

(No Model.)

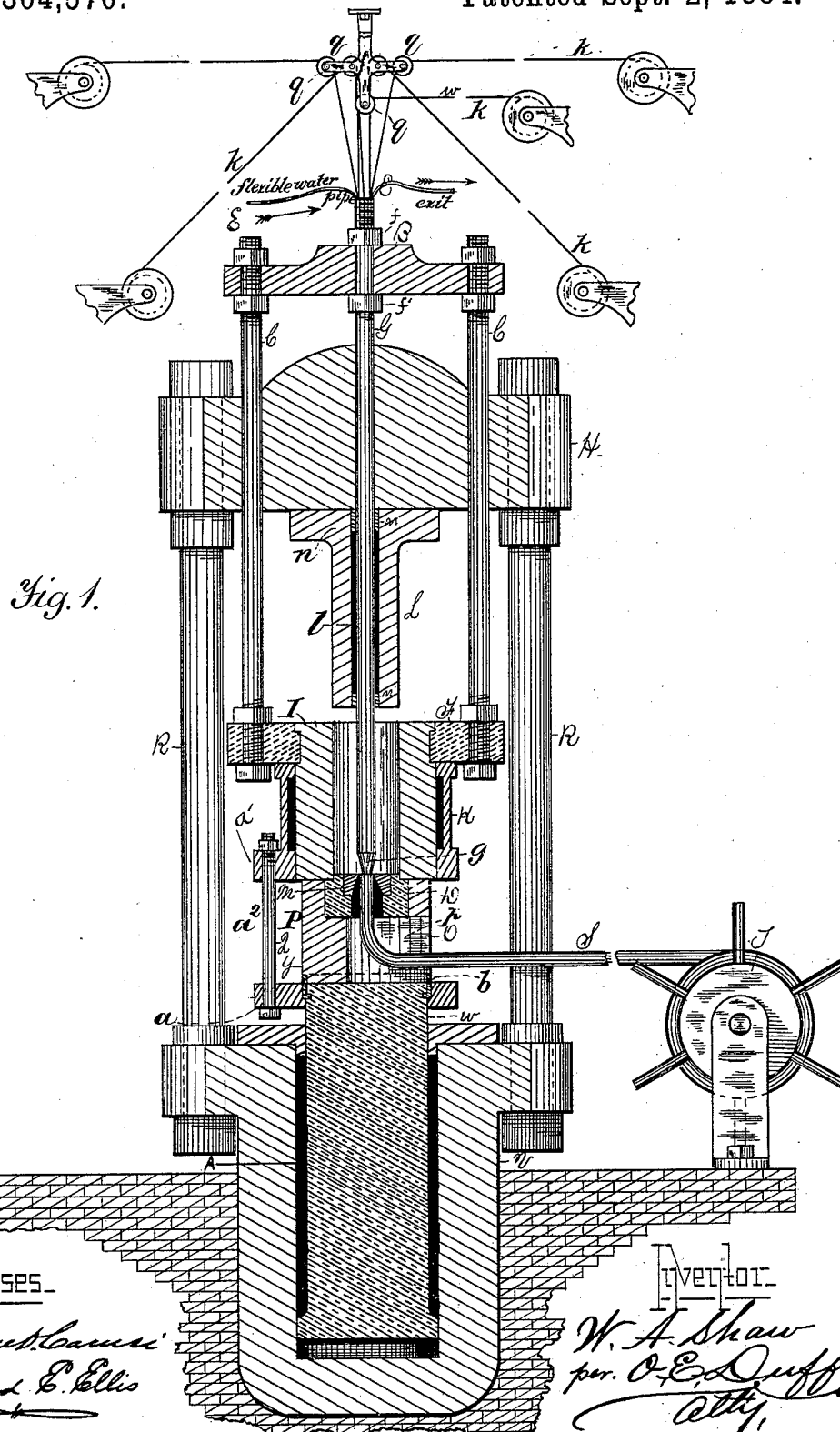
3 Sheets—Sheet 1.

W. A. SHAW.

LEAD PRESS.

No. 304,570.

Patented Sept. 2, 1884.



(No Model.)

3 Sheets—Sheet 2.

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Fig:3.

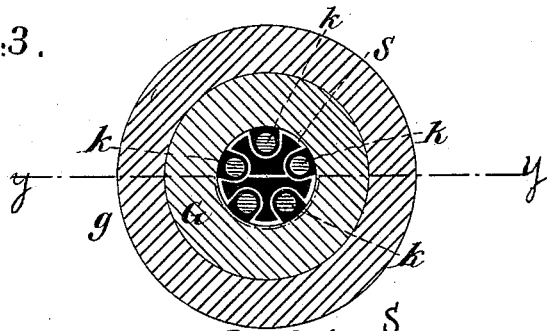


Fig:2.

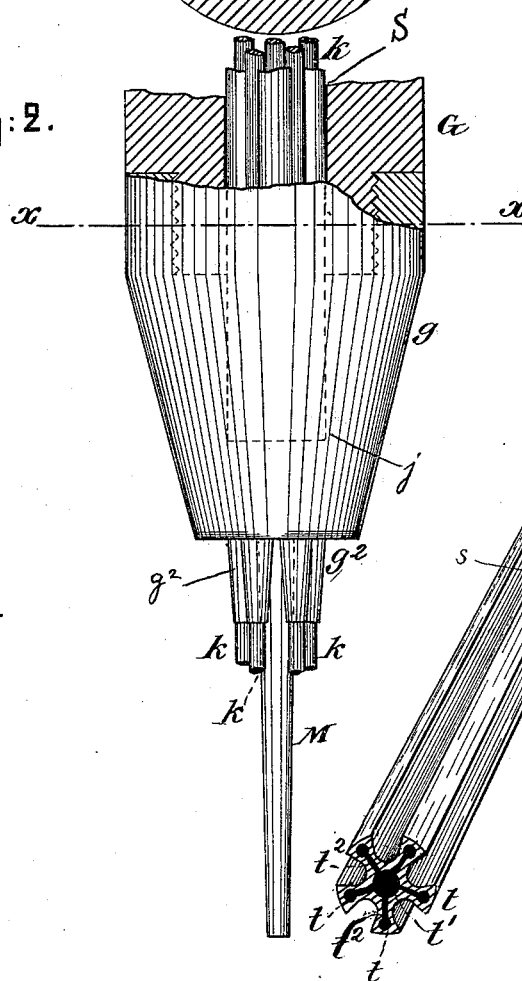
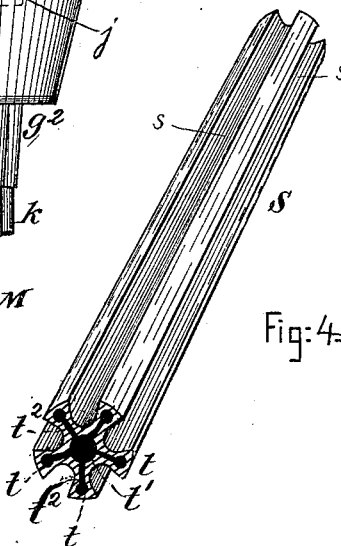


Fig:4.



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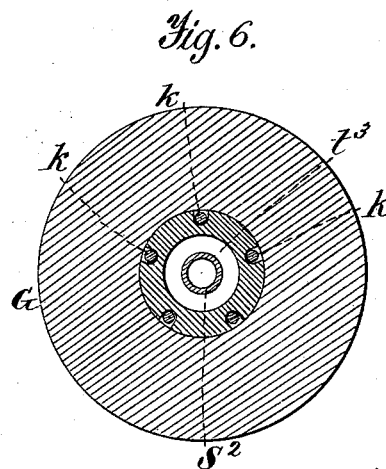
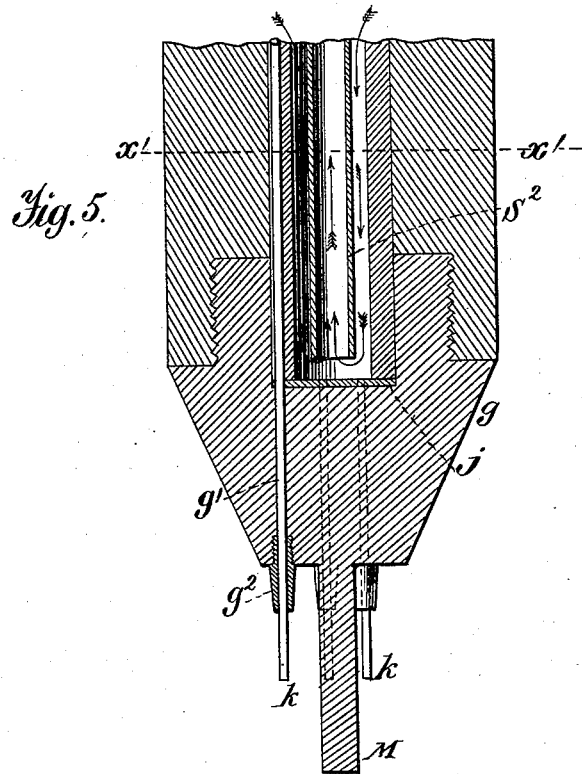
(No Model.)

3 Sheets—Sheet 3.

W. A. SHAW.
LEAD PRESS.

No. 304,570.

Patented Sept. 2, 1884.



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UNITED STATES PATENT OFFICE.

WILLIAM ANTHONY SHAW, OF PITTSBURG, PENNSYLVANIA.

LEAD-PRESS.

SPECIFICATION forming part of Letters Patent No. 304,570, dated September 2, 1884.

Application filed November 8, 1882. (No model.)

To all whom it may concern:

Be it known that I, WM. ANTHONY SHAW, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain
5 new and useful Improvements in Presses; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the
10 same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to that class of wire-incasing machines in which the incasing material—such as fused or semi-fused lead or other plastic metal, or a compound of gums and resinous substances or of soft or fusible insulating substances of any kind—is applied
20 to the wires by means of a cylinder, plunger, and die operating on the principle of the well-known pipe-press.

The objects of my invention are, first, to provide for guiding and protecting the wires as they pass through the cylinder to the die;
25 second, to provide for the ready regulation of the volume of material passing through the die; third, to maintain a number of wires to be incased at proper distances from each other as they pass through the die and become inclosed in a common body of incasing material; fourth, to prevent the wires from interfering with each other as they pass through the cylinder, and from becoming attached together by the adhesiveness of their coverings
30 when insulated with sticky or adhesive substances; fifth, to prevent the insulating coverings of the wires from being injured by the heat of the incasing material as they pass through the cylinder; sixth, to prevent the clogging of the core-bar in its passage through the press-plunger; seventh, to render the machine capable of ready adaptation to the manufacture of various products; and, eighth, to
35 obviate the necessity for stopping the operation of the machine and disconnecting the parts when a wire breaks.

My invention consists in certain novel constructions and combinations of devices for accomplishing these objects, as will be herein-
40 after particularly described.

In the accompanying drawings, Figure 1, Sheet 1, is a vertical central section of a wire-incasing machine constructed according to my invention. Fig. 2, Sheet 2, is a view, 55 partly in elevation and partly in section on line *y y* of Fig. 3, of the lower portion of the core-bar, and showing also a portion of the guide-staff and wires in position; Fig. 3, Sheet 3, is a cross-section of the core-bar on line *x x* of Fig. 2. Fig. 4, Sheet 2, is a perspective view of the guide-staff; Fig. 5, Sheet 3, is a longitudinal central section of a portion of the core-bar and a modified guide-staff and refrigerator arranged therein. Fig. 6 is 65 a cross-section on the line *x' x'* of Fig. 5.

Referring to Fig. 1, Sheet 1, the letter *A* designates the cylinder of a hydraulic press, and *w* its ram. The cylinder and means for operating the ram may be of any well-known and suitable construction, and therefore need not be here illustrated or described with particularity. At its upper projecting end the ram *w* is provided with a stout removable flange, *a*, countersunk around the upper portion of its opening to fit around and under a band, *b*, which surrounds the upper end of the ram and projects somewhat above the same, said band being provided at the lower edge with an inwardly-projecting lip, which takes
70 into a groove formed to receive it. Upon the top of the same is mounted a pillar, *P*, the lower end of which is recessed to fit within the band *b*, the shoulder of the recess resting on the upper edge of said band. A seat is thus formed to hold the pillar in its proper position, while at the same time the band *b* prevents the flange *a* from being displaced upwardly. The pillar *P* is recessed concentrically in its top to receive the die-holder *D*, in the top of which is seated the die *m*, said die-holder being annular in form, and having its upper portion, which projects above the pillar, reduced to fit in the cylinder *I*, which is thus held in a proper position on the pillar
85 and its adjustment facilitated when the parts are assembled. The said pillar *P* is provided with a laterally opening recess, *p*, which extends under the die-holder and permits the lateral delivery of the product of the machine, 90 this product in the present instance being illustrated as a pipe-like electric cable, *S*, 95 100

which is wound upon a reel, T, as it emerges from the recess *p*.

The cylinder I, which is to hold the incasing material, is mounted upon the top of the pillar P, with its lower end embracing the reduced portion of the die-holder D and its upper end provided with a thick outwardly-projecting flange or firmly attached ring, F, through apertures in which are secured the lower ends of the sliding guide-rods C C, which play vertically through guide-passages formed in the head-block H, and have their upper ends secured to a cross-beam, B.

Around the cylinder I is arranged a jacket, K, between which and said cylinder hot-water or steam may be caused to pass to keep the incasing material from cooling too rapidly. The jacket is firmly held to the cylinder, and has at its lower end ears or lugs *a'*, which are connected to the flange *a* of the ram by stay-rods *a''*.

The head-block H is firmly supported at the top of the posts R R, the lower ends of which are secured to the hydraulic cylinder. To the lower side of this head-block H is secured the upper end of the plunger L, which plays in the cylinder I for the purpose of forcing the incasing material through the die *m*. This plunger L has a central passage, *l*, through which plays the tubular core-bar G, which plays also through a guide-passage formed for it in the head-block H, axially in line with the passage through the plunger.

The upper end of the core-bar G is adjustably secured to the cross-beam B by the nuts *ff'*, and its lower portion extends centrally into the cylinder I and terminates in a conical tip, *g*, which projects more or less below the upper edge of the die *m*, according to the adjustment of the core-bar G. The adjustability of the core-bar is for the purpose of regulating the volume of the incasing material which passes between the conical tip *g* and the die *m*, as it will be seen that the farther the said tip extends into the die the narrower will be the passage-way around it. The passage through the plunger L has a somewhat greater diameter than the core-bar G, for the purpose of leaving a space between the two, and is provided at its upper and lower ends with removable bushings *n* and *n'*, which form snug bearings for the core-bar. The reason for leaving this space between the core-bar and plunger is that if the core-bar fitted its passage only loosely enough to permit its sliding a small portion of the incasing material, which, owing to the great pressure upon it, would be forced in between the plunger and holder, would spread over the inner wall of the plunger and fill said space, thus seriously retarding the play of the core-bar therein. Especially is this the case when metals are used as the incasing material, from the fact that they are forced in while in a molten condition and become cool and solid when the plunger is withdrawn temporarily from the cylinder and adhere very tenaciously to the

parts. By providing the wide space or chamber, into which the metal may enter, the small quantity of the material which is forced between the lower bushing and the core-bar will settle in the lower part of the plunger-passage, from which it may be readily removed by removing the bushing, whenever required.

In giving a particular description of the core-bar G, I will refer to Figs. 2 and 3, Sheet 2, and Figs. 5 and 6, Sheet 3. The main portion of the core-bar is tubular, or provided with a common central passage-way for all the wires; but its tip *g*, which is removably attached by screw-connection, is solid at its lower portion, except that it is provided with separate single wire-passages *g'*, as shown in Fig. 5, these passages being arranged in circular series about its center, and each terminating at the lower end of the tip in a nipple, *g''*. These nipples project below the die when the incasing material is passing, and guide and support the wires, as shown at *k*, in proper position when said material is forced in between them and closes around them. From the center of the lower end of the tip *g* projects a core, M, which gives shape to the central passage when a pipe-like casing is formed with wires inclosed in its wall. This core may be omitted when solid rope-like casings are to be formed, and a nipple may be inserted at the lower end of a central single-wire passage.

A machine may be provided with several core-bars, tips, and different numbers of and variously-arranged single-wire passages and nipples, and some with and some without cores, so that by selecting a proper core-bar and tip the machine may be very quickly adapted to the manufacture of a product of any desired character. If the wires to be used are insulated with fibrous or other non-fusible and non-adhesive material, they may be passed freely through the central passage of the core-bar without guides; but in the use of wires coated with fusible and adhesive substances, the core-bars should have arranged within them a guide-staff, such as shown at S, Figs. 3 and 4, Sheet 2, or a modification thereof, such as shown at S', Figs. 5 and 6, Sheet 3, the tip *g* being socketed to receive the lower end of said staff. The guide-staff S, Fig. 3, is cylindrical in shape, and should fit snugly within the central passage of the core-bar, and have such length that when its lower end is inserted in the socket in the nipple its upper end will be approximately even with the top of the core-bar. In the outer face of the guide-staff are formed longitudinal grooves *s*, deep enough to receive the wires, the grooves being at equal distances apart. Through the metal between the grooves are formed water-passages *t*, and through the center of the staff a larger water-passage, *t'*, this larger water-passage being connected to the smaller ones by radial grooves *t''* in the lower end of the staff. When the guide-staff is inserted in the socket of the tip *g*, its lower end should be seated

5 closely upon a vulcanized-rubber, leather, or similar yielding gasket, *j*, as shown in section in Fig. 5 and on dotted lines in Fig. 2. The wires are to be passed down through the grooves *s* in the staff, which should be in line with the single-wire passages *g'* of the tip.

10 A flexible water-pipe, *E*, (see Fig. 1,) may be connected with the top of each of the passages, and water be forced or allowed to flow down through the passages *t* and up through the central passage, *t'*, or vice versa, to cool the guide-staff, and consequently the wires, and prevent injury to their insulation by heat.

15 In the modified form of guide-staff illustrated in Figs. 5 and 6, Sheet 3, the exterior surface and arrangement of grooves are the same as shown in Fig. 4; but the outer water-passages are omitted, and the central water-passage, *t'*, is larger, and has arranged concentrically within it a tube, *S'*, separated from the wall of the staff by an intervening space, and not reaching to the bottom of the staff. Water may be caused to flow down through the space around the tube *S'*, and up through said tube, and off through a suitably-connected flexible discharge-pipe.

20 An important function of the guide-staff is to obviate the necessity for stopping the operation of the machine and disconnecting most of the parts when one or more wires break, as is required when such an accident happens in the operation of machines of this class as heretofore constructed.

25 When a wire breaks in my machine, it is only necessary to seize the end next the reel and force the wire down through the proper groove and wire-passage, when it will be seized by the incasing material and carried on, and may be afterward connected with the portion from which it was broken by opening the casing, splicing the wire, and patching or soldering up the opening.

30 Directly over the top of the core-bar are a number of guide-pulleys, over which the wires *k* pass to the holder, said pulleys being mounted on a suitable bracket or other support. The wires pass to the pulleys from reels, which may be arranged in any convenient manner.

35 In using the machine the wires are first passed over the guide-pulleys and down through the grooves of the guide-staff, single-wire passages of the tip *g*, and out a short distance through the nipples. The ram *w* being then in the lowermost portion and the plunger *L* out of the cylinder *I*, said cylinder is charged

with the incasing material in the usual manner, and the water turned onto the hydraulic cylinder *A* below its ram, which will be forced upward, the plunger *L* entering the cylinder *I* and forcing the incasing material out through the die *m*, between the nipples *g'*, and around the wires, said incasing material joining in a common body around the wires and taking the form of a tube around the core, if one be used. The end of the product—for instance, an electric cable—is guided out through the recess *p*, and as soon as a sufficient length is formed it is attached to the reel *T* or any other similar reel, and wound up in the usual manner.

40 In so far as relates to the construction of the tip and nipples, whereby they are adapted to guide and support the wires, although I have shown and described the same with some particularity, I do not claim the same herein, but reserve such construction as the subject-matter of an application now pending.

45 Having now fully described my invention and explained the operation thereof, I claim—

1. The combination of the ram having a pillar seat formed upon its top, the pillar arranged in said seat, and having a recess formed in its top to receive a die-holder, the die-holder arranged in said recess, and having its top shouldered and reduced to fit the bottom of the cylinder for holding the incasing material, and the cylinder resting upon the top of the pillar and shoulder of the die-holder, and securing the reduced portion of the die-holder, substantially as and for the purpose set forth.

2. The combination, with the core-bar having a common wire-passage, of a suitable device within the core-bar for guiding and for keeping the wires separated as they pass through said core-bar, substantially as described.

3. The combination, with the core-bar, of the removable guide-staff having grooves for the wires, substantially as described.

4. The combination, with the core-bar, of the guide-staff having grooves for the wires, and provided with water-passages, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

WM. ANTHONY SHAW.

Witnesses:

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O. E. DUFFY.