(No Model.)

H. B. COBB.

LEAD PRESS.

No. 408,375. Patented Aug. 6, 1889.

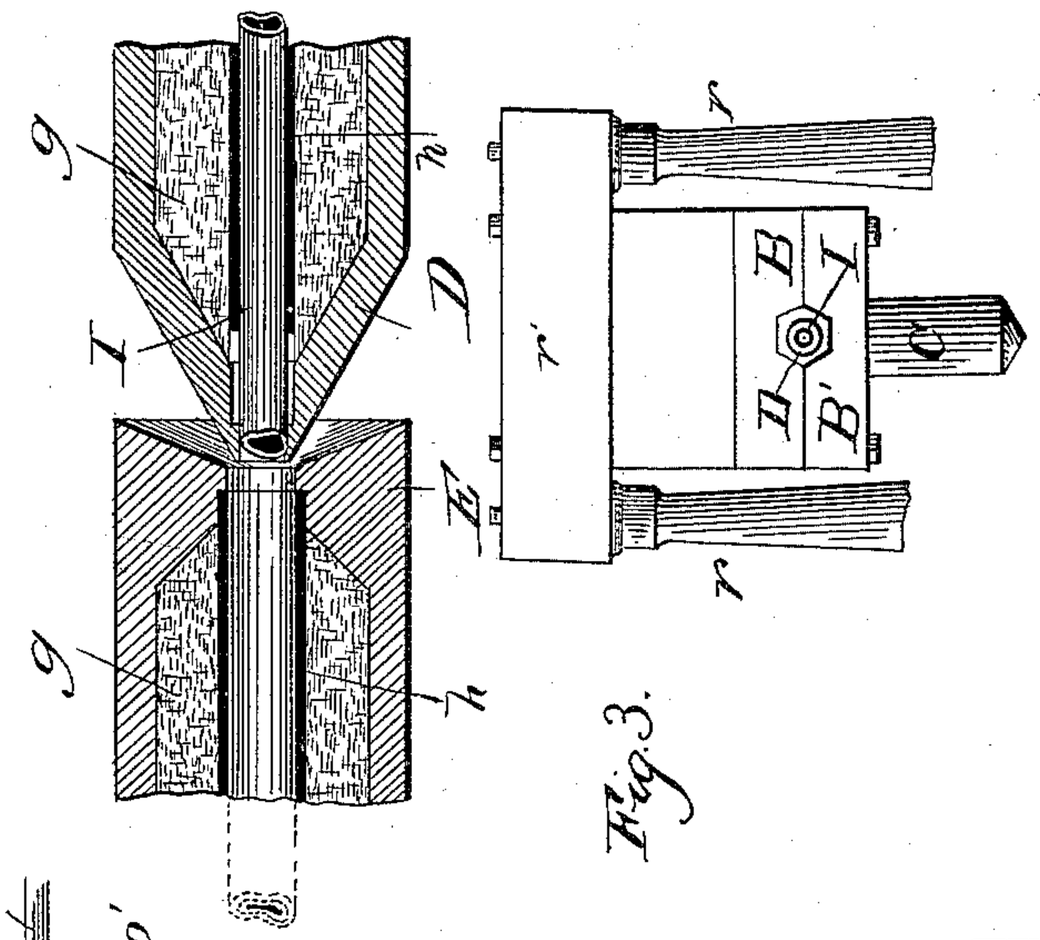

Fig. 3.

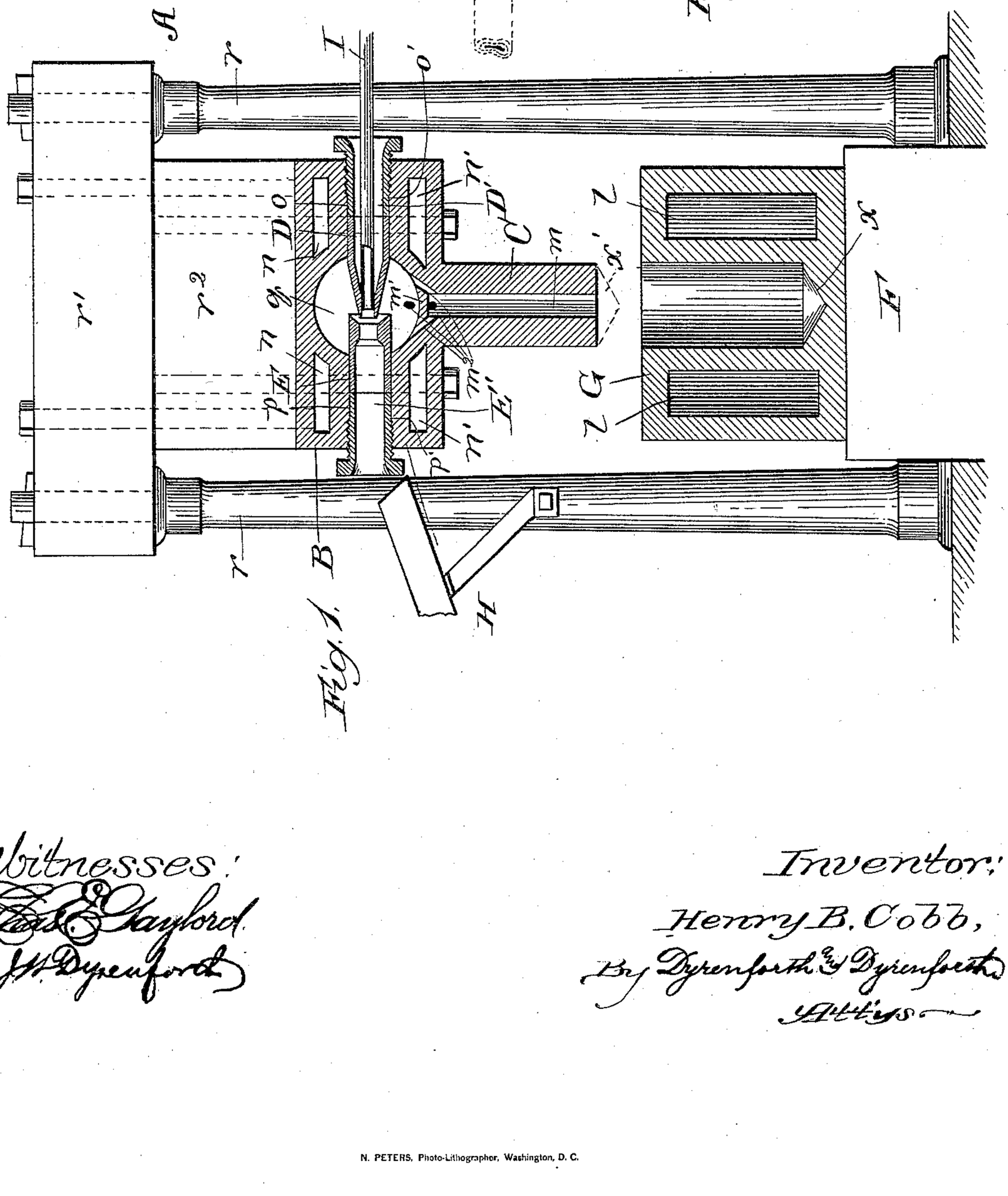

Fig. 1.

Witnesses:
Chas. E. Gaylord.
J. H. Dyrenforth

Inventor:
Henry B. Cobb,
By Dyrenforth & Dyrenforth.
Attys.

UNITED STATES PATENT OFFICE.

HENRY B. COBB, OF WILMINGTON, DELAWARE.

LEAD-PRESS.

SPECIFICATION forming part of Letters Patent No. 408,375, dated August 6, 1889.

Application filed October 5, 1888. Serial No. 287,270. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. COBB, a citizen of the United States, residing at Wilmington, in the county of New Castle and State of Delaware, have invented a new and useful Improvement in Lead-Presses, of which the following is a specification.

My invention relates to an improvement in the class of devices commonly employed to make tubing, particularly from molten lead, and involving as general features a massive frame supporting a stationary plunger, and a reciprocating ram below the plunger and carrying, to reciprocate with it, a mold comprising a core-tube, and a die-tube transverse to the plunger and lead-cylinder and leading into a chamber and surmounted by a lead-cylinder communicating with the mold, and in vertical line with the plunger, whereby when the ram is forced upward it presses the contents of the lead-cylinder against the plunger, which thus enters the cylinder and forces the lead laterally through the mold, thereby forming it into tubing, which emerges from the machine at a right angle to the latter.

The immediate object of my invention is to improve a machine involving the general construction above set forth in a manner to adapt it particularly to coat with metal any length (up to many hundreds of feet, if desired) of tubing composed of plastic or incompact material, such as soft rubber.

In order to render the machine suitable for my purpose the mold should be stationary, since the tubing to be coated being incompact, like soft putty, if the mold were reciprocating in feeding the tubing the latter would be liable to break. Other changes besides are desirable particularly to adapt the said machine to my purpose, and will be definitely pointed out in the description and claims hereinafter contained.

In the accompanying drawings, Figure 1 shows a lead-press in sectional elevation. Fig. 2 is a broken sectional view of a modified construction of the die detail, and Fig. 3 is a broken end view showing the upper part of the lead-press.

A is the lead-press, having metal columns r, supported on a suitable base (not shown) and surmounted by a metal block r'. Below the block r' and secured to or integral with it is a head r^2.

B is a metal block having a chamber q in one side and semi-cylindrical channels p and o in the same side and leading from opposite directions into the chamber q, and around the chamber q is formed in the block B the usual horizontal chamber n for steam.

B′ is another block having a chamber q' in one side and semi-cylindrical channels p' and o', leading from opposite directions and, like the channels p and o, from the outer lateral sides of the block into the chamber q', and the usual steam-chamber n' is provided around the chamber q'. A hollow plunger C extends from the side of the block B′ opposite that in which the chamber q' is provided, the passage m in the plunger being preferably cylindrical and extending through it into the said chamber. The parts B and B′ are secured to the under side of the head r^2 and to each other in a manner to cause the chambers q and q' and the channels $p\ p'$ and $o\ o'$ to coincide, as shown. The upper end of the passage m in the plunger is covered by a bridge m', (which may be cast integral with the block B′,) having openings m^2, preferably four in number and equidistant apart, between the edge of the bridge and edge of the mouth of the passage m, the openings affording communication between the plunger-passage and chamber $q\ q'$.

D is a core-tube tapering toward one end to the extremity thereof on its outer side and tapering on the inside part way only toward the end and cylindrical the rest of the way, as shown.

E is a die-tube, preferably concave at one end, as shown, and having a bore resembling that in the tube D. The tubes D and E are inserted into the passage afforded by the coincident channels $o\ o'$ and $p\ p'$, respectively, from opposite ends thereof, and meet at their respective tapering and concave extremities near the center of the chamber $q\ q'$, the tube D thus entering the concave end of the tube E and the bores in both tubes coinciding. The tubes are not sufficiently long to extend to the outer extremities of the passages provided to receive them, thereby leaving sufficient space behind each (and which is thread-

ed, as shown) to receive hollow externally-threaded plugs D′ and E′, which should flare, as shown, at their outer ends.

F is a ram, of ordinary construction in machines of the class to which my improvement relates, and operated, preferably, by hydraulic pressure, (to effect which operation the means are not, however, shown, inasmuch as they involve no feature of novelty and are common for the purpose;) and G is the lead-cylinder, the inside bottom *x* of which should be synclinal, and in the wall of the cylinder is the usual circumferential passage *l* for steam. The cylinder G is supported on the vertically-reciprocating ram F in a position wherein the plunger C coincides with the chamber portion thereof.

To operate the machine, a charge of molten lead (this being the substance I employ, though of course the operation remains the same whatever be the substance, so long as the latter be suitable for the purpose) is introduced into the cylinder G and allowed to set for a few minutes, when the ram is actuated to raise the lead-cylinder and cause the plunger C to enter it. As the plunger (which fits snugly into the lead-cylinder) comes into contact with the surface of molten lead, the air on the surface of the latter will have been forced out through the passage *m*. The pressure of the plunger against the lead in the cylinder G forces the lead into the chamber *q q′*, and thence laterally around the tapering end of the tube D into the tube E, thereby forming it into tubing, in which form it emerges from the machine at the plug E′, when it is led into a trough H, through which cold water is caused to flow, and thus cooled to permit it to be handled for coiling it upon a suitable reel. (Not shown.) Soon after the metal has been started around the cylindrical end of the tube D, I insert an end and feed a length of plastic tubing I (through which water or other suitable fluid is running, as described in my application for Letters Patent, Serial No. 287,269, filed concurrently herewith) through the tube D′ D into the tube E, whereby it becomes coated with the lead as the latter is formed into tubing, and the pressure of the lead forces the coated plastic tubing out of the machine, as described. When the charge of lead in the cylinder is exhausted in the operation, as described, the cylinder requires replenishing to enable the operation to be repeated or continued, the former when the charge has been just sufficient to coat the length of tubing to be incased, and the latter when the charge is insufficient to coat the entire length, which may be so great as to produce repeated emptying of the lead-cylinder, and consequently require repeated replenishing thereof. When the plunger C reaches nearly to the bottom of the cylinder G, it compresses the remnant of the contents of the cylinder into the form of the bottom of the latter against the end of the plunger, as shown by the dotted lines at *x′*, and when the cylinder is lowered, inasmuch as the mass *x′* not only sticks to the plunger, but is held by the core in the passage *m*, the cylinder is entirely depleted of its contents by withdrawing from the plunger, and when, after replenishing the cylinder, it is again raised for another operation, or to continue the operation, the plunger forces out laterally, owing to its form, all air in the cylinder above the lead, and thus prevents any air from becoming mixed with the molten metal, which would tend to produce flaws in the tubing.

If the plastic tubing I be passed through the machine without stoppage, there is no danger of its being burned by the heat of the metal brought into contact with it, even if it contain no water or other cooling medium, (the purpose of introducing water through the plastic tubing being set forth in my aforesaid concurrent application for a method of incasing tubing composed of plastic material.) If stopped, however, the external surface of the plastic tubing through which water is passing, as aforesaid, may become injured by the heat to which it would be subjected during the period of stoppage in the chamber *q q′*. To guard against injury from this cause, I construct the tubes D and E as shown in Fig. 2, and a description of which construction is as follows:

Each tube D and E has its bore enlarged, and contains centrally a metal (preferably brass) tube *h*, around which is packed magnesia *g*, or other material non-conductive of heat. The inner end of each tube *h* enters a socket, as shown, in the forward inner end of its respective inclosing-tube D and E, and may be withdrawn therefrom by sliding it slightly backward, if desired, when a stoppage of the feed of the plastic tubing is made, in order to withdraw it entirely into the non-conducting material and thus reduce the exposure of its end to the influence of the heat in the chamber *q q′*, through which end, if thus exposed, the heat would be the more readily conducted to the plastic tubing.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a lead-press, the combination of a reciprocating lead-cylinder, a stationary hollow plunger in line with and above the lead-cylinder, and a stationary mold above the plunger and communicating therewith, substantially as described.

2. In a lead-press, the combination of a reciprocating lead-cylinder having a synclinal bottom, a stationary hollow plunger in line with and above the lead-cylinder, and a stationary mold above the plunger and communicating therewith, substantially as described.

3. In a lead-press, the combination of a reciprocating lead-cylinder G, a stationary hollow plunger C in line with and above the lead-cylinder, a stationary chamber *q q′* above the hollow plunger and communicating therewith, tubes D and E, leading horizontally into

the sides of the said chamber and coinciding at their bores near the center thereof, the tube D extending into the adjacent end of the tube E, and a bridge m' in the chamber $q\ q'$ over the opening in the plunger, substantially as described.

4. In a lead-press, the combination of a reciprocating lead-cylinder G, a stationary hollow plunger C in line with and above the lead-cylinder, a stationary chamber $q\ q'$ above the hollow plunger and communicating therewith, tubes D and E, containing each a tube h, surrounded by material g non-conductive of heat and leading horizontally into the sides of the said chamber and coinciding at their bores near the center thereof, the tube D extending into the adjacent feed of the tube E, and a bridge m' in the chamber $q\ q'$ over the opening in the plunger, substantially as described.

5. In a lead-press, the combination of a reciprocating lead-cylinder G, having a synclinal bottom, a stationary hollow plunger C in line with and above the lead-cylinder, a stationary chamber $q\ q'$ above the hollow plunger and communicating therewith, tubes D and E, containing each a tube h, surrounded by material g non-conductive of heat and leading horizontally into the sides of the said chamber and coinciding at their bores near the center thereof, the tube D extending into the adjacent end of the tube E, and a bridge m' in the chamber $q\ q'$ over the opening in the plunger, substantially as described.

HENRY B. COBB.

In presence of—
M. J. BOWERS,
J. W. DYRENFORTH.