

N. Buttrick, Jr.

Making Lead Pipe.

N^o 14, 259.

Patented Nov. 8, 1845.

Fig. 2.

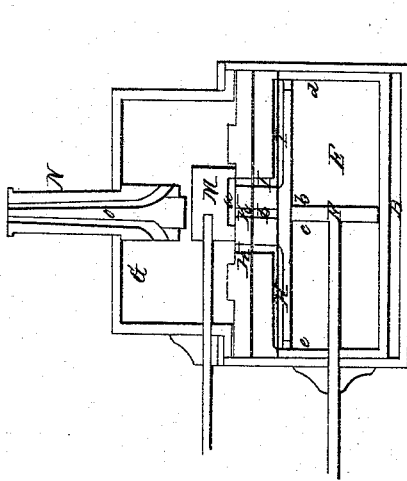


Fig. 3.

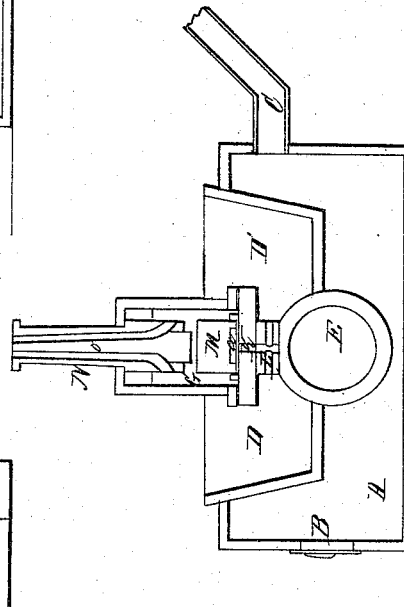
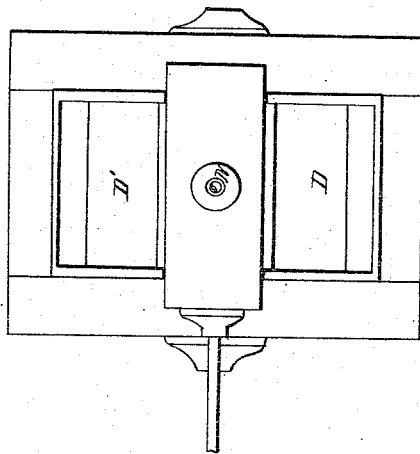


Fig. 1.



UNITED STATES PATENT OFFICE.

NATHAN BUTTRICK, JR., OF CHELMSFORD, MASSACHUSETTS.

MACHINERY FOR MAKING LEAD PIPE.

Specification of Letters Patent No. 4,259, dated November 8, 1845.

To all whom it may concern:

Be it known that I, NATHAN BUTTRICK, Jr., of Chelmsford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Apparatus or Machinery for the Manufacture of Lead or Metallic Pipe; and I do hereby declare that the nature of my invention and the manner in which it operates are fully described and represented in the following description and accompanying drawings, which, taken together, compose my specification.

Figure 1, of the drawings aforementioned, denotes a top view of my improved machinery. Fig. 2, is a vertical, central and longitudinal section of it, and Fig. 3, is a vertical, central and transverse section of the same.

In the several drawings, A denotes a furnace which is supplied with fuel through a door or opening B, or by any other suitable means. The said furnace has a flue C for the discharge of the smoke. Across the furnace from side to side and within the fire space or over it, I arrange the cylinder E, of a hollow double force pump, as seen in the drawings, the said cylinder having a piston F suitably adapted to it, in such manner as to be capable of moving from one end of it toward the other end of it, the rod of the said piston, playing through a stuffing box, applied upon one of the cylinder heads. On each side of the cylinder, and partially within the furnace, I arrange one of two melting cisterns or kettles D D', and with respect to the cylinder and furnace, as seen in the drawings, and over the cylinder, and partially or wholly within the melting cisterns, (or cistern when conjoined) I place an air fountain or chamber G. The said air chamber is connected with the extreme ends of the force pump, by two valve passages H, I, which depart from the bottom of the air chamber, on opposite side of, and near to a vertical passage K, bored or formed downward, into the central part of the bottom plate of the air chamber, and terminating and opening into a horizontal passage L, which opens into each of the melting cisterns, as seen in Fig. 3. Each of the passages H, I, is extended downward, and toward and opens into the cylinder of the force pump, as seen in Fig. 2. A slide valve M, (consisting of a block of metal, having a rectangular chamber *a*, made in it, and

which is open at bottom, as seen in the drawings) is arranged upon the bottom of the air chamber, and so as to work or slide over the upper ends of the passages H, I, K, and, when drawn back to its farthest extent, to only cover the passages H, K, and when forced forward to its greatest extent, in an opposite direction to only cover the passages K, I. The action and arrangement of the said slide valve, with respect to the piston, should be such, that when the latter is being moved in any direction, either backward or forward, the valve shall open a communication between the central passage K, or the melting kettles and one of the parts of the cylinder on each side of the piston, and at the same time open a communication between the air chamber, and that part of the cylinder, which is on the opposite side of the piston. Thus, when the piston F is moved backward, the molten lead or metal, in the melting kettles, will rush through the passages L and K, thence into the space or chamber *a*, of the slide valve, thence through the valve passage I, and into the cylinder, or that part of it, situated between the end *d*, of it, and the end *b* of the piston. On reversing the motion of the piston, the slide valve is moved, so as to overlap the passages H and K, only. The forward movement of the piston, will next expel the melted metal, before drawn into the cylinder, and cause it to rush upward, through the passage I, and into the chamber G. While this is being effected, melted metal has passed from the kettles, through the passage H, and into that part of the cylinder, which is between its end *e*, and the side *c* of the piston, which (metal) in its turn, will be expelled or driven out therefrom, and into the air chamber G, at the next or back movement of the piston. A discharge pipe N, having a core O within it, is inserted in, or through the top of the air chamber G, and extends downward within the same, so as nearly to touch the top of the slide valve. Consequently, as the molten metal is thrown into the air chamber, it will rise above the bottom of the exit pipe N, until the condensation of the air, is sufficient to cause it to rush up through the said exit pipe, and in a steady stream, out of its mouth or upper end. As it escapes therefrom, it cools in the form of a pipe or tube.

By the employment of the double force pump and air chamber, in connection with

the melting pots, I am enabled to regulate the discharge of the lead, and by the spring or counteraction of the air, (in the air chamber) upon the metal, cause it to be delivered
5 under a uniform pressure, and without any air bubbles in it, to create cavities or holes in the pipe, as, whatever air may be forced out of the cylinder, with the lead, immediately escapes into the air chamber, and thus
10 leaves the lead or metal, before it is forced through the tube former or exit pipe. By the employment of a force pump, and air chamber, I thus obtain several very important advantages over the lead pipe machines,
15 as heretofore used. For by them, I am enabled to expel the lead or metal, not only under a regular and steady pressure, but to separate the air from it, before it reaches the exit pipe or tube former. In other machines, the cylinder has been filled by hand,
20 previous to the plunger or piston being driven down. This not only gives the metal time to cool, to a considerable extent, but impregnates it, more or less with air, which
25 is expelled or driven through the tube former, with the metal. The tube former also becomes filled with strips of congealed metal, after each operation, which (strips) have to be removed before the lead pipe can
30 be made. In my improved machine, the fire of the furnace acts both upon the cylinder, and melting pots, and thus enables me to readily melt down any lead, which may
35 happen to be therein, thereby saving much time that would be consumed in putting a common machine in working order.

By my machine, I can make a pipe of any desirable length, while there is metal in the
40 melting pot, whereas, by other machines, the length of the pipe is limited to the quantity of metal, put into, or contained in the

cylinders thereof, alone. So long as there may be metal in the melting kettle of my machine, the process of forming, or making
the pipe, may be carried on. The expulsion 45 of the metal, under the uniform pressure, resulting from the spring of the air, prevents any of that inequality in the strength of different parts of the pipe, which so commonly results from making pipes, by machines as heretofore used. 50

Having thus described my invention, I shall claim—

1. The above described peculiar manner, in which I arrange the cylinder E, with respect to one or two melting cisterns D, D' 55 and the furnace A, whereby the said cylinder is heated wholly or partially by the fire of the furnace, and receives its supply of lead as above specified. 60

2. I also claim the combination of the air chamber G, with the forcing cylinder E, and the pipe former, in the manner and for the purpose or objects as above specified.

3. I also claim the arrangement of the air 65 chamber within, or partially within the melting cistern or cisterns, for the purpose of melting any lead, which, at any time, may congeal, or may have congealed within the said air chamber, the said lead being rendered fluid, by means of heat proceeding 70 from the molten lead of the kettles, and passing through the sides (or a portion thereof) of the air chamber.

In witness whereof, I have hereto set my 75 signature, this, nineteenth day of July, A. D. 1845.

NATHAN BUTTRICK, Jr.

Witnesses:

JOEL Fox,

EDWN J. Fox.