Lake Crystal, Minnesota, and it was donated to the museum by George Hage

of the Watanwan County Historical Society in 1970. Professor Larson estimated the date of manufacture as 1880. An unmarked brass mouthpiece is with this instrument.

Pepper, Number 127

Type	upright with right-facing bell
Signature	J. W. Pepper / Perfected / Philadelphia / 50501
Serial number	50501
Date of manufacture	ca. 1910
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	38.7 cm
Height	71.2 cm
Weight	4.315 kg
First slide length	52.71 cm
Third slide length	85.09 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

According to Lloyd Farrar, the "Perfected" line of Pepper instruments was an imported line of instruments. The "Perfected" instruments were made for Pepper by either C. A. Mouchel of Paris or by Brisson of Paris until about 1910, and by Bohland and Fuchs of Grazlitz after 1910. This tuba is somewhat similar in construction and dimensions to No. 285, an instrument probably made by Bohland and Fuchs, but this tuba does not have a spine. The details seem close enough to speculate that No. 127 was made by Bohland and Fuchs, but there are no instruments identified as having been made by either Brisson or Mouchel in the collection, so a true comparison is difficult to make.

This upright has suffered an extensive amount of damage, so the dimensions may not be entirely accurate. Extra tubing has been added to the tuning slide to convert this tuba to low pitch. This would probably place the date of manufacture sometime in the early part of this century.

Jenkins/Harwood, Number 296

Type	upright with right-facing bell
Signature	The Perfected Harwood Professional / Genuine Harwood Registered / Warranted for 10 years / J. W. Jenkins Sons Music Co. / Sole Agents / K.C. Mo. / USA
Serial number	3373
Date of manufacture	late nineteenth or early twentieth century
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	38.4 cm
Height	72.2 cm
Weight	5.045 kg
First slide length	52.07 cm
Third slide length	83.82 cm
Pitch	high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The term "Perfected" was used by instrument dealers to indicate an imported instrument. In this case, Harwood may have been the manufacturer, although none of the sources consulted mentioned this name in conjunction with instrument manufacture. It is possible that Harwood was an English manufacturer.

This instrument is well-constructed, and it is larger than many of the imported tubas, but the bore is relatively small. It is very close in construction to No. 288, the X-Ray instrument. The dimensions of the two instruments are somewhat similar, and this upright also has a set of low pitch conversion shanks. This would likely place the date of manufacture in the early twentieth century. The two instruments are not similar enough to suggest that they were

made by the same manufacturer. There is a serial number, but that may have been added by Jenkins.

Arne Larson acquired this tuba in Glencoe, Minnesota in 1947. All the valve buttons, the second valve stem, and the first valve cap are missing. There are also a few minor dents in the main bow. The instrument is in very good condition otherwise.

Gunkel, Number 124

Type	upright with right-facing bell
Signature	Henry Gunkel / Paris / Lyon & Healy / Chicago / Sole Agents
Date of manufacture	ca. 1869-1899
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.675 cm
Bell diameter	32.3 cm
Height	86 cm
Weight	4.33 kg
First slide length	50.80 cm
Third slide length	81.92 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	R-R-R-F

This tuba is one of the few in the collection of E-flat instruments which more closely resembles the older bombardons in appearance. The body is fairly long and narrow and the bell quite small. Number 124 is almost identical in construction and dimensions to No. 2564, another Gunkel instrument of about the same vintage.

The leadpipe goes to the third valve, and all of the valve slides are at the rear of the instrument. There is no third coil, but there is a rather long second coil which ends at the first valve casing after crossing in front of the valve assembly. There is a prominent spine but no other decoration of any kind. The construction is solid but not of a high degree of craftsmanship.

The date for No. 124 was established based on information gleaned from various sources. These sources indicated that Lyon and Healy began selling instruments in 1869 and began making their own instruments about 1889.

This dating would seem to be reasonable, and it would seem to reflect the transition from the older bombardon type to the new tuba type as well.

This tuba seems to be in good condition except for the missing second valve button. The bore diameter was estimated from an outside measurement. A representation of a ship appears under the signature. There is a nickel-plated mouthpiece marked "Elkhorn."

Lyon and Healy, Number 311

Type	upright with right-facing bell
Signature	Lyon & Healy / Chicago
Date of manufacture	ca. 1869-1899
Materials	brass with German silver ferrules and brace pads
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	27.1 cm
Height	98.2 cm
Weight	3.035 kg
First slide length	50.17 cm
Third slide length	76.20 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This is very likely one of the earliest tubas sold by Lyon and Healy of Chicago. The lack of a serial number and the German silver ferrules used on this instrument indicate that it was almost certainly imported. It was probably made in the 1860s or 1870s, because Lyon and Healy is not identified as an agent, nor does the tuba bear the inscription "Own Make." It is possible, though unlikely, that this tuba was made by Lyon and Healy.

The valves appear to be of the "Berliner-Pumpen" type, and the valve slide tubing arrangement on valves one and three is unusual. The tubes enter and exit the valves on opposite sides, and this makes it necessary for those slides to be set sideways. The second valve slide enters and exits the valve at the same distance from the top. (This characteristic is unique to No. 311.) There is a finger ring and a curved brace between the first and third valve slides.

Number 311 is clearly more of a saxhorn or a bombardon than it is a modern tuba. The bell is quite small, and the body of the tuba is long and narrow. There is also a good bit of distance between the bell and the second bow. There is an unmarked, silver-plated mouthpiece. The valves are numbered 13, 14, and 15. This instrument is generally in good condition except for some dents in the section between the main bow and second bow.

Fig. 23. Lyon and Healy, Number 311.

Besson, Number S-111

Type	upright with right-facing bell
Signature	F. Besson Levete / 198 Euston Road / London / Louis Schreiber / Sole Agent / United States
Serial number	26356
Date of manufacture	ca. 1867-1873
Materials	brass
Valves	three piston, top-action
Bore diameter	1.65 cm
Bell diameter	32.2 cm
Height	84.1 cm
Weight	4.56 kg
First slide length	50.8 cm
Third slide length	84.46 cm
Pitch	possibly low
Tuning slide	before valve assembly
Slide placement	R-R-R-F

Arne Larson acquired this tuba, the only Besson E-flat upright in the collection, from John Alfredo of New Haven, Connecticut in 1981. Number S-111 bears the Besson trademark of a brass ball soldered to the main bow of the instrument.

Number S-111 is more like the earlier bombardons in construction because of the small bell and the tall, somewhat thin body. (Besson retained this style for a number of years.) The valve slides, like those of the Gunkel-Healy instruments, are placed at the rear of the instrument, and only the tuning slide is placed in the front. The placement of the tuning slide gives this tuba a distinctive profile.

The date for this instrument was established using two major sources. The F. Besson Company in London was changed to Besson and Company Limited in 1873, and Schreiber founded

his United States agency in about 1867, so it is likely that No. S-111 was made in that period. If the signature is incorrect, then this upright could have been made as late as the first decade of the twentieth century.

There are very few dents in the body of this instrument. The first and third valves, the second valve button, the second valve slide, the water key and the leadpipe ferrule are all missing. "Besson pretest" is stamped on the first valve casing.

Gunkel, Number 2564

Type	upright with right-facing bell
Signature	Henry Gunkel / Paris / Lyon & Healy / Chicago / Sole Agents
Date of manufacture	ca. 1869-1899
Valves	three piston, top-action
Bore diameter	estimated 1.675 cm
Bell diameter	32.3 cm
Height	85.5 cm
Weight	4.35 kg
First slide length	43.18 cm
Third slide length	78.74 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	R-R-R-F

All of the dimensions of No. 2564, except for the valve lengths, are identical to those of No. 124, another instrument made by Gunkel and sold by Lyon and Healy. Other details of construction, including the valve slide positions and the routing of the leadpipe to the third valve, are virtually identical as well.

Number 2564 is more like the bombardons or saxhorns than the modern tubas in construction. The body is tall and relatively thin, and the bell is quite small. This upright was probably imported and sold about the same time as No. 124, but it may be higher in pitch than that instrument, give the valve slide lengths. The date of manufacture was estimated based on information from a variety of sources, including sources about the maker and the agent.

The bore diameter was estimated from an outside measurement. This tuba is in excellent condition except for a small dent between the main bow and the second bow. There

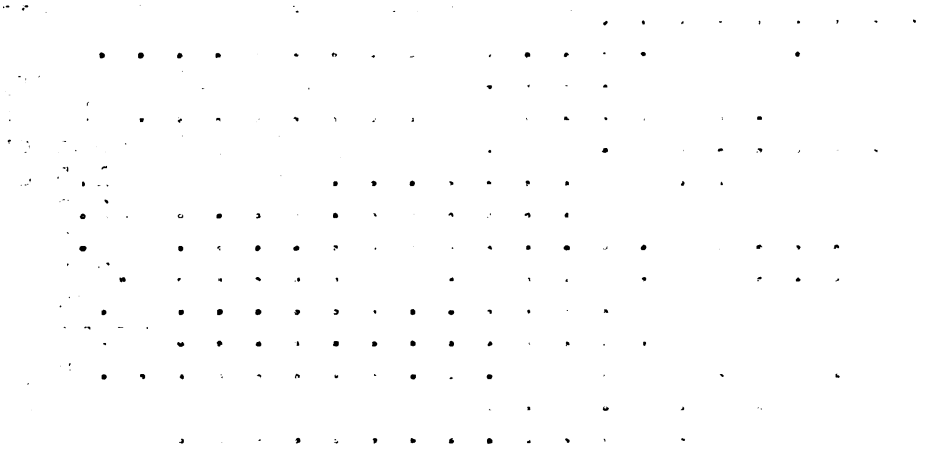
is an unmarked silver-plated mouthpiece. A representation of a ship is engraved under the signature.

Unsigned, Number 260

Type	upright with right-facing bell
Signature	none
Date of manufacture	late nineteenth century
Materials	brass
Valves	three piston, top-action
Bore diameter	estimated 1.5 cm
Bell diameter	32.3 cm
Height	84.3 cm
Weight	3.775 kg
First slide length	49.53 cm
Third slide length	76.70 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-R-R-F

Professor Arne Larson obtained this upright in Duluth, Minnesota in 1951. The small bell and the rather tall, thin body indicate clearly that No. 260 is perhaps a second or third generation bombardon, made perhaps in the mid to late nineteenth century. It does not resemble any of the other upright instruments, so the maker may remain a mystery. The leadpipe goes to the third valve, and the valve slide tubes are either set to the rear or to the side of the valves. The main tubing makes an "S" curve to begin the inner coil after it exits the first valve casing. The quality of construction is good.

The presence of the crown on the bell and the two medallions marked "Oporto 1865" and "Philadelphia 1876" indicate that No. 260 is probably of European origin. Langwill lists a number of makers whose mark was a crown, but there are no makers listed with the crown mark and the exposition medals, so it is difficult to even speculate about the manufacturer.



The bore diameter was estimated from an outside measurement. Two valve buttons are missing. There are some major dents in the main tubing between the first and second bows. The valves are numbered 55, 56, and 57.

DeVere, Number 289

Type	upright with right-facing bell
Signature	Jules DeVere & Co. / Paris / Montgomery Ward & Co./ Sole Agents / Chicago
Date of manufacture	late nineteenth or early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.525 cm
Bell diameter	28.9 cm
Height	75.6 cm
Weight	3.425 kg
First slide length	52.07 cm
Third slide length	78.11 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-R-R-F

Number 289 has a very small bell, given the bore expansion which takes place. The leadpipe/tuning slide enters the third valve, so the tuning slide must cross in front of the valve assembly. The main tubing exits at the top of the first valve to begin the inner coil. There is a prominent spine to protect the main bow.

The quality of construction is quite modest, which reflects the general tendency of companies like Montgomery Ward and Sears to sell second or third line instruments at a reduced cost. Jules DeVere and Company is not listed in the standard references, and it may well have been a rather small manufacturing firm which made instruments primarily for export.

Arne Larson acquired No. 289 at Sault St. Marie, Michigan in 1951. The receiver has been removed, and there are a number of dents between the bell section and the second bow. The valves are numbered 67, 68, and 69.

York, Number 128

Type	upright with right-facing bell
Signature	Made by J. W. York & Son / Grand Rapids, Mich.
Serial number	11413
Date of manufacture	ca. 1897-1904
Materials	brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	38.6 cm
Height	69.7 cm
Weight	5.57 kg
First slide length	50.8 cm
Third slide length	82.82 cm
Pitch	probably high
Tuning slide	after valve assembly
Slide placement	F-F-F-f

Number 128 has suffered a great deal of damage, but clearly the workmanship is quite good. It is most similar in construction to York, No. 110, an instrument made much later, especially in the way in which the second bow almost touches the bell. (The bell has been flattened but the extent of the damage is not clear.) The inner coils and the valve slide arrangements are similar to those of most of the other Yorks, and like the other Yorks, this tuba has rather wide ferrules and is well-braced. The dimensions of this tuba suggest that it is a York Model 30 medium-bore instrument. It has been damaged extensively at the bell and at the main bow. The third valve slide is missing.

York, Number 256

Type	upright with right-facing bell
Signature	Made by J. W. York & Son / Grand Rapids, Mich.
Serial number	28621
Date of manufacture	ca. 1904-1910
Materials	brass
Valves	three piston, top-action
Bore diameter	estimated 1.675 cm
Bell diameter	49.7 cm
Height	78 cm
Weight	7.585 kg
First slide length	52.71 cm
Third slide length	85.73 cm
Pitch	probably high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The dimensions of this York tuba suggest that it is the same as the York model 51 "monster" E-flat advertised in the Ditson Guidebook No. 2 of the 1920s and the York catalogs from the early part of the century. This tuba and all of the large-bore York instruments have a distinctive curve in the tuning slide. This shifts the slide over far enough to make it more accessible. Number 256 also has the extra "doughnut" of tubing near the tuning slide, and that makes it possible to convert the instrument to low pitch. (The extra tubing does not appear in either the Ditson or the York engravings.) The tubing does not bear the patent date of 1910, which means that the tuba would have been made before 1910.

The bore diameter was estimated from an outside measurement. The bell has been flattened somewhat, and there are a number of dents around the main bow. This instrument has a brass mouthpiece inscribed "York & Son 20."

Grand Rapids, Number 267

Type	upright with right-facing bell
Signature	USA Line / Made by Grand Rapids Band Instrument Company / Grand Rapids, Mich. USA
Serial number	8466
Date of manufacture	early twentieth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	1.675 cm
Bell diameter	49.8 cm
Height	80.4 cm
Weight	6.935 kg
First slide length	53.34 cm
Third slide length	83.82 cm
Pitch	high and low
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The Grand Rapids Band Instrument Company was a subsidiary of York, and it made the low-priced line of York instruments. All of the Grand Rapids tubas in the collection have the same general characteristics, many of which are not similar to the Yorks. This particular tuba is of the "monster bass" variety. The tuning slide has a set of sleeves which serve to convert the instrument to low pitch. The date of manufacture of No. 267 is, therefore, in the very early twentieth century.

The third valve button is missing. There are a few minor dents, but otherwise this instrument is in good condition. A nickel-plated mouthpiece marked "GRBl Co. 18" is with this instrument.

York, Number 138

Type	upright with right-facing bell
Signature	J. W. York & Sons / Grand Rapids, Mich.
Serial number	62846
Date of manufacture	ca. 1917-1921
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.675 cm
Bell diameter	49.9 cm
Height	84.8 cm
Weight	7.602 kg
First slide length	55.88 cm
Third slide length	93.98 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

Despite some minor bell damage, this instrument is in the best condition of almost any other upright in the collection. It is almost exactly the same instrument as the York "monster" E-flat bass shown in the Oliver Diston Guidebook No. 2 which was published in the 1920s. The signature is somewhat different, but this is probably the York Model 51.

Number 138 does not have the extra tubing for converting the pitch from high to low, and the valve slides clearly seem to be long enough to make this a low-pitch instrument. This tuba has the curved tuning slide found on some of the larger-bore Yorks, and the design features are the same as those found on most of the other York instruments as well.

Imperial/White, Number 681

Type	upright with right-facing bell
Signature	The Imperial / Made in Austria / H. N. White / Importer / Cleveland, O.
Date of manufacture	late nineteenth century
Materials	nickel-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.6 cm
Bell diameter	41.2 cm
Height	77 cm
Weight	5.405 kg
First slide length	54.61 cm
Third slide length	85.09 cm
Pitch	possibly high and low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

Mr. Sal Cardello of King Musical Instruments was unable to find any reference to this tuba in the company records. It is reasonable to assume that this instrument was imported in the last decade of the nineteenth century before full brass production was started at the King factory. The construction suggests a fairly high quality of workmanship, and, in many respects, this instrument resembles an American made instrument of the early twentieth century. However, the "B & F" stamped on the second valve casing is clear evidence that No. 681 was made by Bohland and Fuchs of Grazlitz.

The main tubing which exits the third valve to become the tuning slide has the peculiar curve characteristic of the larger bore Bohland and Fuchs instruments. This is a large instrument which resembles the large-bore Holton and York tubas in many ways. There is a brass ball in the center of the main bow which may be an additional trademark.

This instrument is in good condition except for some minor bell damage and a few dents around the main bow area. The bore diameter was estimated from an outside measurement. The second valve button is not original. An unmarked brass mouthpiece is with this instrument.

Holton, Number 134

Type	upright with right-facing bell
Signature	Frank Holton / Chicago
Serial number	1020
Date of manufacture	ca. 1909
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.675 cm
Bell diameter	47.4 cm
Height	82.5 cm
Weight	7.665 kg
First slide length	55.25 cm
Third slide length	82.55 cm
Pitch	probably low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

The fact that this tuba so closely resembles the York instruments made about the same time is perhaps no coincidence, since, according to Gene Pilzuk (former employee of York), Holton purchased York tubas and stenciled his signature on them. Holton later copied the York design when he began making his own instruments. The similarities between the early Holton instruments and the York instruments cannot be ignored, and, in this case, it is very likely that No. 134 was made by York.

There is no evidence that Frank Holton built musical instruments in Chicago, especially an instrument of this quality. Further, this instrument is almost identical in every detail to York, No. 256 which was made about the same time. The ferrules on this tuba are the same as on the York instruments, but the ferrules of later Holton tubas, made in Elkhorn, are plain. Also, the signature does not say "Made by Frank Holton" but only "Frank Holton - Chicago."

The Holton Company provided an exact date of manufacture for this instrument, and they called it a "monster" E-flat tuba. They also noted that it was sold to C. G. Fletcher of Russellville, Indiana. The tuning slide of this instrument has extension tubes to convert it to low pitch, so the date of manufacture is probably correct. Number 134 is in good condition except for a few minor dents. The third valve button is not original.

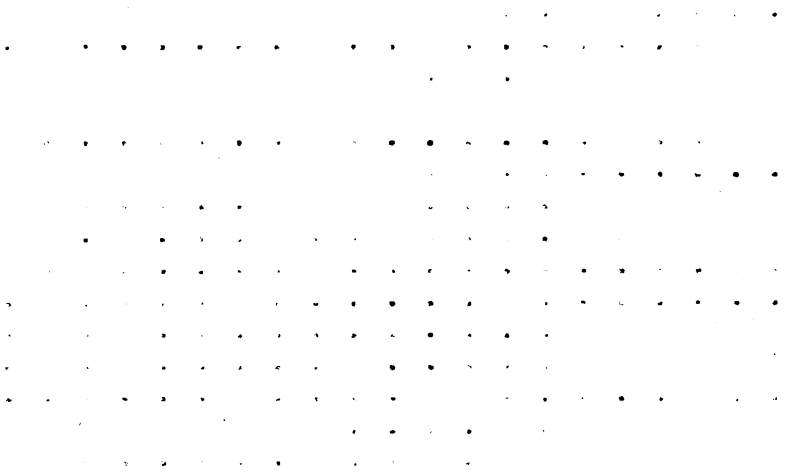
Unsigned, Number 261

Type	upright with right-facing bell
Signature	none
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.55 cm
Bell diameter	31.6 cm
Height	73 cm
Weight	3.71 kg
First slide length	50.17 cm
Third slide length	80.01 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The design of No. 261 is very much like the design of many imported instruments. There is a prominent spine, and the small coil protrudes beyond the third valve slide in a manner similar to that of instruments by Marceau, Thibouville-Lamy, Pepper, and Lyon and Healy. This instrument is generally very much like Nos. 282 and 258--both imports.

Number 261 has a curved brace between the first and third valve slides, and this type of brace is found only elsewhere on an instrument by Joseph Higham, but there is not enough evidence to show that this tuba is a Higham instrument.

There appears to be a low-pitch extension on the main tuning slide, and so the date of manufacture would have been in the first two decades of the twentieth century. There are some dents in the bell section and at the second bow. The second valve button is missing. The valves are numbered 31, 32, and 33. A silver-plated mouthpiece marked "Frank Holton -- Chicago 47" is with this instrument.



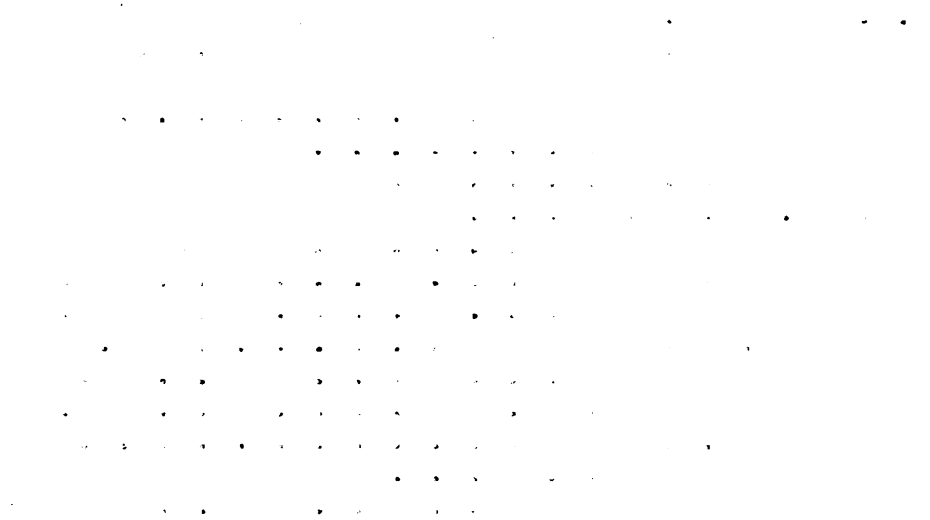
King, Number 283

Type	upright with right-facing bell
Signature	King / Made by H. N. White / Cleveland, Ohio
Serial number	12876
Date of manufacture	ca. 1893-1915
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.55 cm
Bell diameter	37.3 cm
Height	79.2 cm
Weight	6.325 kg
First slide length	55.88 cm
Third slide length	88.9 cm
Pitch	low
Tuning slide	after valve assembly
Slide placement	F-F-F-f

Information about the date of manufacture of this instrument was provided by Mr. Sal Cardello of King Musical Instruments. Number 283 should be high pitch, given the date of manufacture, but the valve slide lengths suggest a low-pitch instrument. Either this tuba was built to play both high and low pitch or it was one of the early low-pitch models.

There are so few King upright instruments in the collection that it is difficult to make comparisons, but this medium-bore tuba has much in common with the side-action King tuba, except for the valve assembly. It is almost as if the same basic design was used, and the main coil was shifted from one side of the bell to the other to accommodate the action.

Number 283 is well-crafted, and it is also in good condition despite its age. There is some minor bell damage,



and there are a few small dents near the main bow. The first valve slide was apparently replaced. The bore diameter was estimated from an outside measurement. "King -- Made by H. N. White -- Cleveland" is stamped on the second valve casing. Arne Larson obtained this tuba in 1956 at Minneapolis, Minnesota.

Marceau, Number 122

Type	upright with right-facing bell
Signature	Marceau & Cie / Paris / Sears Roebuck & Co., Inc. / Sole Agents / Chicago
Date of manufacture	ca. 1897-1920
Materials	brass
Valves	three piston, top-action
Bore diameter	estimated 1.4 cm
Bell diameter	29.2 cm
Height	70.9 cm
Weight	3.33 kg
First slide length	47.63 cm
Third slide length	81.28 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The first catalog in which Sears and Roebuck advertised the Marceau instruments was the catalog of 1897. Prior to that time, the company acknowledged that its instruments were made by foreign makers, but they did not indicate the makers. Engravings of Marceau instruments in the Sears catalogs show instruments with spines, and this tuba does not have a spine. It is apparent that in some catalogs, however, Sears used the same engravings for similar instruments of different brands. The dimensions given in the catalogs are the same as the dimensions of No. 122.

This is a solid instrument, but it is clearly not top quality. The design is much the same as that of many European tubas, and No. 122 has the small bell characteristic of many of the French instruments. The bore diameter was estimated from an outside measurement. The second valve

button is missing. There are a number of small dents, but this tuba is in good condition otherwise. The valves are numbered 64, 65 and 66.

Couesnon, Number 121

Type	upright with right-facing bell
Signature	Couesnon & Cie / Fournisseurs de L'armee / Paris / Chateau-Thierry 23
Date of manufacture	ca. 1900-1920
Materials	brass
Valves	three piston, top-action
Bore diameter	1.45 cm
Bell diameter	37.3 cm
Height	73.1 cm
Weight	4.42 kg
First slide length	50.8 cm
Third slide length	79.38 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

This tuba is similar in design to many of the European instruments, but it is of good quality. The third coil is not as small as that of many imports, nor is it as exposed. The bell is also relatively large, especially for a French instrument. The information given below the signature "Exposition Universelle de Paris -- 1900 -- Hors concours membre du Jury," would place the date of manufacture for No. 121 sometime after 1900. The lengths of the slides indicate either a high-pitch or perhaps a high and low-pitch instrument, so 1920 is probably a safe upper limit.

Number 121 is well-made with wide ferrules and solid bracing, unlike many of the imported instruments. Couesnon has also maintained a reputation for high quality instruments, and it is easy to see why based on an examination of this tuba. "France NCU" is stamped on the receiver. This tuba is in good condition except for a few very small dents.

Fillmore, Number 2290

Type	upright with right-facing bell
Signature	American Make / Fillmore Solo / Cincinnati, Ohio
Serial number	20830
Date of manufacture	late nineteenth or early twentieth century
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	1.5 cm
Bell diameter	38.3 cm
Height	72.4 cm
Weight	5.41 kg
First slide length	53.34 cm
Third slide length	85.09 cm
Pitch	high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

The "American Make" on the signature is strong evidence that this tuba was made in the United States, although, at first glance, the instrument appears to have more in common with imported tubas. Number 2290 is similar in construction to No. 291, a Grand Rapids Band Instrument Company upright, and to No. 288, the X-Ray instrument of unknown origin. It is closest to the X-Ray instrument, especially in the size and placement of the ferrules, the construction of the braces and brace pads, and the general dimensions.

There is a serial number, so this is quite likely an American instrument made probably in the late nineteenth or early twentieth century. The fact that it is so close to the X-Ray instrument is evidence that No. 2290 could have been made either by King or by the Cleveland Musical Instrument Company. This would be logical, since the

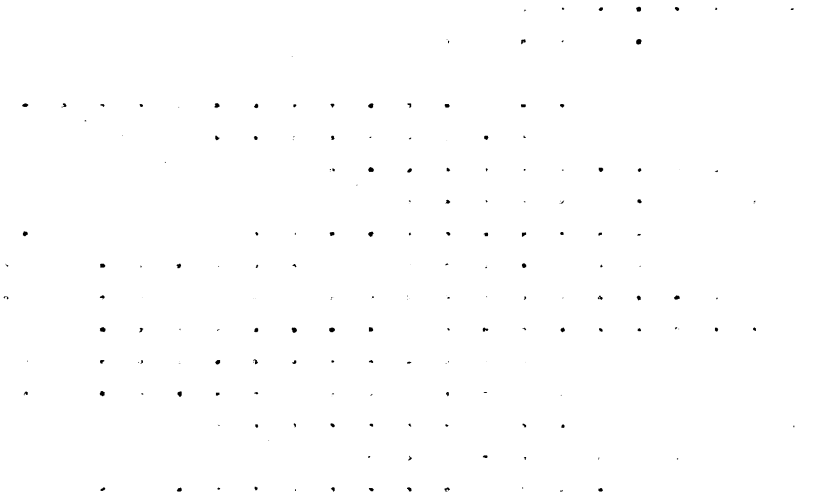
Fillmore Music House was located in Cincinnati, Ohio. This tuba is in excellent condition except for some small dents in the tubing around the main bow.

Lyon & Healy, Number 250

Type	upright with right-facing bell
Signature	Lyon & Healy / Own Make / Chicago / USA
Serial number	5796
Date of manufacture	ca. 1889-1925
Materials	silver-plated brass
Valves	three piston, top-action
Bore diameter	estimated 1.65 cm
Bell diameter	35.5 cm
Height	78.1 cm
Weight	5.31 kg
First slide length	49.53 cm
Third slide length	80.65 cm
Pitch	probably high
Tuning slide	after valve assembly
Slide placement	F-F-F-f

This instrument was probably made before the twentieth century. The presence of a serial number and the information on the signature make it fairly certain that No. 250 is an American made instrument. There are several Lyon and Healy tubas in the collection, but this tuba is clearly unique. Except for the spine, this upright is very similar in construction to King No. 283, although the tuning slide is longer on this tuba and the dimensions are not the same. The inner coil construction is similar.

The quality of workmanship is quite good, and this appears to be a solid instrument. There are some dents in the bell. The bore diameter was estimated from an outside measurement. All the valve caps are missing.



M. Claton, Number 248

Type	upright with right-facing bell
Signature	M. Claton / Maker / New York
Date of manufacture	late nineteenth or early twentieth century
Materials	brass
Valves	three piston, top-action
Bore diameter	1.65 cm
Bell diameter	31.5 cm
Height	76 cm
Weight	3.85 kg
First slide length	48.9 cm
Third slide length	80.01 cm
Pitch	probably high
Tuning slide	before valve assembly
Slide placement	F-F-F-F

No information was readily available about M. Claton, so it was difficult to estimate a date of manufacture. The method of construction would indicate that the instrument was made in the late nineteenth or early twentieth century, and the pitch of this tuba is probably high, so the latest it would have been made would have been about 1920.

Number 248 has a curved brace between the first and third valve slides like the Higham instrument and the upright by Thibouville-Lamy. This tuba also has similar braces between the third valve slide and the main bow and between the tubes of the tuning slide. The tubes of the first and third valve slides are quite close together, and there is a prominent spine. Number 248 is similar in many ways to the imported instruments, but the ferrules are fairly wide and decorated as they are on many American tubas, and the quality of construction is quite good. The

bore size is also quite large given the size of the instrument.

There are a few minor dents in the main body of this tuba, but it is generally in good condition. The valves are marked 13, 14, and 15.

CHAPTER III

INDEX OF MANUFACTURERS AND AGENTS

The process of finding historical information about musical instrument manufacturers is difficult at best because so few companies maintain archives, and because many of the companies represented in the collection are no longer in business or have been absorbed by larger firms. One must relay on information provided by former employees, which is not always completely reliable, or one must try to obtain information from published sources. It is unfortunate that so little published information exists concerning the growth and development of the musical instrument manufacturing business in the United States.

Much of the following material was obtained through personal interviews with employees and former employees, as well as through public libraries, city directories, and the like. The primary source used to verify the personal interviews was of little help in establishing dates of operation. No published information could be found about some of the manufacturers or agents; a factory location was taken from the signature of the instrument when no other information was

available. The material presented is therefore as complete a record as can be compiled within the scope of this document.

C. G. Conn, Limited

Charles Gerard Conn and Eugene Dupont, a horn maker, founded the C. G. Conn Company in 1875. The first factory was established in Elkhart, Indiana, and it produced cornets at first and other brasses soon thereafter. A subsidiary plant, purchased from Isaac Fiske, was opened in Worcester, Massachusetts, in the late nineteenth century, and, by the 1890s, the firm offered brasses, flutes, clarinets, saxophones and a variety of "Wonder" stringed instruments. Financial difficulty led to the sale of the company to Carl Greenleaf in 1915, and he changed it from a mail-order business to a retail distribution operation.[1] Conn and Buescher co-manufactured instruments under the name "Elkhart Band Instrument Company" in the 1920s and 1930s, and Conn also followed the usual practice of selling unstenciled instruments to other firms for stenciling and resale.[2]

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[1]The New Grove Dictionary of Music, 1980 ed., s.v. "Conn," by Carolyn Bryant.

[2]Telephone interview with Lloyd Filio, Selmer Corporation, Elkhart, Indiana, 24 January 1984.

J. W. York and Sons

This firm was started in 1881 by James Warren York, who moved to Grand Rapids, Michigan, from Boston, where he had been employed by the Boston Musical Instrument Manufactory. He built a three-story factory on South Division Avenue in Grand Rapids in 1900.[1] Sons Frank and Charles came into the family business, and the firm continued to produce brass instruments through the 1960s. The York family was out of the business by 1935, and the firm was sold to a local conglomerate at that time. The business was sold three more times, and the Grand Rapids plant was finally closed in 1971.[2] York produced some of the finest brasses made in the United States during that time. The York company was manufacturing about three hundred instruments per month at the peak of its production activity during the early part of the century.[3] The trade names "York," "Grand Rapids Band Instrument Company," and "USA Line" are all affiliated with the J. W. York and Sons Company.

Buescher Band Instrument Company

The Buescher Band Instrument Company was founded by August Buescher in 1888, at Elkhart, Indiana. The original plant burned down in 1901, and a new plant was constructed

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[1]Grand Rapids (Mich) Press, 10 February 1927.

[2]Telephone interview with Very Avery, retired employee of York, Holland, Michigan, 24 January 1984.

[3]Grand Rapids Press, 12 December 1908.

in 1903, at which time the company began producing brasses with the serial number three thousand. The union label was stamped on Buescher instruments beginning in about 1915. Buescher purchased the Elkhart Band Instrument Company in 1926 and used that trademark for its low-priced instruments. Some of the later "Elkhart" instruments were made jointly by Buescher and Conn during this period.

The Buescher Band Instrument Company went bankrupt in the 1930s, but it was reincorporated and continued to produce instruments until the early 1960s. The Selmer Corporation purchased the company in 1963, and Selmer continued to use the Buescher name on some of its instruments.[1] "Buescher," "Elkhart Band Instrument Company," and "Windsor" were trade names used by the Buescher Band Instrument Company.

J. W. Jenkins and Company

The Jenkins firm was founded in Kansas City, Missouri, in 1878 by John Woodward Jenkins, and it was essentially a family business until the late 1960s, specializing not in the manufacture but in the sale of musical instruments.[2] Branch stores were established in the midwest and mid-south by the middle of the twentieth century, and by 1965, the

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[1] Telephone interview with Lloyd Filio, Selmer Corporation, Elkhart, Indiana, 24 January 1984.

[2] Kansas City Journal Post, 17 May 1938.

Jenkins Music Company was one of the four largest retail music businesses in the United States.[1] By 1974, however, the company was bankrupt.[2]

The Jenkins company was an American agent for tubas manufactured by the German firm of August Heinel as well as for Harwood instruments. Signatures on the Jenkins instruments in the collection include "The New Jenkins Special" and "The Perfected Harwood Professional." Jenkins Music Company continues to operate under new management, but there are apparently no records available.

Lyon and Healy

George W. Lyon and Patrick Healy formed their business in 1864. They came to Chicago from Boston, where both had worked for Oliver Ditson. The business started as a sheet music operation, but Healy bought Lyon's interest in the firm in 1880 and began selling all kinds of musical instruments as well. He also began manufacturing pianos, violins and harps at that time.[3] The company soon developed an assembly-line operation and was manufacturing about 100,000 instruments per year by 1890.[4]

The firm apparently began selling a limited number of musical instruments as early as 1869, and they must have

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[1]Kansas City Star, 26 March 1965.

[2]Kansas City Star, 18 August 1974, p. 7F.

[3]Chicago Tribune, 10 September 1939.

[4]Chicago Tribune, 26 December 1979.

continued to import instruments even after the establishment of the factory. Lyon and Healy imported Buffet woodwinds, Jaubert brasses and Gunkel brasses in addition to their own instruments.[1] They stopped production of wind instruments by about 1925, and they are now engaged primarily in the production of harps.[2] The manufacturing operation is owned by the Entertainment Division of the Columbia Broadcasting System, and the main Chicago store is now closed.[3] The trade names "Own Make" and "Silver Piston" appear on Lyon and Healy brasses in the Larson Collection.

Rudolph Wurlitzer Company

Franz Rudolph Wurlitzer was born in Saxony, and he emigrated to the United States, where he settled in Cincinnati, Ohio. He established a musical instrument trade by 1860, just in time for the Civil War, and his firm was one of the leading suppliers of wind instruments and drums to military bands during that time. In 1865, Wurlitzer opened a branch store in Chicago, and he registered the name "Rudolph Wurlitzer and Brother" in 1872. The name was changed to Rudolph Wurlitzer and Company in 1890.[4] By 1913, the

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 99.

[2]William Scarlett, personal letter, 5 July 1984.

[3]Chicago Tribune, 26 December 1979.

[4]The New Grove Dictionary of Music, 1980 ed., s.v. "Wurlitzer," by Cynthia Adams Hoover.

Wurlitzer Company was billing itself as the "World's Largest General Music House," and it sold an assortment of American and European musical instruments.[1] In the 1930s, the Chicago store had music teachers giving free lessons to any individual who bought a Wurlitzer instrument, or at least an instrument from the Wurlitzer company.[2]

Wurlitzer is now known primarily for its pianos and electronic organs, but it did absorb a number of smaller instrument manufacturing firms, of which the Martin Band Instrument Company was one of the largest.[3] Wurlitzer instruments in the collection bear the signatures "Rudolph Wurlitzer Co." and "Symphony." Other trade names for Wurlitzer tubas include "Professional" and "Lyric Monster."[4]

Martin Band Instrument Company

The Martin Band Instrument Company was established in Elkhart, Indiana, in the early part of the twentieth century. Martin absorbed both the Hoosier Band Instrument Company and the Peddler Band Instrument Company, but the firm went bankrupt in 1965 and was absorbed by the Richards

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[1]Rudolph Wurlitzer Company, general catalog ca. 1913, p. 53.

[2]Interview with Frank Balaam, retired Michigan band director, Olivet, Michigan, July 1984.

[3]Elkhart (Ind.) Truth, 30 April 1965.

[4]Rudolph Wurlitzer Company, general catalog ca. 1913, pp. 53-55.

Musical Instrument Company, which also owned the factories of Blessing and Reynolds.[1] About 1965, the Richards company went bankrupt, and the plant, raw materials, and instrument inventory were sold to the Wurlitzer Corporation for $325,000.2 The factory sat idle for one year while in the hands of the Wurlitzer Corporation until it was purchased by the G. Leblanc company.[3] The signature "Indiana" indicates a second-line Martin Band Instrument Company instrument.[4]

Louis B. Malecki and Company

Louis Malecki came to the United States in the late nineteenth century when he was twelve years old. By 1903, he had established a music store on Wabash Avenue in Chicago, and this company was listed in the classified Chicago city directories until 1914.[5] Malecki sold his Chicago business to Carl Fischer in about 1926, and, in 1932, he moved his family to Grand Rapids, Michigan, where he purchased the Freiderich Music House.

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[1]Telephone interview with Lloyd Filio, Selmer Corporation, Elkhart, Indiana, 24 January 1984.

[2]Elkhart Truth, 30 April 1965.

[3]Telephone interview with Nick Hammond, G. Leblanc Company, Kenosha, Wisconsin, 11 June 1984.

[4]Langwill, Index of Musical Wind Instrument Makers, p.103.

[5]William Scarlett, personal letter, 5 July 1984.

The Malecki company did not make instruments but bought them from both American and European manufacturers. Many of these instruments were stenciled with the Malecki name. James Malecki, Louis' son, recalled that the York instrument company was one of the primary suppliers of brass instruments to the Malecki company. The firm ceased to sell instruments after 1947 when the elder Malecki died.[1] The signature "Louis B. Malecki -- Majestic" appears on one instrument in the collection.

H. N. White Company

The trade names "King" and "King Cleveland" have been associated with this company for so long, that few people are aware of the fact that the company was named after the founder, Henderson N. White, until 1965. Henderson White began the business in Cleveland, Ohio in 1893, and it was owned by the White family until 1965. It was sold to Nate Dahlin at that time and sold again to Dan Henkin in 1983. The company has long manufactured brass instruments, but there is evidence that some instruments were imported from Europe and sold by White in the early years of the business.[2] There is also evidence to suggest that H. N.

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[1]Interview with James Malecki, Malecki Music, Grand Rapids, Michigan, 17 May 1984.

[2]Sal Cardello, personal letter, 8 February 1984.

White purchased the Cleveland Musical Instrument Company sometime in the early part of the century.[1]

The King Musical Instrument Company is now a division of the Seeburg Corporation, and it markets instruments under the trade names "King," "King Cleveland," "Tempo," "Marigaux," "Excella," and "LeMaire."[2] "American Standard" was also a trade name used by the H. N. White Company as was "Gladiator." The company produces brass instruments, saxophones, clarinets, flutes and piccolos.[3]

Frank Holton and Company

Frank Holton was an accomplished trombonist who played in Sousa's band before venturing into the musical instrument manufacturing business. In the late 1890s, he rented some rooms on Madison and Clark streets in Chicago, and he began repairing band instruments.[4] Holton also began selling used instruments purchased from various sources.[5]

There is no firm evidence to suggest that Holton manufactured band instruments while the business was in Chicago,

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[1]Sal Cardello, personal letter, 31 July 1984.

[2]Christopher Paulakis, The American Music Handbook, (New York: Free Press, 1974), p. 657.

[3]Langwill, Index of Musical Wind Instrument Makers, p. 168.

[4]Glen Bridges, Pioneers in Brass (Detroit: Sherwood Publications, 1965), pp. 93-4.

[5]H. A. Vandercook, reprint from Musical Messenger, Holton band instrument catalog, 1920.

although it is possible that he built a few prototype instruments, or that he modified instruments of other manufacturers during this time. Holton had wanted to open his first factory in his home town of Allegan, Michigan, but he was discouraged by the city fathers, and so he built a factory at Elkhorn, Wisconsin, instead.[1] At least one source indicated that Holton purchased instruments of other makers and stenciled them with his trademark, and this may be true.[2]

The Holton company was purchased by the G. Leblanc Corporation, which continues to use the Holton trademark today. Holton also used the trademark "Collegiate" for some of its moderately-priced instruments.

Pan American

The Pan American Band Instrument and Case Company was evidently an independent firm started in the early twentieth century, which was purchased by the Conn company.[3] (The time of purchase may have been in the 1920s.) Conn used the Pan American instruments as their second line from about 1930 to 1950.[4] Pan American apparently had a second-line

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[1]Bridges, Pioneers in Brass, pp. 93-4.

[2]Telephone interview with Gene Pilzuk, former employee of York, Grand Rapids, Michigan, 2 February 1984.

[3]Langwill, Index of Musical Wind Instrument Makers, p.118.

[4]Charles H. Gorby, personal letter, 17 January 1984.

of instruments called "Cavalier," which Conn used as their third line during the same period of time. The Pan American name was evidently changed after this time; it may have become what is now referred to as the "Conn Director."[1]

Some of the Pan American instruments in the Larson collection have the prefix "P" before the serial number. This could perhaps identify the Pan American instruments made by Conn. Pan American also must have its own serial number sequence, because the dates established by the Conn sequence are not the same as those established by the Pan American sequence. Pan American evidently made a variety of brass instruments, because there are still a number of Pan American French horns, tubas and baritones to be found in schools and collection.

Cleveland Musical Instrument Company

Almost no information was available about the Cleveland Musical Instrument Company, but it is possible to piece together a probable sequence of events given a number of scattered and somewhat indirect references. The construction techniques of the Cleveland instruments in the collection show a relationship to the instruments manufactured

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 118.

by the H. N. White Company, so H. N. White may have used the Cleveland Musical Instrument Company to produce second-line instruments during the early part of the century. Mr. Sal Cardello of King Musical Instruments speculated that the Cleveland company started as an independent business owned by two gentlemen known as Hruby (or Ruby) brothers. He then indicated that the company may have been purchased by H. N. White, perhaps sometime in the early part of the century.[1]

At least one of the Cleveland Musical Instrument Company instruments in the collection bears the trademark "American Standard." According to Langwill, this was also a trademark used by the H. N. White Company for some of its band instruments.[2] Conn, Martin and others used subsidiary companies to produce second-line and third-line instruments, so it is therefore quite likely that the Cleveland Musical Instrument Company was a subsidiary of the H. N. White Company.

Bohland and Fuchs

This manufacturing firm was operated in Grazlitz, Bohemia, (Austria) from the later nineteenth century to the mid-twentieth century. A record of instruments listed in Langwill would indicate that Bohland and Fuchs made brass

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[1]Sal Cardello, personal letter, 31 July 1984.

[2]Langwill, Index of Musical Wind Instrument Makers, p. 168.

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instruments primarily, and that the firm exhibited a number of these instruments at expositions during the late nineteenth century.[1]

Bohland and Fuchs sold a number of instruments to American companies beginning in the 1890s. There is an H. N. White import in the Larson Collection with the trademark "Imperial" sold by Bohland and Fuchs about that time. In the 1920s, and perhaps later, Bohland and Fuchs sold instruments to Sears and Roebuck; these instruments were marketed under the trade name "Glorioso." Bohland and Fuchs also sold instruments to J. W. Pepper of Philadelphia, just before World War I.[2] There are some other instruments in the collection stenciled by American companies which appear to be Bohland and Fuchs instruments as well.

All of the Bohland and Fuchs tubas in the collection appear to be at least as well made as the second-line American instruments. It may be reasonable to assume that the bulk of the Bohland and Fuchs business was in the export of musical instruments of modest quality.

Carl Fischer

The Carl Fischer company was founded in about 1872 and had major retail stores in both Chicago and New York. The firm began as a music publishing house, but it also manu-

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 14.

[2]Lloyd Farrar, "Chronologies and a Survey of Serial Numbers," Silver Spring, Maryland, (mimeographed)

factured band instruments under the name "Carl Fischer Musical Instrument Company." The interest in the instrument manufacturing concern was sold in about 1934, and the company existed independently for a number of years. It was purchased by Martin Tolchin of Tolchin Musical Instruments in the late 1960s.[1] The music publishing house is still in operation, and it continues to be based in New York.

The Fischer company was the sole agent in the United States for instruments made by the F. Besson Company.[2] They also apparently imported instruments from other European manufacturers as well. The brand names "Reliable" and "Professional Grade" appear on instruments in the collection sold by Carl Fischer.

F. Besson

The Besson firm was established in France about 1838, and part of the operation was moved to London in 1851. Gustav Auguste Besson, the founder, is credited with having produced the first prototype mandrels for multiple construction of brass instruments. After Besson's death, the firm passed to control of his widow and two daughters, one of whom, Mme. Fontaine-Besson, managed the company. The French firm stayed under family control until the 1950s, when it

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[1]John Boerner, Carl Fischer Incorporated, personal letter, 20 January 1984.

[2]Langwill, Index of Musical Wind Instrument Makers, p. 46.

was taken over by Couesnon. The English firm was purchased by Boosey in 1940.[1]

According to Langwill, the name of the English firm changed to Besson and Company, Limited about 1873.[2] Louis Schreiber, a cornetist who lived in the United States, was the agent for Besson in the later nineteenth century.

J. W. Pepper

James W. Pepper was listed as an engraver in the 1845 Philadelphia city directory. In 1876, he began the publication of three musical papers, one of which was the Brass Band Journal, and, by 1877, he had opened a store for selling music. Pepper also opened branch stores in Chicago and New York, and, by about 1880, he began the manufacture of musical instruments as well.

It was during this time that Pepper also began a musical instrument import business. He became associated with Henry Distin, a Philadelphia maker, who had come to the United States from England, and who served as Pepper's import agent beginning in about 1882. Pepper imported instruments from a number of sources, and he continued to make brass instruments and drums in his American factories until well into the twentieth century. A succession of family members continued the company, mainly as a

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[1]The New Grove Dictionary of Music, 1980 ed., s.v. "Besson," by Edward Tarr.

[2]Langwill, Index of Musical Wind Instrument Makers, pp. 11-12.

publishing house, until 1941, when bankruptcy was declared. The company was purchased by a stockholding corporation in 1942, and since that time has been revitalized as a music publishing business.[1] Pepper trade names found on instruments in the Larson Collection include "Standard" and "Perfected," both probably names for imported instruments.

Grand Rapids Band Instrument Company

This company is generally considered to have been a subsidiary of the York band instrument company of Grand Rapids, Michigan. Vern Avery, a former employee of York, recalled that York used the Grand Rapids instruments as a second line and the instruments marked "USA Line" for their third line. Mr. Avery also recalled that York used the same serial number sequence for all the York and Grand Rapids Band Instrument brasses.[2]

Mr. Gene Pilzuk, also a former employee of York, thought that the Grand Rapids Band Instrument Company was an independent business operated at least for a time by Walter Wilkins of Grand Rapids. Wilkins apparently had equipment to make instruments, which he did (poor ones, according to Mr. Pilzuk), but he bought tubas from York.[3]

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[1]Lloyd Farrar, "Chronologies and a Survey of Serial Numbers," Silver Spring, Maryland, (mimeographed)

[2]Telephone interview with Vern Avery, retired employee of York, Holland, Michigan, 24 January 1984.

[3]Telephone interview with Gene Pilzuk, former employee of York, Grand Rapids, Michigan, 2 February 1984.

The only available records on the Grand Rapids Band Instrument Company are the articles of association registered with the Kent County, Michigan, clerk's office. The articles are dated 29 April 1912, and three of the names of individuals who signed the articles also appear on the articles of association for York, notably the names of James and John Duffy, major stockholders in York.[1] It seems fairly certain that York did own the Grand Rapids Band Instrument Company, and perhaps it was started by York. However, York may have purchased a company already in existence to produce second-line instruments.

Gretsch

The Gretsch company was founded in Chicago in 1883, and it was primarily a distributor of brass instruments. This means that Gretsch purchased instruments from other manufacturers and stenciled the Gretsch name on them. Gretsch was also the American agent for Couesnon and Company, a French firm.[2]

Gretsch had a store in downtown Chicago which sold student-line instruments during the period just before and during World War II. It was one of the few companies doing

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[1]Telephone interview with Jill Bernott, Kent County, Michigan Clerk's office, Grand Rapids, Michigan, 15 August 1984.

[2]Langwill, Index of Musical Wind Instrument Makers, p. 59.

business during the war that continued to have brass instruments available for sale.[1] Instruments sold by the Gretsch company as represented in the Larson Collection bear the signature "Gretsch American." Gretsch also sold a line of instruments with the trademarks "Commander" and "Serenader."

Couesnon and Company

Couesnon, Gautrot and Company was established in Paris in 1883. In 1888, the name was changed to Couesnon and Company, and about the same time, the firm began to absorb several smaller French firms, including Massin and Thibouville.[2] The practice of buying smaller companies apparently continued for a number of years, and Couesnon was involved in a number of other mergers as well.

The Couesnon catalog of 1890 states that "the instruments, according to different categories, have different trademarks, and that the company will sell without a trademark as the customer prefers."[3] This was evidently a common practice carried out not only by Couesnon, but by a number of other manufacturers as well, judging from the instruments in the collection. Couesnon did use the

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[1]Interview with Frank Balaam, retired Michigan band director, Olivet, Michigan, July 1984.

[2]The New Grove Dictionary of Music, 1980 ed., s.v. "Couesnon," by Edward Tarr.

[3]Langwill, Index of Musical Wind Instrument Makers, p. 29.

trademark "Lafayette" for some of its instruments, but the Couesnon tuba in the collection does not bear that trade name.[1] Couesnon furnished instruments to the French army beginning in about 1882.

Louis Schreiber

Louis Schreiber was well-known in the United States as a cornetist during the latter part of the nineteenth century. He was born in Coblenz, Germany in 1827, and he emigrated to the United States in 1856, at which time he settled in New York City to work as a soloist and teacher.[2] In 1865, Schreiber took a patent for an improved string rotary mechanism, and soon after, in 1867, founded a manufacturing business in New York.[3]

Schreiber exhibited a copper wind instrument at the Paris Universal Exposition in 1867, and he won a bronze medal for his efforts, which indicates that his instruments must have been of acceptable quality.[4] The business,

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 89.

[2]Bridges, Pioneers in Brass, pp 76-7.

[3]Langwill, Index of Musical Wind Instrument Makers, p. 145.

[4] Paran Stevens, Report of the U. S. Commissioners to the Paris Universal Exposition, ed. William P. Blake, 5 vols. (Washington: United States Government Printing Office, 1867), 5:17.

however, was apparently not highly successful. Schreiber was an American agent for the F. Besson company sometime during the latter part of the nineteenth century.[1]

Montgomery Ward and Company

Like Sears, Roebuck and Company, Montgomery Ward imported band instruments from Europe and sold them through their mail-order business during the first part of the twentieth century. The signature "Concertone" was used by Montgomery Ward for both the imported instruments and for those instruments manufactured in the United States. The company also used the trade names "Our Leader" and "Majestic" for some of the band instruments it sold.

Many of the Ward instruments appear to be second-line or third-line instruments, given the prices listed in the general catalogs. Wards was an agent for Jules DeVere of Paris as well as for a number of other European manufacturers, but, unlike Sears, Roebuck, the company was reluctant to identify the makers in the catalog advertisements, and the records are not available from the company.[2]

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[1]Bridges, Pioneers in Brass, pp. 76-7.

[2]Montgomery Ward and Company, general catalogs, 1916-17, 1925-26, 1927-28, 1902.

W. J. Dyer and Brother

William J. Dyer established a music house in Faribault, Minnesota, in 1879. Two years later he moved to Saint Paul, Minnesota, and, by 1875, he had established a store in Minneapolis. Between 1872 and 1875 the business was known as Dyer Brothers and Howard. This was changed to Dyer and Howard in 1876, and changed again to W. J. Dyer and Brother in 1885. The business remained in this name until it closed in 1941.[1] W. J. Dyer is listed in the standard references as a maker of violins, but not as a maker of wind instruments.[2] It is likely, therefore, that the Dyer brasses were manufactured by someone else. Dyer tubas in the collection bear the signatures "W. J. Dyer and Brother -- Diamond" or "Dyers Improved Model."

Sears, Roebuck and Company

It is not surprising that Sears, Roebuck and Company was one of the largest distributors of brass instruments during the period from 1895 to 1935. Sears imported and sold brass instruments by Jules DeVere and Company of Paris, Marceau and Company of Paris, Henri Gautier ("Virtuoso" instruments), Pietro Rossie (rotary-valve cornets), Dupont of Paris, Bohland and Fuchs of Grazlitz ("Glorioso"

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[1]Patricia Harpole, Minnesota Historical Society, personal letter, 17 January 1984.

[2]Woodcock and Henley, Universal Dictionary of Violin and Bow Makers, p. 22.

instruments), Tourville and Company of France, Lamoreaux Brothers, and LaBonte of Paris. Sears also sold their own line of American made instruments under the brand names "Supertone," "Pride of Elkhart," "Director," and "Advance Brand." The American manufacturer was most likely Conn or some other large manufacturing concern. Sears, Roebuck and Company did not manufacture any of their own brass instruments but stenciled them, sometimes with the manufacturer's name already engraved on the bell of the instrument.[1]

Fillmore Brothers Music House

An upright E-flat tuba in the collection marked "Fillmore Solo" was sold by the Fillmore Brothers Music House in Cincinnati, Ohio. The business was started by James H. and Frank Fillmore in 1874, and it was operated primarily as a music publishing house until it was purchased by Carl Fischer in 1951. As far as can be determined, the company did not produce band instruments, but it did sell instruments under the Fillmore name. After the death of James H. Fillmore in 1937, the company was operated by his son James Henry, the march composer.[2] In 1952, the physical assets of the Fillmore plant were shipped to New York, and the Cincinnati plant was closed.[3]

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[1]Sears, Roebuck and Company, general catalogs, 1893-1935.

[2]Cincinnati Post, 20 December 1951.

[3]Cincinnati Post, 24 April 1952.

Penzel and Miller

G. L. Penzel started a musical instrument import business in New York in 1880, and he was joined by Miller (Mueller) before the end of the century. The firm is now operated by Edward Mueller and sons, who are engaged in the manufacture of high-grade clarinets.[1]

Slater and Martin

No information was available about the Slater and Martin company, although the signature on the Slater and Martin tuba in the collection shows the location as New York. The instrument on which the signature appears is a bell-over-the-shoulder instrument, so it is reasonable to assume that the company was in operation during the mid-nineteenth century. Langwill lists a Martin and Martin company operating in New York, London and Philadelphia, as well as an M. Slater in New York. There may be some relationship between these individuals and the Slater and Martin company.[2]

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 121.

[2]Ibid., p. 149.

Girardi Strumenti Musicali

The only information available concerning this company appears on the signature of the instrument in the collection. It is likely that Girardi Musical Instruments was in business in the later nineteenth century and perhaps the early twentieth century, but it is no longer in operation. The signature shows the address as: Garibaldi Street, Naples, Italy.

Quinby and Hall

The firm of Quinby and Hall operated in Boston, Massachusetts, between the years 1866 and 1899.[1] In 1861, David C. Hall was in partnership with J. Lathrop Allen, inventor of the Allen flat-windway rotary valve. Benjamin Quinby and his brother George of Boston were machinists who, in 1861, began a musical instrument manufacturing business. David Hall joined the Quinby brothers in 1867, and from 1867 to 1875 the firm was called Hall and Quinby. Benjamin Quinby patented a box valve during this time, but most of the instruments made by the company were made with the Allen flat-windway valves. The firm continued to make musical instruments until 1884, at which time they began producing rotary brushes.[2]

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 47.

[2]Robert Eliason, "Early American Valves for Brass Instruments," Galpin Society Journal 23 (1970): 95.

Seltmann

This individual was a maker of brass instruments in Philadelphia, presumably during the mid-nineteenth century. Seltmann is represented in the collection by bell-over-the-shoulder instruments. Other instruments by this maker that are extant include a helicon and a saxhorn. This information helps to substantiate both dates of operation and Seltmann's role as a brass maker.[1] Seltmann also sold cornets similar to those made by Henry Distin, marked with the Distin trademark, in Philadelphia, between about 1886 and 1888.[2]

Henri Gunkel

Langwill lists Gunkel as a nineteenth-century Parisian instrument manufacturer. The Stearns Collection in Ann Arbor, Michigan, has a Gunkel cornet and clarinet, which would indicate that Gunkel made both brasses and woodwinds. Most of the Gunkel instruments in the Larson Collection were made in the mid to late nineteenth century. Lyon and Healy was the American agent for Henri Gunkel, at least in the latter part of the nineteenth century.[3]

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 147.

[2]Lloyd Farrar, "Chronologies and a Survey of Serial Numbers," Silver Spring, Maryland, (mimeographed)

[3]Langwill, Index of Musical Wind Instrument Makers, p. 45.

A. Lecomte and Company

Arsènné-Zoe Lecomte (1818-1892) was a Parisian instrument manufacturer who started a business in 1859, after having been an employee of Gautrot in Paris. Surviving instrument show that the company produced both brasses and woodwinds. Lecomte won a number of exposition awards for his instruments, including medals at the 1867, 1878 and 1889 Paris Expositions. Lecomte held at least one patent for an improvement in bassoon construction. The firm was purchased by Charles and J. Ullman in 1902, and, although they kept the firm name, they apparently ceased the production of musical instruments.[1]

Joseph Higham

Higham was an instrument maker in Manchester, England, who made a variety of wind instruments including cornets, ophicleides, and clarinets. He held a patent, dated 1857, for a rotary-valve mechanism. The company was founded in 1842, and, according to the signature on the Higham instrument in the collection, became "Maker to the Army -- 1852" and "Brass instrument manufacturer to the Army and Navy and for export" in 1863. After Higham's death, P. Robinson began trading under the name "J. Higham," and the

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 92.

company operated under that name until 1930, when it was purchased by Mayers and Harison.[1] Higham instruments were sold in the United States by Lyon and Healy during the latter part of the nineteenth century.[2]

Edmund Paulus

A signature on an E-flat tuba in the Larson Collection reads: "Edmund Paulus -- Markneukirken -- Sachen." Paulus was an instrument manufacturer in Markneukirken and Berlin, Germany, between 1878 and 1898.[3] According to the signature, Paulus succeeded J. Lemke as the king's "Hof-instrument macher," perhaps sometime in the late 1880s.

Boston Musical Instrument Manufactory

This firm was in existence from 1869 to 1919, and it was known primarily for its "Three-star" cornets. The company was formed by six artisans who had worked for other manufacturers in the Boston area. The Boston Musical Instrument Manufactory was one of the leading manufacturers of band instruments during the 1880s, and the company supplied instruments to several leading band soloists during

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 70.

[2]York's Musical Journal, advertisement for Higham band instruments, (December, 1885) p. 5.

[3]Langwill, Index of Musical Wind Instrument Makers, p. 119.

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that time. It was reincorporated as the Boston Musical Instrument Company in 1919, and it was sold to Cundy-Bettony that same year.[1]

John F. Stratton

John Stratton (1832-1912) was a manufacturer and importer of brass instruments who established factories in New York (1857), Markneukirken (1866), and Leipzig (1868), which were eventually sold in 1883.[2] Stratton made sax-horns and bell-over-the-shoulder instruments. He was also involved in a partnership with Foot of New York sometime during the later nineteenth century.[3] The only Stratton instruments in the group of E-flat instruments in the Larson Collection are bell-over-the-shoulder tubas which bear the signature: "John F. Stratton -- New York."

Tonk Manufacturing Company

Max Tonk emigrated to the United States from Berlin in 1852, and he started a fancy furniture manufacturing business in Chicago in 1873.[4] The company made piano stools

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[1]The New Grove Dictionary of Music, 1980 ed., s.v. "Boston Musical Instrument Manufactory," by Robert Eliason.

[2]The New Grove Dictionary of Music, 1980 ed., s.v. "Stratton," by Robert Eliason.

[3]Langwill, Index of Musical Wind Instrument Makers, p. 155.

[4]William Tonk, Memoirs of a Manufacturer (New York: Presto, 1926), p. 243.

and music cabinets, but there is no evidence that Tonk Manufacturing made wind instruments. William Tonk left the firm about 1881 and moved to New York, where he established another factory. By 1914, Percival Tonk took over the Chicago business, and he continued to operate it, primarily as a furniture manufactory, until 1963.[1]

H. B. McMillan and Sons

This company was apparently a retail music and musical instrument concern operating in Cleveland, Ohio, during the late nineteenth and early twentieth centuries. McMillan was, at one time, the sole United States agent for instruments manufactured by Henri Marchand of Paris. McMillan also sold instruments with the trademark "Criterion."[2]

Keefer

The Brua C. Keefer Manufacturing Company was established in Williamsport, Pennsylvania, in 1909, when Keefer bought the musical instrument manufacturing concern of Henry Distin. (Distin came to the United States in 1877, after he had established a successful business in London, and he started the American factory soon after his arrival, but the company began to have financial difficulty in 1905, and it

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[1]Larry Viskochil, Chicago Public Library, to E. A. Downing, Atwood, Kansas, 20 July 1968.

[2]Langwill, Index of Musical Wind Instrument Makers, p. 100.

went into receivership in 1908.)[1] Keefer brass instruments of all types were produced in Williamsport until the 1940s, when production ceased because of World War II.[2] The Keefer firm continued to deal in musical instruments from 1940 to 1974.[3]

A. K. Hüttl

The brass instrument manufactory of Anton Konrad Hüttl was founded in 1877 in Grazlitz, Austria. This firm made brass and woodwind instruments which won a number of awards, including a bronze medal at the Paris Exhibition of 1878. The company is now headquartered in Wales, and specializes in the manufacture of double French horns.[4] Hüttl is represented in the Larson Collection by one tuba.

Tourville and Company

This manufacturer was not listed in the standard references consulted, but available information indicates that Tourville was a Parisian firm which was operating during the late nineteenth and early twentieth centuries. The Sears,

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[1]Lloyd Farrar, "Keeping up with Keefer: Distinland not so Distant," American Musical Instrument Society Newsletter 10 (1981): 1-2.

[2]Lloyd Farrar, "Chronologies and a Survey of Serial Numbers," Silver Spring, Maryland, (mimeographed)

[3]Langwill, Index of Musical Wind Instrument Makers, p. 80.

[4]Ibid., p. 76.

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Roebuck and Company catalog of 1907 shows Sears as the sole United States agent for Tourville, but very little biographical information is given. The same catalog advertises a patented high/low pitch quick change conversion mechanism unique to the Tourville instruments. Sears began selling the Tourville instruments in 1905 and apparently quit selling them by 1911.[1] This company was in operation by at least 1880, but no closing date has been found.[2]

Smith and Company

The Smith family of Wolverhampton was well known for brass instrument making throughout much of the nineteenth century. The Smith whose name appears on the upright in the collection is probably Richard Smith, who operated in London between about 1880 and 1890. Richard Smith is listed in Langwill as a dealer in military musical instruments and as a band music seller and publisher. It is not known whether the instrument in the collection was made by Smith or stenciled by his company.[3]

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[1]Sears, Roebuck and Company, general catalogs, 1905-1911.

[2]Andre Larson, "The Golden Age of Bands 1860-1915," vol. 2, liner notes (Mark Records MC-6211-A, 4 May 1977).

[3]Langwill, Index of Musical Wind Instrument Makers, p. 150.

Jerome Thibouville-Lamy

Jerome Thibouville-Lamy was born in 1833, but the business bearing his name was claimed to have been established in 1790. The company owned factories in Paris and La-Couture, and these factories were some of the first in Europe to have modern machinery. The firm was active in the production of brass, woodwind and stringed instruments, and additional businesses were opened in London (ca. 1894) and New York. Thibouville-Lamy was one of the first companies to make a double French horn with an ascending third valve.[1]

Marceau and Company

The Marceau band instrument company had a long and apparently rather fruitful relationship with Sears, Roebuck and Company beginning as early as 1900, and continuing into the 1920s. Sears was the sole United States agent for Marceau during part of that time. Very little information is readily available about the Marceau company, despite claims by Sears that Marceau was one of the most well-known Parisian instrument manufacturers. Langwill lists the company as a modern maker.[2] It is interesting to note how the descriptions in the Sears catalogs changed from the early years of the century to the 1920s. The Marceau

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 158.

[2]Ibid., p. 102

company, which had been "celebrated" and "renowned" in the early catalogs, was merely a maker of "good quality" brass instruments in the later catalogs.[1]

Reverie

No information was available concerning this brand name, but information on the signature of the instrument in the Larson Collection with this trademark indicates that the manufacturer was active in Berlin about the time of World War II.

Frederick LeBaron

LeBaron was either a manufacturer or an independent craftsman operating in Paris during the late nineteenth or early twentieth century. It was evidently a small company, or perhaps a cottage industry, because the LeBaron name is not listed in the standard references.

M. Claton

This name does not appear in the New York City directories, nor does there seem to be any information available about M. Claton.[2] Claton was evidently an individual maker operating in the New York area in the late nineteenth or early twentieth century.

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[1]Sears, Roebuck and Company, general catalogs, 1895-1920.

[2]New York Public Library, correspondence, 23 January 1984.

Anton Bach

Langwill does not list Bach as a maker of musical instruments. Bach may have established one of the forty or more smaller firms in Grazlitz, or he may have been an independent craftsman who purchased parts from Bohland and Fuchs and assembled his own instruments. Probable dates of operation are from the later nineteenth century to the early twentieth century.

V. F. Cerveny and Sons

The firm of Vincent Franz Cerveny and Sons was founded in 1842 at Konniggratz, Bohemia. According to Langwill, it was one of the most important brass instrument factories of the second half of the nineteenth century.[1] Branch factories were established in both New York and Kiev in the later nineteenth century.[2] The Cerveny firm won a number of medals at various expositions, and Cerveny is generally credited with having made a number of improvements in the construction of the bass tuba. His most significant contribution was the invention of the modern contra-bass instrument, which he built in both BB-flat and CC.[3] The Cerveny firm is still one of the most respected brass manufacturers, especially of tubas.

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 24.

[2]Bevan, The Tuba Family, p. 143.

[3]Sachs, History of Musical Instruments, p. 430.

F. Jaubert and Company

This musical instrument manufactory operated in Paris around the turn of the century.[1] It is likely that Jaubert and Company made only brass instruments, but this is not certain. Lyon and Healy of Chicago was an American agent for Jaubert during the later nineteenth and early twentieth centuries.

LePiere

This firm was in operation in Paris, presumably around the turn of the century. It is not known who served as the American agent for LePiere.

R. Wunderlich

Langwill lists a Wunderlich operating in Chicago around 1914, and he indicates that Wunderlich made the first model of a five-valve B-flat French horn designed by Lorenzo Sansone.[2] Wunderlich also had a music store in Chicago during the 1920s and 1930s.[3] One of Wunderlich's apprentices, Carl Geyer, was a highly respected maker of French horns through the middle of this century.[4]

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[1]Langwill, Index of Musical Wind Instrument Makers, p. 77.

[2]Ibid., p. 173.

[3]Interview with Frank Balaam, retired Michigan band director, July 1984.

[4]Langwill, Index of Musical Wind Instrument Makers, p. 53.

August Heinel

No dates are available for this manufacturer, but the firm must have been in business around the turn of the century, because Heinel's instruments were imported and sold by the J. W. Jenkins music company in Kansas City. Jenkins was the sole United States agent for Heinel's tubas during part of that period. The Heinel firm was located in Markneukirken, Germany.

Pertin American

None of the printed sources or interviews yielded information on the origin of this company. It is not known whether Pertin was a maker or merely a dealer in musical instruments. The company operated in Chicago, presumably during the first part of this century, but it is not listed in the directories of that city.

American Educator Band Instrument Company

This company also operated in Chicago, probably in the early part of the twentieth century, but the firm's name does not appear in the Chicago city directories, nor were any sources able to provide information. At least two sources recalled both the American Educator company and the Pertin company, but they could provide no information beyond name and location. It is not known if the American Educator company manufactured band instruments or only marketed them.

CHAPTER IV

ANALYSIS OF THE DATA

The purpose of this chapter is to present an analysis of the data collected in the survey. This will be done by instrument type. Helicons, sousaphones and upright instruments will be discussed separately, and some attention will be given to the special instruments as well. Statistics will be compared in order to arrive at some general statements about each group of instruments. Tables of statistics by instrument group are also provided in Appendix B.

Helicons

There are twenty-three instruments of the helicon type in the group of E-flat instruments. Fourteen of those are definitely American made instruments; four instruments bear signatures representing France, Germany and Italy; one tuba is unsigned, and the remainder have signatures of American companies, but they were probably not made by the agency indicated.

The oldest of these instruments could have been made as early as 1870, but it is unsigned and difficult to trace.

It seems more likely that the oldest tuba in the group was built in the 1880s. In fact, the earliest date that can be confirmed is 1890, for a Conn helicon. Conversely, the newest instrument that can be dated with some certainty is also an American tuba--King, No. 255--made between 1915 and 1925. It is possible that some of the instruments, notably the Martin tubas, could have been made somewhat later. An acceptable range of dates may be between 1880 and 1930 for the helicons.

No single maker is represented most frequently in this group; Conn, King and Buescher are each represented by three instruments, and there are two Martin instruments and two Yorks. No other manufacturers are represented more than once.

All but three of the helicons are three-piston instruments. One of the three, a Buescher, has four piston valves, and the other two are both European instruments with three rotary valves each and the clockwork spring mechanism. The helicons were designed primarily as marching instruments, so extended range and the need for improved intonation must not have been critical factors in helicon design. Cost may also have been somewhat prohibitive.

All of the instruments are constructed of brass; ten are silver-plated, two are nickel-plated, and two are

lacquered. The lacquering may have been done at a later time, since it was apparently not a common practice, at least until about 1930.

Bore sizes range from the relatively narrow 1.45 centimeters on the Malecki instrument to the large-bore Girardi helicon, which measures 1.95 centimeters. Generally, most of the helicons seem to be medium to medium-large bore. Ten of the helicons fall within the 1.7 cm to 1.775 cm range, and six instruments are somewhat smaller, falling within the 1.45 cm to 1.55 cm range. Five helicons are within a range of 1.6 cm to 1.675 cm. The two tubas with the largest bores are the two European rotary-valve instruments--Paulus, No. 683 and Girardi, No. 313.

The Girardi helicon also has the smallest bell diameter at 27.7 cm, while the single Holton helicon measures 51 cm across the bell. Approximately fifty-six percent of the helicons fall within the 48 cm to 51 cm range, and all except possibly one of those instruments is of American make. The remainder of the instruments fall within a 36 cm to 40 cm range, and the smaller exceptions are European instruments. The range of height is between a low of 90 cm for a small-belled French instrument to a high of 126 cm for one of the larger Conn helicons. There is a fairly even distribution, so it is difficult to make judgments about average heights.

There is a significant weight difference among the helicons, and once again the French instrument is at the low

end at 4.32 kilograms, while one of the American made Conns weighs over twice that much--8.98 kg. The American tubas generally weigh one to two kilograms more than their European counterparts, indicating that perhaps the American instruments are made of thicker metal. Even some of the larger bore imported instruments are significantly lighter than the domestic tubas. Bow sizes range from 55 cm to 70 cm, with the majority of the instruments falling within the 60 cm to 68 cm range.

Theoretically, the third valve slide of a brass instrument, if it is to lower the fundamental pitch three semitones when used alone, should equal approximately nineteen percent of the total length of the instrument.[1] The first valve slide length should equal about twelve percent of the total length of the instrument, so the relationship between the lengths of the first and third valve slides may be expressed by the ratio 1:1.58. (The ratio is more accurately expressed as 1:1.55 in a tempered tuning system.) However, in actual practice, the third valve slide is rarely used alone, and it may be built so that the 2-3, 1-3, and 1-2-3 valve combinations may be better in tune. An instrument built so that the 2-3 combination is in tune rather than sharp has a longer third valve slide. The relationship of the third valve slide to the first in this case may be expressed by the ratio 1:1.64. Instruments with ratios

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[1]Norman Hunt, Guide to Teaching Brass, 3d ed. (Dubuque, Iowa: William C. Brown, 1978), p. 43.

greater than this will be less sharp on the 1-3 and 1-2-3 combinations but flat on the 2-3 valve combination.

The first to third valve slide ratios of the helicons vary from 1:1.4 to 1:1.81, and not a single helicon is built precisely to the 1:1.64 ratio, although seven of the tubas have higher ratios--three American, two European and two probably European. Sixteen of the twenty-three helicons are over the 1:1.55 ratio, while the remainder fall below this mark down to the 1:1.4 ratio mentioned previously.

There are at least two possible explanations for the variations in ratio. Either the manufacturers expected that the third valve slide would be pulled--perhaps from 1.5 cm to 8.5 cm--or very little research work had been done in that period concerning brass instrument acoustics. Since the first automatic compensating system was made in the nineteenth century, it is reasonable to assume that the acoustical research was generally known to the makers; therefore, the former explanation seems the most likely. Also, there does not seem to be a basis for assuming that makers began to build longer third valve slides beginning at any particular time.

The valve slide lengths were also used to judge whether the instrument was built in high or low pitch. Unfortunately, only a limited number of instruments can be definitely judged either high or low (and that judgement based in part on established dates of manufacture), because no clear cut separation is apparent in the valve slide lengths. One

centimeter gradations exist from the shortest to the longest slides in each group, with only one, or at most two, skips of more than one centimeter, so the measurements are of little help in determining pitch within this group. There are also some helicons which were built probably in the first two decades of the twentieth century, which could have been used in ensembles of either high or low pitch. It might be accurate to state, however, that instruments with first valve slide lengths of 55 centimeters or greater are probably low-pitch instruments.

Some standardized construction techniques can be seen within the group of helicons, some of which may be characteristic of the E-flat wrap-around instruments in general. One of the most clearly visible techniques of construction is the way in which the main coil of the instrument is completed. Since less primary tubing is required with the E-flat instrument than with a BB-flat instrument, and because the coil dimensions of any wrap-around instrument need to be large enough to accommodate the body of the player, the coil construction of the E-flat instrument must compensate for the difference in tubing length.

The Conn, King, Martin and Holton instruments have a nonfunctional section of tubing which completes the coil. This is also true of one or two other instruments which may be of American make--Pertin, No. 1169 and Gretsch, No. 305. The extra tubing appears to be functional, but it is cut at

an angle and soldered to that part of the main coil just after the bell section. The functional tubing to which it is attached at the other end curves back toward the valve assembly. This tubing makes one more half-coil before entering (usually) the third valve. The tuning slide may or may not be contained in this section of the tubing. The visual effect of this construction technique is one of a bulkier looking valve and slide assembly.

The second type of main coil arrangement, found on the York and Buescher instruments as well as on some of the European instruments, is a completely functional main coil which continues another half-coil around the inside of the beginning of the main coil, and which usually enters the third valve. All but one of the instruments constructed in this fashion have the tuning slide before the valve assembly. The visual effect is one of less bulk in the valve and slide assembly.

The Malecki helicon and Dyer tuba, both probably imports, are constructed with yet a third type of coil arrangement. The tubing completes a full coil (back to the bell section), and then it immediately doubles back on itself to enter the first valve. The result is a double tube, with perhaps five to ten centimeters space between the tubes, which is approximately one-third of the total length of the main coil. This appears to be a European construction technique, although that remains to be seen with the sousaphones.

A variant of this same technique is found on the German and Italian instruments with rotary valves, although the doubled tube has a larger gap on these instruments. Also, the main coil of each instrument is flat for approximately one-third of the total length of the coil. This effect seems to give these instruments more character, and it certainly makes them easier to identify. This technique is necessary because of the rotary valves.

There are a great many different valve slide arrangements amount the group of helicons. The purpose of each arrangement seems to be to keep the slides within the confines of the main coil as much as possible in order to avoid damage, although this is accomplished with varying degrees of success. Slides are unprotected as soon as they are extended, in many cases. The two most common valve slide patterns are illustrated below, along with a third, less common pattern, that appears on a few instruments. There are slight variations within each basic pattern.

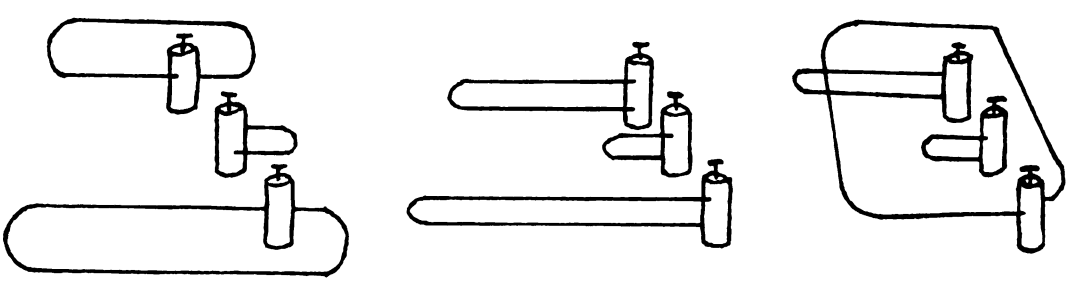

Fig 24. Helicon valve slide patterns.

The direction of the second valve slide is the most significant change in the first two examples, while the distinctive coil of the third valve slide is apparent in the third illustration.

Tuning slide placement varies somewhat with each instrument, but the majority of the tuning slides are placed underneath the valve slides. Fourteen of the helicons have tuning slides placed before the valve assembly, while nine instruments have tuning slides placed after the valve assembly. There seems to be considerable variation in the amount of slide length available in the tuning slides.

Not all of the instruments have bell braces, because this appears to depend in part on the length of the bell section. Such braces are noticeably absent on the Buescher tubas. Decorative turning on the large ferrules is more charactertic of the American made instruments, and, generally, the domestic helicons are more solidly constructed. The two good quality European instruments in the group are certainly crafted with as much care.

Comparison of Helicons by Individual Makers

The three Conn helicons are somewhat similar in construction, as would be expected, but Number 147 and Number 150 have the same dimensions, while Number 680 is a much smaller (and older) instrument. Number 680 has different bracing and tuning slide placement as well. However, there are too few instruments to speculate about design changes

which may have taken place.

The same cannot be said of the King helicons. Despite some differences in dimensions, and perhaps thirty years difference in dates of manufacture, all three King instruments are remarkably similar in construction and detail, thus showing very little design change in this particular type of King instrument.

The Buescher helicons seem to be the least consistent in detail, indicating that Buescher evidently experimented more with design changes, at least on its helicons. The two three-valve instruments are similar in dimensions, but the valve and tuning slide arrangements are quite different. This design change took place sometime between the late nineteenth century and 1915. The slide arrangement of the four-valve instrument is quite different from that of the other two helicons, in part perhaps because of the fourth valve. The placement of the tuning slide on the four-valve instrument is the most noticeably different detail.

There are two York helicons which are very much alike, and two Martin instruments which are similar in dimension and detail, but with only two instruments to examine by each maker, it is difficult to make any judgements about design changes. The absence of clearly established dates of manufacture also makes this task difficult. No other maker is represented more than once, although the Malecki and Dyer tubas may have been made by the same maker.

Sousaphones

There are thirty E-flat sousaphones in the Larson Collection. Four of these instruments are the bell-up rain-catcher type. The greatest number of sousaphones are of American make (twenty-three), and three are definitely imported instruments, while six have signatures of American companies not clearly identified as manufacturers. Most of the six were probably made in this country. Conn made six of the sousaphones, and Conn's subsidiary, Pan American, made four. Four instruments were made by King, and the Cleveland Musical Instrument Company made two instruments, as did York. It should not be surprising that Conn has the largest representation in the collection, since the bell-forward model was their invention.

The oldest datable instrument in the group of sousaphones--a bell-up model--was made in 1910. The sousaphone was not in general use until 1898, and the design for the bell-forward model was not introduced by Conn until 1908, so one would not expect to find sousaphones of the same age as the helicons.[1] The newest instrument in the group for which a date can be established with certainty is a King instrument, which was made between 1940 and 1945, although the Reverie sousaphone (No. 3168) may have been made between 1945 and 1949, if the information from the signature was interpreted correctly. Most of the sousaphones in this group were probably made in the 1920s and 1930s.

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[1]Bevan, The Tuba Family, p. 16.

Three of the thirty instruments have four valves, and all of the sousaphones are piston-valve instruments. Even the three German instruments have piston valves, which probably means that they were manufactured for export only, because rotary-valve helicons were still used in German and Austrian marching bands well into the 1930s.[1] The Conn four-valve instrument was made for the military, and it is possible that the other two four-valve sousaphones were also made to military specifications in the hope of gaining military contracts, because four-valve upright instruments were certainly available at that time, and they would have been superior in quality to the marching instruments. Gene Pilzuk, a former employee of York, recalled that York made a number of prototype instruments for government inspection, so this may have been a common procedure among the American manufacturers.[2]

Only four instruments in the group are plain brass. The majority are silver-plated instruments. Five of the eighteen silver-plated instruments have gold-plated bell interiors. This type of plating makes a striking impression on the marching field, and such instruments are still common today, especially among the major university marching bands. The remaining instruments are lacquered.

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[1]Carse, Musical Wind Instruments, p. 306.

[2]Telephone interview with Gene Pilzuk, former employee of York, Grand Rapids, Michigan, 2 February 1984.

Bore sizes among the sousaphone range from an estimated 1.4 cm for the Anton Bach import to an estimated 1.8 cm for an instrument of American make. The larger-bore instruments fall within the 1.7 cm to 1.75 cm range, which is similar to the large-bore helicon grouping, and most of the remaining instruments have bore diameters which fall within the 1.6 cm to 1.68 cm range. Small-bore instruments are exceptional in this group, with only three tubas with bore sizes in the 1.4 cm to 1.45 cm range. The pattern seems to suggest that the sousaphones as a group contain more large-bore instruments than the helicon group.

The smallest bells are among the bell-up sousaphones (49.4 cm is the smallest), possibly because the radiating and directional properties of the large bells are not critical to bell-up instruments. Sousa was trying to avoid the directional sound when he designed the instrument. Another reason may be because the only bell pattern available at the time was for the helicon type, which tended to have a bell size in the 30 cm to 50 cm range. The bell-front sousaphones, on the other hand, have bells as large as 66 cm in diameter, and a bell size of about 60 cm is average in this group.

Height varies from 114 cm to 146 cm, and the majority of the instruments are in the 126 cm to 132 cm range. This is not a critical measurement, however, because the bell section of each instrument can be removed, and the placement of the bell affects the height measurement, unlike the

helicons which have a fixed height. Bow diameter measurements are about the same as those of the helicons, and these measurements fall within the 60 cm to 70 cm range. Individual instrument weight is quite evenly distributed within a range of 7.8 kg to 11.2 kg. The lightest instrument weighs 7 kg, and the heaviest weighs 11.2 kg. The imported instruments are generally lighter, indicating that they were probably made with thinner brass.

The valve slide lengths are again of so great a variety that they are of little value in predicting the pitch of the individual instruments. First valve slide lengths as short as 52 cm are found on instruments made too long after the turn of the century to be high pitch. All but two of the sousaphones seem to be low pitch, based on dates of manufacture, although there may be some examples of instruments made to play at both pitch levels. Generally, the first valve slide lengths fall within the 50 cm to 55 cm range, while the majority of third valve slides are between 80 cm and 85 cm long. The first to third valve slide ratios vary from 1:1.494 to 1:1.82, with the greatest concentration of instruments in 1:1.53 to 1:1.59 range, which is still too low for pitch accuracy on the 2-3 valve combination with the valve slides in all the way, but generally high enough to reduce the amount of third valve slide extension needed. There are in fact a smaller number of sousaphones than helicons in the range needed for an acoustically correct 2-3 combination.

The main coil design features of the helicons are also common to the sousaphones, although some interesting variations are apparent. The H. N. White Company kept the nonfunctional tubing design with the raincatcher tubas, but the company changed to the functional tubing design (like that of the Buescher helicons) on its bell-front sousaphones. The bell-front instruments were made somewhat later, of course. York changed from a fully functional coil on its helicons to a variation of the Conn helicon design on its sousaphones. A large, flat shoulder rest completes the main coil instead of the nonfunctional tubing as found on the Conn instruments. Unfortunately, there are only two York sousaphones in the group, and they were made within ten years of one another, so it is difficult to know if this was the only sousaphone coil design that York used.

Conn and Pan American retained the nonfunctional tubing design on the sousaphones. The Conn sousaphones in the collection represent about fifty years of development, so it may be safe to assume that no change was made to this design feature while Conn made E-flat sousaphones and helicons.

The three European sousaphones have the same doubled coil arrangement as the Malecki and Dyer helicons have, and both of those instruments are probably imports. Since this construction technique does not appear on any marching instruments of clearly American make, it is probably correct to call this a European design feature. All available

photographs and engravings of European piston-valve helicons confirm this statement.

One or two unusual valve slide arrangements appear in the sousaphone group, but the two most common slide arrangements are the two illustrated previously. The sousaphones as a group also have a greater number of instruments with a variation of the second design.

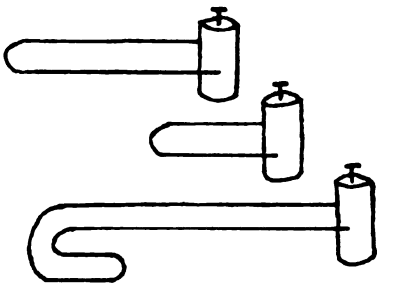

Fig. 25. Sousaphone valve slide pattern.

The slide tubes on some of these instruments are on top of one another rather than side by side.

Twenty of the sousaphones have the tuning slide placed after the valve assembly, and the three imported instruments are among the group of ten with the tuning slide placed before the valve assembly. The tuning slides are under the valve slides on all but four of the instruments. This arrangement would require that a player reach through the valve tubing to manipulate the tuning slide.

Some of the instruments that have the tuning slide after the valve assembly have tuning slides which are larger in diameter than the valve slides. This shows that at least

some makers were beginning to take advantage of the possibility to have a more even expansion of the bore throughout a greater length of the instrument. The expansion takes place within the tuning slide on some instruments, so that the tuning slide tube coming from the third valve is smaller in diameter than the tuning slide tube after the slide bow. This is especially true on more modern sousaphones.

As far as can be determined, all of the sousaphones have, or had, adjustable leadpipes. (The adjustable leadpipe is the extra tubing, commonly called the gooseneck, which is inserted into the base of the leadpipe and can be adjusted for the comfort of the player.) Not all the helicons have such adjusting mechanisms, so it may be appropriate to consider the adjustable leadpipe an early twentieth century innovation.

Each of the sousaphones has an adjustable bell, except for two of the bell-up instruments, although the bell section can be removed from these instruments. The bells are held in place by a group of either two or three bell screws, which tend to disappear without constant vigilance. Further, bell sections tend to fall off if not secured properly; this damages the bell and frequently converts the perfectly circular, machined bell bottom into an ellipse. This innovation was likely conceived both to make the bell adjustable for the player's comfort and to allow the instrument to be stored and transported more easily.

Comparison of Sousaphones by Individual Makers

The Conn sousaphones in the Larson Collection were built between 1924 and 1938, and the group includes one four-valve instrument and one bell-up instrument. The dimensions are generally similar, and all but one of the instruments have a relatively large bore. Even the four-valve instrument is similar in design, for it appears to be a three-valve instrument configuration with the fourth valve added. There are no apparent major design changes among the Conn sousaphones, which would indicate that Conn experimented very little with sousaphone design during this period. The four Pan American sousaphones are also quite similar in detail and dimensions, but they were built within about two years of one another, so any comments about consistency of design would be purely speculative.

The two Holton instruments are somewhat difficult to compare, because one is a four-valve instrument. It would appear that the three-valve instrument design was not modified appreciably with the addition of the fourth valve. The older instrument has a longer bell brace, and the placement of the ferrules is slightly different, but there appear to be no other major design modifications.

Only one of the bell-up Kings in that group of four King instruments is significantly different in dimensions, although the newer instruments have increasingly longer third valve slides. There is a definite difference in construction between the two raincatcher instruments and

the two bell-front sousaphones. Both of the bell-up instruments have the Conn coil configuration, but the two bell-front sousaphones have the functional coil similar to those of the Buescher helicons. The two raincatchers were made between 1910 and 1915, and the two bell-front sousaphones were made between 1930 and 1940, so it is not possible to know for certain when the design change took place. It is possible that King adopted the newer arrangement when the company switched to the bell-front models. There are no significant difference in tubing arrangement between the four instruments other than tuning slide length.

The Cleveland Musical Instrument Company is represented by two sousaphones which are quite dissimilar in valve slide and tuning slide construction, but which are somewhat similar in main coil design. The end of the coil on No. 141 cuts across the middle of the coil to enter the first valve casing, while a small bit of nonfunctional tubing continues to the opposite side of the coil in order to act as a brace for the valve assembly. This may have been an experimental design, or one copied from a European instrument, since it is so similar to an imported sousaphone illustrated in the 1925-26 Montgomery Ward and Company catalog. There are also two Concertone instruments which are similar in construction, but are possibly imports made by two different makers.

The quality of construction varies a good deal among the instruments in the group. The Conn, King and York tubas have a modest amount of ferrule decoration, and they are

generally well constructed, as are the Holton instruments. Many of the rest of the sousaphones are built solidly, but they were obviously made as moderate to low-priced instruments, perhaps costing about one hundred dollars in the 1920s. It is probable that all were made to be marching instruments, but, judging from the printed sources, the sousaphones were also used in concert bands and dance bands perhaps as much as they were used on the march. This cannot have made a good impression on discriminating conductors, because there must have been tone and intonation problems with many of these instruments.

Upright Tubas

The uprights are by far the largest single group of E-flat instruments in the collection. Eighty-six instruments are in this group, with multiple representation by a number of manufacturers. Conn is once again represented by the largest number of instruments with ten; there are nine Lyon and Healy instruments and seven Yorks; H. N. White, Grand Rapids Band Instrument Company, and Holton are represented by four instruments each. Five Pepper instruments are in the group of eighty-six, and there are only three Buescher tubas. Wurlitzer, Fischer and Jenkins each have two instruments in the collection. The only European manufacturers represented by more than one instrument are Gunkel of Paris and Bohland and Fuchs of Grazlitz. Gunkel instruments are with the Lyon and Healy group, and the Bohland

and Fuchs tubas bear a variety of signatures. There are approximately forty-four manufacturers and agents represented in the group of uprights, and thirty-three of those companies are represented by only one instrument.

A large number of instruments were not made by the companies whose signatures appear on the instruments. This is true of some of the H. N. White, Pepper, Fischer, Wurlitzer, Jenkins, and Lyon and Healy instruments, so it is difficult to arrive at any accurate manufacturing statistics for the group of uprights. Instead, the figures may more accurately reflect the marketing techniques that the manufacturers and agents employed in the midwest during the late nineteenth and early twentieth centuries.

The large mail-order companies like Sears, Roebuck and Company were apparently not able to compete with the major American manufacturers and agents, because their representation in this group is limited, and it is also very limited among the helicons and sousaphones. The large catalog firms sold very few bass instruments, if this collection represents an accurate cross-section of the total merchandising picture for the period of time under consideration.

The oldest instrument in this group for which a date of manufacture can be established with certainty is a Conn tuba made in 1887, although some of the Lyon and Healy tubas may have been made as early as 1869. One of the York instruments was made about 1921, and this may be the newest instrument, but there are other instruments which may have

been made later than that date. 1880 to 1930 may, therefore, be used as a time frame for the dates of manufacture of the upright instruments, and it may be accurate to say that most of the upright E-flat tubas were made between 1890 and 1920.

All of the instruments are made of brass with two possible exceptions. (The two exceptions may be made of German silver, but this is doubtful.) Thirty-three of the instruments are plain brass, fifteen are nickel-plated brass, thirty-six are silver-plated brass, and two are lacquered brass. Both of the lacquered uprights were probably finished at a later date.

The plating on many of the silver-plated instruments is somewhat thin, no doubt to save cost, and the nickel-plating is more common with this group than with either the sousaphones or helicons. It was generally standard practice for many manufacturers to produce plain brass instruments, and then plate them, or have them plated, to order. The silver-plating added as much as twenty to twenty-five percent to the cost of the instrument, and nickel-plating added somewhat less, so it is easy to see why so many of the uprights are unplated, despite the work required to keep a plain brass instrument polished. Untreated silver will also tarnish, so many players must have found the added expense not to be worthwhile. The nickel-plated instruments are not badly tarnished, but some of them have begun to deteriorate nonetheless, because of flaking.

Only two instruments in the group of eighty-six are four-valve instruments. Both are American made, and both have the fourth valve placed at the side. The single rotary-valve instrument in the group has only three valves and was made in Germany. (There are seven other rotary-valve instruments in the special group which will be discussed later.) Ninety-six percent of the uprights, then, are piston-valve instruments with three valves, and only seven of those eighty-three tubas are side-action tubas, four of them Conns. Clearly, the preference here is for three-piston, top-action instruments.

The number of uprights make it possible to be more accurate in describing bore characteristics. The smallest bore size in the group is 1.4 cm, and the largest is estimated at 1.925 cm. The half-centimeter difference from smallest to largest is significant, because a modern medium-bore baritone has a bore diameter of approximately 1.4 cm, and a modern BB-flat tuba has a bore diameter of approximately 2 cm. The resulting difference in tone quality between a large-bore and a small-bore E-flat instrument will be quite dramatic, as will response in the extreme registers. Table 2 illustrates the breakdown by bore size.

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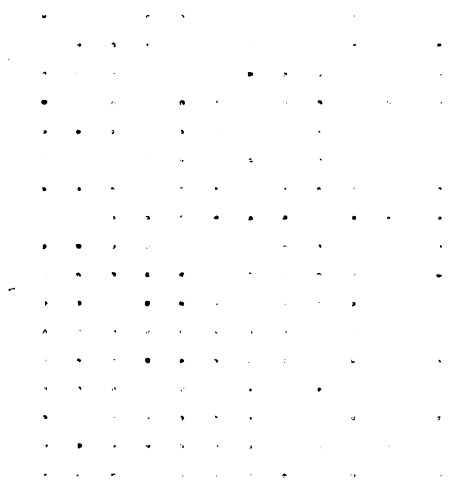
TABLE 2

UPRIGHT BORE SIZE DISTRIBUTION

Bore in centimeters	Number of instruments
1.4	3
1.425	1
1.45	10
1.5	12
1.525	6
1.55	14
1.575	4
1.6	8
1.625	3
1.65	4
1.675	13
1.7	2
1.725	2
1.75	1
1.775	1
1.8	1
1.85	1
1.925	1

It is readily apparent that the largest concentration of instruments is in the 1.45 cm to 1.55 cm range, with another large group in the 1.6 cm to 1.675 cm range. There are a minimum number of larger-bore instruments, and only four instruments fall below the 1.45 cm mark. Bore sizes were not listed in the literature from the period, but all four of the Holton tubas are listed as "monster" (i.e., large-bore) tubas in the Holton correspondence, and the bore diameters of these instruments range from 1.65 cm to 1.725 cm. Therefore, it might be safe to classify instruments with a bore diameter of 1.65 cm and above as large-bore tubas.

The sousaphones as a group are larger-bore instruments



than the uprights, and the helicons also tend to be larger as a group, but not the same extent as the sousaphones. This tendency toward a larger bore may be a reflection of the manufacturers' attitudes concerning the marching instruments. They may have felt that the larger bore was necessary for the field instrument, or that helicons and sousaphones were not suitable instruments for young players, who would have benefited from the smaller-bore instruments.

Bell sizes of the uprights vary from 27.1 cm to 51.1 cm. There is a large concentration of instruments in the 49 cm to 51 cm range, and another concentration in the 36 cm to 38 cm range, which may reflect the difference between the large-bore and the medium-bore instruments. A number of European instruments have bell sizes below 32 cm, but there are no instruments of clearly American make below that mark. This may be because the bore sizes of most of the domestic instruments are 1.5 cm or larger.

About eighty percent of the uprights are between 72 cm and 82 cm in height. Bell damage or damage to the main bow could account for as much as two centimeters loss of height, so this may not be a critical measurement. The instruments of exceptional height, on the other hand, are closer to the bombardon type rather than the modern tuba type. These instruments all have small bells, and this group includes some of the Gunkel/Lyon and Healy tubas and the Besson/Schreiber instrument, all of which are among the oldest uprights in the group.

Weight seems to be more equally distributed than height, within a range of 2.9 kg for a very small Wurlitzer tuba to 8.3 kg for a four-valve, large-bore Holton instrument. Many of the instruments under five kilograms in weight, and almost all of the instruments in the three kilogram to four kilogram range, are imports. This reflects the tendency of the imports to be smaller, of course, but it also may indicate that the imported instruments are made of somewhat thinner material. There are instruments of probable domestic make which are made of thinner materials as well.

First valve slide lengths, even with this large group, offer no means to accurately predict pitch, perhaps because so many of these tubas were made in that period of experimentation when the change from high pitch to low pitch was taking place. The highest concentration of numbers is found at 52 cm, with 24 instruments in this group, while a group of 14 instruments is centered around 50 cm. There is also a group of 16 uprights in the 53 cm range. The group of 13 tubas in the 54.5 cm to 56 cm range may indicate instruments of definitely low pitch. The third valve measurements show similar concentrations in the 81 cm, 83 cm, and 85 to 86.5 cm ranges.

The first valve to third valve slide ratios range from 1:1.49 to 1:1.82, with the bulk of the uprights in the 1:1.52 to 1:1.66 range. This range corresponds quite closely with the sousaphones and less so with the helicons.

Even with this large a representation, it is difficult to justify an argument in favor of the gradual lengthening of the third valve slide over a period of time. Most manufacturers obviously expected that the third valve slide would be pulled a considerable amount to bring the valve combinations better in tune. As a matter of fact, many of the upright instruments have the third valve slide constructed so that the slide may be pulled to increase the slide length by at least 30 cm, which is plenty of room to make the necessary adjustments, even if the instrument is converted to low pitch from high pitch.

A number of common construction techniques can be cited within the upright group, excluding the single rotary-valve instrument. The greatest majority of top-action instruments have the valve slides constructed as shown in Figure 26.

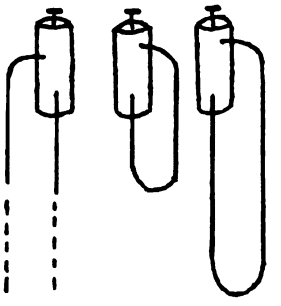


Fig. 26. Top-action valve slide construction.

The slides are normally positioned at the front of the instrument. There are some variations in the way in which the slide tubes enter and exit the valve casings. The

space-saving arrangement common to some of the Conn instruments is a variation on the usual technique.

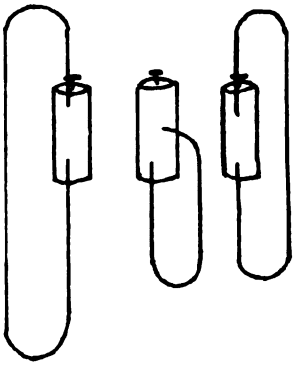


Fig. 27. Conn valve slide construction.

There are also some exceptional instruments that have the slides in the rear, or that have the leadpipe going to the third valve.

The pattern illustrated in Figure 26 may have been advantageous to the makers for two reasons. Less crook-work is required with this arrangement, so the cost of manufacture could be less, and the maximum slide extension can be achieved, provided of course that the inner slide is long enough. It will be remembered that this pattern was discussed in Chapter I in conjunction with the Sax instruments. This pattern evidently evolved into a fairly standard arrangement for top-action instruments beginning sometime in the later nineteenth century.

The tuning slide placement for instruments with the tuning slide placed before the valve assembly generally follows the pattern illustrated below:

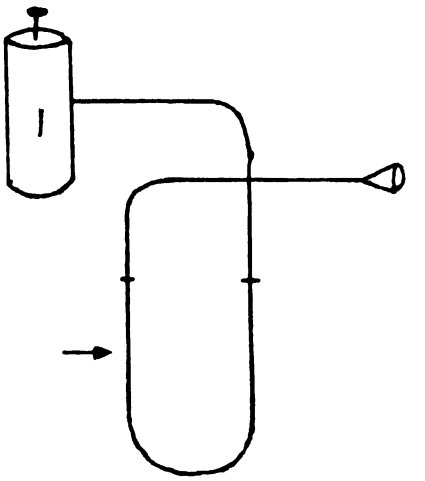
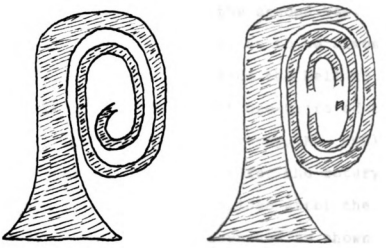


Fig. 28. Tuning slide arrangement for instruments with the tuning slide before the valve assembly.

There are a small number of top-action instruments that do not have the tuning slide arranged in the manner illustrated in Figure 28, and there is some variety in space between slide tubes for those that do.

Instruments with the tuning slide after the valve assembly have more space between the tuning slide tubes, and almost all have the slide placed directly behind the valve slides. There are two exceptional instruments that have a curve in the tuning slide to bring it forward to the same plane as the valve slides. There are also a few instruments that have tuning slides with a space-saving "U" shaped moveable slide.

There is an additional difference in the inner coil arrangement of the top-action instruments, which seems to go hand in hand with the tuning slide placement. This difference is illustrated in Figure 29.



Tuning slide before/Tuning slide after

Fig. 29. Inner coil arrangement of upright instruments with tuning slides placed before or after the valve assembly.

Those instruments with the tuning slide before the valve assembly have a small elliptical coil, while the instruments with the tuning slide after the valve assembly have the longer tuning slide. Most frequently, the bow on the former type takes a position halfway between the small coil and the main bow (e.g., Higham, No. 281). On the latter type, the third bow is either placed close to the main bow (e.g., Conn, No. 129) or placed approximately halfway between the main bow and the valve assembly (e.g., King, No. 367). The exceptions are discussed at some length in the catalog.

There is a great variety among the uprights concerning the relationship of the bell to the second bow. Either the second bow is so close to the bell as to be almost resting on it, or it is far enough away from the bell to show a clear bell section equal to almost one-third of the total length of the instrument (e.g., Cerveny, No. S-9).

The side-action tubas, except for the rotary-valve instrument, all have the tuning slides after the valve assembly, and the valve tubing arranged as shown in Figure 30.

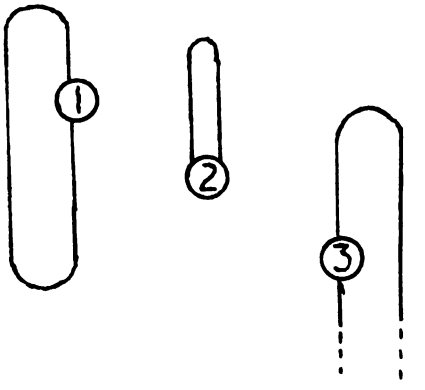


Fig. 30. Side-action valve slide arrangement.

Both of the four-valve instruments are top-action, with the fourth valve placed to the side, unlike the valve placement of many modern four-valve, top-action tubas. The fourth valve must be manipulated with the index finger of the left hand, which is good for dexterity, but uncomfortable, because the player must reach across the front of the tuba to manipulate the valve. This kind of reach would be virtually

impossible on a large-bore BB-flat instrument, which is perhaps the reason why modern makers have abandoned it, even on the larger-bore E-flats.

A majority of the domestic instruments have the tuning slide after the valve assembly. It was stated earlier that this arrangement could allow for a more even expansion of the bore, although, curiously enough, the makers did not apparently take advantage of this possibility on the upright design. It is clear, however, that the arrangement with the tuning slide after the valve assembly is far more common on the American than on the European uprights. The most important exceptions are the second-line domestic instruments (e.g., Grand Rapids Band Instrument Company tubas) and some of the Conn tubas.

The quality of workmanship varies a great deal among the instruments in this group. A great many of the imported instruments are inferior in workmanship to many of the American instruments. It is important to point out, though, that the difference in quality as represented in the Larson Collection does not automatically mean that European instruments are generally inferior. It simply reflects the reason why instruments were imported in the first place--they were cheaper.

Comparison of Uprights by Individual Makers

C. G. Conn is represented by at least eleven instruments in the group of uprights, and the Conn group has instruments manufactured as early as 1887 and as late as 1920. There are four side-action tubas, made in the years 1889, 1890, 1898 and 1902. The two earliest instruments are built with the second bow almost resting on the bell, while the two later instruments show a design change in favor of a somewhat longer bell section. This design change is characteristic of all the Conn instruments made after 1898, so it is apparent that Conn made the change somewhere between 1890 and 1898. There are no significant changes in valve tubing design, but the upright made in 1902 does have the "U" shaped tuning slide. None of the other, newer Conns have this feature, so it must have been a short-lived innovation, perhaps copied from another manufacturer.

The top-action instruments made after 1900 all have the space-saving valve slide arrangement, indicating that a design change took place sometime in the last decade of the nineteenth century. Conn manufactured top-action instruments with the tuning slide after the valve assembly at least in 1901, but the remaining top-action tubas made before and after that date do not show a similar change. The design could have been experimental.

Comparison of the dimensions yields very little by way of established patterns. The two newest instruments are larger in bore size and heavier than most of the rest of the

Conns, but these two are of the "monster" E-flat type. Conn must have made a smaller-bore E-flat at the same time, but there is no such instrument in the collection.

Bore sizes among the remaining Conns are generally in the 1.55 cm to 1.6 cm range; bell diameter, height and weight measurements are consistent, although the newer instruments are taller, perhaps because of the bell section. It is generally true that the instruments made before 1900 have a first valve slide length in the 52 cm range, as it is true that the tubas made after 1900 have a first valve slide length in the 54 cm range. Unfortunately, this pattern is not consistent enough to be able to support an argument equating valve slide length and pitch. Nine of the Conns have the first to third valve slide ratio in a range between 1:1.56 to 1:1.62.

The wide variety of styles and the number of subtle differences in construction make it apparent that Conn had more than one model of E-flat instrument, and that the company experimented a great deal with design changes over the years. Both Colonel Conn and his successor, Carl Greenleaf, were innovators and experimenters, so it is perhaps logical to see such a wide variety of instrument types among this large group.[1] The quality of construction is quite good among all the Conn instruments, so it should not be surprising to see Conn so well represented.

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[1]"100 Years of Conn," promotional flyer, C.G. Conn, Elkhart, Indiana, 1975.

York and its subsidiary, the Grand Rapids Band Instrument Company, are also represented by eleven instruments, dating from ca. 1897 to ca. 1921. It is immediately apparent that there are only two basic models in each group --a medium-bore and a large-bore "monster" instrument. This is confirmed by a comparison of bore dimensions, for all of the larger-bore instruments have bore diameters of 1.675 cm, while the smaller instruments fall within a 1.5 cm to 1.55 cm range.

The quality of workmanship on the York instruments is quite good, but the Grand Rapids tubas appear to be more cheaply made, although not appreciably so. The earlier instruments have the second bow quite close to the bell, unlike the later instruments, and this pattern is consistent with the Conn instruments. All of the York uprights have the tuning slide placed after the valve assembly, while all of the Grand Rapids uprights have the tuning slide placed before the valve assembly. This may have been a way in which York was able to cut costs in production.

Conn seems to have experimented a great deal with basic configurations, but York apparently made more subtle changes within a well-established design. The York and Grand Rapids tubas show the design changes primarily in the tuning slide. One of the Yorks has the "U" shaped tuning slide mentioned earlier, and some of the other instruments show differences in the curve of the tubing as it exits the third valve. The tuning slides on the Grand Rapids instruments vary both in

length and in distance between slide tubes. The distance between the third bow and the main bow also varies somewhat among the Grand Rapids instruments, but this is caused in part by the difference in distance between the bell and the second bow. It is most noticeable on the larger instruments, where the third bow is farther away from the main bow if the second bow is closer to the bell. A fair representation of the mature product of York's experimentation can be seen in the medium-bore York, No. 268 and the large-bore York, No. 138.

Bell sizes for the York and Grand Rapids instruments are consistently between 38 cm and 39 cm for the smaller-bore uprights, and between 49 cm and 50 cm for the larger tubas. Height measurements are also consistent within about a four centimeter range, and weights compare almost as favorably, with the smaller instruments in the 5.2 kg to 5.5. kg range, and the larger tubas in 6.9 kg to 7.9 kg range. The only exception is a late model, medium-bore instrument.

First and third valve slide measurements are not as consistent as the other dimensions, nor do these measurements appear to follow a clear-cut progression toward longer slides on newer instruments. Two of the seven Yorks are inconsistent with such a pattern, and the four Grand Rapids instruments do not appear to exhibit a pattern. It might be quite accurate to state, however, that the low-pitched York instruments have first valve slide measurements of between

55 cm and 56 cm, and third valve slide measurements of between 90 cm and 93 cm. Comparison of the first to third valve slide ratios would suggest that York was aware of the need to help correct pitch deficiencies by making a longer third valve slide.

Four instruments bear the H. N. White signature, but only three were made by that company. The fourth upright was made by Bohland and Fuchs of Grazlitz and imported, probably before the company began making tubas. Two of the American made tubas are smaller bore (1.55 cm, approximately), while the third is a large-bore "monster" tuba. One of the smaller-bore instruments is side-action, so any comparison for design changes is somewhat difficult.

Construction of the bell section through the second bow is quite similar for all three instruments, despite the difference in bore size. In fact, the two smaller-bore instruments seem to be very much alike, except for the valve assembly and the valve slide tubing. It is possible that King took the basic design for the top-action instrument, rotated the coil to the other side of the bell, changed the tuning slide section slightly, and placed the side-action assembly on the new instrument. In retrospect, it seems that Conn may have done the same thing with its top-action instruments, at least the tubas which have the tuning slide after the valve assembly.

All of the King instruments are well-made, showing a high degree of craftsmanship. There are no unusual design

features, and even though the three instruments are different, it would appear that the company started from one basic design and worked from that to develop the various sizes and action. This is not to say that the design did not change, because all three of these instruments were made within about twelve years of one another, but all were made in the early years of the company, so perhaps it was their first basic design.

There are four Holton instruments in the group of uprights, all made between 1909 and 1917. All four are large-bore instruments and all are quite similar in construction and dimensions, despite the fact that one is a four-valve instrument. The similarities between these tubas and the York tubas have been discussed in the catalog, as has the possibility that some of the Holton instruments were made by York. The later Holton instruments do not have the same kind of decorative, wide ferrules as the Yorks, even though the basic design is the same, and the quality of construction appears to be quite good for all four instruments. Like York, it would seem that Holton chose to modify a single design, rather than experiment with basic configurations. Only eight years of production are represented here, so it is difficult to speculate further.

Two top-action tubas and one side-action tuba constitute the Buescher group of uprights. The three instruments were made within five years of one another, but each is different in basic construction, bore, and valve slide

length. Buescher, No. 135 has the tuning slide curved forward to put it at the same plane as the valve slides; Buescher, No. 112 looks very much like some of the Conn instruments, and Buescher, No. 344 has the "U" shaped tuning slide, side-action valves, and a squared look to the main bow. The three instruments are so dissimilar, in fact, that one must examine details like the ferrules and spines to find a clear relationship.

The great diversity in style, especially within such a short time span of manufacture, could mean that Buescher was engaged in a great deal of experimentation in brass instrument construction during the early part of the century. This possibility seems even more likely when one examines the three Buescher helicons in the collection. It is fair to assume that they too were made within a few years of one another, yet all have radically different valve tubing designs. The full extent of the experimentation is not known, but the experiments must not have been entirely unsuccessful, because Buescher production figures indicate that they would have been reasonably close to York in yearly production during the first three decades of the twentieth century. The extent to which Buescher woodwinds figure into the production numbers is not known.

It should be interesting to consider for a moment the relationship between Buescher and Conn. The two companies collaborated on instrument making in the 1920s and 1930s, but they must have had a working relationship before that

time, in part because they were two of the largest instrument manufacturing firms in Elkhart. The extent to which each influenced the other is not know, but it is clear that the instruments in the collection which show the greatest variety of detail are those made by Conn and Buescher.

Five upright instruments are signed "Lyon and Healy" or "Silver Piston," but only one of the group is an American made instrument, and it is similar in construction, but not in detail, to the King uprights. There is not sufficient evidence to claim that the remaining four instruments were made by the same foreign jobber, but there is enough evidence to suggest that perhaps only two or three makers are represented. Lyon and Healy was an American agent for both Jaubert and Gunkel, and two of the instruments resemble the Sears/ Marceau tuba, so it is likely that the four imports are all French instruments. Not one instrument in the group is particularly well-made, and all are significantly lighter than most of the domestic instruments, so it is probable that they were made with cheaper materials. All are small-bore instruments with small bells, and all are likely high pitch.

The J. W. Pepper instruments have serial numbers--commonly found only on American instruments from the period--yet all were probably made in Europe between 1903 and 1914. Three of the five were probably made by Bohland and Fuchs, and the other two were probably made by French manufacturers, perhaps either C. A. Mouchel or M. Brisson

and Company of Paris. Two of the Bohland and Fuchs instruments are easy to identify because of the curve in the tuning slide as it exits the third valve. This is characteristic of all the Bohland and Fuchs instruments which have the tuning slide following the valve assembly.

The Pepper tubas are all small to medium-bore instruments. Two pairs of instruments have similar dimensions, but only one of the pairs was probably made by the same manufacturer. The quality of construction is good for the German instruments and fair for the lighter French instruments. Three of the five have the tuning slide before the valve assembly, and two of those are French.

Pepper, like Lyon and Healy, is credited with having manufactured a large number of band instruments in the late nineteenth and early twentieth centuries. It is curious, therefore, to find that only one of the eleven uprights of Pepper and of Lyon and Healy was made in this country. One likely explanation may be found in Lloyd Farrar's Pepper chronology:

> A decade earlier Pepper had announced his intention to produce an American made line of instruments which could be sold competitively with less expensive foreign goods. This, in fact, he did. The record shows, however, that it was the Perfected (i.e., imported) line of instruments that achieved the greatest popularity, probably because they were musically satisfactory instruments which could be sold cheaper than the J. W. P. "Own Make" instruments.[1]

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[1]Lloyd Farrar, "Chronologies and a Survey of Serial Numbers," Silver Spring, Maryland, (mimeographed)

Three other pairs of instruments with the same signatures are found in the group of uprights. The two Wurlitzer tubas may have been made by the same manufacturer, perhaps Wurlitzer. They are among the smallest instruments in the collection, and they are cheaply made. The pair of instruments bearing the Jenkins signature were not made by the same manufacturer, and the only similarity between the two is bore size. One of the Jenkins uprights has an unusually large bell, and this could have been an attempt by the manufacturer to enhance the sound and projection capabilities of a small-bore instrument. The workmanship is quite modest on both instruments.

The two Carl Fischer instruments may have been made by the same manufacturer at different times, because there are a number of similarities, but the bell section length, spine construction, and ferrule placement do not match. Both are of fair quality and exhibit a tubing design similar to that of many European instruments.

John F. Stratton made two of the five bell-over-the-shoulder tubas in the Larson Collection, and possibly a third. The quality of workmanship is very much the same between the two instruments, indicating that they may have been made about the same time. Number 1427 is a smaller instrument in bore size and height, but it is similar in every other way to No. 316. The inner coil and the tuning slide design of these two tubas seem to be characteristic of the Stratton instruments.

Some of the characteristics which seem to be common among the bell-over-the-shoulder group include the American string rotary action, the short leadpipe, and the valve slide arrangement as illustrated in Figure 31.

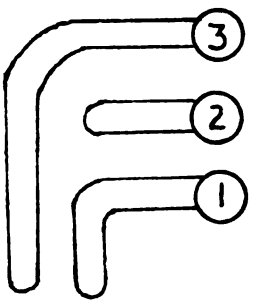

Fig. 31. Valve slide arrangement for bell-over-the-shoulder tubas.

All five of these instruments were made in either New York or Philadelphia, which may account for the similarity of design. Photographs and engravings of other bell-over-the-shoulder instruments show different construction techniques, especially in the valve tubing and in the position of the leadpipe.

CHAPTER V

CONCLUSIONS

The primary purpose of the research has been to establish a written record of the E-flat tubas in the Arne B. Larson Collection, to be used both by the museum staff and by researchers interested in the tubas or in brass instruments in general. There were no preconceived ideas or concepts to prove before entering into the research, so any conclusions drawn from an examination of the instruments are based solely on the facts as they presented themselves during the course of the research.

It must be stated once more for the record, that most of the E-flat tubas in the Larson Collection were obtained within a limited geographical area; that is, the five-state area consisting of South Dakota, North Dakota, Minnesota, Nebraska and Iowa. Some of the conclusions may, therefore, be limited by this fact. However, the Larson Collection does have probably the largest concentration of E-flat tubas to be found anywhere in the United States. In any case, the primary purpose of the research has been fulfilled.

It is clear that major E-flat tuba design changes were

beginning to be made in the last three decades of the nineteenth century. The older bombardon or saxhorn type began to evolve into the modern tuba type. The last instrument of the saxhorn type in the collection was made no later than 1889, and, by that time, the more modern tuba design was well established. This can be seen quite clearly in the Conn instruments. Only about ten percent of the upright instruments in the group are of the older design, and there are a few instruments which may be said to be transitional, but the bulk of the tubas made in the last two decades of the nineteenth century are of the modern design.

The helicon tuba enjoyed a moderate success in this country, because examples of this type were made at least in the 1920s and perhaps later. The close relationship between the sousaphone and the helicon is supported both by the existing literature and by the clear physical relationships found among instruments of both types in the collection. Some of the manufacturers even used the same coil and valve designs for both types of instruments. The eventual preference for the sousaphone is also evident here, however, for the evidence suggests that sousaphones and helicons coexisted in this country for about thirty years (1900 to 1930), until the sousaphones became more popular. The fact that both groups seem to be of equal quality points to the

conclusion that perhaps the marketing techniques of the instrument manufacturers had something to do with the decline in popularity of the helicon. It is also possible that the larger and higher bell of the sousaphone gave this instrument an edge over the helicon on the marching field.

A look at the collection clearly reveals a preference for the upright instruments, since they account for sixty-two percent of the total group. Cost may have been a primary factor here, because, based on estimates taken from a number of catalogs, the cost of an upright instrument was up to forty percent less than that of a sousaphone or helicon of comparable quality. This would have been an unnecessary expenditure, unless the instrument was needed for marching. The limited number of imported (and cheaper) sousaphones in the collection further justifies this statement. Amateur tubists evidently were unwilling to pay top dollar for an American made sousaphone when they could find a cheaper upright instead.

There is also a clear preference for three-valve, top-action instruments. In fact, there are enough of these instruments to assume that the top-action, piston-valve instrument was the most popular type of E-flat tuba in the United States during the late nineteenth and early twentieth centuries. An examination of the available merchandising catalogs seems to support this claim.

Side-action instruments were available as early as 1899, but they account for only about eight percent of the

upright instruments in the collection. All but one are American made instruments of good quality, so perhaps cost or availability prohibited these instruments from becoming more popular during this period. Only one bell-front upright is in the collection, making it clear, as Bevan claims, that such instruments were not generally available until after the 1920s.[1]

The differences between European and American helicons are immediately clear, as is the progression in design from the older European type to the newer American type. The rotary-valve helicon with its flattened coil is clearly European; this writer found no photographs or engravings which show an American rotary-valve helicon. The double coil arrangement has already been mentioned as a characteristic of European helicons and sousaphones, but there are other differences as well.

The European helicons are generally smaller in dimensions with smaller bells than American helicons, which tend to be larger, and which clearly have more widely flaring bells.[2] One need only compare Girardi, No. 313 with King, No. 146 to see the extremes in these differences. The immediate American heritage of this European design can be seen clearly in Conn, No. 680, which is perhaps the oldest

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[1]The New Grove Dictionary of Music, 1980 ed., s.v. "Tuba," by Clifford Bevan.

[2]Jeremy Montague, The World of Romantic and Modern Musical Instruments (Woodstock, New York: Overlook Press, 1981), p. 97.

American helicon in the group. It is the smallest of the American helicons, and it has the smallest bell, but the bell does have more flare than those of older European instruments. The progression toward an instrument with a larger bell and larger overall dimensions is clear as one examines the rest of the American made helicons. The progression toward a more flared bell is also seen in the European instruments, but to a lesser extent.

The only other design feature of the helicons which might be considered to be an American design is that of the valve assembly and slide tubing arrangement commonly found on the domestic instruments. No European helicon in the collection, or in any available photograph or engraving, has this particular design. The use of nonfunctional tubing to complete the main coil was at first thought to have been an American innovation, but a drawing of a "Champion" contra-bass helicon made by Distin before 1860 shows a variation of this design.[1] Perhaps Distin was also one of the first manufacturers to use this method in the United States.

The sousaphones clearly owe their bell design to American ingenuity and their coil design to European technology. There are no bell-front sousaphones with small bells, even among the European sousaphones, and this may show how quickly and completely the new design was accepted. The same may be said of the three piston valves

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[1]Lilla Fox, Instruments of Processional Music (London: Letterworth Press, 1967), p. 31.

usually found on these instruments. The sousaphone assumed its modern form almost immediately, with only minor design changes through the years. The next major innovation was probably the fiberglass sousaphone, which was patented some sixty years after the bell-front instrument appeared.

The placement of the tuning slide before the valve assembly cannot be positively identified as a European design, since ten American uprights and a number of domestic sousaphones and helicons have this feature. However, all of the European upright instruments, except for three instruments made by Bohland and Fuchs, have the tuning slide before the valve assembly. All of the French and English uprights have such arrangements. Conversely, the majority of the American tubas have the tuning slide after the valve assembly, so it might be possible to speak of a European or American preference, since this preference seems to be clearly established.

American made tubas with Vienna rotary valves are not uncommon today, but the conclusion that can be drawn from the research is that such valve assemblies were not made by the American makers during the late nineteenth and early twentieth centuries. None of the good quality domestic instruments in the collection have rotary valves. Further, the evidence suggests that the manufacture of rotary-valve instruments was generally confined to Italy, Germany, Austria, and other eastern European countries during this period. This speaks to the success of the Périnet valve

design in the United States, because, through the 1860s, American makers were producing brasses with American string rotary action, and they evidently abandoned it in favor of the Perinet valve. The reasons for the success of the Perinet valve are quite clear--it was simpler and less delicate than the American rotary mechanism, and it was less complicated than most of the American designs in use to that point.

The generally poorer quality of the European instruments, especially the uprights, has been mentioned in this paper. It was thought at first to be true of European instruments made during this time, but research into the manufacturers and importers, and their practices, has brought to light some reasons for the differences in quality.

Many of the large American brass instrument manufacturing firms still in business today were started in the last two decades of the nineteenth century, following the lead of such smaller eastern manufacturers as Thomas Paine, E. G. Wright and Isaac Fiske, who made a number of high-quality musical instruments. Some of the newer manufacturing firms, including Conn, Buescher, White, and, later, York and Holton, built factories in the midwest for the purpose of turning out large quantities of musical instruments. Elkhart, Indiana, became the home of Conn, Buescher, and a number of smaller manufacturers, while York built a factory in Grand Rapids, Michigan, and Holton built

one in Elkhorn, Wisconsin. Both J. W. Pepper of Philadelphia and Lyon and Healy of Chicago also began manufacturing instruments at this time.

The purpose of this large-scale manufacturing was evidently to capture the increasing American amateur musical market and the school band instrument market. The evidence of this growth is apparent in Conn's production figures, which started at one thousand instruments per year in 1877, and increased to five thousand instruments per year by the late 1890s. The majority of the American manufacturers produced good quality instruments, as evidenced by the collection.

The growth of a number of smaller music publishers and musical instrument retailers also began about this time. Many of these smaller dealers set about to become American agents for foreign instrument manufacturers, or to buy instruments from foreign manufacturers and stencil their trademark on the instruments. This kind of activity was not confined to the small companies, because Pepper and Lyon and Healy engaged in this practice, even though they also made their own instruments. The large mail-order companies also became involved in the selling of imported instruments by the end of the century. One other factor in the rush to cover the expanding instrument market was the small individual maker, who may have worked independently, or who may have purchased parts or unfinished instruments from factories.

The end result of all this activity was that the retailers and importers captured a share of the instrument market by selling imported instruments for lesser prices than could be offered by the larger American companies. The American companies responded by creating their own second-line instruments, often under a different name. The effect of this kind of activity is clear when one examines the signatures on the upright instruments in the Larson Collection. No less than thirty-nine manufacturers or agents are represented, and twenty-eight of those are represented by a single instrument.

It should be apparent, then, that the generally lower quality of the European tubas in the collection is probably not representative of the European instruments that were manufactured during this period, but represents instead the preferences of American importers who were buying cheap instruments in order to be competitive. The amateur musican who could not afford to pay one hundred dollars for a top-line instrument could probably afford to spend fifty dollars for an import, or perhaps a bit more for a second-line domestic instrument.

Yet another practice was common among the large American manufacturers. This was the practice of selling unmarked instruments to be stenciled and sold by smaller companies. Some of the instruments in the collection which are unmarked were obviously made by the larger American manufacturers, and some of the instruments stenciled and

sold by little-known companies were obviously the work of the larger manufacturers as well. Many of these instruments were the very same models that the manufacturers touted as their top-line instruments, yet they were sold unmarked to be marked with the name of some small retailer. A somewhat similar situation existed for the foreign jobbers, who sold to many different American retailers; these retailers were each spending advertising money to convince the public that theirs was the best product. The reason for this industrial prostitution was suspected, but not confirmed, until the present writer received a letter from a musical instrument dealer who had been in business for a number of years:

> The Conn company's three lines were Conn, Pan American and Cavalier. Conn would stencil--that is, put people's names on instruments if they bought certain quantities of which Sears, Roebuck was one of their customers along with the Pan American and the Cavalier being made at the request of the purchaser. (sic) The idea here was that in the slow months of January and February the factories could keep their production up by supplying instruments to the mail-order catalogs and the larger retail dealers.[1]

The practice of selling unmarked products, both domestic and foreign, was evidently a problem which reached beyond the musical instrument industry. In March of 1909, Congress passed a resolution which required clear identification of country of origin for all goods sold in the United States.2

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[1]Charles Gorby, South Charleston, West Virginia, Personal letter, 20 July 1984.

[2]Lloyd Farrar, "Chronologies and a Survey of Serial Numbers," Silver Spring, Maryland, (mimeographed).

It was assumed at the beginning of the research that instruments with signatures would be relatively easy to identify, and that there would be an abundance of historical information about the manufacturers and agents. It was also assumed that the American made instruments would be somewhat easier to date because of the serial numbers. None of these assumptions were true.

A major difficulty encountered in examining many of the instruments was that the signature was often of little value in discovering the maker. This problem was created because of the manufacturing and import practices just discussed. Some of the instruments were only marked with a trade name, so the quest to discover the origin of those instruments was a longer one.

One of the ways in which the larger manufacturers expanded their operations was by buying smaller firms, sometimes for the purpose of using such facilities to manufacturer second-line instruments. A cursory examination of Chapter III will reveal that some of the companies listed changed hands perhaps as many as four times. Often, the exchange of records from one location to another resulted in the loss of important documents, because the new owners did not have a need to save such materials. No instrument records survive for York, Martin, or Lyon and Healy, for example, and the Conn and Pepper records were accidentally destroyed. Fortunately, independent researchers have been able to reconstruct some records.

Historical information about the companies, except Conn, was generally unavailable. The manufacturers properly had little idea that the preservation of historical data would be important or useful at some future date. Only a very few businessmen took the time to write about their work. Colonel Conn and Max Tonk were two who did, while a few others provided biographical material for newspaper articles. Also, a few companies like York and Pepper published magazines, and these were useful in a limited sense.

The presence of a serial number does not always indicate an instrument of American make, nor is the number useful in discovering the date of manufacture of a particular instrument if no records are available. Further, not all manufacturers were consistent in the way in which they assigned serial numbers. York, for example, had the serial numbers stamped on the valves as they were made, so a good deal of time could have elapsed between the making of the valve and the completion of the instrument.

The research provided a good many insights into the business practices of the musical instrument manufacturers, some of which have already been noted. Perhaps the most unsettling discovery made by this writer was that profit, rather than pride, was apparently the most important motivating force in the practices of the manufacturers. There was a good deal of pride in the quality of the finished product, but perhaps not to the same extent as that of the

independent craftsmen in the time before the mass production of musical instruments.

The demise of the E-flat tuba in concert bands in the United States was earlier blamed on intonation problems inherent in the E-flat tuba as well as on the increased range and better tone quality of the BB-flat instrument. A fourth valve is necessary if the E-flat instrument is to be played reasonably well in tune on certain valve combinations, and if it is to have the extra range available to the BB-flat instrument. Furthermore, a large-bore instrument is necessary if the lower register is to have a tone comparable to that of the BB-flat instrument. The existence of a number of large-bore upright instruments in the Larson Collection indicates that manufacturers must have been sensitive to the latter problem, but the presence of only two four-valve instruments in the group perhaps shows the degree to which manufacturers and players were less sensitive to the range and intonation problems inherent in the E-flat three-valve tuba. One may add to this evidence the number of tubas of less than good quality, as well as the number of instruments made seemingly without regard for the need for a longer third valve slide.

E-flat and BB-flat tubas were used together in American bands beginning in the later nineteenth century, and even then the intonation problems between the two pitches of instruments must have been evident to players and conductors. A reasonably priced BB-flat tuba can play fairly

well in tune within the characteristic band part register, but an equally inferior E-flat instrument will have more intonation problems in the same register. One must conclude from the evidence in the collection, that inferior three-valve E-flat instruments were quite common during the later nineteenth and early twentieth centuries. This fact, coupled with what was apparently the gradual reduction of octave writing in band tuba parts, seems to provide clear evidence that the E-flat tuba disappeared from American bands for precisely the reasons stated in Chapter I.

One more factor which could have contributed to the demise of the E-flat tuba is the change in pitch standard which occurred gradually during the first two decades of the twentieth century. The amount of extra tubing required to convert a tuba from high pitch to low pitch is significantly greater than the amount required for a small brass instrument, and the addition of tubing to a fixed column changes the taper of the column, affecting both pitch and response.[1] The addition of valve tubing effects such changes, but only temporarily, unlike the effect created by a permanent addition to the tubing. Many of the instruments in the collection have either extra bits of tubing which can be inserted into the tuning slides, or they have been altered at the leadpipe or at the tuning slide to accommodate the pitch change. Further, it may be assumed that at least some

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[1]The New Grove Dictionary of Music, 1980 ed., s.v. "Acoustics," by Arthur Benade.

of the E-flat instruments were not acoustically correct in the first place. The net result is an acoustically imperfect instrument made worse by the addition of fixed tubing.

This, in fact, probably had a limited effect on the reduced use of the E-flat instrument, but it is a factor to consider. All of the winds were affected in a similar fashion during this period, the BB-flat tuba as well, so intonation must have been a severe problem during the transition. It is possible, however, that the inherent problems with the three-valve E-flat instrument were magnified by the modifications discussed.

All of the measurements which were taken are valid insofar as they provide information about the current condition of the individual instruments. There is no doubt that some of the measurements would have been different had all the instruments been in good condition. This is one reason why comparisons of instruments have been discussed in more general terms in the catalog, and, always, the physical characteristics have been compared as well.

The statistical tables for each of the individual measurements were most useful in describing patterns and trends within the individual groups of instruments, although the patterns were less consistent than desired. The only measurements which did not show fairly clearly defined patterns as expected were the first and third valve slide measurements. This may be because of the transitional period in which the bulk of the instruments were made. Such

measurements of a group of more modern instruments would hopefully be more consistent. The height and bow size measurements for the helicons and sousaphones are probably the least accurate measurements because of the potential for error involved. These measurements also proved to be the least useful, both in comparing individual instruments and in looking at groups.

The comparison of known with unknown instruments was facilitated by looking at such details as valve and tuning slide construction, ferrules and braces. It might be useful to future researchers to create a system by which these details of construction can be compared in order to expedite comparisons, especially if a large group of instruments is involved. A good deal of time could have been saved if a more systematic approach had been taken with these details.

The photograph was the single most useful tool for comparing instruments. Study of the photographs allowed the researcher to more effectively compare groups of instruments by the same maker and compare instruments of known origin with instruments of unknown origin. Any subsequent catalog of larger instruments should provide for access to individual photographs.

The catalog fills a gap in tuba research in several ways. Very little research had been done on instruments made in the period represented by these tubas. Most of the existing research is on the early stages of development in the history of the tuba, and most serious players are fully

aware of the trends of the last thirty years, although a more detailed research project in recent developments would be most welcome.

A good deal of the information collected about the manufacturers and agents and their practices was collected through personal interviews and correspondence, and this information was not generally available elsewhere. The index of manufacturers and agents provides, in some cases, much more detail than is available in the standard references. The research into the York company is a step forward from anything previously written about York and its subsidiary. The estimated production curve which appears in Appendix A of this paper is the first of its kind available on this important brass instrument manufacturer.

The E-flat tubas in the Arne B. Larson Collection are an important part of the musical heritage of this country, and they deserve to be studied. Perhaps nowhere else are there such a large number of one single type of instrument representing such a narrow historical period. It is hoped that this document will be a useful tool for anyone interested in brass instrument research.

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APPENDICES

APPENDIX A

ESTIMATED PRODUCTION CURVES FOR YORK BAND INSTRUMENTS

The estimated production curves for the York band instruments are based on instruments for which serial number and date of manufacture are known, as well as on an estimation of monthly output in the early part of the century and a correlation of serial numbers with patent dates which appear on certain York instruments. Six separate yearly production rates are plotted, and it is expected that the year of manufacture can be estimated from these production curves. For example, an instrument with the serial number 28,000 could have been made between the years 1904 and 1910, depending on the actual rate of production. The yearly production rate of 2750 instruments comes the closest to meeting all the criteria used to establish this table, but variations in yearly production are not know, so the range of dates is probably more accurate.

TABLE 3

ESTIMATED PRODUCTION CURVES FOR
YORK BAND INSTRUMENTS

Year	2500 Instruments a year	2700 Instruments a year	2750 Instruments a year	2800 Instruments a year	2900 Instruments a year	3000 Instruments a year
1897	9,500	1,300				
1898	12,500	4,000	2,000			
1899	14,500	6,700	4,750	2,800		
1900	17,000	9,400	7,500	5,600	1,800	
1901	19,500	12,100	10,250	8,400	4,700	1,000
1902	22,000	14,800	13,000	11,200	7,600	4,000
1903	24,500	17,500	15,750	14,000	10,500	7,000
1904	27,000	20,200	18,500	16,800	13,400	10,000
1905	29,500	22,900	21,250	19,600	16,300	13,000
1906	32,000	25,600	24,000	22,400	19,200	16,000
1907	34,500	28,300	26,750	25,200	22,100	19,000
1908	37,000	31,000	29,500	28,000	25,000	22,000
1909	39,500	33,700	32,250	30,800	27,900	25,000
1910	42,000	36,400	35,000	33,600	30,800	28,000
1911	44,500	39,100	37,750	36,400	33,700	31,000
1912	47,000	41,800	40,500	39,200	36,600	34,000
1913	49,500	44,500	43,250	42,000	39,500	37,000
1914	52,000	47,200	46,000	44,800	42,400	40,000
1915	54,500	49,900	48,750	47,600	45,300	43,000
1916	57,000	52,600	51,500	50,400	48,200	46,000
1917	59,500	55,300	54,250	53,200	51,100	49,000
1918	62,000	58,000	57,000	56,000	54,000	52,000
1919	64,500	60,700	59,750	58,800	56,900	55,000
1920	67,000	63,400	62,500	61,600	59,800	58,000
1921	69,500	66,100	65,250	64,400	62,700	61,000
1922	72,000	68,800	68,000	67,200	65,600	64,000
1923	74,500	71,500	70,750	70,000	68,500	67,000
1924	77,000	74,200	73,500	72,800	71,400	70,000
1925	79,500	76,900	76,250	75,600	74,300	73,000
1926	82,000	79,600	79,000	78,400	77,200	76,000
1927	84,500	82,300	81,750	81,200	80,100	79,000
1928	87,000	85,000	84,500	84,000	83,000	82,000
1929	89,500	87,700	87,250	86,800	85,900	85,000
1930	92,000	90,400	90,000	89,600	88,800	88,000
1931	94,500	93,100	92,750	92,400	91.700	91,000
1932	97,000	95,800	95,500	95,200	94,600	94,000
1933	99,500	98,500	98,250	98,000	97,500	97,000
1934	102,000	101,200	101,000	100,800	100,400	100,000
1935	104,500	103,900	103,750	103,600	103,300	103,000
1936	107,000	106,600	106,500	106,400	106,200	106,000
1937	109,500	109,300	109,250	109,200	109,100	109,000
1938	112,000	-------	-------	-------	-------	-------

APPENDIX B

DISTIBUTIONAL TABLES

TABLE 4

HEIGHT, WEIGHT AND BELL SIZE DISTRIBUTION OF UPRIGHTS

Height (cm)	Number	Weight (kg)	Number	Bell Size (cm)	Number
70.	2	3.	1	27.	1
71.	3	3.2	1	29.	5
71.5.	2	3.4.	6	30.	3
72.	6	3.6	2	31.	2
72.5.	4	3.8.	7	32.	8
73.	4	4.	7	33.	3
73.5.	4	4.2.	2	34.	2
74.	5	4.4	8	35.	4
74.5.	2	4.6.	5	36.	10
75.	6	4.8	4	37.	5
75.5.	5	5.	6	38.	17
76.	2	5.2	5	39.	3
76.5.	1	5.4.	6	41.	3
77.	3	5.6	5	42.	1
77.5.	4	5.8.	1	43.	2
78.	4	6.	1	44.	1
78.5.	2	6.4.	5	46.	1
79.	3	6.6	1	47.	1
79.5.	1	6.8.	1	49.	5
80.	4	7.	3	50.	6
80.5.	3	7.2.	1	51.	3
82.	2	7.6	4		
82.5.	3	8.	3		
83.5.	1	8.4	1		
84.	2				
84.5.	2				
85.	1				
85.5.	1				
86.	1				
90.5.	1				
91.	1				
98.	1				
98.5.	1				

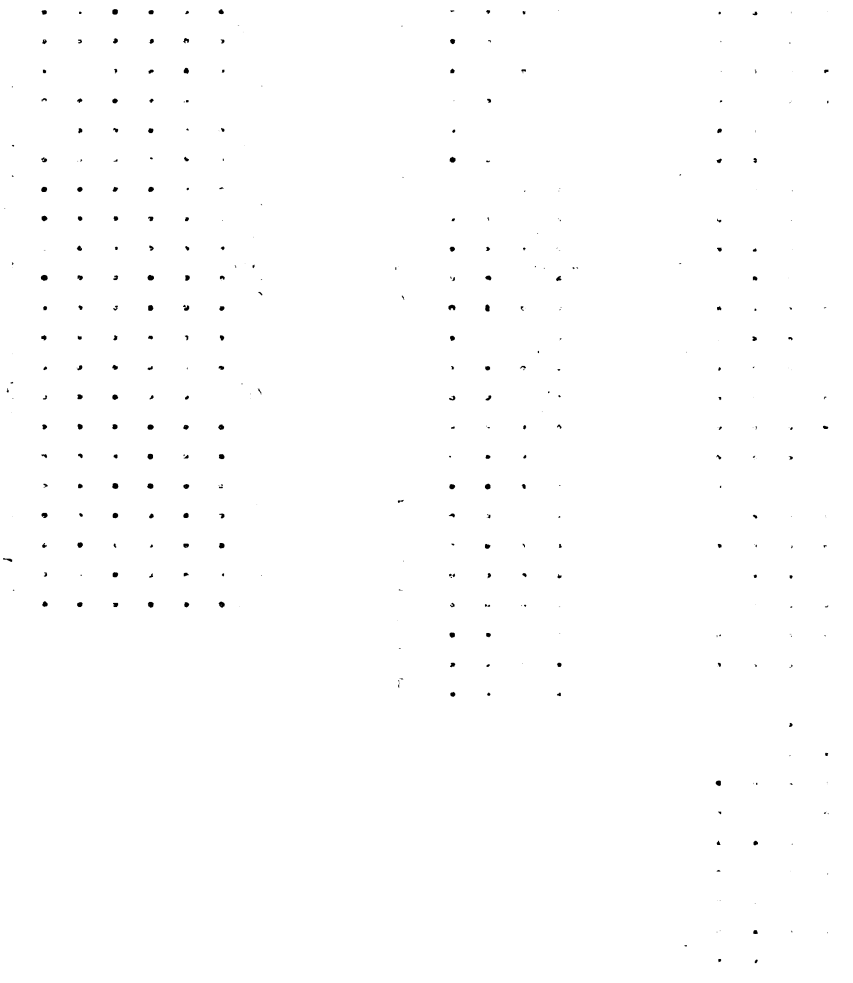


TABLE 5

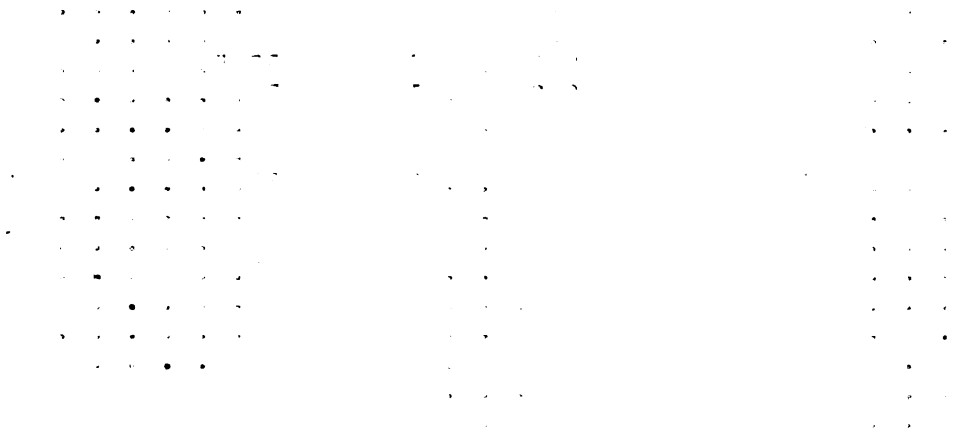
HEIGHT, WEIGHT AND BELL SIZE
DISTRIBUTION OF SOUSAPHONES

Height (cm)	Number	Weight (kg)	Number	Bell Size (cm)	Number
114. . .	2	7.0. . .	1	49.5.	1
116. . .	1	7.8. . .	2	51.0.	3
117. . .	1	8.0. . .	2	55.5.	1
119. . .	2	8.2. . .	1	56.0.	1
120. . .	1	8.4. . .	2	58.0.	1
121. . .	2	8.6. . .	2	58.5.	1
123. . .	1	8.8. . .	3	59.0.	2
124. . .	1	9.0. . .	5	60.0.	1
126. . .	5	9.2. . .	2	60.5.	9
127. . .	6	9.8. . .	1	61.0.	7
128. . .	2	10.2. . .	1	61.5.	2
130. . .	2	10.6. . .	1	64.0.	1
132. . .	2	11.0. . .	2	66.5.	1
139. . .	1	11.2. . .	4		
146. . .	1	11.8. . .	1		

TABLE 6

HEIGHT, WEIGHT AND BELL SIZE
DISTRIBUTION OF HELICONS

Height (cm)	Number	Weight (kg)	Number	Bell Size (cm)	Number
91. . .	1	4.4. . .	1	27.5.	1
92. . .	1	4.6. . .	2	31.0.	2
94. . .	1	5.0. . .	2	34.0.	1
97. . .	1	5.2. . .	2	36.5.	1
101. . .	1	5.4. . .	1	37.0.	1
103. . .	1	6.2. . .	2	38.5.	1
104. . .	3	6.4. . .	1	40.5.	3
106. . .	1	6.6. . .	1	48.5.	2
109. . .	1	6.8. . .	2	49.0.	1
110. . .	1	7.2. . .	1	49.5.	2
112. . .	1	7.4. . .	2	50.5.	6
113. . .	1	7.6. . .	1	51.0.	1
114. . .	2	8.0. . .	1		
118. . .	1	8.2. . .	1		
119. . .	1	8.4. . .	1		
120. . .	2	8.6. . .	1		
126. . .	2	9.0. . .	1		
127. . .	1				



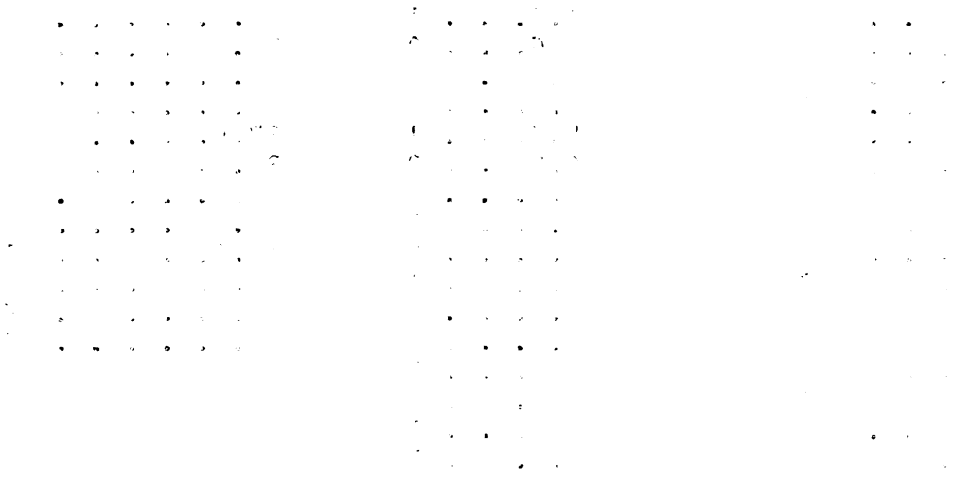


TABLE 7

DISTRIBUTION BY SLIDE RATIO

Ratio 1:	Upright	Sousaphone	Helicon
1.40	0	0	1
1.46	0	0	1
1.48	0	1	0
1.49	2	2	1
1.50	2	2	1
1.51	0	0	1
1.52	2	0	2
1.53	2	4	0
1.54	3	1	0
1.55	3	4	0
1.56	8	3	2
1.57	5	1	3
1.58	3	3	0
1.59	10	3	2
1.60	6	0	0
1.61	12	0	2
1.62	2	1	0
1.63	7	1	0
1.64	4	0	0
1.65	1	1	0
1.66	4	0	0
1.67	0	0	2
1.68	3	2	3
1.69	1	0	0
1.70	1	0	0
1.71	1	0	0
1.72	0	1	0
1.73	1	0	1
1.75	0	0	1
1.81	0	0	1
1.82	1	1	0

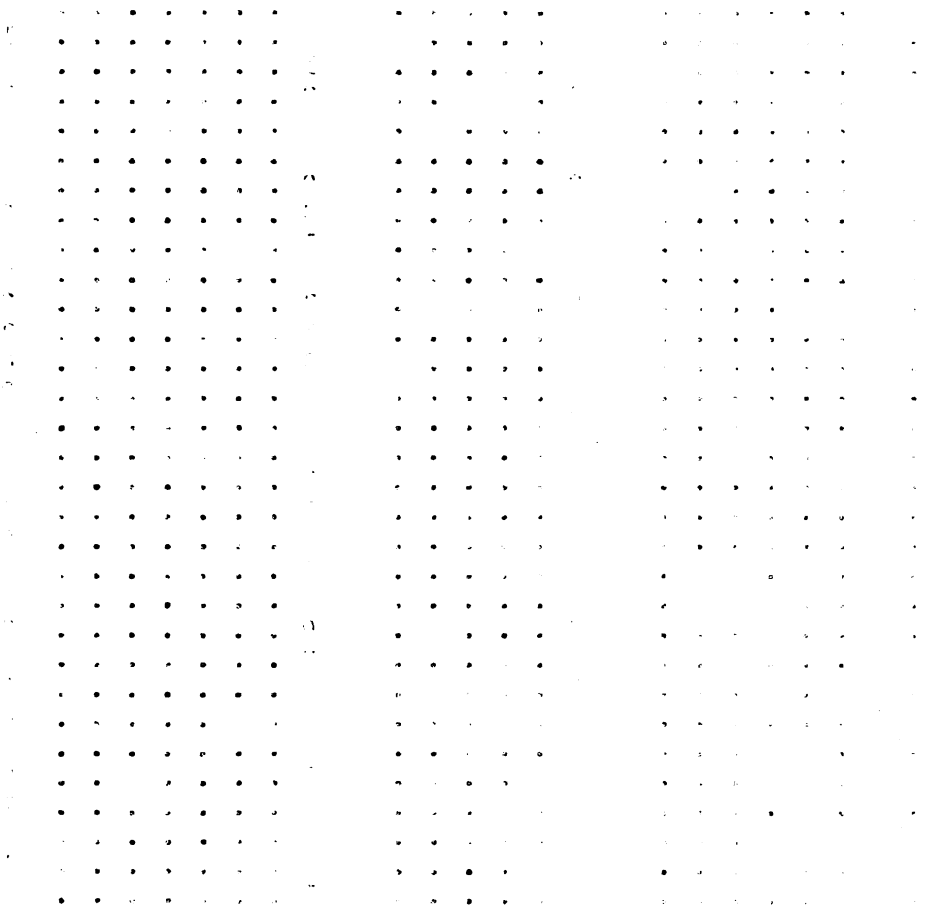


TABLE 8

DISTRIBUTION BY BORE SIZE

Bore (cm)	Uprights	Helicons	Sousaphones
1.400	3	0	2
1.425	1	0	1
1.450	10	1	0
1.500	12	2	0
1.525	6	1	0
1,550	14	2	0
1.575	4	0	0
1.600	8	2	4
1.625	3	0	2
1.650	4	1	3
1.675	13	2	2
1.700	2	1	1
1.725	2	0	3
1.750	1	6	5
1.775	1	3	5
1.800	1	0	2
1.850	1	1	0
1.925	1	0	0
1.950	0	1	0

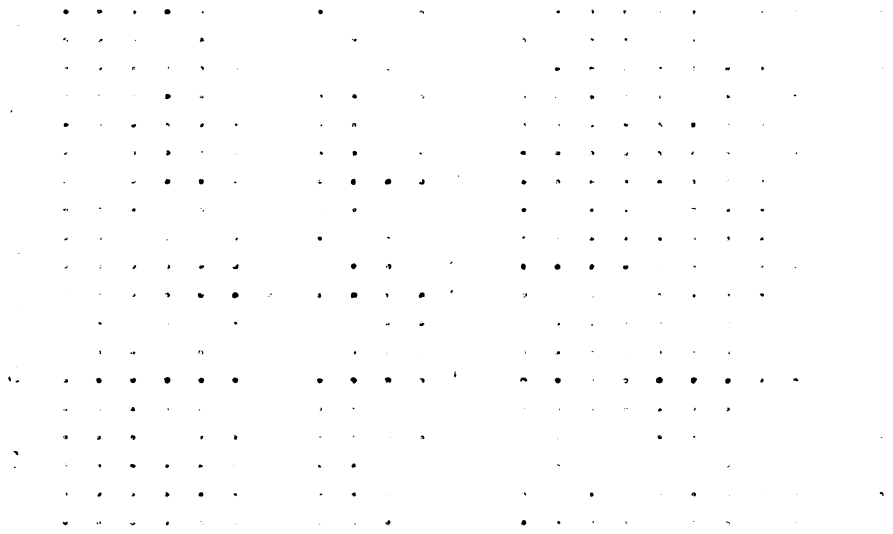


TABLE 9

DISTRIBUTION BY FIRST VALVE
SLIDE MEASUREMENT

Length (cm)	Upright	Sousaphone	Helicon
43.18	1	0	0
45.72	0	0	2
45.93	1	0	0
46.90	2	0	0
47.63	1	0	1
48.26	2	1	2
48.90	3	0	0
49.21	1	0	0
49.53	4	3	1
50.17	3	0	0
50.80	11	4	1
51.44	4	1	0
52.07	15	3	3
52.71	9	0	0
53.02	1	0	0
53.34	12	5	3
53.66	1	0	0
53.98	2	2	1
54.61	6	4	3
55.25	3	2	0
55.88	4	2	2
56.51	0	2	0
58.42	0	1	4

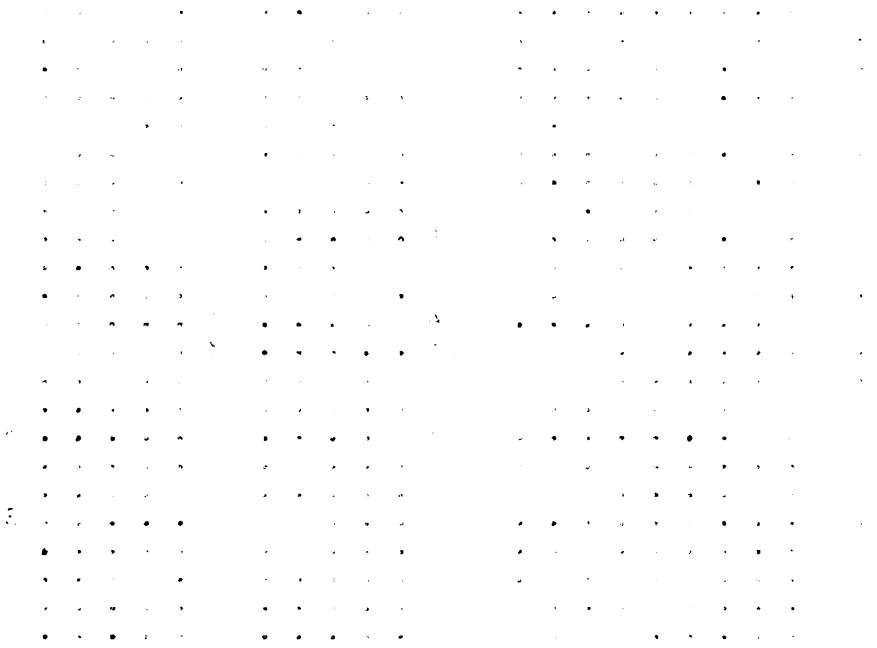
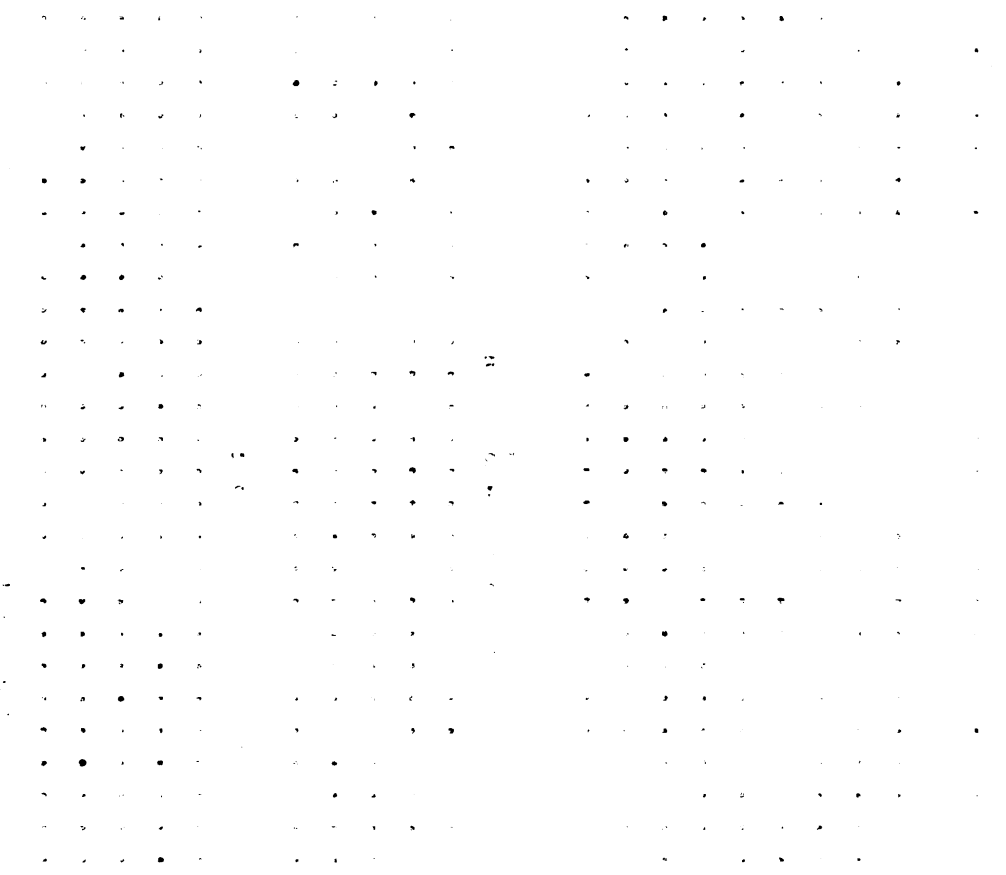


TABLE 10

DISTRIBUTION BY THIRD VALVE
SLIDE MEASUREMENT

Length (cm)	Upright	Sousaphone	Helicon
73.03	0	0	1
73.66	1	0	0
76.20	2	2	2
76.70	1	0	0
77.47	2	0	1
78.11	3	0	0
78.74	3	2	0
79.38	2	0	0
80.01	3	2	0
80.65	3	0	0
81.29	10	1	4
81.92	5	0	0
82.55	5	2	1
83.19	1	0	0
83.82	13	7	3
84.46	1	3	0
85.09	8	5	3
85.73	2	0	0
86.36	8	2	1
87.00	5	0	1
87.63	2	0	2
88.90	2	1	2
89.53	0	2	1
90.17	1	1	0
91.44	0	0	1
92.71	0	0	1
93.98	1	0	0



APPENDIX C

INSTRUMENT NOMENCLATURE

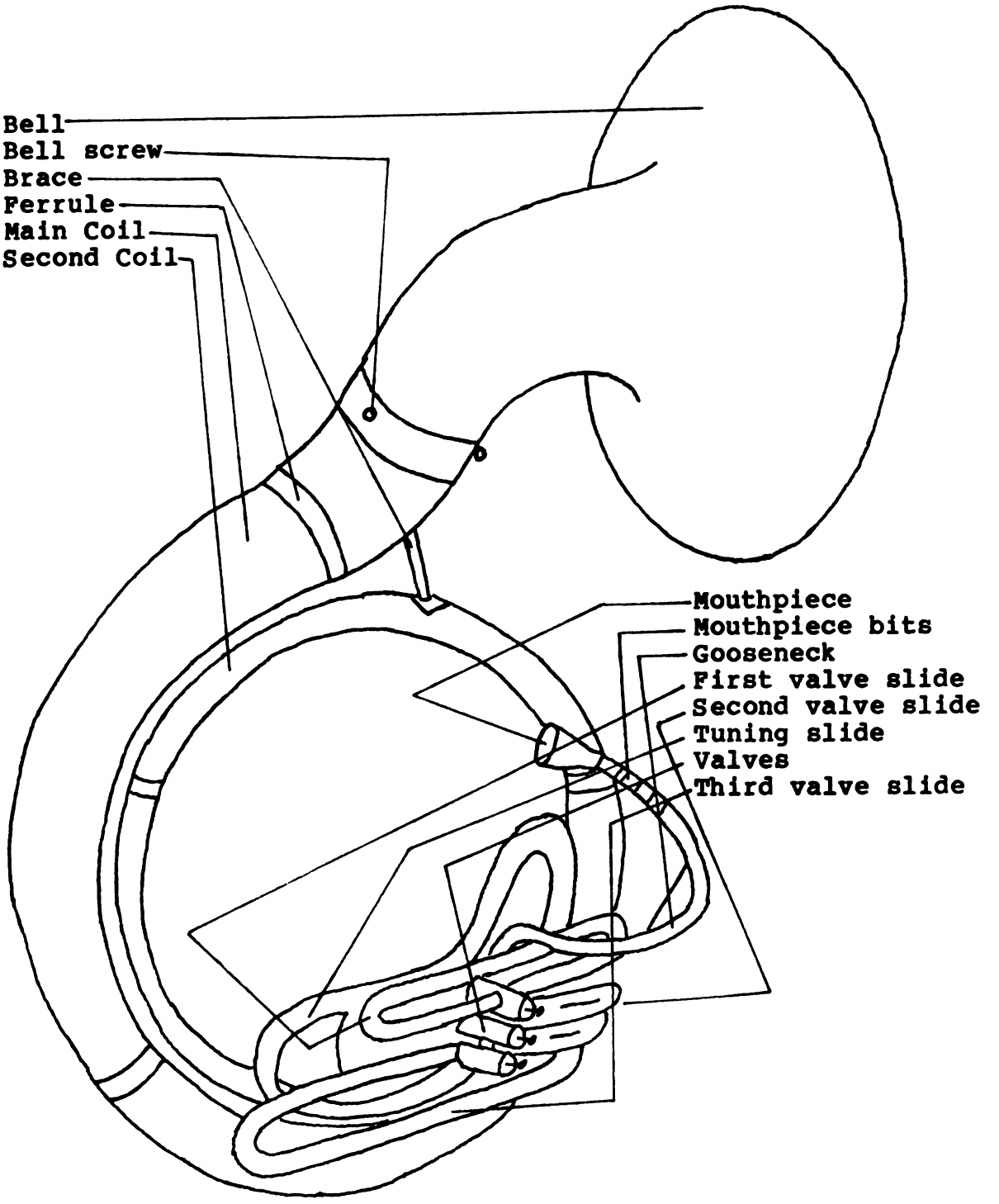


Fig. 32. Sousaphone Nomenclature.

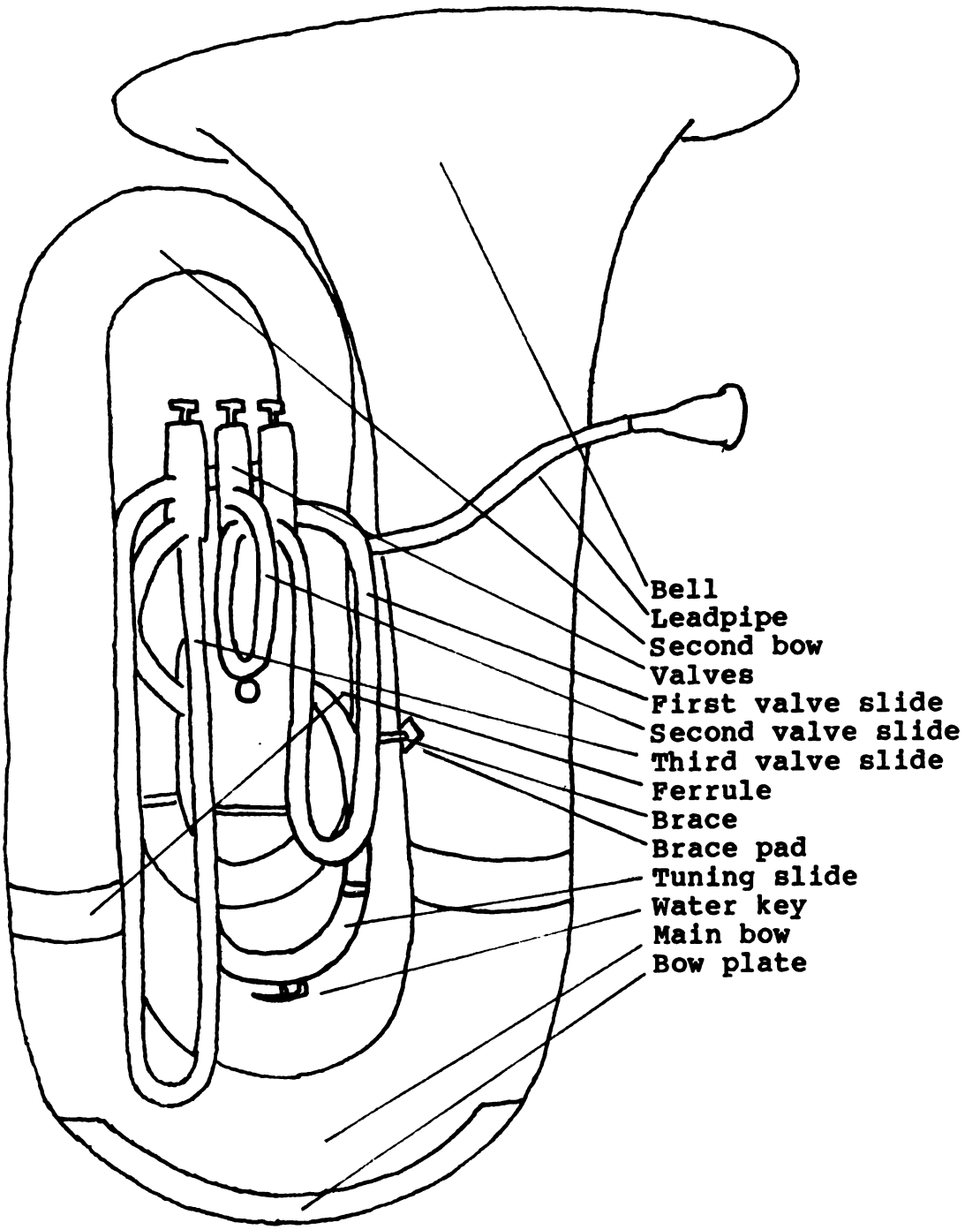


Fig. 33. Upright tuba Nomenclature.