Building the Side Blast Forge

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Written by Mark Aspery

This article is based upon the modified drawings supplied by Mark Aspery as used in his school of blacksmithing. The side blast forge works well with either coal or coke, but is particularly suited to burning coke as the clinker formed solidifies below the air blast.

The side blast forge can be fabricated by any blacksmith with the tools to cut and weld steel plate and pipe.

3/16 Hot rolled plate material was used in the building of this traditionally British "Side Blast" forge, however they have been built out of 1/8. All pipe is Schedule 40 Black pipe.

The method of working the side blast is that the Tuyure is a pipe that feeds directly into the side of the fire. There is no fire pot as such, but the pan is filled with dirt and a hollow dug out as the use dictates. If this pipe was not cooled somehow, it would burn up. So, it is jacketed and water-cooled.

Mark states that this fab. job should last about 7 - 10 years depending upon use and abuse. It will rust out before it burns up.

The tank is called the "Boss". Lets start there. It needs to be about 15 gallons capacity to prevent boiling over.

2 pieces of 18 inches x 24 inches are used as the front and back. If you look at the drawings, you will see a mark indicated at the 4 1/2 inch/center line. Each plate will have a different sized hole cut in it.

The front plate will have a 5-inch hole and the rear a 3-inch hole. Both of these have to accommodate pipe so they need to be fairly accurate.

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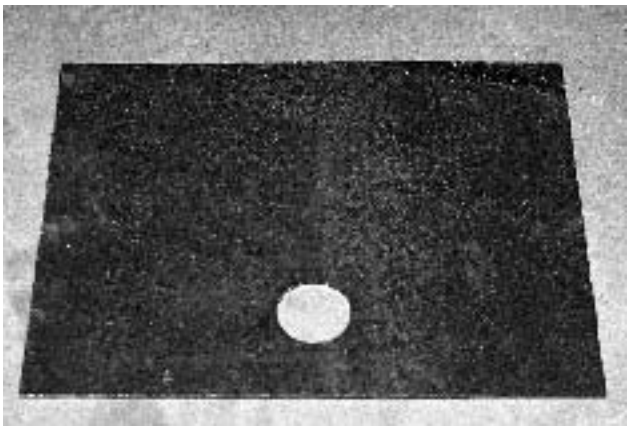


Fig 1 Back plate of the Bosh

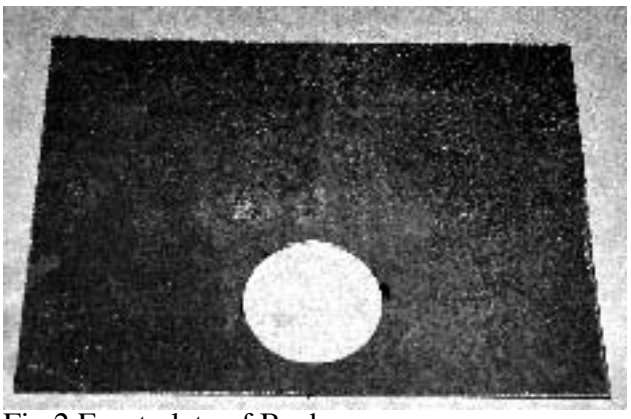


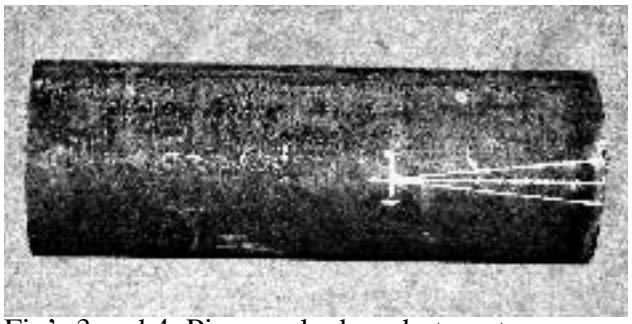
Fig 2 Front plate of Bosh

The bottom plate (9" x 24") will have a "Bonny" or a plumbing fitting welded to it so that the tank can be drained without too much of a fuss. It is placed 3 inches from a corner (45 degrees)

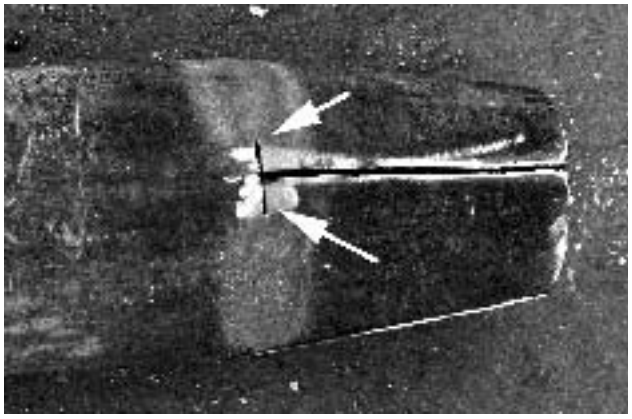
The water jacket is a 5 inch pipe 16 inches long. You can make the tuy iron out of a shorter length of pipe, but this example is for a full sized forge ready to accommodate a chimney. There are 4 pie slices taken out of one end so that it can be tapered down to 3 1/2 inches to take the end cap. Draw an X on the ground. On each leg measure out half the outside diameter of the pipe. By placing the pipe within these lines it makes dividing it into 4 pieces is easy.

Each pie to be cut out of the 5 inch pipe is 1 1/4 inches wide at the mouth tapering to nothing over 6 inches.

Cut a 1/2 inch cut on either side of the line at the small end, this will prevent the pipe from buckling when you bend it.



Fig's 3 and 4. Pipe marked ready to cut above and shown cut and bent below



Heat the pipe, bend and weld it.
If you intend to use an electric blower stay with the 1 1/4 inch ID pipe for the air blast pipe. If you are intending to use a hand wound blower, there is too much friction in the small pipe and you will need to replace it with a bigger pipe for most of the way inside the water jacket.
I used 2 1/2 inch pipe and tapered it down to 1 1/4 at the end to match the 5 inch pipe. The pie slices to be taken out are 1"x 5".

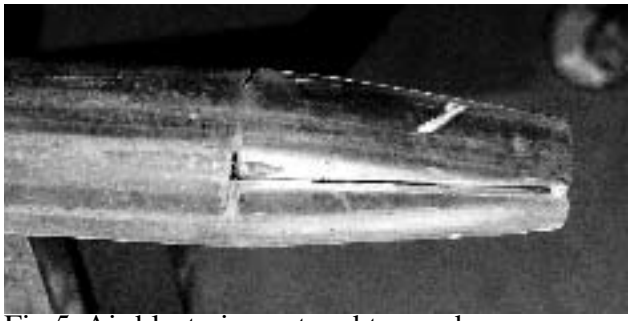


Fig 5. Air blast pipe cut and tapered.

Onto this end will fit the donut (3 1/4 OD) that need to be cut from the drop of the 5 inch hole cut in the front plate.
Fit the donut onto the tapered end of the 2 1/2 inch pipe and weld inside and out.
Taking the front plate, weld on the the 5 inch pipe. If instead of passing the 5 inch pipe fully through the hole you pull back an 1/8 of an inch, you will have a good "V" to weld in on the backside! Tack it first then weld inside and out.

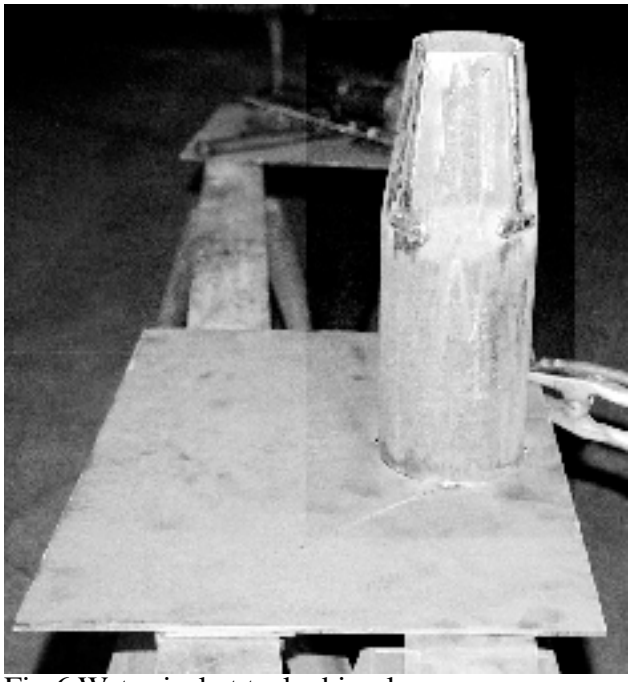


Fig 6 Water jacket tacked in place

Tack on the sides. Again touch the inside corner to inside corner and give yourself a nice "V" to weld in.
After the sides are tacked on to the front plate, tack on the back plate, again leave the "V".
Fully weld the sides and back.
Now slide in the 2 1/2 inch pipe and donut combo. If all is aligned well, weld it on.

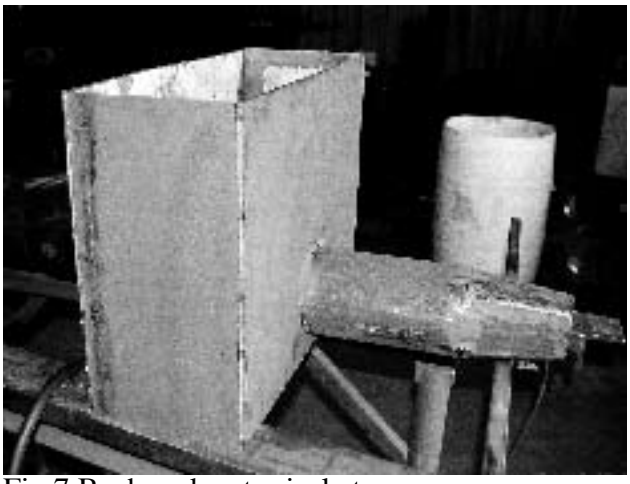
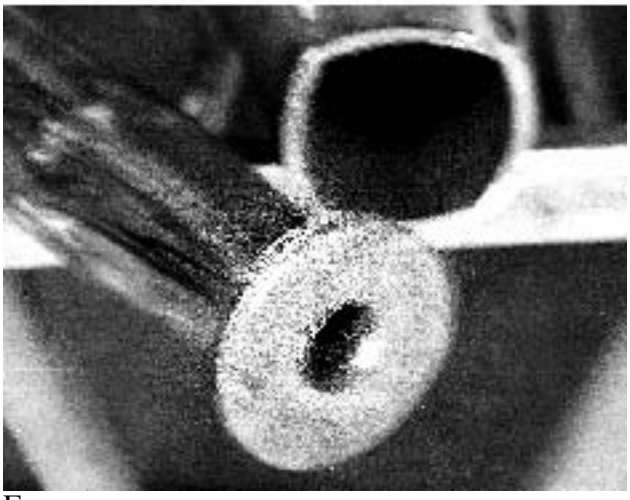


Fig 7 Bosh and water jacket

The only weld that cannot be done on the inside and out is the donut onto the tapered 5-inch pipe weld.

When all has been welded fully, weld on the bottom plate.

The forge pan should be 9 1/2 to 10-inches deep. Mark does not recommend using the front of the boss as the back of the pan. He prefers to double skin this area to facilitate easy removal of the boss and tue iron and to prevent heat transfer from the forge to the boss other than by the water jacketed pipe.



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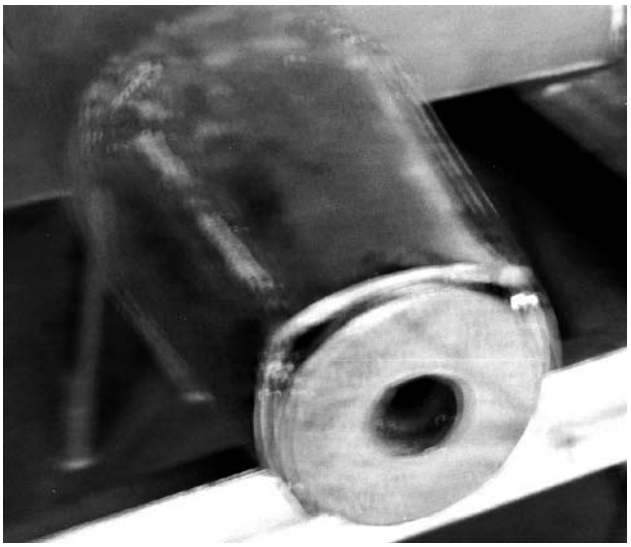
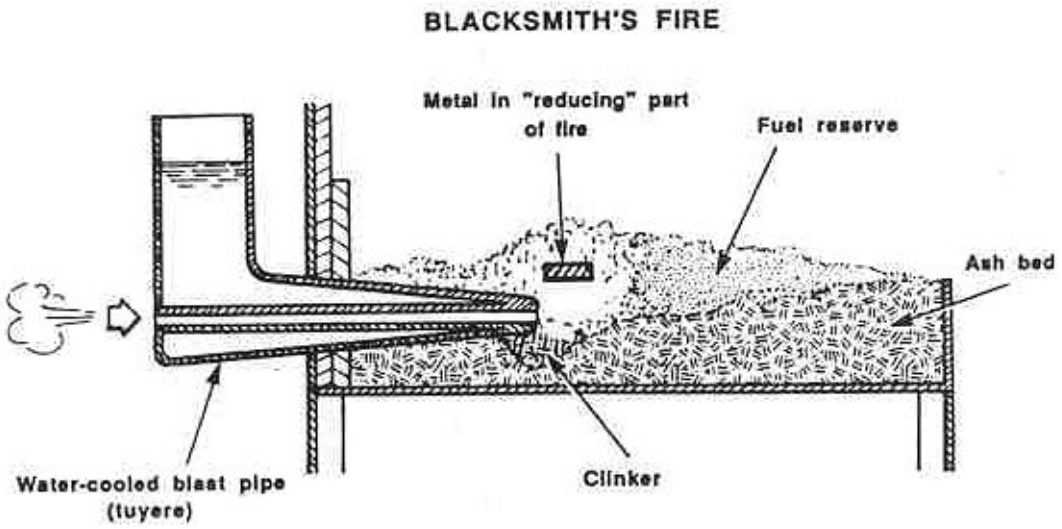
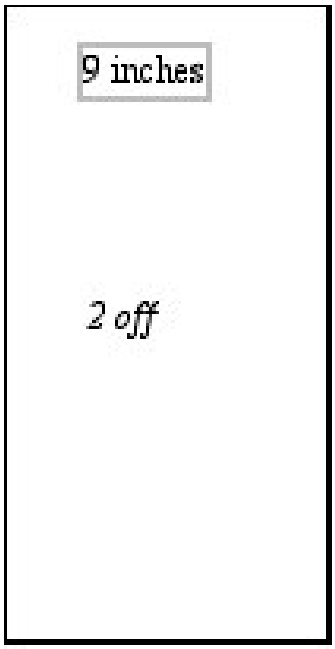
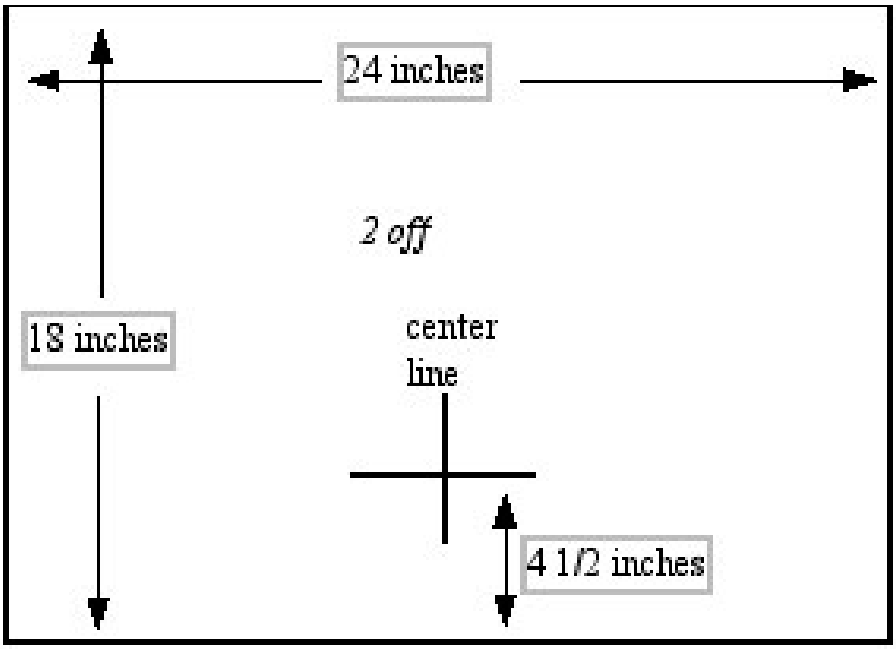
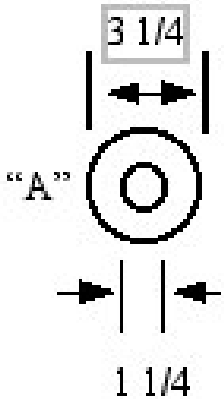
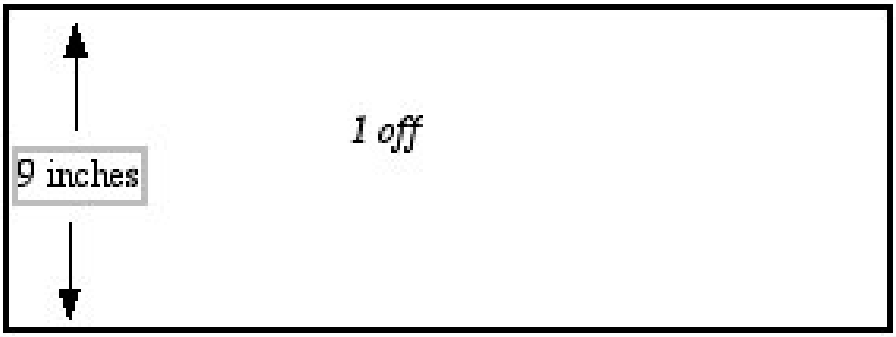


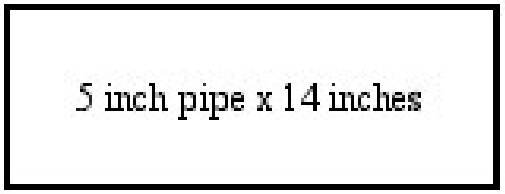


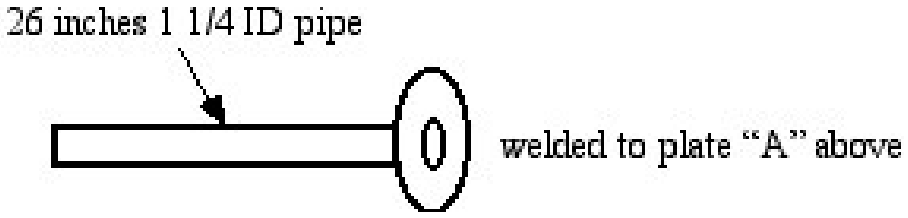

9 inches
2 off


24 inches
2 off
18 inches
center
line
4 1/2 inches


3 1/4
"A"
1 1/4


1 off
9 inches


5 inch pipe x 14 inches


26 inches 1 1/4 ID pipe
welded to plate "A" above