(No Model.) 2 Sheets—Sheet 1.

G. L. KITSON.

MACHINE FOR MAKING SEAMLESS LEAD COVERED ELECTRICAL CONDUCTORS.

No. 364,177. Patented May 31, 1887.

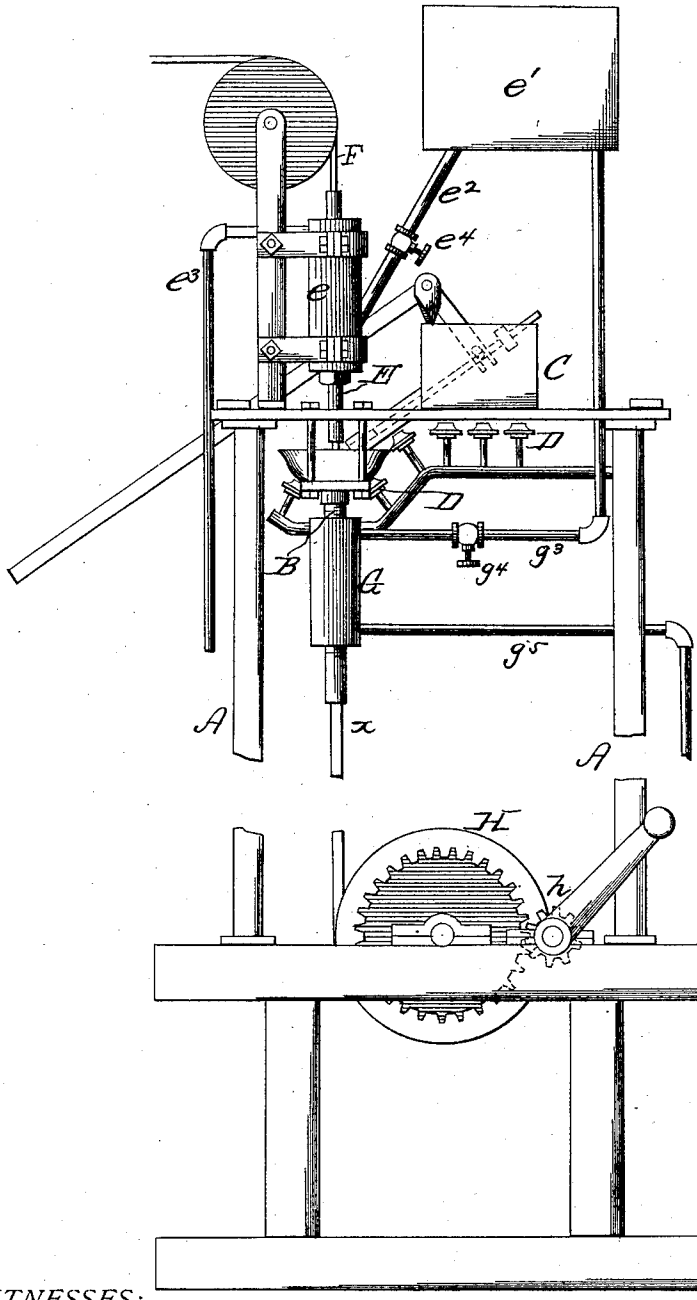


Fig. 1

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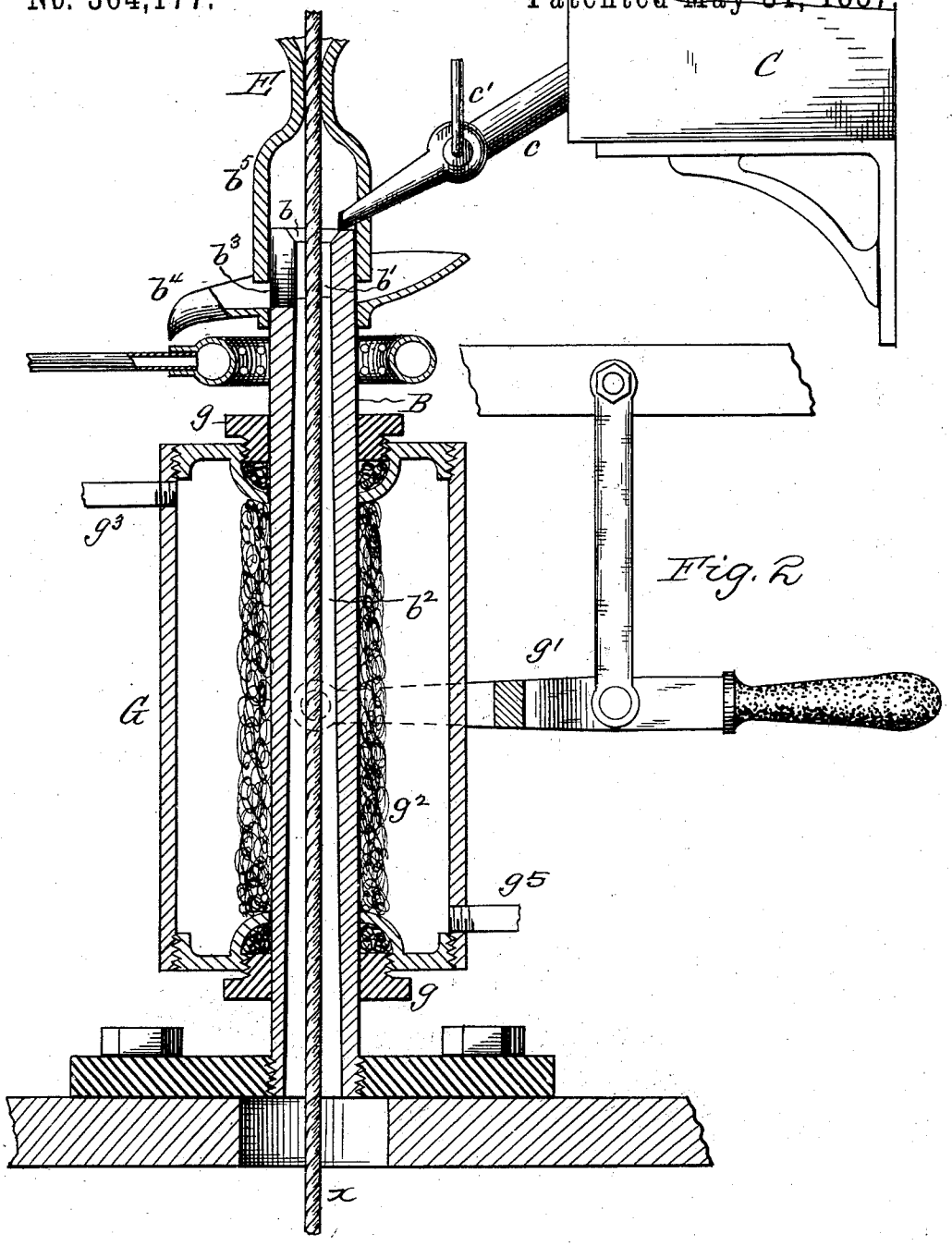


Fig. 2.

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UNITED STATES PATENT OFFICE.

GEORGE L. KITSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE KITSON ELECTRIC COMPANY, OF CAMDEN, NEW JERSEY.

MACHINE FOR MAKING SEAMLESS LEAD-COVERED ELECTRICAL CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 364,177, dated May 31, 1887.

Application filed December 21, 1886. Serial No. 222,185. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. KITSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making Seamless Lead-Covered Electrical Conductors or Cables, of which the following is a specification, reference being had therein to the accompanying drawings, wherein—

Figure 1 is an elevation of a machine for making lead-covered electric conductors or cables embodying my invention, and Fig. 2 is a vertical section, drawn to an enlarged scale, of parts of the same, showing slight modifications of construction.

My invention has relation to machines for making seamless lead-covered electric conductors or cables having suitable insulation between the wire and its lead covering; and it has for its object to so construct the machine that the operation of casting the seamless lead covering upon the conductor is continuous and rapid; and, further, for improving the detail parts of the machine, whereby it is made more effective and durable.

My invention accordingly consists of the combination, construction, and arrangement of parts, as hereinafter described and claimed.

In the drawings, A represents the framework of the machine, which is preferably vertical, and affords a support for a mold or die, B, a melting pot or vessel, C, burners D for said die and pot, and a guide-rod, E, for leading the conductor F to die B, the conductor being covered with suitable fibrous or other insulation, as desired.

The guide-rod E is suitably supported in the ends of a water-jacket, *e*, which is secured to frame A. The water for jacket *e* is supplied from a tank, *e'*, or other source of supply, by a pipe, e^2, connecting with the jacket at or near its bottom, as shown, and it has at or near its top an overflow or outlet pipe, e^3, so that by regulating cock e^4 in pipe e^2 a flow of water through jacket *e* from below upwardly is provided to keep the guide-rod E cool and prevent it charring or otherwise impairing the insulation on the conductor drawn through the same.

The die or mold B is more plainly shown in Fig. 2, and consists of a pipe having at its upper end a mouth or chamfered edge, *b*, a short straight bore, *b'*, and a tapered bore, b^2, the latter gradually increasing in diameter from the straight bore *b'* to the bottom of mold B, as shown. In the straight bore *b'* the lead covering is cast around the conductor, and the tapering bore b^2 is provided for chilling purposes and for admitting of more readily drawing the lead-covered conductor through the mold without friction, so as to prevent breaking the continuity of the lead covering. At the top of the mold is preferably provided a lateral slot, b^3, which communicates with an overflow pan or chute, b^4, beneath which are located gas or other burners, D, for heating the upper part of the mold to maintain the lead supplied thereto in a fused condition.

The upper end of the mold is preferably covered by a sleeve, b^5, which is an enlargement of the guide E, as plainly shown in Fig. 2, and this is provided to prevent exposure of the conductor to the external air after it enters guide E, and for correspondingly protecting the fused lead supplied to the mold. This cover or sleeve b^5 also admits of an air-chamber between the top of the mold and guide E, which chamber contains highly-heated air under pressure due to the heat of the burners and to the evaporation of the moisture from the insulation on the conductor in passing through the chamber. This pressure in said chamber in a measure effects a pressing effect upon the lead in the mold and assists in the formation of casting the lead cover upon the conductor. Upon the mold B is a cylinder or water-jacket, G, which slides up and down on the mold, and has suitable end stuffing-boxes, *g*, and operating-lever *g'*.

If desired, waste or other suitable material may be wrapped around the mold inside of jacket G, as indicated at g^2, to prevent too sudden chilling of mold B. The jacket G has at or near its top a supply-pipe, g^3, provided with a valve, g^4, and at or near its bottom an exit or overflow pipe, g^5. The pipe g^3 may lead to tank *e'* or other source of supply.

The melting-pot C has a spout or pipe, *c*, provided with a suitable cock, *c'*, and leads to the mold, as indicated in Fig. 1 or in Fig. 2.

Upon frame A is suitably mounted a reel, H, having actuating mechanism *h*.

The operation is as follows: The conductor *x* is suitably prepared and passed through guide E and the mold and attached to the reel H, the water-supply for jackets *e* and G having previously been turned on and the burners D lighted to fuse the lead in pot C and heat the upper part of mold B. The cock *c'* is then turned to admit the molten metal to the die or its chamfered end *b* and straight section *b'*. The metal flows around the conductor and immediately becomes more or less chilled, and as the conductor is gradually wound upon reel H it is gradually drawn through the die and in its passage is enveloped by a seamless continuous lead cover. As the cover is formed in the straight bore *b'* of the mold, it is not subject to friction as it is drawn through the tapered section b^2 of the mold; hence the drawing or feeding of the conductor is easily and smoothly accomplished and the continuity of the covering is maintained.

If the upper part of the mold gets too hot, the jacket G is raised more or less so that its water-supply will gradually lower the temperature of the mold, and if it is not hot enough the jacket G is lowered.

The slit b^3 in the upper part of the mold is very narrow, or its area is so proportioned that the lead will run into the mold faster than it will run out of said slit, and it is provided to carry off the dross or other impurities in the lead.

It will be observed that the casting of the lead cover around the conductor depends upon the flow of metal to the mold and in it, and not to mechanical or other pressure devices; and as it is obvious that the details of construction may be greatly varied to practice my invention I do not limit myself to the forms shown. Thus, for instance, if the jacket G slides, as shown in Fig. 2, its inlet and outlet pipes are flexible, or have a flexible section. If fixed, as shown in Fig. 1, the pipes are rigid.

What I claim is—

1. In a lead-covering machine for electric conductors, the combination of a die or mold, devices for feeding the conductor through the mold, and a flow of metal to the mold, whereby a seamless lead covering is formed on the conductor, substantially as set forth.

2. The combination of a hollow mold, a melting-pot having a pipe or spout leading to the mold, devices for feeding the conductor through the mold, and heating devices for said pot and mold, substantially as set forth.

3. In a machine for lead-covering electric conductors, the combination of a die or mold, B, having a cooling-jacket, G, and actuating devices for raising or lowering said jacket, substantially as set forth.

4. The combination of hollow die or mold B, the sliding jacket G, having inlet and outlet pipes, and suitable end stuffing-boxes, substantially as set forth.

5. The combination of hollow die or mold B, sliding jacket having inlet and outlet pipes, and actuating devices, substantially as set forth.

6. The combination of hollow die or mold B, jacket G on said die, having inlet and outlet pipes, and devices for feeding an electric conductor or wire through the die, substantially as set forth.

7. In a seamless lead-covering machine, the combination of a guide, E, having a jacket provided with an upward flow of water, and a die or mold, B, having jacket G, provided with a downward flow of water, substantially as set forth.

8. The die B, having slit b^3, straight bore *b'*, and tapering bore b^2, as and for the purpose set forth.

9. The combination of a die having a water-jacket, a guide, E, having a like jacket, burners for the die, and actuating devices for drawing a conductor or wire through the guide and mold, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE L. KITSON.

Witnesses:
S. J. VAN STAVOREN,
CHAS. F. VAN HORN.