(No Model.)

J. ROBERTSON.

HYDRAULIC LEAD PRESS.

No. 346,563. Patented Aug. 3, 1886.

Fig. 1.

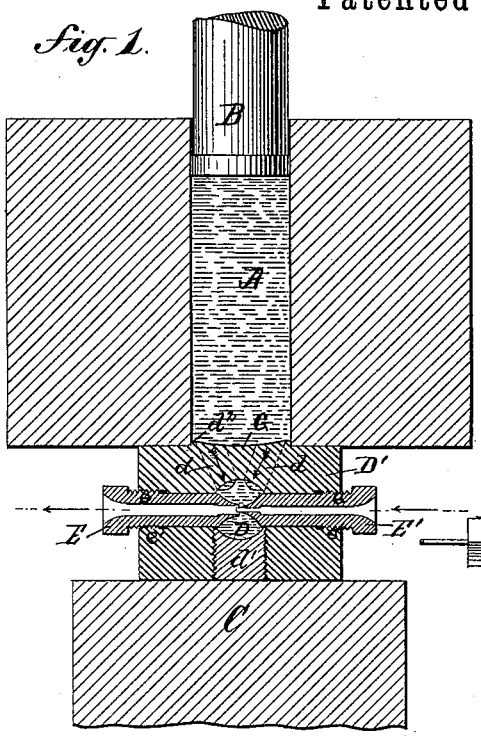


Fig. 3.

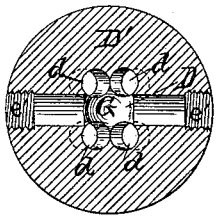


Fig. 2.

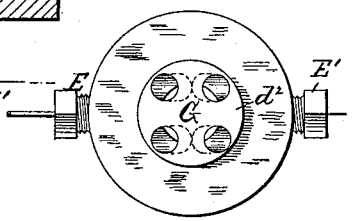
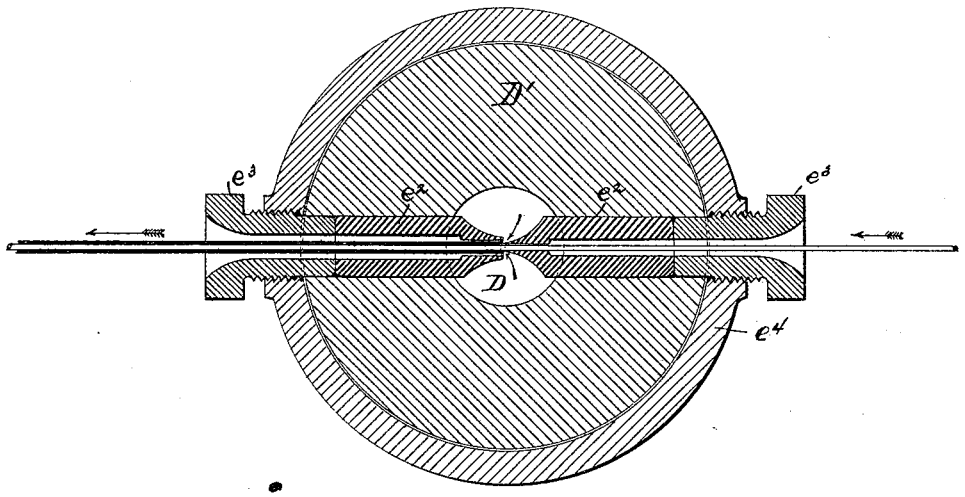


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN ROBERTSON, OF BROOKLYN, NEW YORK.

HYDRAULIC LEAD-PRESS.

SPECIFICATION forming part of Letters Patent No. 346,563, dated August 3, 1886.

Application filed November 16, 1885. Serial No. 182,921. (No model.)

To all whom it may concern:

Be it known that I, JOHN ROBERTSON, of Brooklyn, county of Kings, State of New York, and a citizen of the United States, have invented an Improved Hydraulic Lead-Press, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a hydraulic press for coating wire with lead or other analogous material, and for making lead pipe, and similar uses; and my invention consists in the combination of devices hereinafter described and claimed.

Figure 1 is a vertical section of those parts of a hydraulic lead-press known as the "lead-holding cylinder" and its plunger and the upper end of the ram, together with the chamber in which are the die and core-tube, and which contains my invention. Fig. 2 is a plan of the chamber containing my invention. Fig. 3 is a cross-section of the same, giving a plan looking toward the side adjacent to the lead-cylinder, and showing the passages leading from said cylinder to the chamber, and also the peculiar "bridge" I employ intermediate said cylinder and chamber. Fig. 4 is a cross-section, enlarged, of the block in which the "coating-chamber" is formed, and showing some details of my invention.

A is the lead-holding cylinder, which is to contain the lead to be pressed through a die around the wire to be coated. B is a plunger working in said cylinder. C is the ram.

The hydraulic cylinder is not shown, nor the cross-head to which the plunger B in these presses is usually fixed, which cross-head is generally connected by bolt-rods to the hydraulic cylinder. These parts and their arrangement are so well known that it is not deemed necessary to show them.

D is a chamber, which I call the "coating-chamber." This chamber is preferably spherical, and there is communication to it from the lead-cylinder through passages *d*, which will be presently described. This chamber is preferably located vertically below the lead-cylinder, and arranged, as shown, intermediate the ram and said cylinder. In constructing this chamber and its passages it is best to form it in a metal block which is distinct and separate from the lead-cylinder, as shown, and which may thereafter be secured to the lead-cylinder by bolts or in any well-known manner. This chamber D may be conveniently formed by first boring the block from the under side upward to about the median line, the diameter of such bore being substantially the desired diameter of the chamber, then by forming one half or the upper part of the spherical wall of the chamber at the bottom of the recess thus constituted, and then closing the bore with a plug, *d'*, the inward end or face of which is fashioned to form the other half or part of the spherical chamber.

The block in which the chamber D is formed is bored transversely to constitute seats for the die E and core-tube E', respectively, on diametrically-opposite sides of the chamber D. The die and core-tube fit into these seats, and may be held therein by a thread, *e*, cut on each fitting into a thread, *e'*, cut on the interior wall of the seats, as shown.

I find it desirable that the diameter of the chamber D should be such that when the die and core-tube are seated and properly adjusted to each other, as shown, only the noses, or but a fractional part of said die and tube, are exposed in the chamber, the main portion of the entire length of said die and tube lying in and being sustained by their said seats in the block.

I find it preferable to make the die and core-tube each in two parts, e^2 and e^3, as shown in Fig. 4, the parts e^2 of each constituting the opposed operative ends and resting in the seats in the block, while the parts e^3 project into these seats and abut against the rearward ends of the parts e^2 and extend beyond the wall of the block, and there have each a screw-threaded seat in the block, as shown in Figs. 1 and 3. A ring or band, e^4, may be employed to encircle the block, and when used the die and core-tube may be screw-seated therein, as shown in Fig. 4.

Communication is had between the lead-cylinder and the chamber D by the passages *d*. These passages are two or more in number, and I find it preferable to employ four, as shown in the drawings. These passages are cut through the wall or block between the cylinder and the chamber, so that their mouths in said chamber open upon either side of the

opposed die and core-tube, thus leaving that portion of the said wall or block immediately over the line of the said die and tube intact, as shown at G. This portion G thus constitutes a bridge between the cylinder and the chamber D in line with the opposed die and core-tube. As the chamber D is, as has been stated, of preferably less diameter than the lead-cylinder, the passages *d* are desirably arranged to converge somewhat from their cylinder-mouths to their chamber-mouths.

In the operation of my apparatus the lead pressed into the chamber D from the cylinder is prevented from descending and impinging directly upon the die and core-tube by the bridge G, the lead entering the chamber by the passages on each side of said die and tube. When the chamber is filled, the pressure from all sides toward the center will be substantially equal, and thus the lead will be forced into the die and around the wire from the core with the same pressure at all points on the circumference of the wire, and the coating thereby given the wire will be of uniform thickness throughout. The liability of the core-tube and die to be fractured or clogged by an unequal pressure on opposite sides is wholly avoided in my apparatus. I prefer to form an annular shoulder on the upper face of the block, as shown at d^2, of the same diameter as the cylinder, substantially, and adapted to fit snugly into the bottom of the cylinder. When thus formed, this block D′ may be thus simply seated between the cylinder and the ram, and will need no other fastening to hold it in place in this position. I find it advantageous to have the chamber D in this separate block D′, as the block may be the more readily kept comparatively cool, and the passage for wire through the coating-chamber may be short, the wire being concealed in the apparatus during operation for only a short distance.

It is obvious that by means of my described parts the wire to be coated may be passed through the die and core-tube at right angles to the lead-cylinder, which is very desirable in lead-presses of this description.

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

1. In a lead-press, the combination, with the lead-cylinder, of a coating-chamber, in the walls of which are seated a diametrically-opposed die and core-tube, together with a passage or passages leading from said cylinder and opening into said chamber on each side of said die and core-tube, and a bridge or partition intermediate the cylinder and the chamber, and in line above the opposed ends of the said die and core-tube, as and for the purpose specified.

2. In a lead-press, the combination, with the lead-cylinder, of a spherical coating-chamber, in the walls of which are seated, diametrically opposed to each other, the die and core-tube, the bridge or partition between said cylinder and chamber extending in line above the opposed ends of said die and core-tube, together with passages leading from said cylinder to said chamber, and opening (one or more) into said chamber on each side of said die and core, as and for the purpose specified.

3. In a lead-press, the combination, with the lead-cylinder, of a spherical coating-chamber, in the walls of which, and diametrically opposed, are seated the die and core-tube, with the bodies thereof resting wholly in said seats, and the noses thereof only projected into said chamber, together with a bridge intermediate the said cylinder and chamber in line above the opposed ends of the said die and core-tube, and passages (one or more) leading from said cylinder into said chamber, and opening therein on each side of said die and core-tube, as and for the purpose set forth.

4. In a lead-press, the combination, with the lead-cylinder, of a distinct and separate metal block intermediate the cylinder and the ram, in which is formed the coating-chamber, together with a bridge intermediate said cylinder and chamber, and in line above the die and core-tube, which are seated, diametrically opposed, in the walls of said chamber, and passages (one or more) leading from said cylinder and opening into said chamber on each side of said die and core-tube, as and for the purpose specified.

5. The metal block D′, in which is formed the chamber D, and having diametrically-opposite recesses or bores, in which are seated, respectively, the die E and core-tube E′ together with the bridge G and the channels *d*, leading from within the circle of the shoulder d^2 to and opening (one or more) into said chamber on each side of said die and core-tube, whereby when said block is arranged intermediate the lead-cylinder and ram of a lead-press, as described, the chamber therein will operate as a coating-chamber, as specified.

6. In a lead-press, the metal block D′ intermediate the lead-cylinder and ram, and in which the chamber D is formed, bridge G, and channels *d*, as described, together with the die E and core-tube E′, each constituted of the two parts e^2 and e^3 and the band or collar e^4, all constructed and arranged as and for the purpose specified.

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