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THESIS
BASKET INDUSTRY
C. G. BURNS





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B A S K E T I N D U S T R Y

BY

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The object of this thesis is the discussion of basket making with special reference to costs. Owing to the large number of different kinds of Patents Baskets made under this patent, no effort will be made to discuss each but will take one specified size as representative of the industry and follow it through the various processes of its manufacture. The representative basket will be the 25 lb. patent or the half bushel basket.

The basket industry is not very important from the economic standpoint, especially to the Lumberman. The demand for timber is not so great that it will in any way affect the supply, but it is of more or less importance to several different industries, the greatest of which is fruit growing.

Several years ago, fruit of nearly every kind was shipped in barrels or loose in the car; but of late years the growers of the east and the south have experimented with baskets and found them a success. Fruit in baskets can be shipped with less loss, also less time and trouble. It can be put on the market quicker and reaches the ultimate consumer easier and in more saleable condition than if it were in barrels, or in car load lots.

As soon as a demand was created for a container to ship fruit in, various concerns tried to meet this demand and the basket offered was what is known to the trade as the "splint basket", or the "diamond." The advantages and disadvantages of these forms of baskets will be discussed in this thesis.

At this time, among the numerous efforts to supply a container were those of the Saginaw Patent Basket Company which put out a basket known to the trade as the "Saginaw Patent Basket." This Saginaw basket was put up in such a manner that it was strong and durable as well as being sold at a price that would enable the fruit growers to use it economically.

It is not the intention to convey the idea that the splint basket is not being used, because it is and to quite a large extent in Michigan and several of the southern states. There are several large factories in Michigan where the splint basket is made.

The splint basket in various sizes from the small grape basket that holds only a few pounds to the large clothes basket which holds several bushels, are made especially for peaches, plums, pears, apples, mellons, cherries, grapes, all kinds of berries as well as fish, clothes, nuts, and picnic lunches.

The splint basket is made somewhat similar to the patent, the only difference being in the number of pieces put into the basket. The patent basket when made up complete with cover and handle, consists of only twelve pieces of veneers, while one splint basket contains all the way from 25 to 100 and requires greater skill to construct as well as more time.

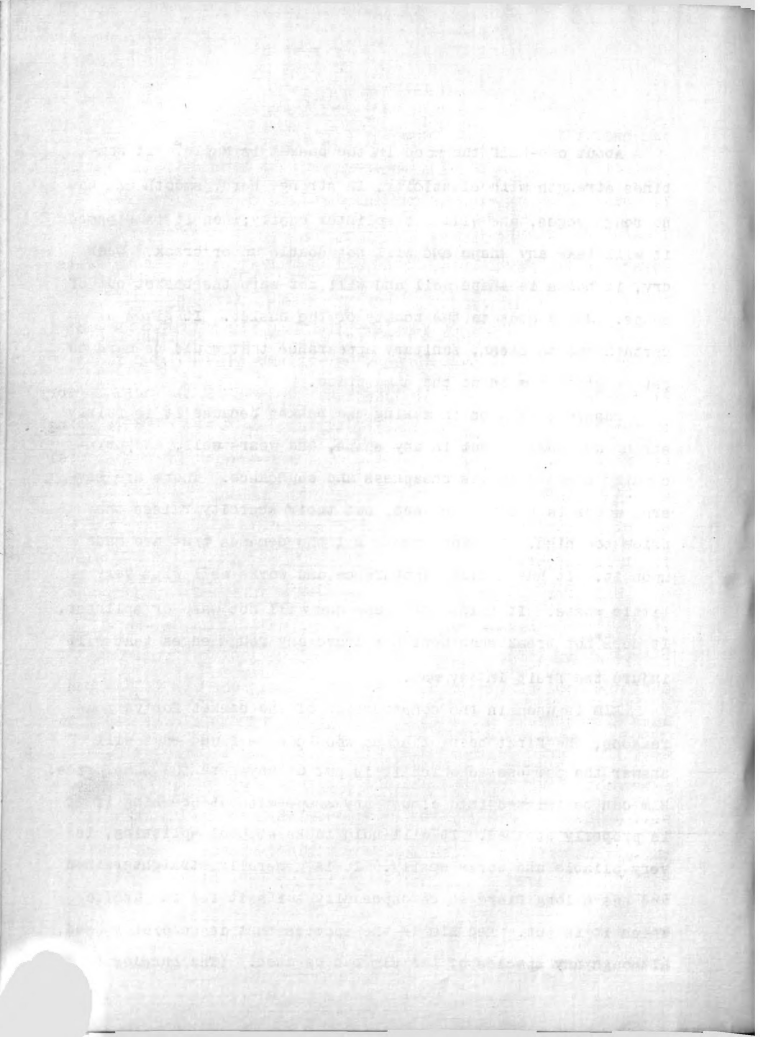
The patent is made up in numerous sizes and owing to small number of pieces of veneer in each, it is stronger as well as cheaper.

The woods used in the manufacture of this patent basket are Maple, Elm, and Basswood.

About one-half the wood in the basket is Maple. It combines strength with elasticity, is strong, hard, smooth and has no rough edges, and will not splinter easily; when it is steamed it will take any shape and will not double up or break. When dry, it holds its shape well and will not warp the basket out of shape. Maple adds to the beauty of the basket. It gives a certain smooth clean, sanitary appearance that would be hard to get in another wood at the same price.

Basswood is used in making the basket because it is fairly strong and easily bent in any shape, and wears well, and principally because of its cheapness and abundance. There are several woods that could be used, but their scarcity raises the price too high. Basswood meets all the demands that are made upon it. It has a clean appearance and works well with very little waste. It holds its shape and will not warp or splinter. It does not break when bent nor leave any rough edges that will injure the fruit in any way.

Elm is used in the construction of the basket for various reasons, the first being that no wood can be found that will answer the purpose to which it is put at anywhere the same price. Elm can be twisted into almost any shape without breaking if it is properly steamed. It will hold tacks without splitting, is very pliable and works easily. It is generally straightgrained and has a long fibre which especially suits it for the use to which it is put. Red Elm is the species that is generally used, although any species of the Elm can be used. (The handles of



the basket is also made from Elm.)

It does not make so much difference the kind of wood that is used in the covers, as any wood as long as it is not too full of knots will answer the purpose. Hence in making the covers, they use slabs and odds and ends that are found in waste material.

One of the greatest problems that the fruit grower has to contend with is the question of the package in which the fruit is shipped. Shipping fruit in barrels has never been satisfactory to the grower. They are large, heavy and costly as well as being heavy to handle. Several bushels of fruit are put in each barrel and if infection of any kind gets into the fruit, the whole barrel is generally a total loss before it is known that the fruit is infected.

Shipping in barrels effects the sale of the fruit somewhat in that the consumer generally does not care to buy a whole barrel of fruit at a time, as it is so long before it is used that the most of it spoils. Shipping in barrels and in carload lots also affects the sale of fruit in another way. In order to sell fruit or nearly any other saleable product, it must have a certain amount of neatness and attractiveness about it as well as quality and quantity. The product must be pleasing to the eye as well as to the palate, so the question to the fruit growers was, "How can the fruit be put on the market in the most attractive manner?" Various contrivances were used. Sacks were tried, but it was found that the cloth did not protect the fruit from bruises when shipped and they were more or less cut

and bruised after they had been shipped any distance.

Boxes have been tried for packing fruit but they are so expensive that it was found they could not be used at any profit.

After a good many different kinds of containers were tried and found wanting, the question of using baskets for shipping fruit was considered. They were used and met with varying degrees of success.

What is known as the "Diamond" basket was first used and it soon became quite popular. It was used quite extensively, but still was not quite satisfactory owing to the fact that they were made from small splints and could not be put so close together but that little holes were left between the splints. These holes allowed the fruit to become more or less injured, and another fault was that they were not very stiff and would not hold their shape very well, giving more or less when handled. This action between the individual fruits might break the skins and let in the spore of some fungi which infection would destroy the fruit.

Even with these objections, the "Diamond" basket was used quite extensively by the fruit growers in the various parts of the United States.

In 1890, there was put on the market what is known as the "solid bottom basket," which was constructed as follows:

The bottom consisted of a solid piece of wood, generally of some soft wood. This was cut into correct dimensions and rounded at the ends. A piece of Elm vaneer which was previously cut to

the correct length and width is taken and the bottom part nailed to the piece of wood that is to serve as the bottom. The vaneer is cut so it will reach around the bottom and the two ends meet. An elm hoop is then nailed on the outside of the vaneer at the bottom so the tacks will pass thru the vaneer into the bottom holding the vaneer fast to the bottom. Another is then nailed around the top to make the basket stronger. The handles are made the same way as those for the "diamond" and "patent" basket and are fastened the same way.

When this basket first appeared on the market, it met with instant favor and was adopted by fruit growers as fast as it became known as it was a much better basket than the "diamond", would last longer, was cheaper, stronger, and the fruit was not so to be bruised as it was in the splint basket. The most important thing about this basket to the fruit grower was that it was cheaper as well as having a very neat appearance. It was trim and smooth and altogether gave the fruit a much better appearance than any other package that had ever been tried.

This is like a great many other things; as well as having a great many advantages, it had a number of disadvantages. The chief draw back to the solid bottom basket is that after it has been used a couple of times, or has been allowed to stand in a damp place, the tacks rust off and the bottom will fall out. If the basket is kept in too dry a place, the vaneer will become dry and crack open. The vaneer generally cracks open where a tack has been driven in, so this in turn allows the bottom to fall out or the top to pull off. This fault in the basket has

been overcome to a great extent and there are more solid bottom baskets used today than any other.

Up to 1894, the Saginaw Basket Company had been making both the "diamond" and the "solid bottom basket." They had been studying carefully the advantages and disadvantages of the various kinds of baskets on the market, and in 1854 they patented and put on the market what is known today as the "Saginaw Patent Basket."

This basket was created with the purpose of embodying all the good points of the present makes of baskets, and eliminating all its disadvantages. To begin with, the "diamond" basket's greatest disadvantages were the splints left holes between them, and the basket was not strong, and was easily broken. The "patent basket", when properly made, will hold water. It is made of veneer of such a thickness that it is strong and will hold its shape and will not cause the fruit to become bruised.

The disadvantage of the solid bottom basket is that the bottom drops out. The patent basket is made solid. Four pieces of veneer go to make up the body of the basket. The bottom and sides are all of one piece of veneer, so it is impossible for the bottom to fallout.

The patent is the cheapest of the three, is a better looking basket, will last longer and keep its shape better even than does the solid bottom basket.

The Maple, and Basswood used in the manufacture of the patent basket gives it a very distinctive appearance. It has a clean attractive appearance when filled with fruit that no other basket

has.

The process of manufacture of the patent basket is an interesting study. The logs are unloaded from the car in the yard of the mill and as they are needed they are sawed up into the various lengths required and put into the cooking vat. This is a large tank filled with water which is kept at boiling temperature by live steam from the engine. The logs are left in the vat from 24 to 36 hours when they are taken out of the vat and peeled and hoisted to the height of the lathe by means of a block and tackle system suspended from a car above. The car, with the log or "blot" suspended, is run to the lathe where the bolt is fastened in. The bolt is made to revolve against a sharp knife so the wood is peeled off in long strips called "vaneer". This vaneer is cut to varying thicknesses varying of course with the use to which it is to be put. As the vaneer comes from the lathe, it is carried and laid on a long table which is called the "clipper." The clipper is so arranged that by adjusting it, the vaneer can be cut to any width from $\frac{1}{4}$ of an inch up to 3'. After the vaneer has been run through the clipper, it is carried to the various parts of the factory where it is utilized for the purpose for which it was intended. (Up to this point, the work is all done by day workers; but from here until the basket is finished, the work is done by piece work.) As I have taken the 25 lb. basket for my foundation, I will try and follow it through its various processes of manufacture.

From the clipper the Maple and Basswood bottom pieces or straps are carried to the department where the webs are made,

the web is the basket before it is put into the form. It consists of the material which goes to make up the basket, put together. These webs are generally made by girls who get a certain price per dozen for making them. After the webs are made, they are carried to the nailing room where the basket is made into its shape.

The webs are placed in a steam box and live steam turned in. This softens the material and makes it easier to bend. The nailer "who is the one that makes the basket," puts an elm hopp around the form and fastens it. He then puts the web into the form and pulls the two parts together, one part fitting over the other with the web between. By this process, he gives the basket its shape. The nailer then takes a second elm hoop and places it over the first with the web between; then nails the two together. This done, the corners of the web which project beyond the edge of the elm hoop are cut off with a knife. The basket is then finished and then is taken from the form.

The baskets are then taken to large drying sheds. These consist of a roof and floor with open sides to allow free circulation of air. In this manner the baskets are dried, being piled up very loosely. After the baskets are dried, they are nested together, 50 in a bunch, and are then ready for shipment.

The handles after they come through the clipper, are put into vats of boiling water, and when they are thoroughly steamed, they are taken out and bent over a form to give them the proper shape. They are then put into forms to hold them to that shape after which they are taken to the drying room to dry. When they

are dry, they are tied up in bundles of 50 and shipped with the basket.

The handles are not put on the baskets at the factory because of the fact that more baskets can be shipped in a car if the handles are separate.

The material for covers consists of three long pieces and two end pieces. The three top pieces are vaneer and come from the clipper, but the two end pieces that have to be curved to fit the basket are sawed out on a saw made especially for that purpose.

The work of putting the covers together, is done by girls at a certain price per hundred. Besides putting the covers together, a long wire nail is driven into each end of the cover. These nails are small and bend easily and are used to fasten the covers to the baskets.

The vaneer for the covers has to be dried before it is made up, to prevent warping.

The specifications for the 25 pound patent basket is as follows:

Two Elm hoops.

Length.....	58 to 60"
Width.....	1"
Thickness.....	1/8"

Maple Cross Piece "Shorts"

Length.....	20"
Width.....	8 1/4"
Thickness.....	1/16"

Maple Long Piece

Length.....30"
Width.....5 $\frac{1}{2}$ "
Thickness.....1/16"

Basswood Cross Piece "two"

Length.....33"
Width.....5 3/8"
Thickness.....1/16"

Straps for bottom "Elm" "two"

Length.....14"
Width.....1 3/16"
Thickness.....3/16"
Distance apart.....2 $\frac{3}{4}$ "

Covers "Elm, Ash, or Basswood"

Three pieces

Length, two outside ones...18 $\frac{1}{2}$ "
Length, Middle piece.....19"
Width.....2 $\frac{1}{2}$ "
Thickness..... $\frac{1}{4}$ "

Handles "Elm"

Length.....28"
Width.....1"
Thickness.....1/6"

The cost of the timber per thousand delivered at the factory, is as follows:

Maple.....	\$25.00
Elm.....	20.00
Basswood.....	20.00

By carefully scaling the vaneer that goes into a 25 lb. patent basket with reference to the species, I have computed the number of board feet of each species which goes into each basket.

Maple.....	.2450
Elm.....	.1424
Basswood.....	.0768

The costs of the various woods used in the 25 lb. patent basket is as follows:

.2450 board feet of Elm at \$20.00 per thousand, or .4900 cents equals the cost of the Elm used in the basket.

.1424 board feet of Maple at \$25.00 per thousand, or .3560 cents equals the cost of the Maple.

.0768 board feet of Basswood at \$20.00 per thousand, or .1536 cents equals the cost of the Basswood.

The baskets are made by piece work, 38 cents per hundred being paid for the making, or .38 apiece.

The covers are also made by piece work, 20 cents being paid per hundred, or .02 per cover.

The handles are made by day workers, but the cost of making, as near as it can be computed, is .01 cent per handle.

There are 16 tacks used in every basket at a cost of one cent.

The cost of cooking and running through the lathe and clipper,

also adding in the depreciation caused by the wear on the machinery, the total cost would be three cents.

The cost of drying, packing and shipping an individual basket cannot be definitely arrived at, but including the office work and subtracting the breakage and waste percent, the cost is about two cents.

The cost of making the webs is $1\frac{3}{4}$ cents per dozen or .15 cents apiece.

The following is the cost of the woods used in the basket as well as the cost of the various operations in the making; in tabulated form.

Cost Of Maple.....	.3560	cents
" " Elm.....	.4900	"
" " Basswood.....	.1536	"
" " Assembling.....	.38	"
" " Making Covers.....	.2	"
" " Tacks	.01	"
" " Braids.....	.15	"
" " Cooking, lathe, and clipper	.295	"
" " Drying, packing, and waste	.2	"
" " Making Handles.....	.01	"
" " Depreciation.....	<u>.005</u>	"
Total cost of basket.....	2.2496	"

The list price of this basket in the catalog of the Rowley Manufacturing Company of Leonard, Michigan, is 3.7 cents.

As well as the 25 lb., there are a good many different sizes of the patent made, and it might be well to make mention

of some of these at this time.

The smallest patent basket that is made is the 4 lb.

This basket is made with a solid cover and is especially made for fruit such as grapes. They sell at \$16.00 per thousand, and between thirty-five and forty thousand baskets can be shipped in a car.

The next in size is the 8 lb. This basket is used generally by grape growers; also used extensively for the shipment of fish and other products which are more or less heavy, and require a strong but light receptacle. The 8 lb. basket is cheaper than boxes and are much stronger in comparison as to size. They sell complete with cover and handle for \$22.50 per thousand.

The 10 lb. basket has a raised cover similar to the one used on the 25 lb. basket. This basket is greatly favored by peach growers, and meets with the approval of growers having a hilly country or rough roads, because with the raised ~~xxx~~ cover one basket can be piled on top of another without bruising the fruit. These baskets sell complete for \$25.00 per thousand and about twenty-five thousand can be shipped in a car.

The next size is the 15 lb. basket with the raised cover. It holds the same as one-third round peach basket which has to be crated, but the above is strong enough so it does not have to be crated. This basket is used a great deal for peaches, pears, and plums. It sells for \$34.00 per thousand complete, and about twenty-two thousand can be shipped in a car.

The 20 lb. basket has the raised cover, and is also used for peaches, apples, pears, plums, etc. It is a strong durable basket and sells for \$37.00 per thousand complete. About fifteen

thousand can be shipped in a car.

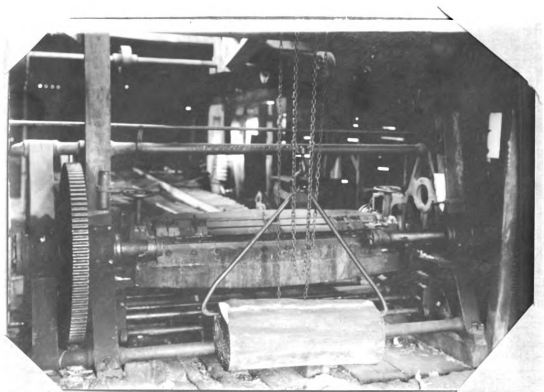
The 25 lb. patent, or the half bushel basket, is the universal size and is put to a good many uses, especially for shipping tomatoes, pears, quinces and apples. When apples are shipped in these baskets, six baskets make a barrel. Apples shipped in these baskets net the grower 30% more than fruit shipped in barrels according to one of the oldest fruit growers in Michigan. Apples stored in Saginaw Patent baskets keep much better and require less room than when stored in barrels.

There is considerable loss in apples when stored in barrels on account of what is called "scalding" which spoils the appearance as well as the sale of the fruit. This does not occur when they are stored in patent baskets.

The 25 lb. patent sells for \$40.00 per thousand complete with raised covers. From twelve to fifteen thousand can be shipped in a car.

Every size of the Saginaw Patent basket is made in the same manner, and of the same number of pieces of veneer. They are all packed in bunches of fifty when ready for shipment. The covers and handles are shipped separate because a great many more baskets can be shipped in a car if this is done, and they are put on by the buyers when they receive them.

The prices and costs used in this thesis were taken from the books of the Rowley Manufacturing Co., Leonard, Michigan. The data and all calculations are based upon their factory and output, and the photographs were taken of their machinery.



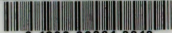




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