

Grand Blacksmithing Bellows

“Measurements”

Estimated date of construction is between 1830's & 1850's (nail study)

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The purpose of the following photos and measurements are provided to anyone interesting in knowing how this historic large blacksmithing bellows was built and especially, for the ones of you that would like to reproduce it.

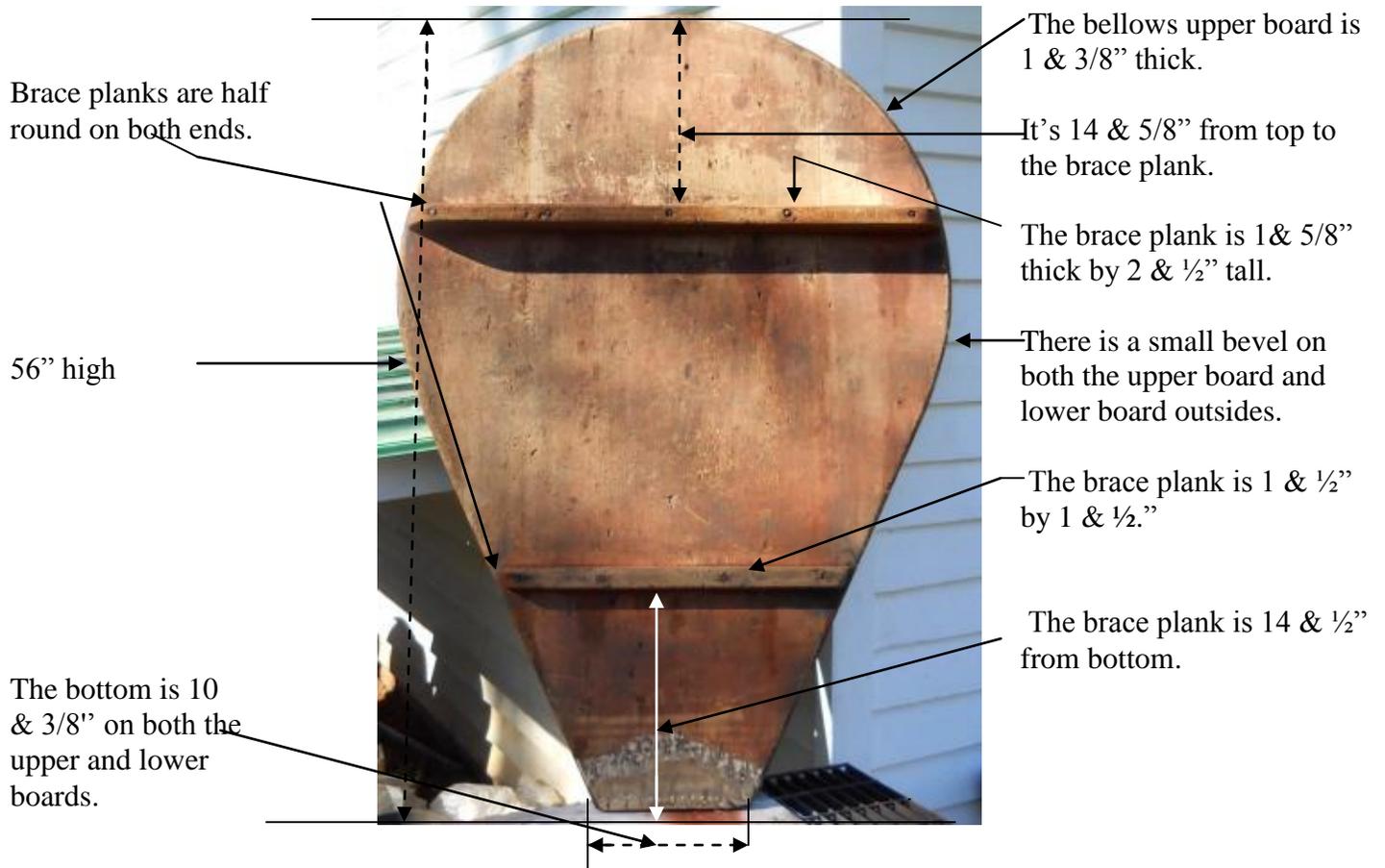
1. Purchased from a lady in Amelia, VA for \$100 on November 10, 2011.
2. The weight is 160 lbs.
3. The length is 7'6" from end of pipe to end of the rear hanger.
4. Width is 48" from end of each side hanger.
5. It is said to have come from a plantation near Richmond, VA (Schutte Plantation)

Before Photo

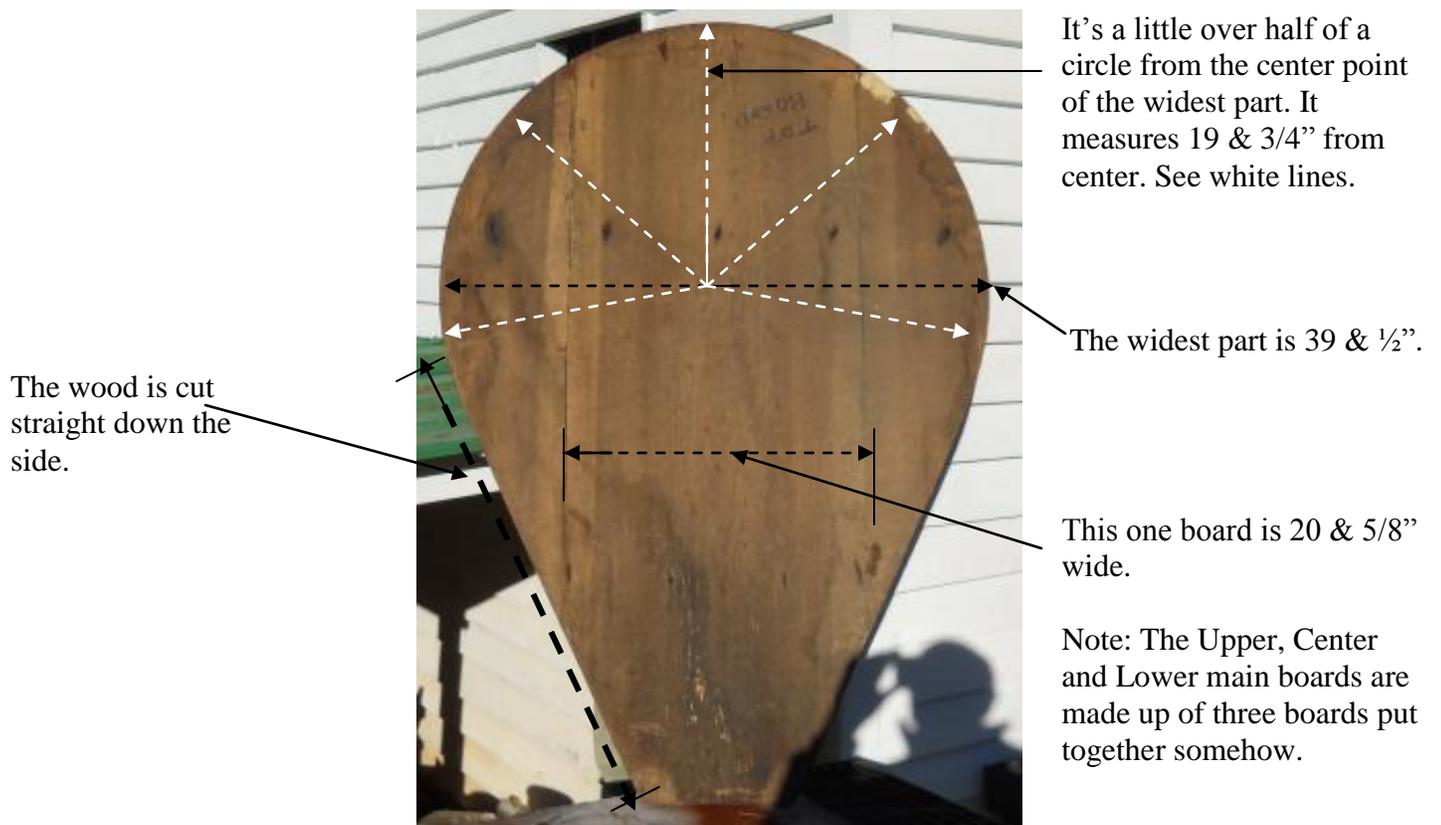


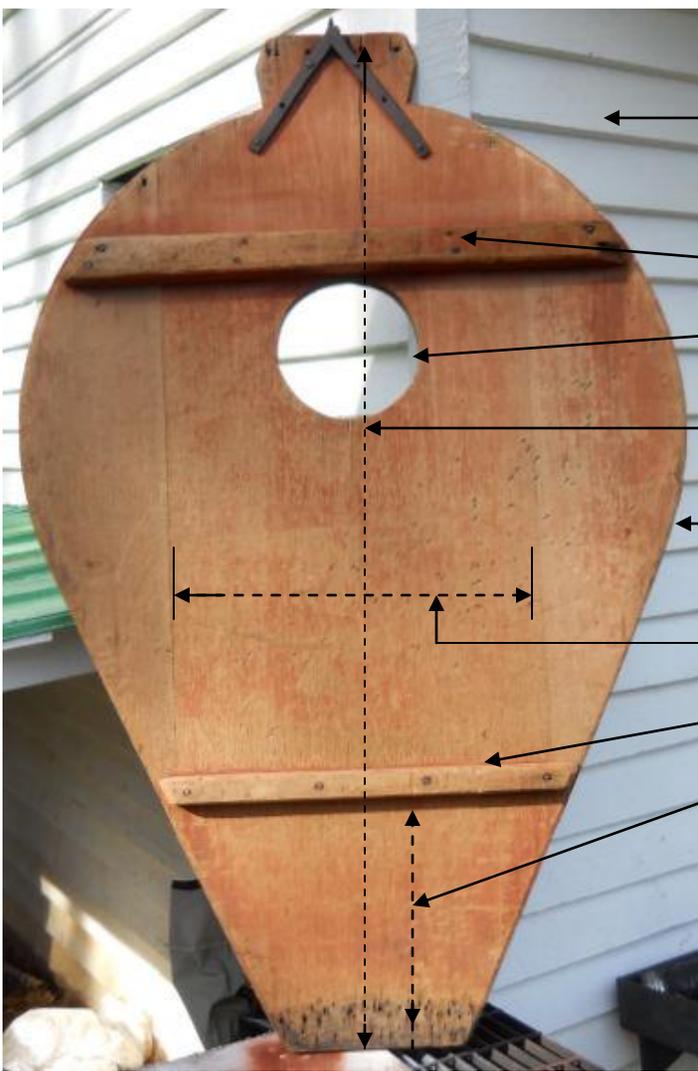
Upper Board (Outside)

2



Upper Board (Inside)





Lower Board (Outside)

The plank is 2 & 1/2" wide by 1 & 3/4" thick.

The circular holes are 8 & 1/2".

It's 60" tall.

This board is 1 & 3/8" thick.

This board is 21 & 3/4".

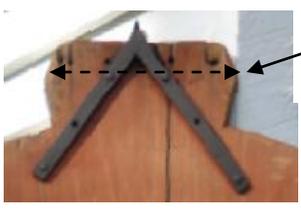
This plank is 1 & 1/4" wide by 1 & 1/2" thick.

Bottom to the first plank is 14 & 1/2".

Lower Board (Inside)



The leather hinge for this flap board is attached here.



It's 10" from this wood point over to the other wood point.



Face up flap
Beveled sides.
9 & 1/2" by 9 & 1/2" by 1/2" thick. Both flaps boards are the same size.



Face down flap
Leather covered only the face down flap board on the Center Board and not the Lower Board flap board. "See all the tack/nail holes".

Center Board (Bottom)

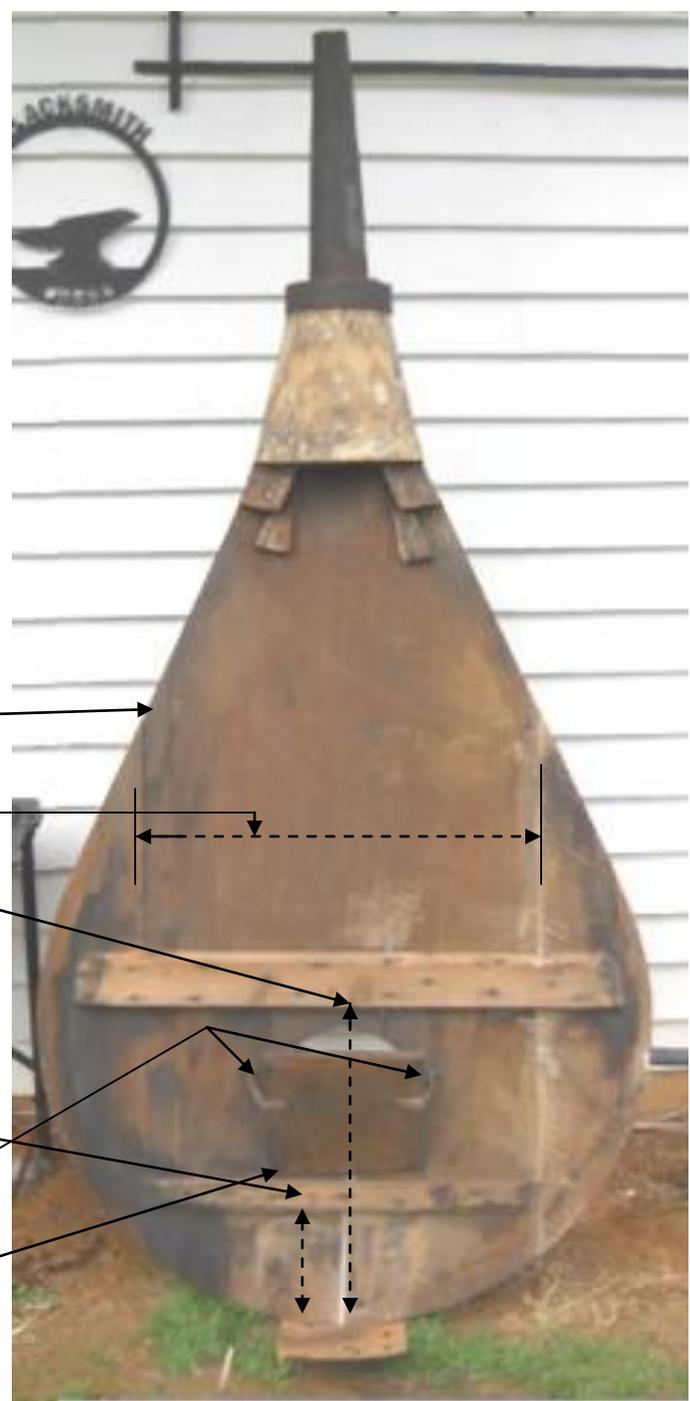


It's 11 & 1/8" from top on the Center Board to the top of the hole. The Lower Board hole is directly under this hole.

Both sides of the brace planks are rough cut at an angle or beveled a lot at both ends and it's the same for the brace planks on the Center Board (Top) that are directly under these two brace planks.

It's 67" from top to the bottom at the down side of the circular iron rim and one continuous piece of board.

Center Board (Top)



The Center Board thickness is 1 & 1/2". It's 1/8" thicker than the Upper or Lower Boards.

This is the widest board yet at 25 & 1/2".

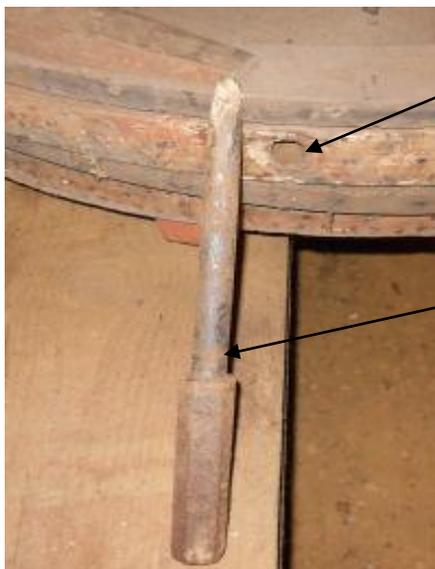
This plank is 1" thick, 3 & 1/2" wide and on the opposite side (center board bottom) it's the same size plank as well as the same distance from the end that is 21 & 1/2".

This plank is 1" thick & 2" wide and on the opposite side (center board bottom) it's the same size plank as well as the same distance from the end that is 7 & 3/4".

6" leather straps on both sides of flap door are there to keep the door from opening too much.

The flap door leather hinge is on the bottom, the other flap door hinge on bottom board is toward the top.

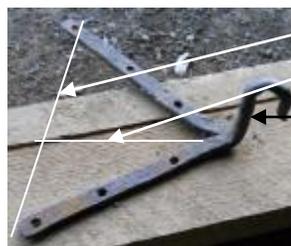
Iron Hangers



On each side of the Center Boards is a hole about 5/8" that hold the iron hanger.

The hangers are 11" long with 6 & 3/4" round iron that goes into the hole. The other thicker part is 1 & 1/8" thick, octagon shaped and has been wrapped around the round metal and forge welded to it. It's about 4 & 1/4" long.

Iron Lifting Bracket



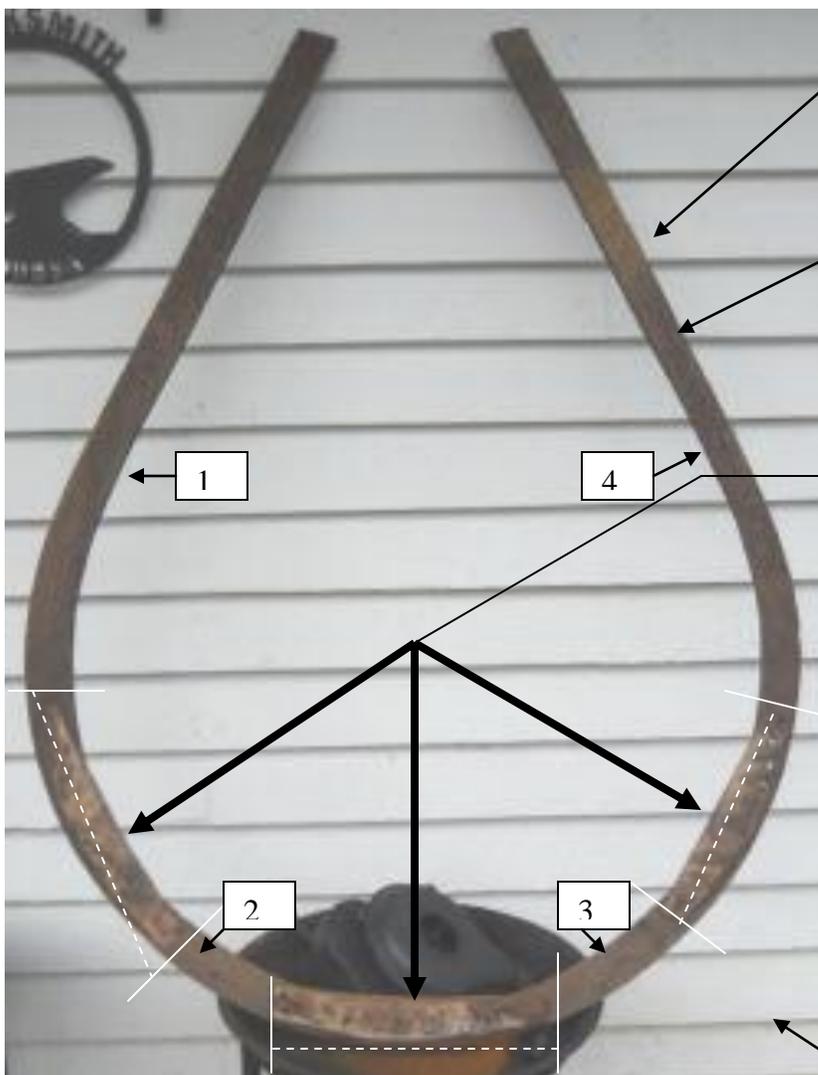
11" across
8"

Height is 3" before it starts to curve to make the hook.



I believe this was a replacement bracket because the holes in the front where the nails are located are showing the holes. There was originally a flat piece of metal with a hook instead of a Y shape with hook.

Floating Arms



There are two floating arms and they are exactly the same except that one (lower chamber) is one inch longer.

They have exactly the same curvature as all the main boards (upper, center & lower).

The wood is 2" wide by 3/8" thick.

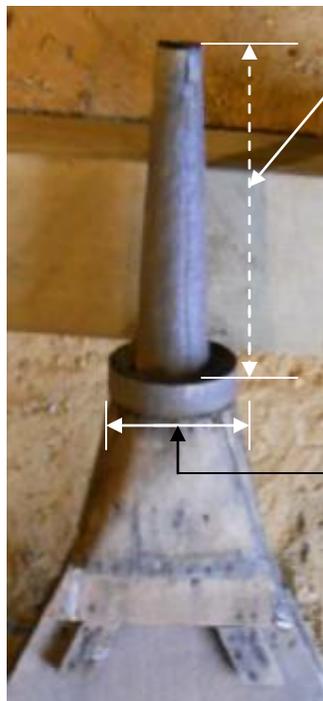
There are four holding planks (numbered) in the floating arm and the ends are **here** and are held in place with three smaller holding planks nailed to them (11" by 2" by 3/8" at the thickest part).



Note the angle of the bevels on the holding planks.

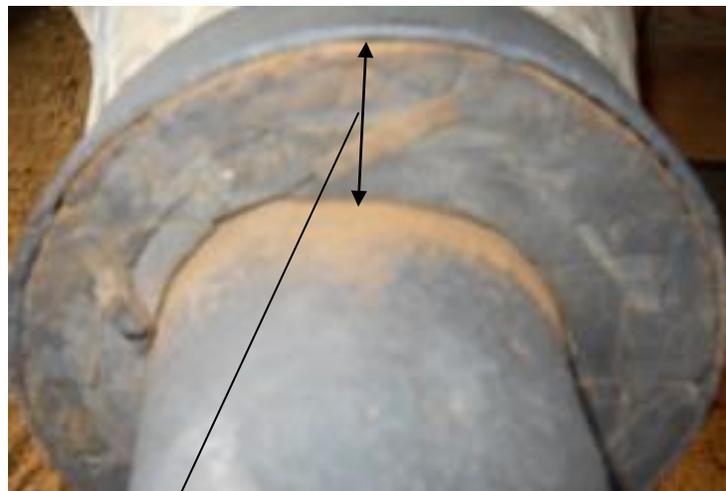
Holding planks are between the white lines.

The Nose (Nozzle) of the Bellows



The cone shaped pipe is about 1/16" thick with a 2" hole at the top end and 16" long to the top of the rim and 17 & 3/4" for total length because the pipe extends another 1 & 3/4" under the rim. The largest part of the pipe is about 4" across at the end that's under the rim.

The rim is about 7 & 3/4" across, outside circumference is 21 & 1/2", 1 & 3/4" wide and the forge welded metal rim is about 1/8" thick.



From the edge of the rim to the pipe is mostly 1 & 1/2" of ends of boards and shims.

The pipe is held in place and is tight fitting because of the use of wood shims in the extended boards that are encompassed by the metal rim.

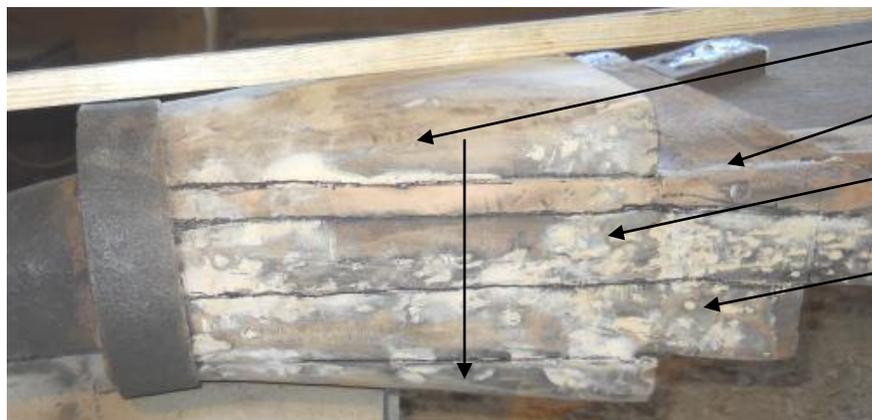


A. View from above looking at the inside top chamber:

I did not take any of this apart due to fear of breaking some or all the boards that are nailed together.

All the following board measurements are given in the total widths, lengths and thickness that you must have to begin to replicate this part of the bellows. They all will need to be cut and/or planed to get the angles and/or curves and to make them fit all the way under the end of the round iron rim.

B. Side view looking down from bottom chamber:



1. Qty two--11 & 1/4" long by 10 & 1/2" wide by 1 & 1/2" thick.
2. Qty one---14" wide by 15" long by 1/2" thick (bottom chamber)
3. Qty one--- This is the Center Board that you have already cut to size.
4. Qty two (each side)—14" long by 3 & 3/4" wide by 1 & 3/4" thick (top chamber)

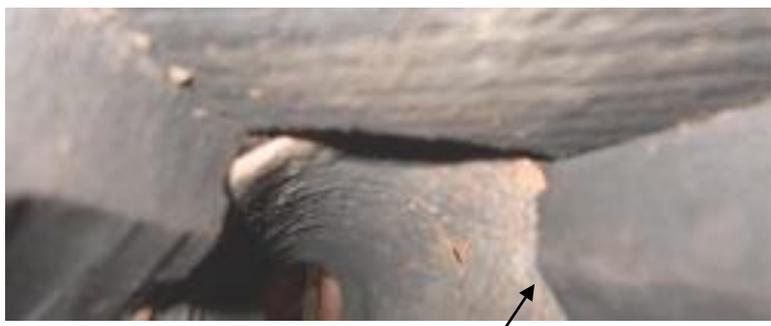
Parts of all the six boards are all the way under the rim. Shims are then put in the boards ends to hold the pipe tight.

Air Hole

(Top chamber only)



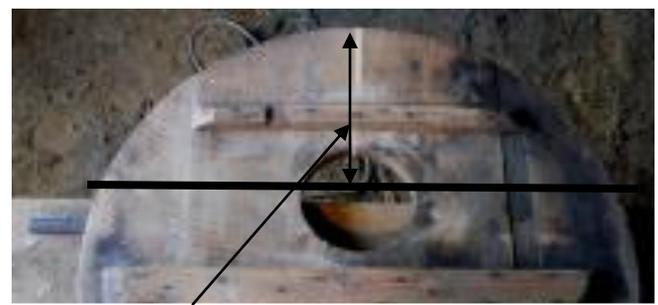
Small 1/2" thick pieces of wood that help hold the floating arms in place with the aid of a strip of leather that is tacked to them and the floating arms.



Inside view looking up:
Note the three boards that are cut a little at 90 degrees 1 & 3/4" from the end. This is stop/hold the end of the cone pipe.



Inside view looking down:
The Center Board (# 3) is chiseled down and rounded into a semi-circle until it reaches the next board (# 2) under it. The #2 board is not chiseled down any and is straight. Part of it is a stop and holds the pipe in place with shims. Also the #3 (Center Board), after it has been chiseled down on the sides into a semi-circle, is then cut straight back. The end stops the cone pipe at 1 & 3/4" before the end and the remainder of the board helps holds it in place with shims.



The center of the 5/8" holes for the two iron hangers on each side of the Center Board are on a line 17 & 1/2" from the center high point of the top curve.



This is a photo of another piece of a very old smaller rotten bellows that I have. Note the wood shims and how the other pieces are made.

Note: There was a 1/4" thickness of horsehair that was under all the leather that enclosed this end.

Horsehair



Note: My next article with photos will be about how I to put the leather on, but first----- I've got to learn how to do it.