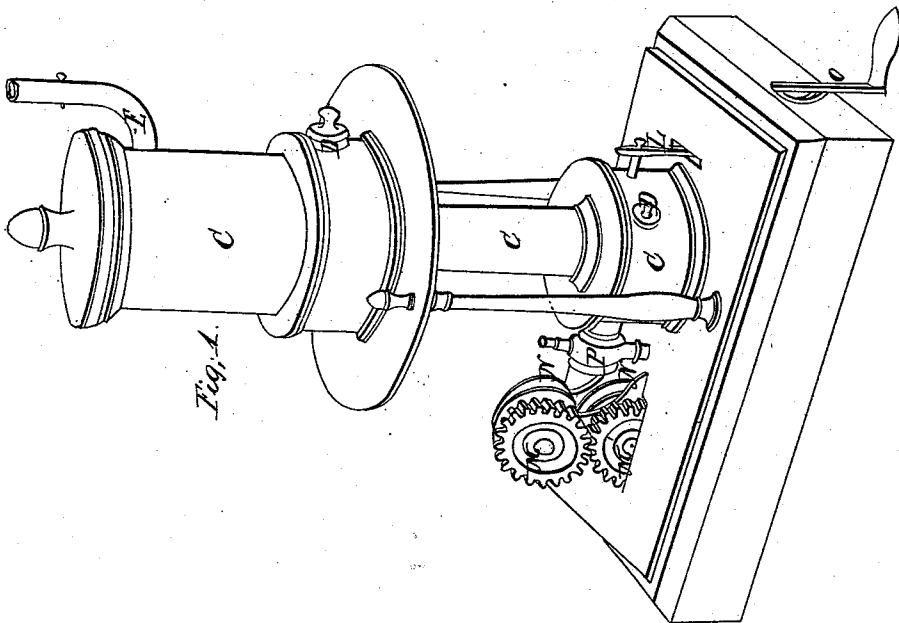
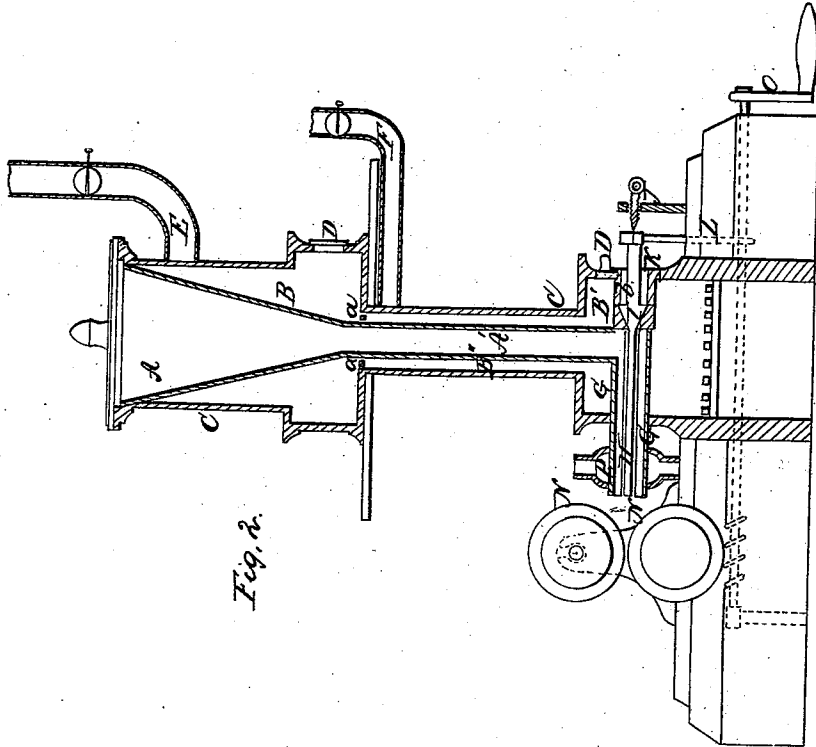


*J. Haing.*

*Casting Lead Pipe.*

*N<sup>o</sup> 3,023.*

*Patented Mar. 30, 1843.*



# UNITED STATES PATENT OFFICE.

JOHN LAING, OF BORDENTOWN, NEW JERSEY.

## MACHINE FOR MAKING PIPES OF LEAD AND OTHER SOFT METALS.

Specification of Letters Patent No. 3,023, dated March 30, 1843.

*To all whom it may concern:*

Be it known that I, JOHN LAING, of Bordentown, in the county of Burlington and State of New Jersey, have invented a new and useful Improvement in the Manner of Constructing a Machine or Apparatus for the Casting of Pipes of Lead, and other Soft Metals; and I do hereby declare that the following is a full and exact description thereof.

10 In my apparatus for casting pipe, the lead is to be melted in a suitable pot, from the lower part of which an iron tube proceeds in a horizontal direction, the internal diameter of which tube is to be the same with that of the external diameter of the pipe to be cast; and within this tube, there is to be a core of iron, of the diameter which is to be given to the bore of the pipe. On the outer end of the first named iron tube, there is to be a hollow nozzle fitted, through which cold water is to be made to run, for the purpose of cooling the pipe as it leaves the tube.

20 So far, my apparatus resembles such as has been previously essayed for the same purpose, but it has been found impossible, heretofore, to prevent the adhesion of the lead, or other soft metal, to the core, said core becoming tinned, or coated with the metal, from which the pipe is cast; in consequence whereof, the pipe adheres firmly to the core, and the process is arrested.

25 My principal improvement consists in the adoption of a plan by which the adhesion of the pipe to the core is effectually prevented, and the pipe can, consequently, be cast interruptedly, and of any length that may be desired. To effect this, I give to the core, while the pipe is being cast, a continuous, vibratory motion around its axis, by which the adhesion of the pipe to it is prevented entirely. I have also improved the manner of forming the melting pot, and of combining it with the furnace, or fire chamber, which is to contain the fuel.

30 In the accompanying drawing, Figure 1, is a perspective representation of the apparatus, or machine, and Fig. 2, a vertical section of it through the middle, from front to back.

35 A, A', is the melting pot, which I make of cast-iron; and I prefer to make it conical, in the upper part, as shown at A, with a cylindrical elongation at the lower part, as shown at A'; by this construction, I can obtain all the height that I desire in the melted column

of metal, without unnecessarily increasing its quantity, and I thus render its pressure sufficient to force out the pipe; this construction, as combined with the fire chambers, also affords an opportunity of applying the fire in a very economical and convenient manner.

40 B, B', are the fire chambers, which occupy a space formed by the shell C, C, of the apparatus, which surrounds the melting pot A, A'. The fuel may be put in through closely fitting door-ways, or stoppers, D, D. It will be seen in the sectional drawing that the fire chamber consists of two parts; an upper, B, and a lower, B', which are generally connected together by the flue space B''; from the upper chamber, proceeds a smoke pipe E; but these two chambers may be separated from each other by a partition at a, a, and an additional smoke pipe pass up from the flue space B''; of the lower compartment, as at F. By either of these arrangements, I am enabled to command and regulate the heat, both in the part where the melting is to be effected, and in that whence it is to flow into the forming tube, G, into which the metal flows from the melting pot.

45 H, is the core which occupies the center of the forming tube G; this core is made slightly conical, to allow for the shrinkage of the metal as it cools around it; at its rear end there is a conical frustum I, which is ground so as to fit into a block of metal b, connected with the forming tube H; and this conical part may be kept in place by a back-center, as at J. A part of the shaft of the core projects through the back of the lower fire chamber, as shown at K, and has attached to it a vibrating rod L, the lower end of which is moved back and forth by an eccentric, or crank motion, so as to rotate the crank backward and forward to a short distance; this I effect by means of a shaft, which serves, also, to turn two delivering rollers that embrace the pipe as it leaves the forming tube.

50 In the perspective view, Fig. 1, M, M', are two toothed wheels which carry the delivering rollers N, N, on their axes; these rollers are hollowed, or fluted, on their peripheries, so as to adapt them to the pipe which is to pass between them. The uppermost of these rollers may be weighted to any requisite amount. Such delivering rollers have been previously used in some analogous machines.

O, is a winch that turns a shaft having on it an endless screw that takes into the toothed wheel M', and upon this shaft is the eccentric, or other similar device that vibrates the rod, and, consequently, the core H. The delivery tube, G, I surround at its outer end by a hollow nozzle, P, through which cold water is to be made to pass during the casting of the pipe; there may be two, or more, such nozzles for larger pipe, should this be found useful. The shaft which turns the delivering rollers, and also vibrates the piston, is shown in red lines in Fig. 2, but not exactly in place, as it does not occupy a place under the center of the machine.

Having thus, fully described the manner in which I, in general, construct and arrange the respective parts of my apparatus, I will here observe that the melting pot, and the fire chambers, may be differently formed, and managed, while my main improvement, that of vibrating the core, may still be retained; these two parts being in their nature distinct from each other; but having essayed various modes of constructing and arranging the melting pot, and of combining it with the fire chambers, I have found that which I have herein described the most convenient and effective. I therefore claim

as my invention, and desire to secure by Letters-Patent—

1. The above described manner of constructing the furnace part of my apparatus in combination with the melting pot and the delivering tube; there being two fire chambers, the uppermost of which serves, mainly, to fuse the metal in the melting pot, while the lowermost serves to regulate the heat of the metal as it flows into the tube G; the melting pot, also, being formed and arranged substantially in the manner herein set forth, and represented in the accompanying drawings.

2. I also claim the manner of preventing the adhesion of the pipe to the core by causing said core to have a continuous, vibratory motion around its axis, as herein made known; and this I claim irrespective of the particular manner of constructing and arranging the other parts of the apparatus, as it may be used in any machine in which the pipe is formed by the flowing of the metal through a tube, furnished with a core, which is to determine the interior, or bore, of the pipe.

JOHN LAING.

Witnesses:

THOS. P. JONES,  
JOHN HITZ.