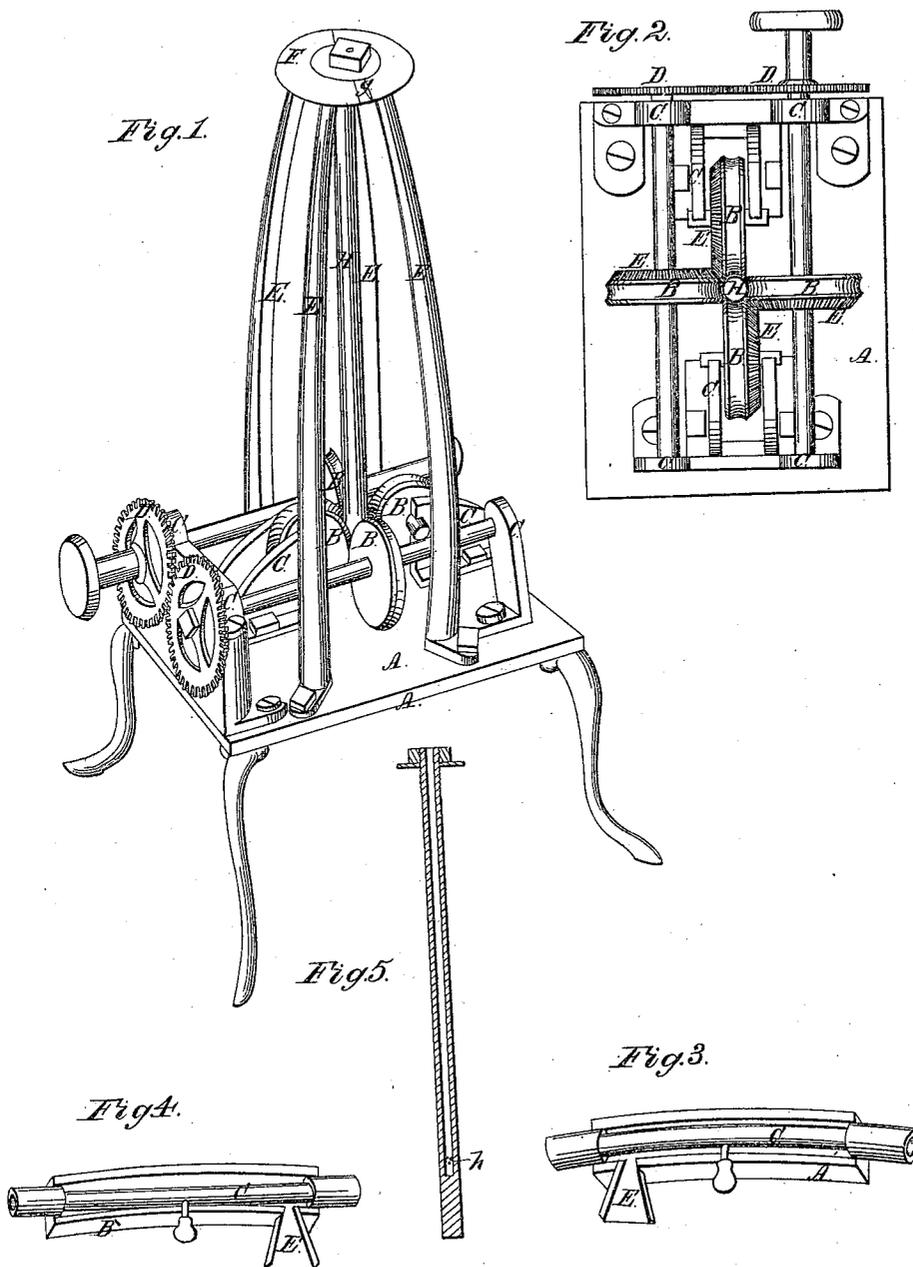


J. C. VAUGHN & F. LEACH.  
MAKING LEAD PIPE.

No. 1,463.

Patented Dec. 31, 1839.



# UNITED STATES PATENT OFFICE.

JOSEPH C. VAUGHN AND FREDK. LEACH, OF TIOGA, NEW YORK.

## MOLD FOR CASTING AND MACHINE FOR DRAWING LEAD PIPES.

Specification of Letters Patent No. 1,463, dated December 31, 1839.

*To all whom it may concern:*

Be it known that we, JOSEPH C. VAUGHN and FREDERICK LEACH, of the town and county of Tioga and State of New York, have invented a new and useful Machine for Manufacturing Lead Pipes, and do declare that the following is a full and exact description,

The nature of our invention consists in providing machinery so constructed as to manufacture, lead into such form (viz., tubes or pipes) as shall answer for conducting water or any other fluid from one place to another.

To enable others skilled in the art to make and use our invention we will proceed to describe its construction and operation, reference being had to the annexed drawings of the same, making part of this specification.

We provide a cast-iron plate A (Figure 1) four feet by three and a half square and six inches thick (or of any dimensions most suitable) and which we denominate a bed plate. Upon this plate we place four rollers B B B B (Fig. 1) sixteen inches diameter and one and one-half inches thick, each having a groove of one quarter of an exact circle turned in its edge and placed at right angles with each other, forming when brought in contact an exact circle or hole, as shown in Fig. 2; B B B B the rollers; H the circle or hole formed by their junction. These rollers are hung on journals or shafts and secured to their place by six pedestals C C C C C C, Figs. 1 and 2,) strongly bolted to the bed plate A and all geared together by gear wheels D D, (Figs. 1 and 2,) being two spur wheels which connect two of the rollers and E E E E, (Fig. 2,) four bevel gear wheels which connect them with the other two, so that when set in motion they all revolve together and with equal motion. The bevel cog wheels may be omitted and the edges of the wheels previously beveled be brought in contact so that they shall be caused to turn together by friction instead of cogs. Immediately under the rollers we make a hole through the bed plate of sufficient size to let the lead pipe pass through freely. Upon each corner we place four standards E E E E (Fig. 1,) about seven feet high, secured to the plate at the bottom by bolts and fastened together at the top by an iron plate F, (Fig. 1) bolted to each standard

and having a slot *g* cut out from the center to the edge of sufficient size to admit a hollow rod or mandrel.

H is a rod or mandrel suspended from the plate F (and which may be taken out or put in at pleasure,) made hollow from the top to within about four inches of the rollers and of sufficient length to reach from the plate F to the bed plate A, passing through the hole H (Fig. 2) (formed by the rollers) and leaving sufficient space between it and the rollers to make the lead of a proper thickness for pipes. Upon this mandrel we place what we denominate a blank—that is, a hollow casting of lead—and then introduce both mandrel and lead between the rollers, (the mandrel being fastened at the top to the plate F.) The rollers are then set in motion drawing the lead off the mandrel, through the rollers and passing it off through the hole in the bed plate, at the same time the rollers reduce it to its proper size and thickness for pipes. The object in making the mandrel hollow is to confine therein a quantity of oil which is emitted through small lateral holes *h* (Fig. 5) drilled into the mandrel at the bottom of its hollow to keep the mandrel and the inside of the lead oiled as the lead is drawn off.

The blanks or pipes are cast in a mold made of cast-iron A, B, (Figs. 3 and 4,) (each figure representing one half of the mold and made to fit each other) and differs from the usual mode of casting only in the plan we have adopted for casting them of a greater length and still of an equal thickness throughout, which is done in the following manner: We make our molds five feet long and bend or curve them so much that the rod C, (Figs. 3 and 4,) which is straight and forms the hole in the casting when placed in the center of the mold at each end, will touch the upper side of the mold in the center as shown in Fig. 4, at which point we drill a hole through the mold, one half of the hole being in each half of the mold. To this hole we fit a rod of iron which we call a gage D made, on the end that enters the mold sufficiently concave to fit on one side of the rod C as it lies in the mold. The gage is then pressed down upon the rod by the hand far enough to spring or bend (the rod) to its proper place in the mold as shown in Fig. 3. The molten lead is then poured into the mold, the gage pressed by the hand still holding the rod to

its place—that is, with its center in a line with the center of the curved molds—until the mold is filled up to the under side of the gage. It is then suddenly drawn back, leaving the rod which is by this time firmly fastened or held to its place by the lead that has already chilled and the lead at the same time continued to be poured in until the mold is filled. The rod and lead are then taken out—the rod drawn out of the lead or blank and replaced in the mold ready for another casting. During the process of casting, the mold is elevated at one end so as to bring it on an angle of about 45 degrees and the lead poured into the highest end through a funnel E (Figs. 3 and 4).

The object in using the gage is to regulate the variation of the rod C caused by the lower side heating before the upper, consequently expanding the lower side most and throwing it out of its place in the mold. In the old mode of casting with a straight mold and rod as soon as the hot lead came in contact with their surfaces they expanded and became convex toward each other, thus reducing the space for the lead on one side and increasing it on the other which of course caused the pipe to be cast of unequal thickness. Now by making the mold gently curved in the manner above described and bending the straight rod so as to make the space for the lead around it the same width and holding it in that position while pouring in the molten lead until it rises to the gage which is then withdrawn—as the lead becomes chilled sufficiently to hold the rod in the

center of the mold and then continuing to pour in lead until the mold be filled—the evil of unequal thickness of pipe in casting arising from the surfaces of the rod and mold next each other becoming convex and the space diminished by the expansion of the metal is prevented.

Having thus fully described our invention and the manner of working the same we would have it understood that we are aware that lead pipes have been made by placing a cast lead tube on to a mandrel and passing the same successively through two grooved rollers until the pipe is reduced to its proper thickness as in the process of making round bar iron; and this we do not claim; but

What we do claim as our invention and desire to secure by Letters Patent is—

1. The employment of four rollers in combination with the fixed mandrel in the manner and for the purpose herein described and also the making the mandrel hollow from the top to near the bottom to contain oil and provided with small holes to allow the oil to percolate and thereby prevent the lead from adhering to the iron, all as herein described.

2. And we also claim the making of the mold curved in combination with the employment of the gage for the purpose and the manner herein described.

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FREDERICK LEACH.

Witnesses:

NELSON JOHNSON,  
H. W. CAMP.