

(No Model.)

J. ROBERTSON.
HYDRAULIC LEAD PRESS.

No. 327,317.

Patented Sept. 29, 1885.

Fig. 1.

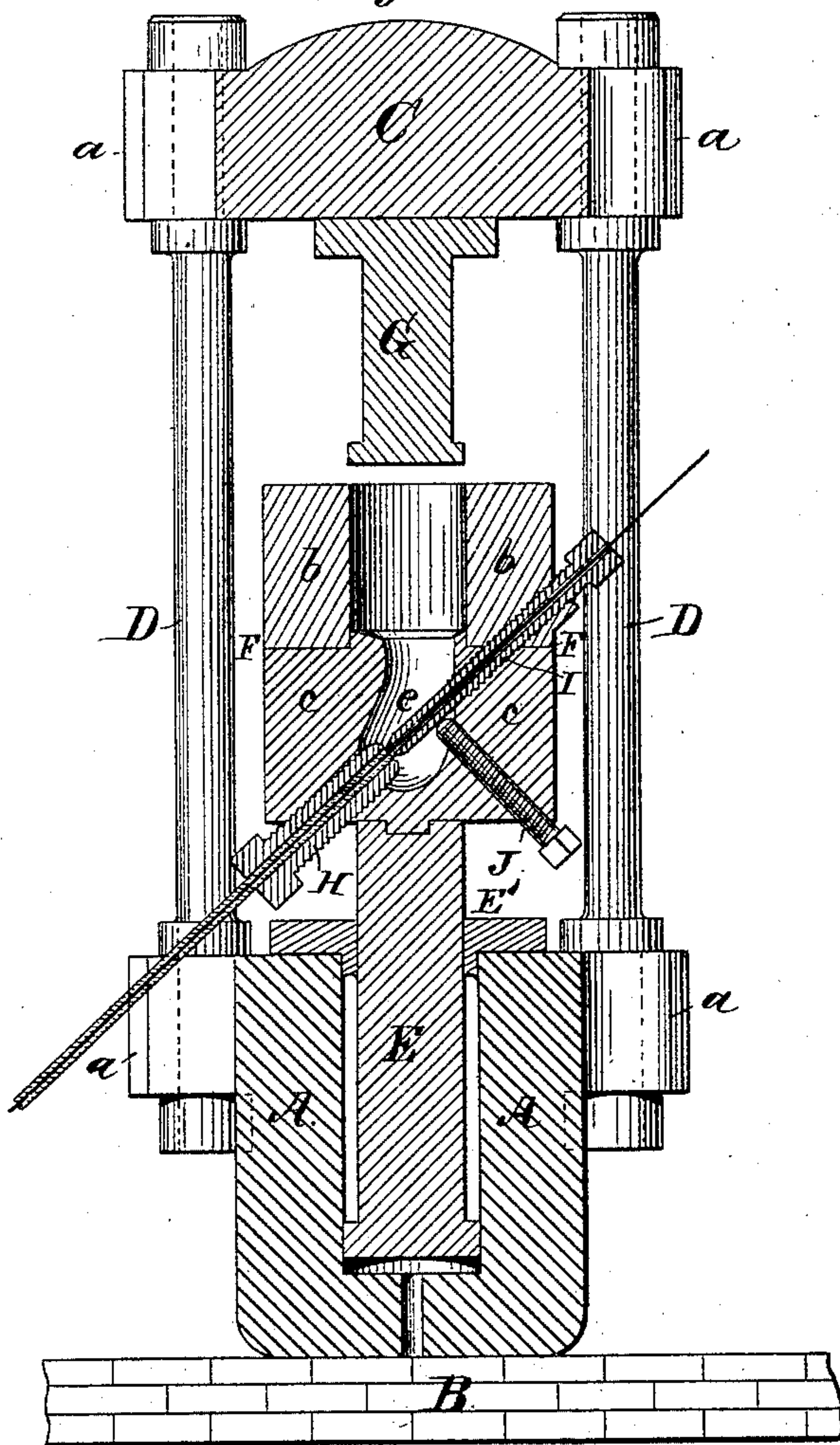
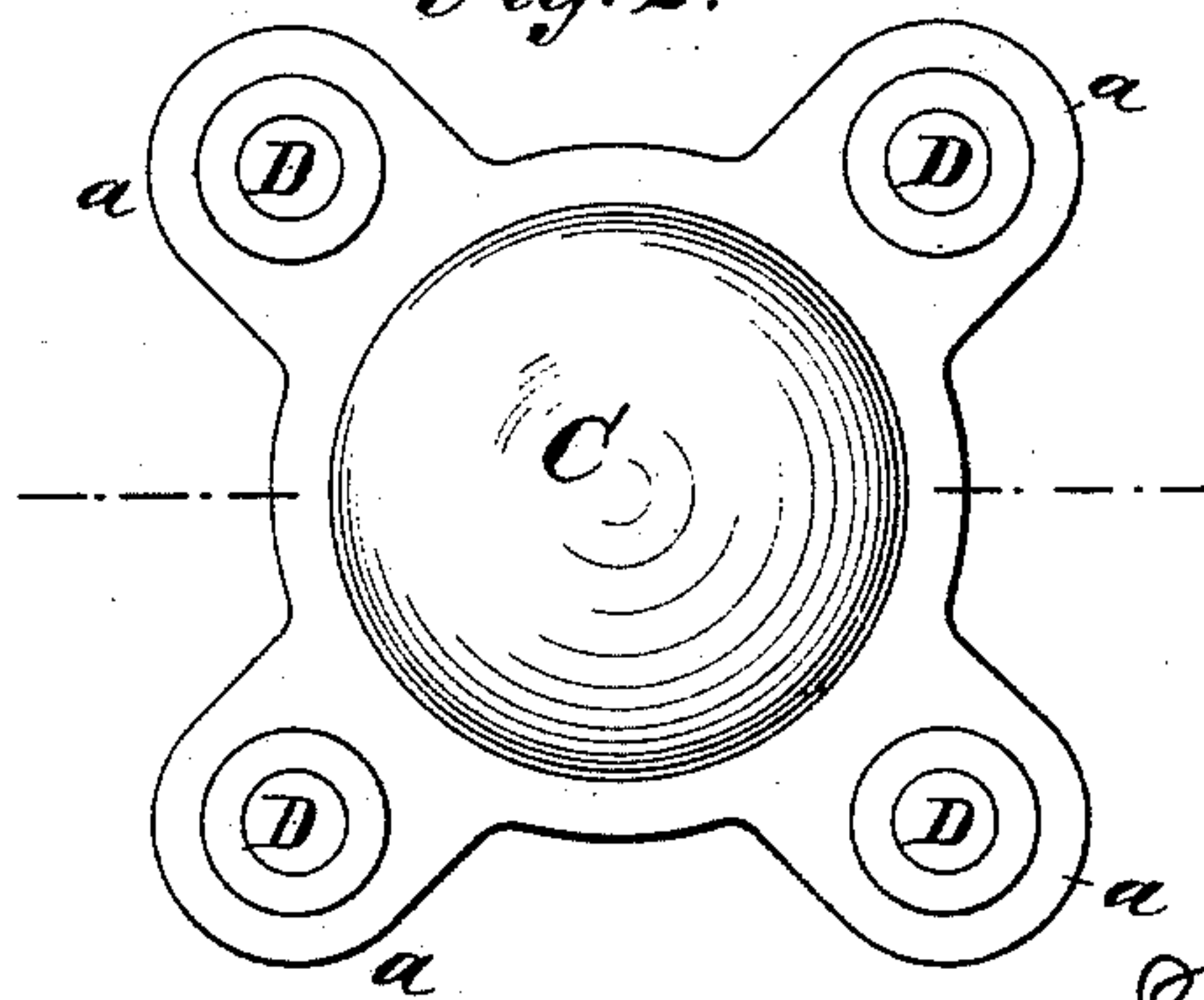


Fig. 2.



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JOHN ROBERTSON, OF BROOKLYN, NEW YORK.

HYDRAULIC LEAD-PRESS.

SPECIFICATION forming part of Letters Patent No. 327,317, dated September 29, 1885.

Application filed October 8, 1884. (No model.)

To all whom it may concern:

Be it known, that I, JOHN ROBERTSON, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Hydraulic Lead-Presses, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same, in which—

Figure 1 is a vertical section of a hydraulic press containing my invention, and Fig. 2 is a plan or top view of the same.

This invention relates to presses designed to make lead pipe or cover wire with a sheathing of lead or other plastic metal or material, such as gums or compounds of gums and resinous substances; and it consists in the combination of devices herein described and claimed.

A represents the cylinder of a hydraulic press resting on a suitable bed or foundation, B. The cylinder is bolted or tied rigidly to a cross-head, C, by means of rods or posts D, which pass through lugs or projections *a*, formed on the said cylinder and cross-head, the extremities of the rods being screw-threaded and provided with nuts, which screw the said lugs rigidly against shoulders on the rods, as represented in Fig. 1.

E' is an ordinary stuffing-box, which may be secured in place in any suitable manner. The ram is to be operated by the means usually employed in hydraulic presses.

E is the ram, fitted to work in said cylinder. Upon the top of the ram is mounted the cylinder F, preferably made in two sections, *b* and *c*, for convenience of construction and operation. This cylinder, which I name the "lead-cylinder," is to contain the lead intended to be pressed through a die around the wire to be coated. The interior of the upper portion or section, *b*, of the said cylinder is made straight. G is a plunger, which depends from the cross-head C, and is fitted to work in the said cylinder. The interior of the lower portion or section, *c*, of the cylinder has, preferably, the form shown in Fig. 1—that is to say, it is of somewhat less diameter than the upper section, and has its axis somewhat eccentric to the axis of the section *b*—the side most nearly in line or coincident with the interior face of section *b* extending down in a right line and rounded or curved inward at the bot-

tom, while the opposite side curves or swells outward from the upper end or neck, and then inward at the bottom, thus forming a chamber, *e*, closed below with a concaved bottom and curved out of the perpendicular, so that the line of its axis is inclined at an angle to that of the upper portion, *b*, of the cylinder, for a purpose that will presently appear.

H is the die through which the lead is pressed from the cylinder F onto and around the wire in the process of coating. This die is substantially a strong tube or pipe, the bore of which at the upper end is the size of the intended wire coating. An aperture or opening is made diagonally through the body of the cylinder into the bottom of the chamber *e*. The tube H and the said aperture being provided, respectively, with male and female screw-threads, the tube is screwed firmly into the aperture, so that its inner end opens, and, preferably, projects a little into said chamber. I is the core-tube through which the wire is conducted to the die. This is also screwed into an aperture made diagonally through the body of the said cylinder, so that its axis is coincident with the axis of H. The inner end projects into the chamber *e*, and the extremity or tip being tapered, so as to be of less diameter than that of the die, as shown in the drawings, is adjusted in apposition with the die, so that the lead in the cylinder F will, under pressure, flow into the said die around the tip of the core-bar.

This location and arrangement of the die H and core-bar conductor diagonally through the cylinder F—or, in other words, inclined and preferably at or about an angle of forty-five degrees to the axis of the cylinder—enables the wire that is to be covered to be conveniently conducted to the die, and the covered wire to be delivered from the press without interference with either the plunger employed to press the lead into the die or with the ram, and without its being necessary to bend the covered wire around an angle or curve in its delivery from the press; also, the conductors through which the naked wire is introduced into the press and that through which the covered wire is conducted out of the press are comparatively short and cheaply made. By reason of the die and the conductor being themselves screwed directly into apertures in the body of the lead-cylinder, their necessary

and proper adjustment to one another is rendered easy and convenient. These results are secured while the flow of the lead into the die around the end of the core-bar takes place with substantially the same facility and perfection as in presses in which the axes of the cylinder, the die, and the core-bar are coincident.

J is a set-screw, which works in a screw-tapped aperture made through the body of the cylinder at right angles or nearly at right angles to the core-bar I. The inner end of the set-screw enters the chamber *e* and impinges against the under side of the core-bar. The pressure of the lead being felt first on the upper side of the portion of the core-bar I that is within the chamber *e*, the tendency of such pressure is to deflect said end downward, and thus throw the tip of the core-bar out of exact concentric adjustment with the die H. The office of the set-screw J is to support the end of the said core-bar conductor and to effect and maintain the said necessary adjustment.

The operation of this press is as follows: The cylinder F being in the position shown in Fig. 1, and the die H and core-bar conductor I being properly adjusted, by turning one or the other out or in, as may be required, the end of the wire to be covered, which may be drawn off from a reel, (not shown,) is passed down through the conductor into the die. The cylinder F being charged with lead, the hydraulic ram is set in motion in the usual way, and the cylinder F is carried upward, the plunger entering the cylinder, whereby the lead is forced out through the die and around the extremity of the core-bar conductor I, the lead enveloping the wire and carrying it with it down through the die and out of the machine, whence it may be wound into a reel.

Of course the cylinder A, with the ram, may be located at the top of the machine in the place of the cross-head C, their position being reversed, so as to give downward motion to the ram, in which case the cylinder F will be placed in a suitable bed or support secured to the posts D.

It is obvious that by giving the lower portion of the lead cylinder—namely, the chamber *e*—the peculiar form shown and described, its axis approaching coincidence with those of the die and core-rod, the lead under pressure will flow into the die around the tip of said rod more perfectly and with greater facility than if the chamber *e* were straight and perpendicular.

I am aware that lead-presses for making lead pipe and for sheathing wire have been used having the core-bar and die arranged with their axes in or parallel to and also at right angles to the axis of the lead-cylinder. I do not claim a press having the core-bar and die arranged relatively to the cylinder in either manner named, as both are somewhat objectionable. When the said bar and die are

arranged parallel to the axis of the cylinder, it is necessary that the core should pass up longitudinally through the plunger, and that the plunger should move up and down on the core-bar, and it is difficult, if not impracticable, to make so tight a joint between the core-rod and the plunger that the lead will not be pressed in between the rod and the sides of the aperture in the plunger, and thus clog the movement of the plunger on the rod; also, the core-rod has to be objectionably long, extending, as it must, above the top of the press, so that there is difficulty in keeping its lower end properly adjusted to the die in the cylinder, and when used to sheath wire there is more or less difficulty in passing the wire through so long a tube. When the core-bar and die are arranged at right angles to the axes of the cylinder and plunger, the material in the die has to move out through the die at right angles to the direction of pressure upon it by the plunger, thus requiring greater pressure and the exercise of greater force to effect its movement through the die than when the direction of pressure is parallel to the axis of the die or other than at right angles to said axis. By my construction of the parts named, as above described, I obviate entirely the difficulties resulting from passing the core-bar through the plunger, and in great measure that resulting from arranging the core-bar and die at right angles to the axis of the cylinder and plunger.

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 tubular screw-threaded die and core-rod fitted to work in screw-threaded apertures made, respectively, diagonally through the body of said cylinder into its interior from opposite sides in line with each other and inclined at an angle to the axis of said cylinder, as and for the purpose described.

2. In a hydraulic lead-press, the combination, with the lead-cylinder, of the diagonally-arranged tubular screw-threaded die and core-rod fitted to work in corresponding screw-threaded apertures through the body of said cylinders, and the set-screw J, fitted to work in an aperture made through the body of the cylinder into its interior and to impinge against the side of the inner end of said core-bar, as and for the purpose described.

3. In a lead-press, the combination, with the lead-cylinder provided with the chamber *e*, having the form described, of a die and core-bar located in and passing diagonally through said cylinder from side to side, with the line of their axes crossing at other than right angles to the axis of said cylinder, as and for the purpose described.

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Witnesses:

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