

(No Model.)

E. E. BERTHOUD & A. F. BOREL.

Machine for Insulating Telegraph Wire.

No. 233,970.

Patented Nov. 2, 1880.

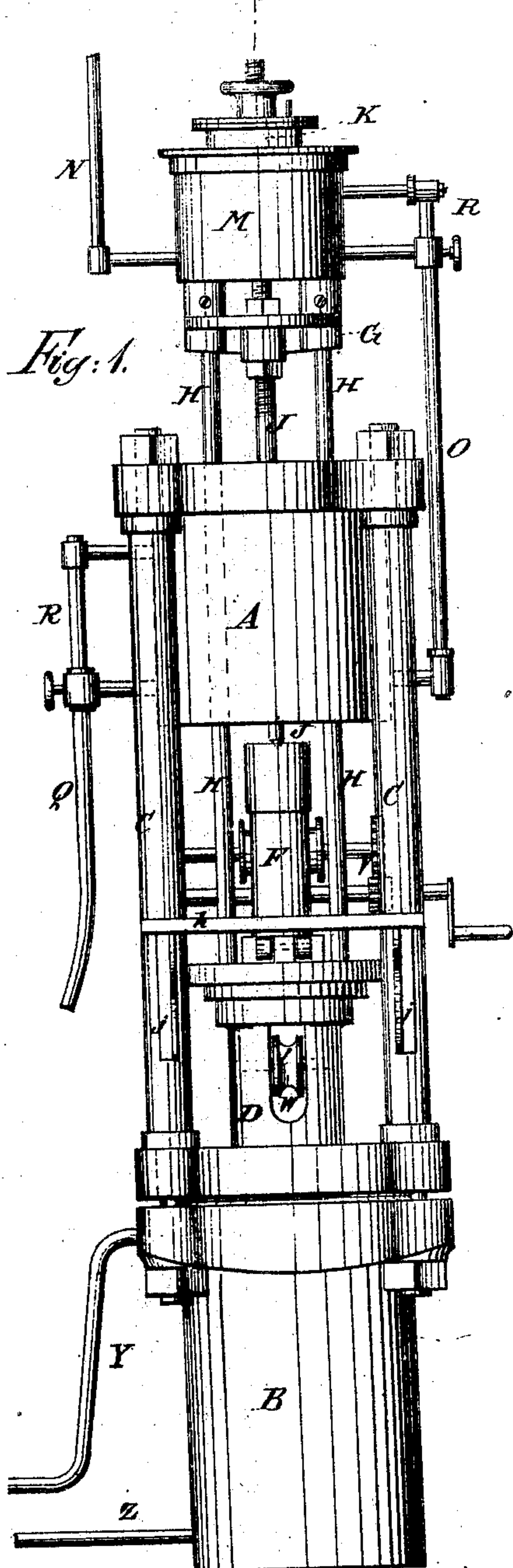


Fig. 1.

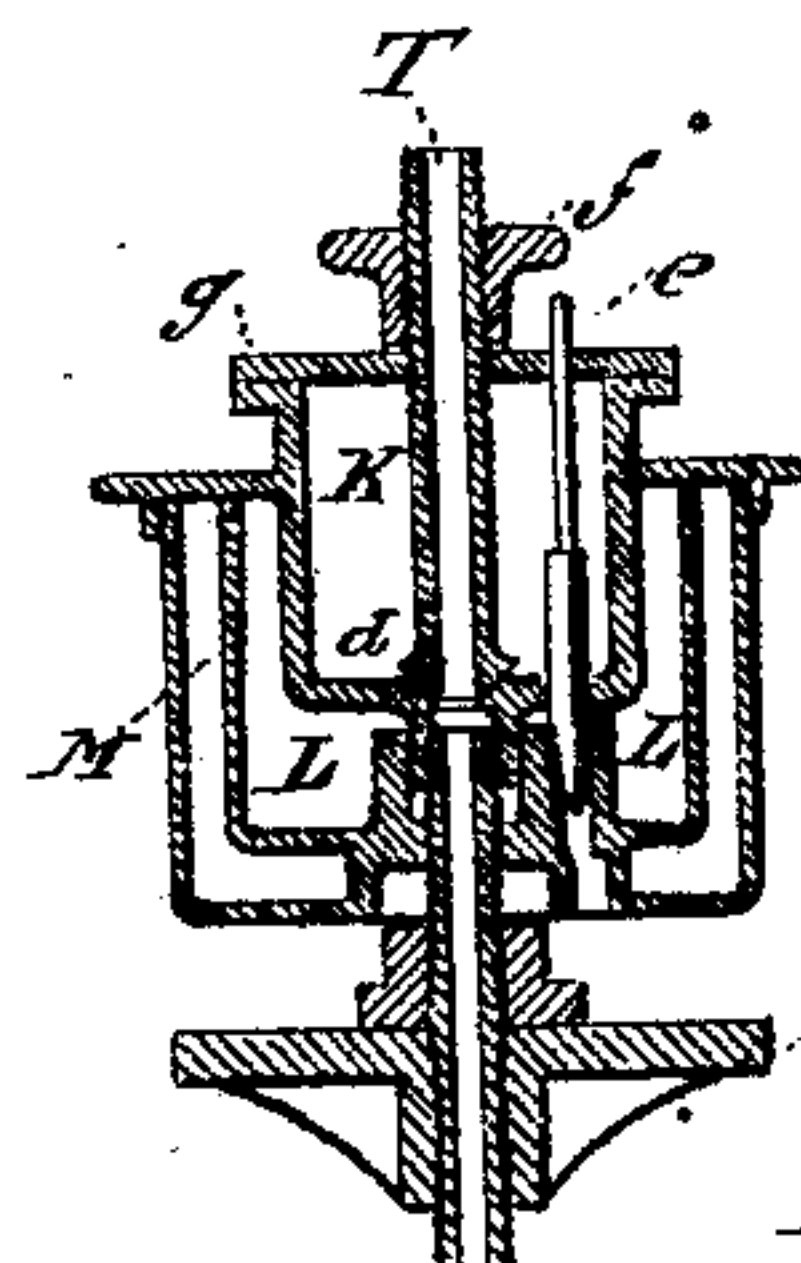


Fig. 2.

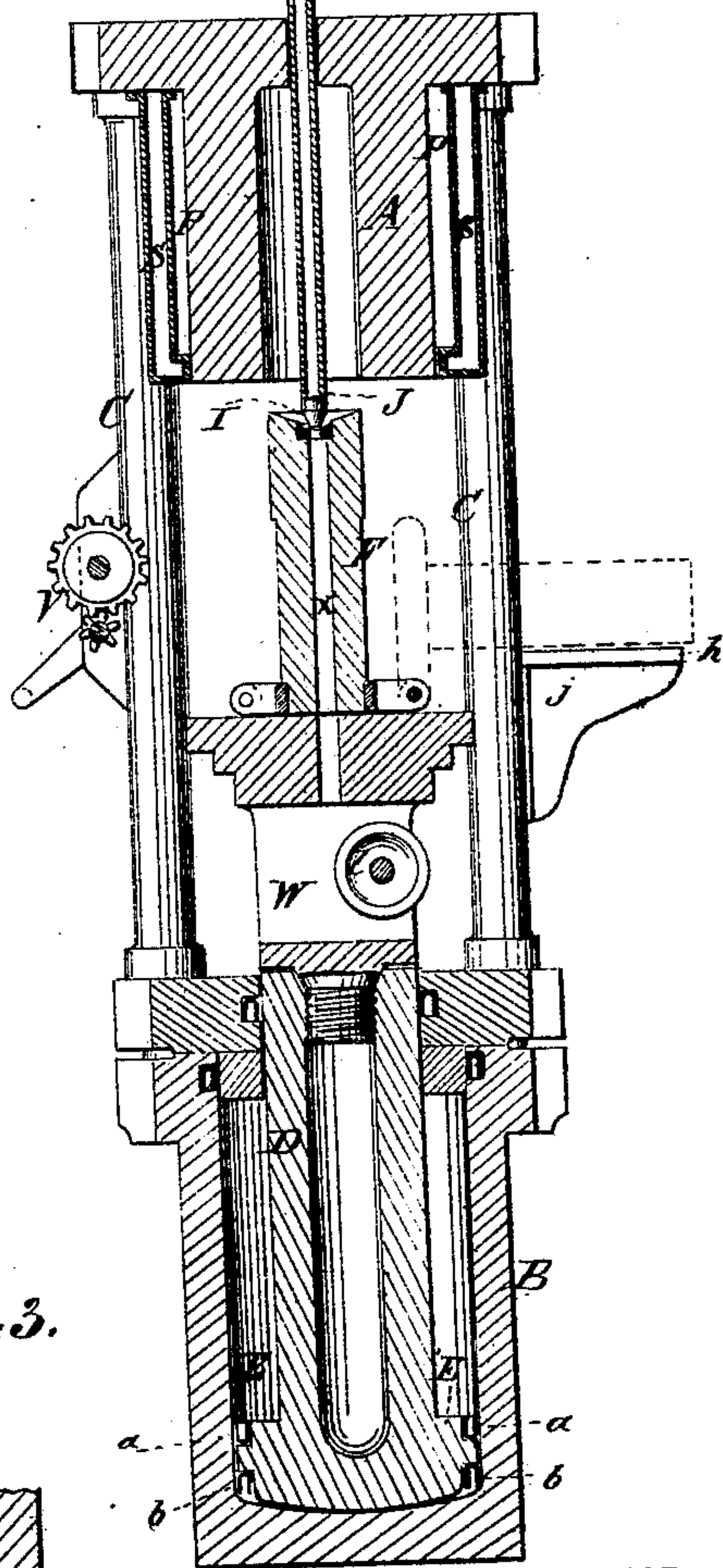
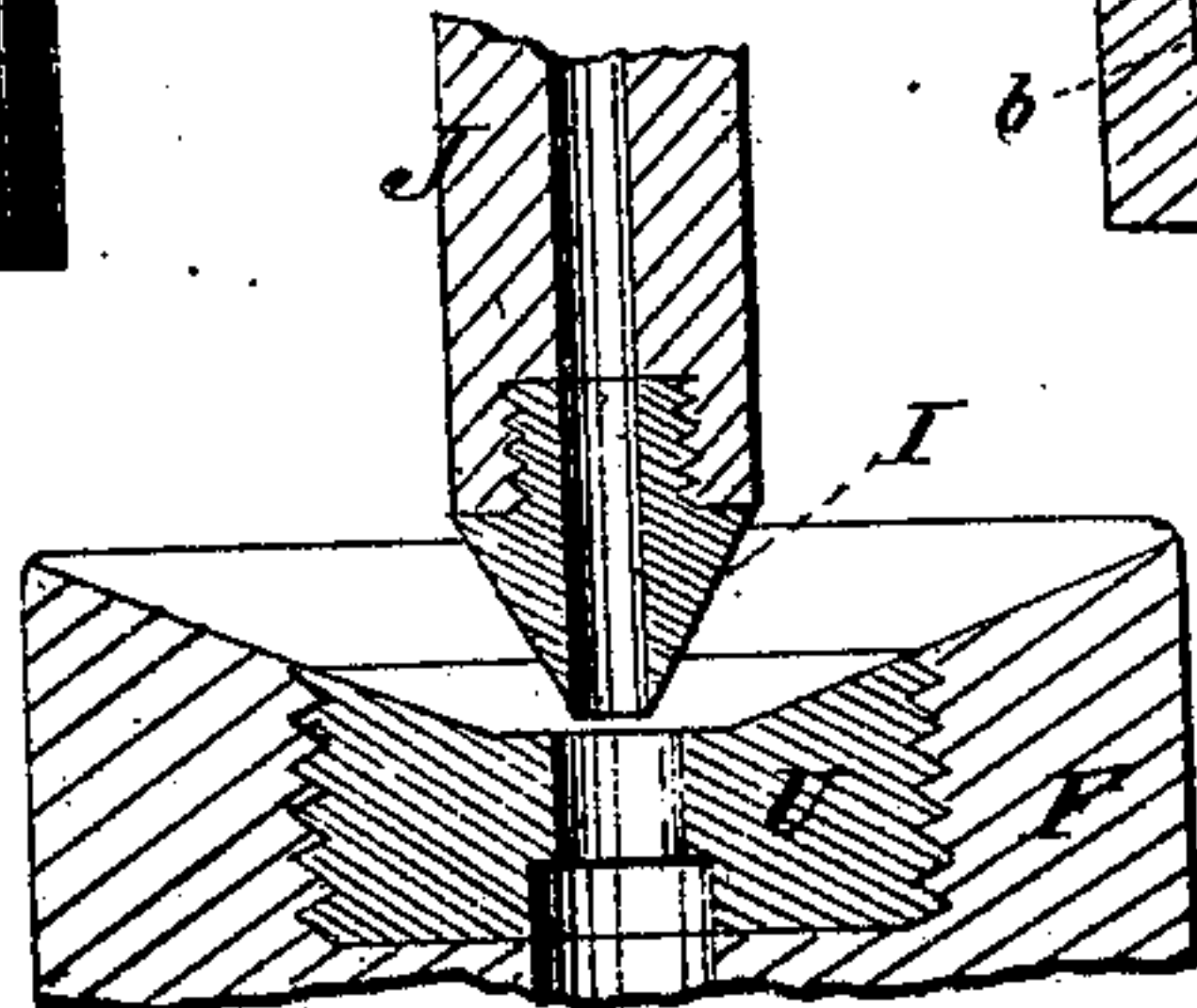


Fig. 3.

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EDOUARD E. BERTHOUD, OF CORTAILLOD, AND ARNOLD F. BOREL, OF
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MACHINE FOR INSULATING TELEGRAPH-WIRES.

SPECIFICATION forming part of Letters Patent No. 233,970, dated November 2, 1880.

Application filed May 28, 1880. (No model.)

To all whom it may concern:

Be it known that we, EDOUARD ERNEST BERTHOUD, of Cortailod, and ARNOLD FRANÇOIS BOREL, of Boudry, Neuchatel, Switzerland, have invented a new and Improved Machine for Making Insulated Telegraph Cables and Wires, of which the following is a specification.

The object of our invention is to provide a new and improved machine for covering telegraph cables and wires with insulating material and with a leaden protecting-envelope.

In the accompanying drawings, Figure 1 is a front elevation of our improved machine for making insulated cables. Fig. 2 is a central cross-sectional elevation of the same on the line *xx*, Fig. 1. Fig. 3 is a detail sectional elevation of the parts forming the leaden tube.

A cylindrical chamber, A, open at the bottom, and adapted to receive a centrally and longitudinally perforated block of lead, is connected with the cylinder of a hydraulic press, B, by means of two or more strong columns, C. The press B contains a piston, D, provided with an annular shoulder, E, and two packings, *a* and *b*, as shown in Fig. 2. Upon the top of the piston D a centrally and longitudinally perforated block, F, is hinged, which block is connected with a platform, G, situated above the chamber A, by means of two rods, H H, passing through the chamber A. The platform supports a tube, J, the lower end of which is provided with a conical or like sharp-edged nozzle, I, which almost touches the top of the hinged perforated block F, whereas the upper end of the tube J supports a vessel, K, containing any suitable insulating material, and is surrounded by a vessel, L, containing hot oil or some other suitable liquid, to keep insulating material in a fluid or semi-fluid state. The vessel L is surrounded by a vessel, M, containing charcoal-powder or some other non-conductor of heat, to prevent the oil from cooling; or the vessel L may be covered with non-conducting material in any suitable manner.

The oil or other liquid is conducted into the vessel L by the pipe N, and passes from there, through the pipe O, into a jacket or annular vessel, P, surrounding the chamber A, and is drawn from there through the pipe Q.

The vessels L and P are provided with the

glass gages R, by means of which the quantity of liquid in them can be ascertained. The vessel P is also surrounded by some non-conductor of heat contained in the jacket S.

The vessel K is provided with valve or cock *e*, for drawing off the remaining insulating material when the operation ceases.

A threaded tube, T, provided at its lower end with a bevel, *d*, which exactly fits onto the top of the tube J, and at its upper end with a nut, *f*, passes through the lid *g* of the vessel K, and is supported upon the same by means of the nut *f*.

An annular shoulder, U, is inserted in the top of the block F, which is beveled toward the center, as is more clearly shown in Fig. 3. As the block F must be rotated on its pintles when a fresh block of lead is to be placed into the lead-chamber A, or if the shoulder U and nozzle I are to be replaced by others, a shelf, *h*, is supported on brackets *j j*, attached to the columns C C, and a windlass, V, is provided on the opposite two columns for the purpose of assisting in raising the block F.

The upper part of the piston D is provided with a slot, W, in which a pulley, *l*, is pivoted.

The pipe Y leads water or oil to the upper end, and the pipe Z to the lower end, of the piston of the hydraulic press B.

The cables may be simply insulated without being covered with lead, if they are only passed through the vessel K and tubes T and J.

Paraffine is preferably used as insulating material.

The operation is as follows: A cylindrical centrally and longitudinally perforated block of lead is placed into the lead-chamber A, and the cable or wire, which must be previously surrounded by a covering of cotton or other fibrous material, is passed through the tubes T and J. If the tube T is slightly raised, the insulating material will flow through the space between the lower beveled end of the tube T and the top of the tube J, and as the cable is in the tube J the insulating material passes into and around the cable, completely impregnating the same. The cable passes through the block of lead, which is kept at a very high temperature by the hot oil or water in the jacket P, so that all the moisture is removed from the fibrous covering of the cable. If wa-

ter is forced into the press-cylinder through the pipe Z, the piston will rise and press the top of the block F against the under side of the block of lead in the lead-chamber A, and the lead is forced to escape in the shape of a leaden tube, the inside diameter of which is equal to the diameter of the lower edge of the nozzle I, and outer diameter of which is equal to the diameter of the aperture in the annular shoulder U through the central bore, X, of the block F; but as the cable has been conducted into this bore by the tube J it is evident that the so-formed tube will snugly surround the cable. As fast as the tube is produced it draws the cable downward, which then passes over the pulley *l* and is wound onto some suitable drum. The bore X of the block F is greater in diameter than the inner diameter of the tube J, so that the covered cable can conveniently pass through it. The nozzle I and the annular shoulder U may be changed for others, so that the thickness of the leaden tube may be made as desired, and cable of any desired diameter may be passed through the tube J. As soon as the entire block of lead has been formed into a tube, the water or other liquid is admitted into the upper part of the press-cylinder through the tube Y, and, acting upon the shoulder E, forces the piston downward, a cock to leave out the liquid below the piston having been previously opened. The block F is then laid over, as shown in dotted lines, and a fresh block of lead is inserted into the lead-chamber A. Any kind of press may be used instead of a hydraulic press.

The insulated cables or wires manufactured with the herein-described machine are more perfectly insulated than any other kind of cable. The insulation is absolutely perfect.

The cable cannot be damaged by moisture; can be handled conveniently without damaging the insulating-envelope, which can be made of any desired thickness; and, finally, permits of using numerous materials for insulators which could not be used for this purpose heretofore, and consequently the price of the cable is materially reduced.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making insulated cables, the combination of the platform G with tube J, supported in said platform, projecting at the lower end with a nozzle nearly to the opening in block F, and sustaining the vessel K at the top, as shown and described.

2. The combination, with the tube J and vessel K, of the threaded tube T, having bevel *d* and the nut *f*, as and for the purpose specified.

3. The combination, with the insulating-vessel K, of the oil-vessel L, the pipe O, the annular vessel P, and the vessel A, as and for the purpose set forth.

4. In an apparatus for making insulated telegraph cables and wires, the combination, with the piston D, of the hinged perforated block F, substantially as herein shown and described, and for the purpose set forth.

5. In an apparatus for making insulated telegraph wires and cables, the combination, with the pivoted block F, of the windlass V and the shelf *h*, substantially as herein shown and described, and for the purpose set forth.

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Witnesses:

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