THE DESIGN AND CONSTRUCTION OF AN ELECTRIC SCREEN

THESIS FOR THE DEGREE OF B. S.

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1933

Civil engineering Highway engineering

THE DESIGN AND CONSTRUCTION
OF AN
ELECTRIC SCREEN

A Thesis Submitted to the Faculty of

Michigan State College

of

Agriculture and Applied Science

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By

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INTRODUCTION

The increase in the truck and automobile traffic is continually bringing road problems to the Highway Department's laboratory division. The laboratory is all the time experimenting with new types of road material to see if the new material which is coming on to the market will hold up under the load for which it is intended. The laboratory has long been in need of some means of sizing the gravel which is one of the most used materials in highway work. The gravel has to be sized up to standard specifications to be able to mix the materials in the right proportions. In the past all the material in the laboratory was screened by hand. This took a great deal of time and increased the expenses of the department. The construction of the Electric Screen will save much time and money.

The Design and Construction of an Electric Screen

In making the Electric Screen it was necessary to make use of the materials available. For that reason the design and construction were developed at the same time. In order to find out at what angle and speed the screen was to be run to obtain best results it was necessary to set up one screen at various angles and to run it at different speeds. From this point the construction progressed rapidly. The screens were spaced as shown in the drawings.

The crank shaft was the next job to undertake. The measurements were taken and the shaft sketched. The shaft was then turned out in a lathe as pictured in the drawings. Three bearings were turned out to fit the shaft. Brakets were bent into shape, drilled, and fitted into place. The shaft was connected to a three horse power electric motor by making use of a ford ring, gear, and pinion. See drawing for details.

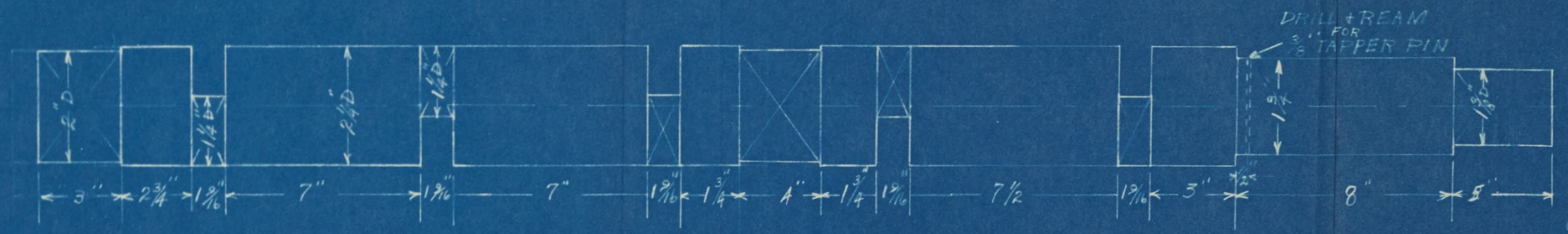
The motor and lower bearing were bolted in place on a platform which was fastened to the main structure by means of four bolts.

The screen racks were designed so that all of the material passing the sieve would be discharged at the high end of the next screen. The materials not passing the sieve would run out of the open end of the screens and discharge into chutes leading from each screen to the ir respective places.

The motor has a resistance put in series with the armature so that the speed of the motor may be changed to suit the conditions.

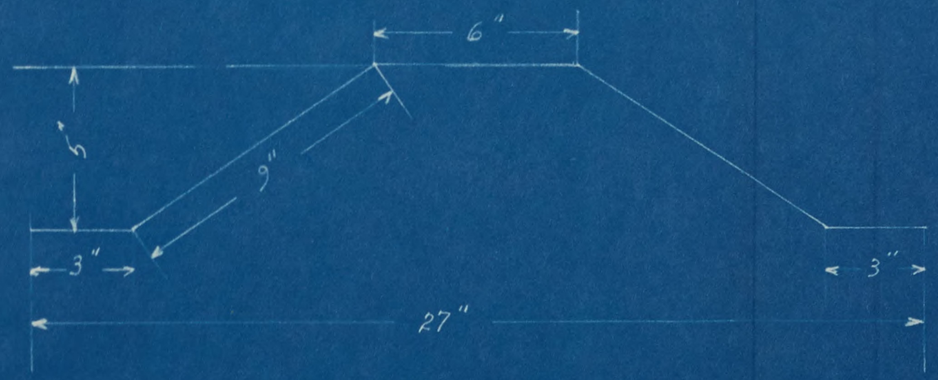
The value of this thesis lies not in the write-up which is very brief, but in the machine itself and in the ingenuity developed by Mr Phelps

E L Allen 6/9/33

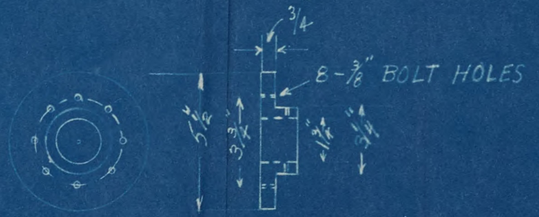


CRANK SHAFT
COLD ROLLED STEEL

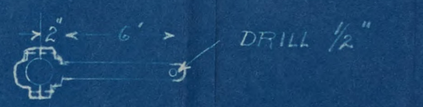
CRANK CENTERS



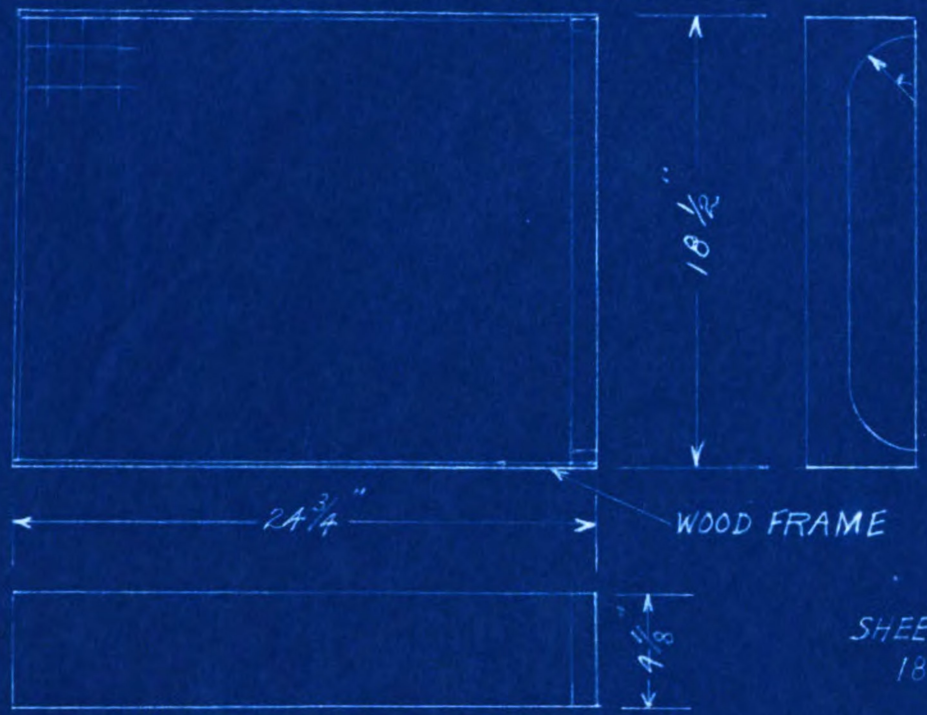
BEARING BRACKET
2" X 1/2 FLAT BAR STEEL



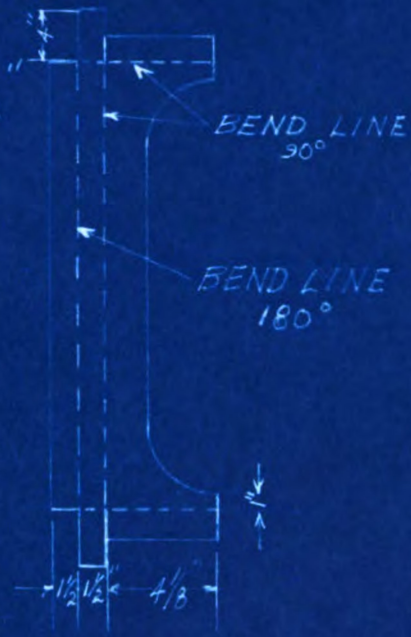
RING GEAR HUB
CAST IRON
FOR
USE WITH FORD GEAR



FORD CONNECTING ROD HEAD
WITH
3/8 X 3/4 FLAT BAR STEEL
WELDED ON

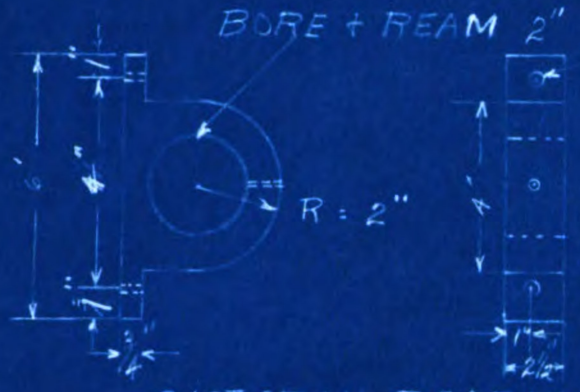


SCREEN



SHEET METAL
18 GAGE

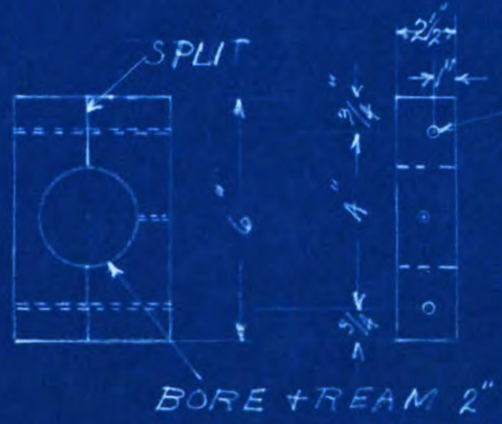
SCREEN SIZES
1 1/2" ; 1" ; 3/4" 1/2" 3/8"
1/4" 1/8" + No 4.



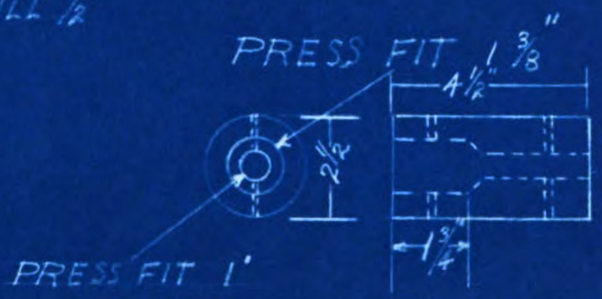
CAST IRON BEARING
TOP

ALL BEARINGS TAPED
FOR ZERK FITTINGS

THRUST BEARING
LOWER

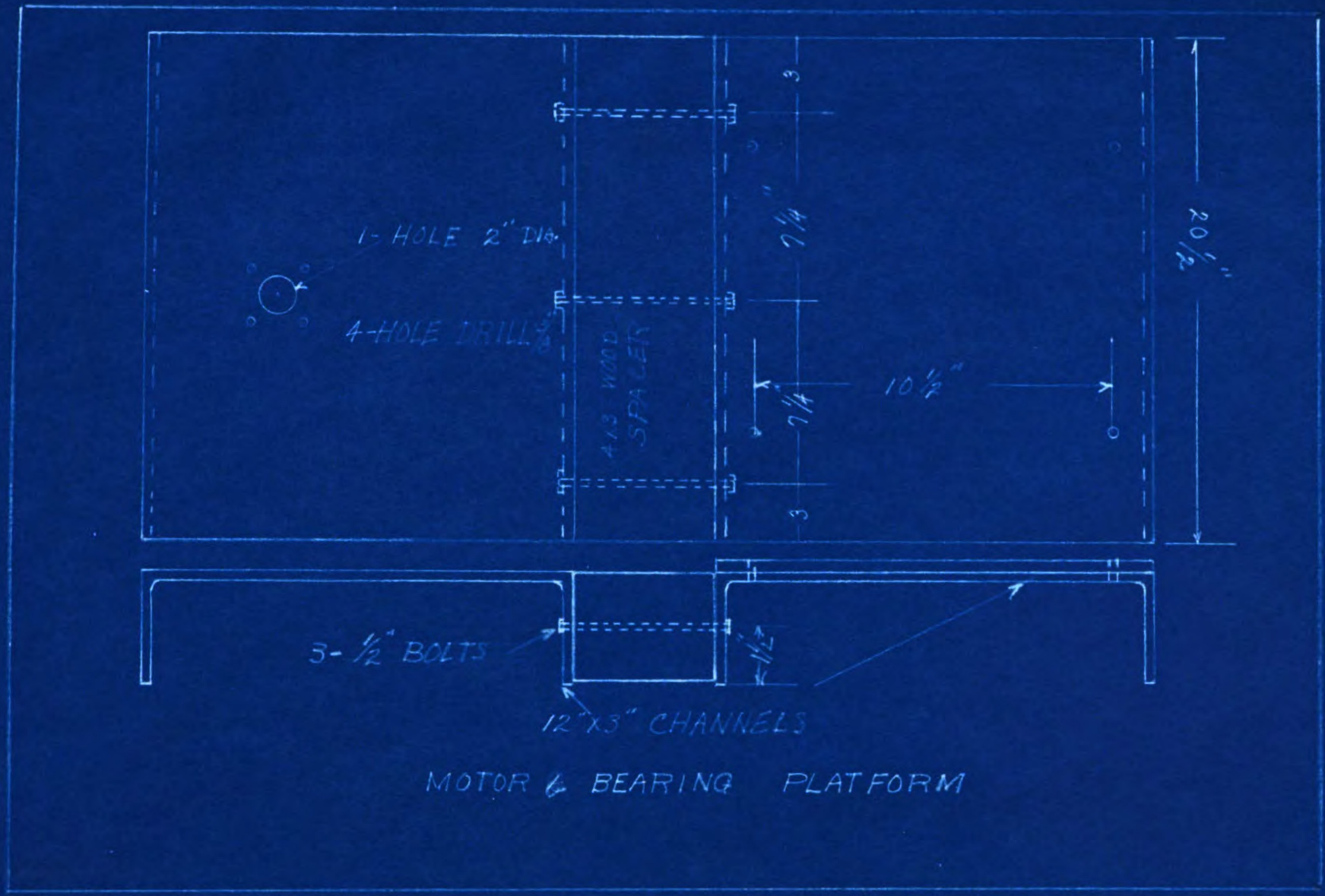


CAST IRON BEARING
CENTER

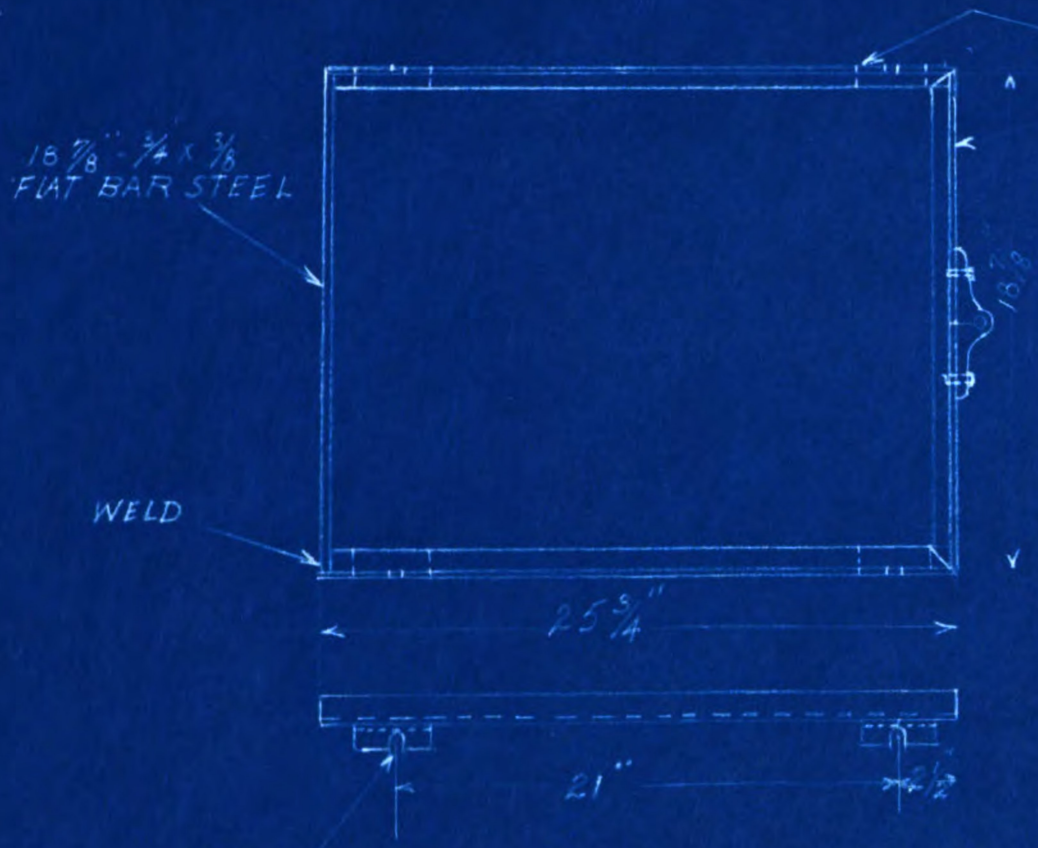


4 HOLES DRILLED
AND TAPED FOR
3/8" ALLEN SET
SCREW

STEEL COUPLING

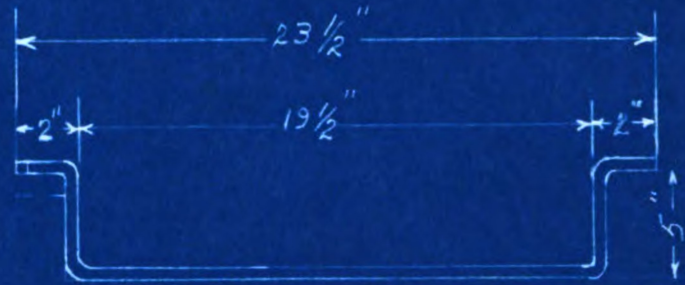


MOTOR & BEARING PLATFORM

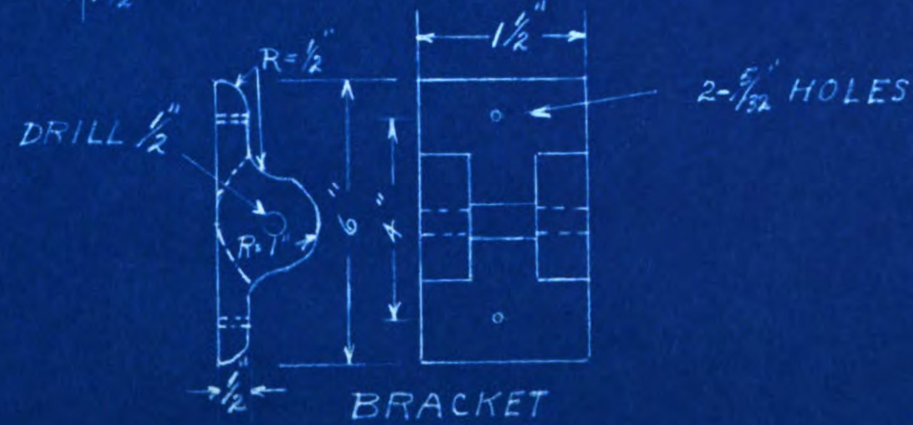


CLIPS
3 - 1¼ x ⅜ ANGLE IRON
⅝" DIAM CUT THRU. AS SHOWN

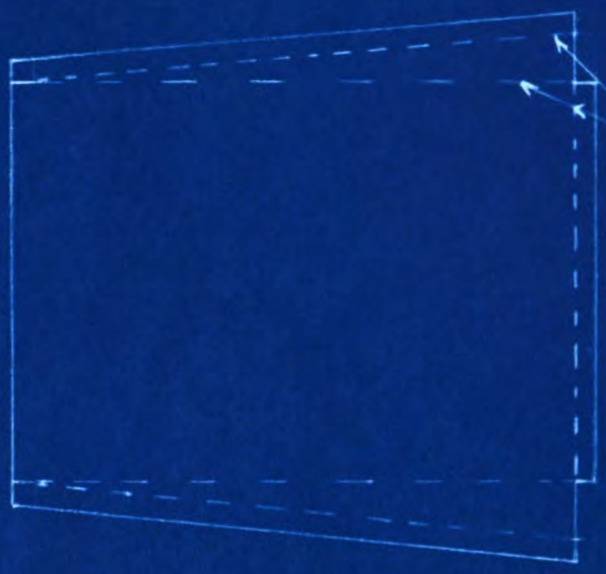
RACK

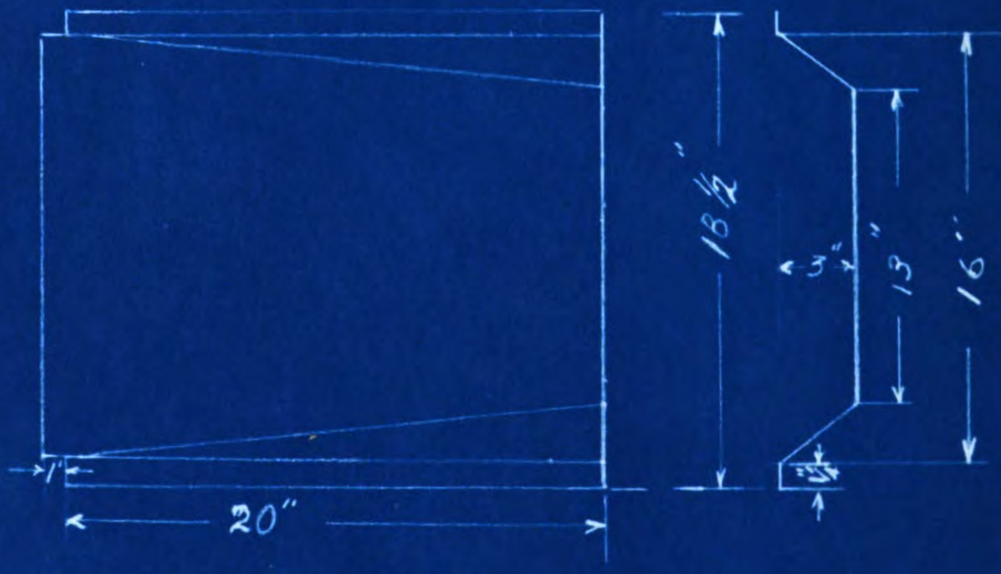


ROCKER BARS
⅝" COLD ROLL STEEL
BENT AS SHOWN



BRACKET





18 GAGE BLACK SHEET IRON

RACK CHUTE

ELECTRIC SCREEN
FOR
THE SIZING OF GRAVEL