

(No Model.)

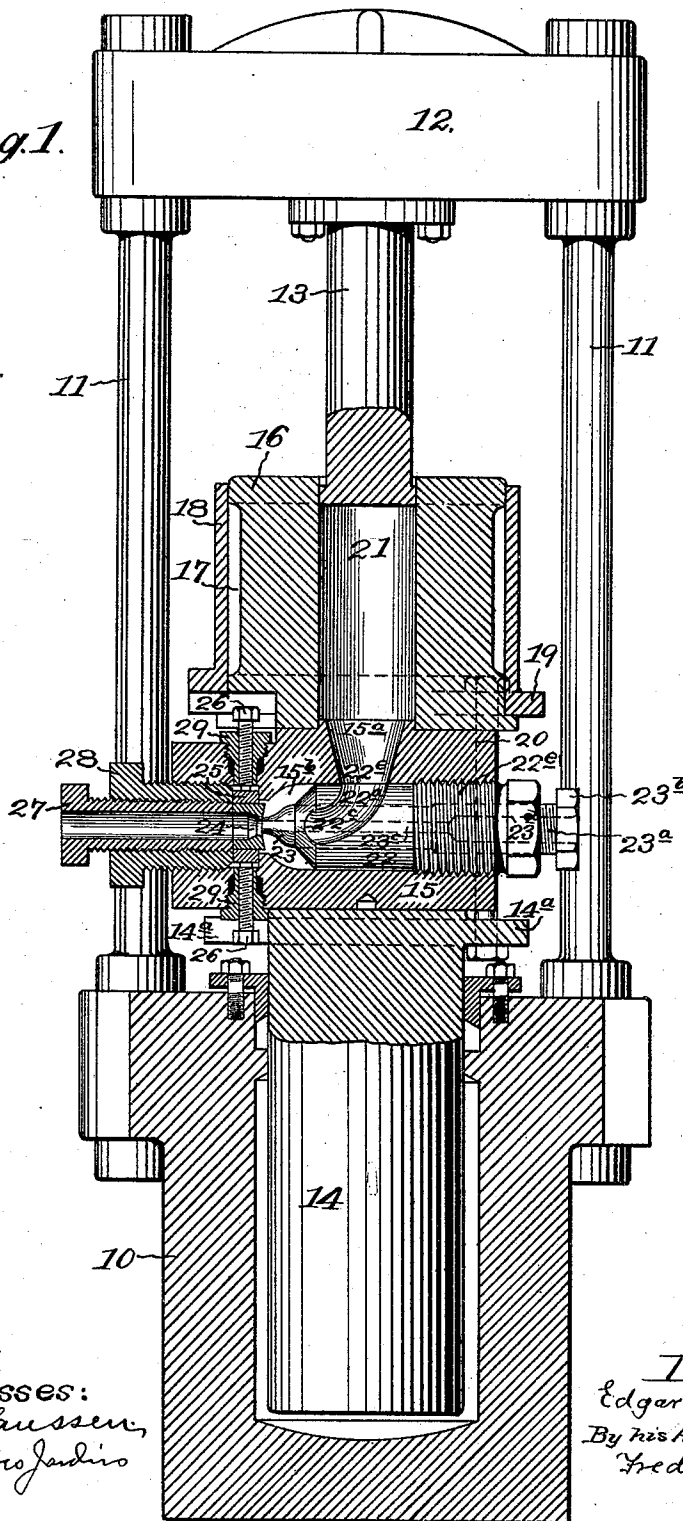
2 Sheets—Sheet 1.

E. H. JOHNSON.
LEAD PRESS.

No. 572,546.

Patented Dec. 8, 1896.

Fig. 1.



Witnesses:
Ed. E. Claussen,
Benj. M. Desjardins

Inventor:
Edgar Howard Johnson.
By his Attorney,
Frederic R. Honey

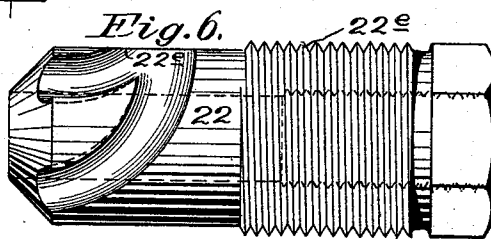
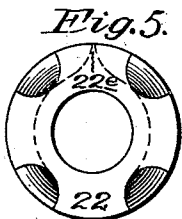
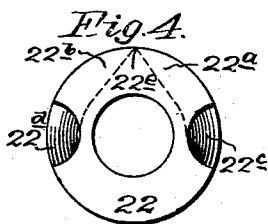
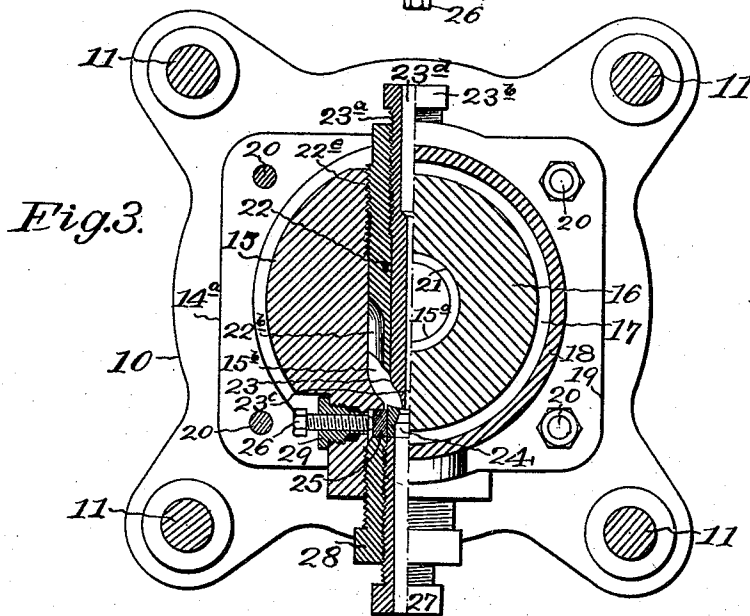
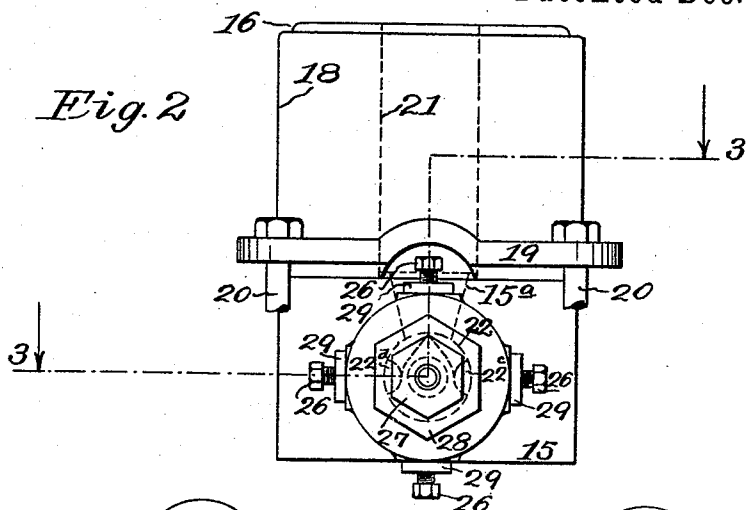
(No Model.)

2 Sheets—Sheet 2.

E. H. JOHNSON.
LEAD PRESS.

No. 572,546.

Patented Dec. 8, 1896.



Witnesses:
Ed. S. Claussen
Benj. M. DeJardin

Inventor:
Edgar Howard Johnson
By his Attorney, Fred R. Honey.

UNITED STATES PATENT OFFICE.

EDGAR HOWARD JOHNSON, OF SEYMOUR, CONNECTICUT.

LEAD-PRESS.

SPECIFICATION forming part of Letters Patent No. 572,546, dated December 8, 1896.

Application filed January 24, 1896. Serial No. 576,694. (No model.)

To all whom it may concern:

Be it known that I, EDGAR HOWARD JOHNSON, a citizen of the United States, residing at Seymour, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Lead-Presses, of which the following is a full, clear, and exact specification.

This invention relates to a lead-press particularly designed to manufacture lead-coated electric conducting-wire such as used for underground cables and the like; but it will be understood that this coating, which I have designated for convenience as "lead-coated wire," can equally well be rubber, and is intended to include all other rubber compounds of various form and character in which an enormous pressure is exerted in a chamber containing the charge of material, as in this case lead, and forced into the die-chamber and thence out through the die-opening.

The principal objects of my invention are to provide a press of the class specified of improved construction and especially adapted for making lead-coated cables with great rapidity at a low cost of manufacture, and to change the machine from one size wire to a smaller or larger size with utmost rapidity and extreme precision.

Another object of my invention is to furnish an improved sleeve adapted to guide the contents from the charge-chamber into the die-chamber at exactly diametrical opposite outlets in said sleeve, and thus relieving the core-die of all side strains, and whereas the pressure is enormous in evacuating the charge-chamber the core-die is very often bent and injured and great delays and unsatisfactory work produced.

Another object of my invention is to provide an improved core-die which is readily adjusted, of simple construction, and whereas the wear on these dies is very great the same may be readily replaced.

Another object of my invention is to provide an improved tube-die with means for adjusting the same relative to the core-die and then clamping the same at opposite sides thereof and locking and holding it rigidly in position, and also adapted to be readily removed in case of breakage and replaced.

In the drawings accompanying and forming part of this specification, Figure 1 is a front view, partly in section, embodying my present invention, said figure showing the hydraulic piston in its lowest position ready to move upward. Fig. 2 shows a left-hand side view of Fig. 1 with the supporting-bars and lower parts of the hydraulic cylinder and piston omitted. Fig. 3 is a sectional plan view on lines 3 3 of Fig. 2. Fig. 4 represents an end view of the sleeve. Figs. 5 and 6 show a side and end view, respectively, of a modified form of the sleeve.

In the preferred construction of my invention herein shown and described the machine for manufacturing lead-coated wire comprises in part a hydraulic cylinder 10, carrying the supporting-bars 11, and sustaining at their upper ends the head 12, from which depends the stationary ram 13.

The numeral 14 indicates the hydraulic piston, which has resting on its top the die-block 15, and upon which rests the supply-cylinder 16. The supply-cylinder is encircled on its outer circumference by a recess 17 and the steam-tight shell 18, provided with the flange 19, through which a series of bolts 20 pass and hold the shell and cylinder tightly bolted to the lateral projecting ears 14^a of the hydraulic piston 14.

The recess 17 of the supply-cylinder is connected with a steam-boiler in the usual manner (not shown) and kept at a high temperature. The central portion of the supply-cylinder is hollow, cylindrical in form, and adapted to receive the close-fitting ram 13, and I have denoted the same as a "supply-chamber" 21, into which the molten lead or the charge of material is placed which shall form the covering of the cable.

The lower part of the supply-chamber 21 communicates with an opening 15^a of the die-block, which is of frustated conical shape and leads downward through two adjacent curved grooves 22^a 22^b of the sleeve 22 into the die-chamber 15^b of the said die-block. The grooves 22^a and 22^b begin at the top of the sleeve at a point 22^c, and then diverge downwardly and around the sleeve and terminate in the two diametrical opposite openings 22^e and 22^d, whereby all side strains are elimi-

nated upon the core-die 23 when the lead is forced from the supply-chamber to the die-chamber.

The sleeve 22 is securely held in the die-block by the threaded portion 22^c and provided with any suitable means to screw the same into place, here shown as a hexagon head. The central portion of the sleeve is hollow and cylindrical and adapted to receive the core-die 23, held in position by the threaded portion 23^a, being adjusted by the head 23^b, and provided with the central opening 23^c of proper size to receive the wire or cable. The front end of the core-die has the central opening preferably enlarged or counterbored for the purpose of more readily inserting the cable, as shown at 23^d.

The tube-die 24 has a central opening of the desired size and shape of the lead tube, is mounted in the annular ring 25, held in its central position by the set-screws 26, and held against rearward displacement by the hollow set-screw 27.

The internally and externally threaded set-screw 28 acts to hold the annular collar 25 in a rigid position, the internal threads coinciding with the threads of the set-screw 27, whereas the external threads coincide with those in the die-block.

The set-screws 26 are preferably tapped into sockets 29, allowing for wear and replacing same when the threads are worn off or in case of breakage.

The operation of the machine will be readily apparent to those skilled in the art by a comparison of the several figures of the drawings, and inasmuch as the difference of my improvement is principally in supplying means for forcing the lead from the supply-chamber into the die-chamber without exerting any side strains upon the dies and to sustain the alinement and prevent breakage or injury to the same, and, furthermore, to supply means for effectively and readily replacing the tube-die in case of breakage or injury, and when returning the same bringing the same into perfect alinement. A coil of wire of suitable size and length is arranged upon a reel adjacent to the machine and the end of the wire inserted into the counterbored opening 23^d of the core-die through the opening 23^c, which is of proper size to fit the cable closely and sufficiently far to extend beyond the tube-die 24. The supply-chamber 21 is then filled with molten lead, passing at the same time into the die-block opening 15^a, the curved grooves of the sleeve, and into the die-chamber 15^b. The hydraulic piston is then slowly elevated, carrying with it the die-block and its adjacent mechanisms, as well as the supply-cylinder, thus forcing the ram with great pressure into the supply-chamber and evacuating its contents from the chamber 21 through the central vertical opening 15^a of the die-block and through the curved grooves 22^a and 22^b of the sleeve into the die-chamber and continuing around the cable or wire

and out through the tube-die 24, drawing the latter along with it as it emerges from the same as a lead-coated wire. The pressure of the ram upon the charge, in this case molten lead, is very great, especially when the same is in a semifluid state, the obstruction being the resistance offered by the deflection from the vertical direction to the horizontal direction, that is, the passage through the grooves 22^a and 22^b, which are of uniform curvature. It will thus be observed that the lead, having once assumed the shape and curve of the groove, will pass along without altering its section, and therefore the resistance will be much less than in the machines now in use. A matter of great importance and efficiency is the openings 22^c and 22^d, from which the metal emerges and enters into the die-chamber 15^b, which are exactly diametrically opposite to one another and serving to equally distribute the metal around the core-die, releasing the same from all side strains and thus preserving and maintaining the same for a long while without renewing.

The tube-die, with its appurtenances, is readily centralized with the core-die by means of the set-screws 26 and held in its position by the hollow set-screw 27 and can be readily removed and replaced when worn or broken.

In Figs. 5 and 6 an end and side view are shown of the sleeve, having the top edge 22^c and the grooves separating into two branches, thus forming four diametrically oppositely-disposed openings from which the metal emerges.

It will be understood that other modifications may be made without departing from the invention; but

What I claim is—

1. In a lead-press, the combination of the die-block provided with the central vertical opening, and the transverse opening, and the removable cylindrical sleeve provided with the two exterior grooves, terminating in the two diametrically opposite openings at the end of the sleeve, and located transversely in the die-block in line with the axis of the central vertical opening substantially as described.

2. In a lead-press the combination of the die-block, provided with the central vertical opening and the transverse opening and the removable cylindrical sleeve provided on its outer circumference with a series of grooves beginning at the top of the sleeve, and branching off into a series of diametrically opposite openings at the end of the sleeve, substantially as described.

3. In a lead-press the combination of a die-block provided with the central vertical opening and the transverse opening, and the removable cylindrical sleeve provided with the two exterior grooves terminating in the two diametrically opposite openings at the end of the sleeve, and located transversely in the die-block, in line with the axis of the central vertical opening, and the cylindrical core-die

mounted concentrically in the sleeve and provided with means, substantially as described, for longitudinal adjustment for the purpose set forth.

5 4. In a lead-press the combination of the supply-cylinder, 16, the die-block, 15, interposed between the piston, 14, and the supply-cylinder, 16, and held together by the bolts, 20, the die-block provided with the central
10 vertical opening, 15^a, and the transverse opening in line with the axis of the central vertical opening, and the removable sleeve 22, with the grooves 22^a, and 22^b, terminating in diametrically opposite openings at the end
15 of the sleeve, substantially as, and for the purpose described.

5 5. In a lead-press the combination of the ram, 13, the supply-cylinder, 16, provided with the supply-chamber, 21, and superimposed on the die-block, 15, the die-block being provided with the central vertical opening, and the transverse opening, the removable cylindrical sleeve, 22, mounted in the transverse opening of the die-block, and provided with the two grooves 22^a and 22^b, terminating in the two diametrically opposite openings, 22^c and 22^d, at the end of the sleeve, and the core-die, 23, supported concentrically in the sleeve, and provided with the screw-thread 23^a, for adjustment substantially as described.
30

6. In a lead-press, the combination of the ram, 13, the supply-cylinder, 16, provided

with the supply-chamber, 21, the die-block, 15, provided with the vertical central opening, 15^a, and the transverse opening extending across the vertical central opening, the sleeve, 22, having the curved grooves, 22^a, and 22^b, the hollow core-die, 23, supported by the sleeve, the tube-die, 24, mounted in
40 the annular collar, 25, with means for central adjustment, and means for holding against rearward displacement, substantially as described, and for the purpose set forth.

7. In a lead-press, the combination of the
45 piston, 14, the die-block, 15, the supply-cylinder, 16, the ram, 13, the die-block provided with the central vertical opening and the transverse opening in line with the axis of the central vertical opening, the sleeve, 22,
50 with the grooves 22^a, and 22^b, terminating in the diametrically opposite openings 22^c, and 22^d, at the end of the sleeve, the hollow core-die, 23, and tube-die, 24, the annular collar, 25, and means for central adjustment consisting of, substantially as described, a series of oppositely-disposed set-screws, 26, and means for holding the same against rearward displacement, as the hollow set-screw, 27, and set-screw, 28, substantially as described
60 and for the purpose set forth.

EDGAR HOWARD JOHNSON.

Witnesses:

CHAS. E. FAIRCHILD,
EDMUND DAY.