No. 679,521. Patented July 30, 1901.

C. H. THORDARSON.

WIRE INSULATING MACHINE.

(Application filed Oct. 12, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

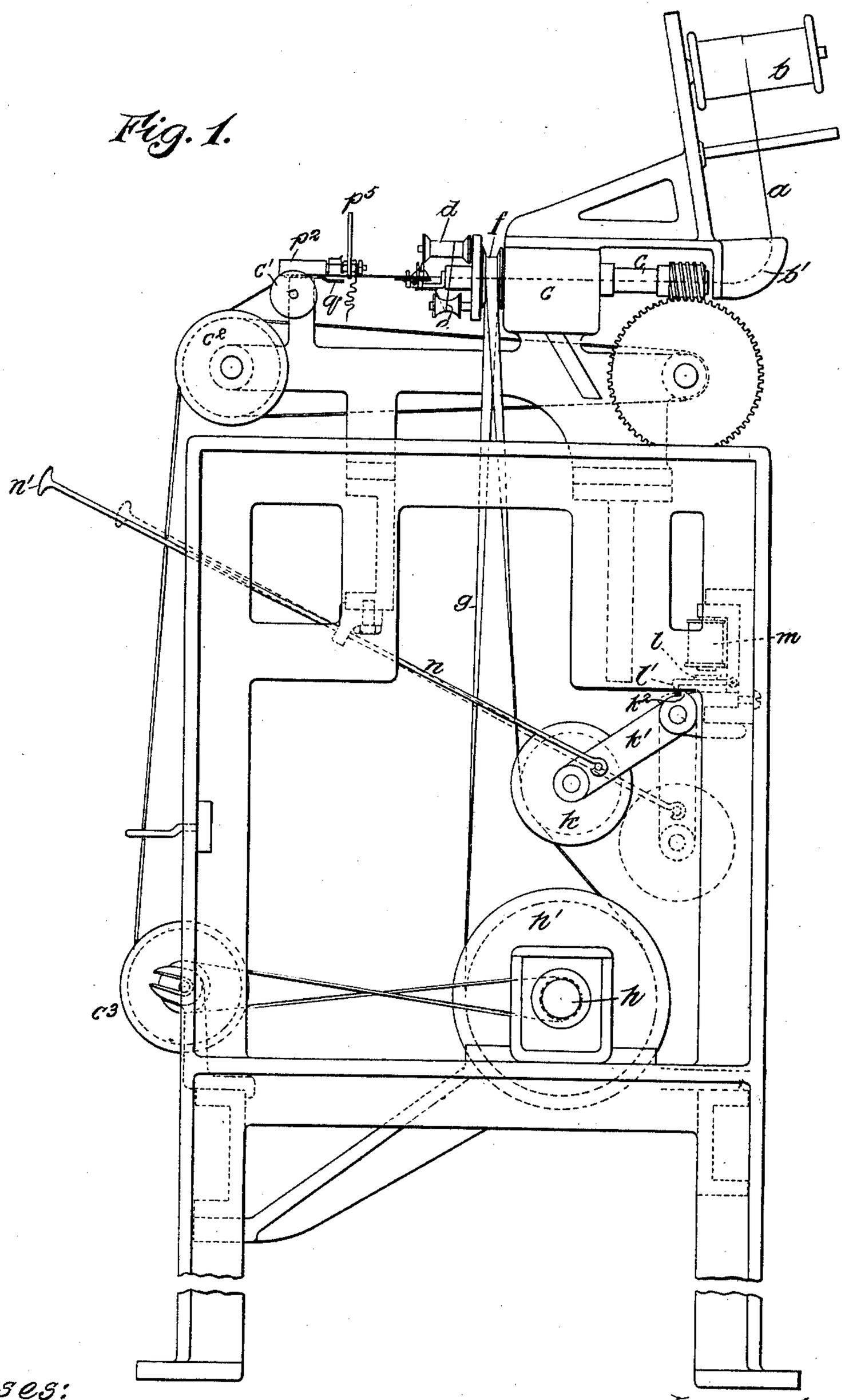

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Fig. 2.

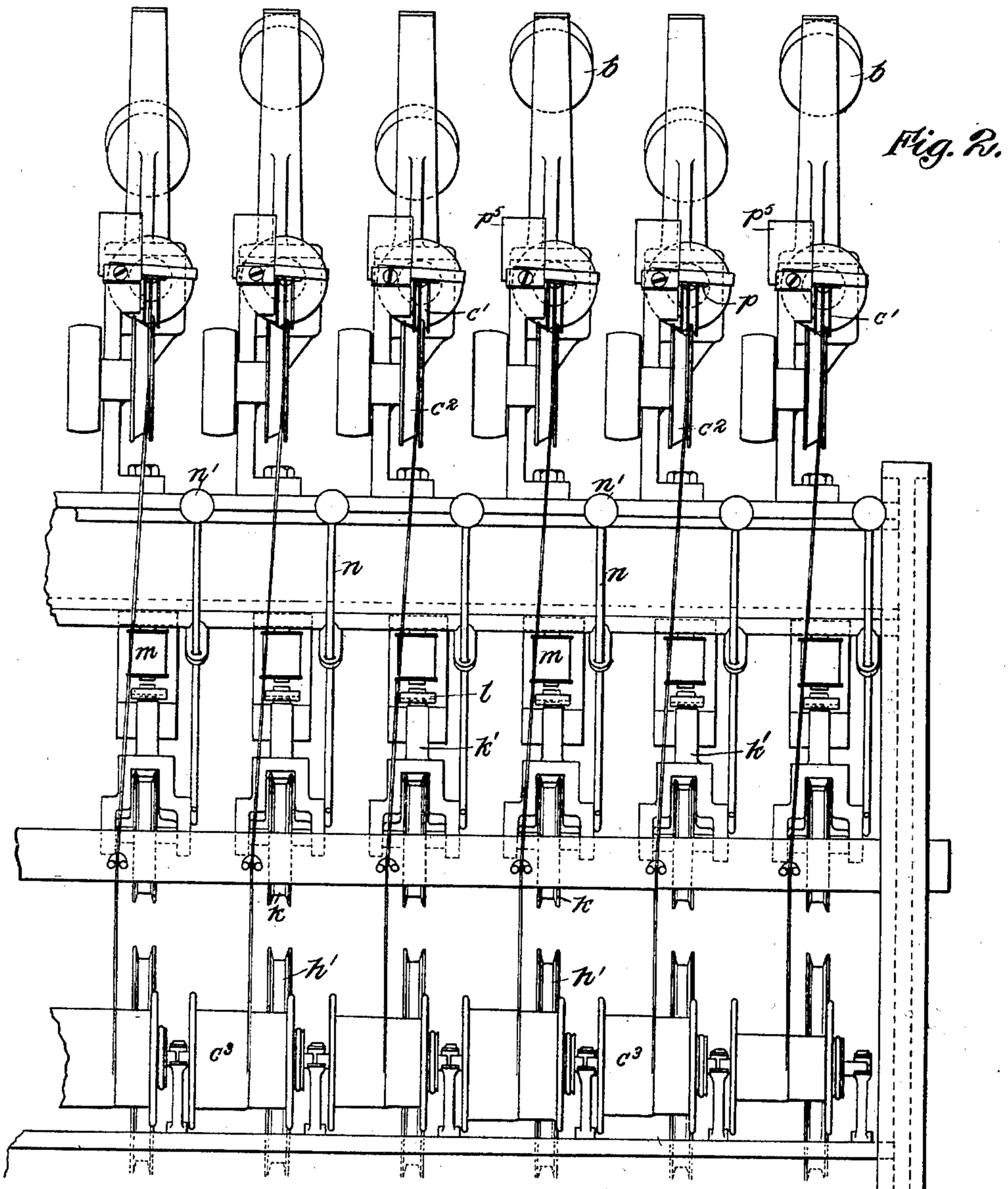

Fig. 3.

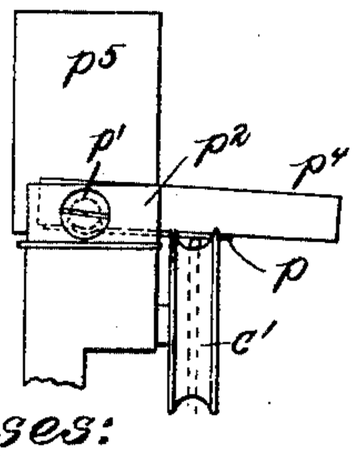

Fig. 4.

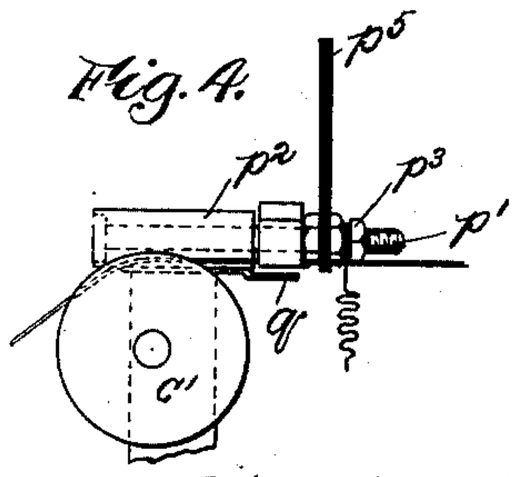

Fig. 5.

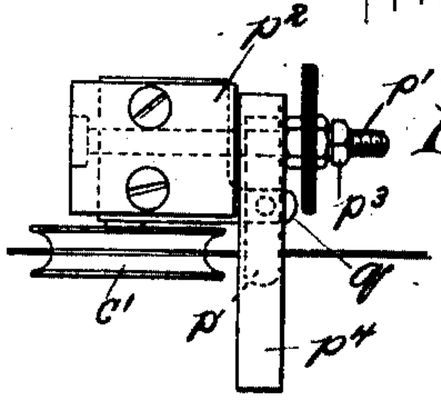

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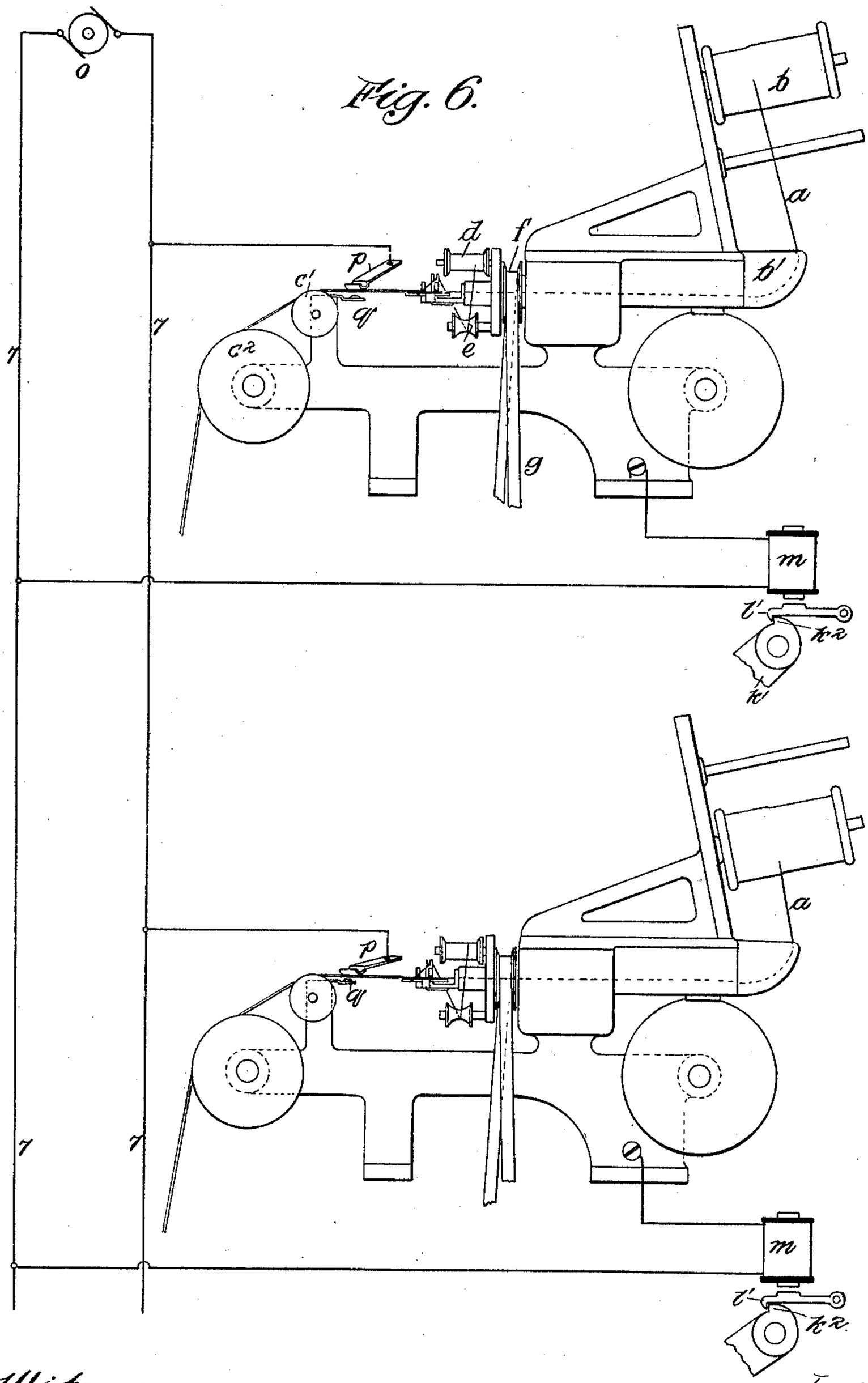
Fig. 6.



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UNITED STATES PATENT OFFICE.

CHESTER H. THORDARSON, OF CHICAGO, ILLINOIS.

WIRE-INSULATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 679,521, dated July 30, 1901.

Application filed October 12, 1900. Serial No. 32,825. (No model.)

To all whom it may concern:

Be it known that I, CHESTER H. THORDARSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Wire-Insulating Machines, (Case No. 1,) of which the following is a full, clear, concise, and exact description.

My invention relates to the manufacture of insulated wire, and has for its object to provide means whereby the wire and the insulating-covering may be tested while the machine is in operation, so that should the wire or insulation break or the wire be imperfectly covered the operation of the machine will be automatically stopped without action on the part of the attendant.

My invention is particularly designed for use in connection with machines for insulating very fine wire which will not stand any very great strain.

In accordance with my invention the bare wire before passing through the insulating-head is connected with one side of an electric circuit, and a light metallic rider is connected with the other side of the circuit and is arranged to bear upon the wire after it has received its winding of insulating-thread. A plate or contact-piece is provided underneath the brush or rider before referrrd to, so that if the wire should break the rider will fall upon the plate and make electrical contact therewith, said plate being connected with the same side of the circuit as the bare wire. In the normal operation of the machine, then, this electric circuit is open; but it will be seen that if the insulating thread or covering should break or be wound imperfectly upon the wire, so as to leave a bare portion thereof, or if the wire itself should break the circuit will automatically be closed. I provide a responsive device in the electric circuit so controlled, which responsive device preferably consists of an electromagnet controlling the operation of the machine, so that when said electromagnet is energized it will operate to stop the machine.

By the use of my invention a very large number of insulating-heads may be mounted in one machine to be run from a common source of power and to be looked after by a single attendant. Thus I have found it convenient to use a machine having apparatus for insulating twenty wires simultaneously—that is, there are, in effect, twenty distinct insulating-machines each independent of the other, but all driven by a common source of power and located side by side, so that a single attendant may supervise the operation of all of them with very little difficulty. If the wire in any machine should break or the insulation be defective, that particular machine—that is, the portion of the whole machine which controls the feeding and insulating of that particular wire—will stop. I provide means whereby the stopping of any particular section of the machine will cause a change in the position of certain parts, which may be perceived at a glance by the operator, thus constituting a signal to her to indicate the condition of the machine. Upon perceiving that the machinery of any section has stopped she will at once examine that section, repair the injury, and start the machine in operation again.

By the use of this invention a single operator may look after a very large number of wires at once.

I will describe my invention more particularly by reference to the accompanying drawings, which illustrate the preferred embodiment thereof, wherein—

Figure 1 is a side or end view of the insulating-machine. Fig. 2 is a front view showing how a large number of sections, each constituting a complete machine of itself for insulating one wire, may be mounted side by side in a row to constitute a single large machine, each of said sections being controlled independently of the other by its own electrical testing, supervising, and controlling mechanism. Fig. 3 is a detail end view showing the rider or contact-piece which rests upon the wire as it passes through the machine after having received its covering of insulating-thread. Figs. 4 and 5 are respectively side and plan views of the same parts, and Fig. 6 is a diagram illustrating the electrical connections.

Similar characters of reference are used to designate the same parts wherever they are shown.

Referring first to Fig. 1, the bare wire *a* is unwound from a spool *b* (shown at the top

of the machine) and is passed horizontally through the insulating-head c, thence around pulleys c' c^2, and finally wound upon the spool c^3. The insulating-head comprises a rotatable face-plate carrying the bobbin d, from which the insulating-thread e is unwound. As the insulating-head is rotated the thread e is unwound from its bobbin and wrapped spirally about the wire a, passing through the center of the head. This construction is well known in the art and needs no particular description.

The insulating-head is formed with a pulley f, about which a belt g is passed, said belt being driven from a belt wheel or pulley h', carried by the main driving-shaft h. The pulleys h' of the several sections of the machine are all mounted upon the same driving-shaft h. An idler-pulley k is carried upon a swinging arm k', and when the apparatus is in its normal condition this idler keeps the belt g tight, so that the insulating-head at the top of the machine is driven thereby. When, however, the arm k' is permitted to drop down into a vertical position, as shown in dotted lines in Fig. 1, it will be seen that the belt g will be loosened and the rotation of the head c stopped.

The arm k' carries a lug k^2 at its upper end, which is adapted to be engaged by a detent l', carried by the armature-lever l. A magnet m is mounted at the rear of the machine, immediately above the armature-lever l, and when said magnet is energized the armature-lever is attracted and the detent l' raised clear of the lug k^2. The arm k' is thus no longer supported and falls to the position illustrated in dotted lines, the result of this being to stop the machine. A rod n, connected with the lower part of the swinging arm k', extends out through the front of the machine and terminates in a button n', which is adapted to be grasped by the attendant. When the machine has been stopped by the release of the clutch controlled by magnet m, it may be started again by the attendant, who will grasp the rod at its end n' and pull it out, thus raising the idler k and tightening the belt. When raised far enough the lug k^2 will be caught by the detent and held until the magnet is again attracted.

As shown in Fig. 6, the several stop-magnets m m are connected in parallel branches of a main circuit 7 7, leading from the poles of a generator o. One side of each of said branch circuits is connected with a rider or brush p, which rests upon the wire as it emerges from the insulating-head of the machine or section with which such branch circuit is associated, and the other side of each such circuit is connected with the frame of the machine, including a plate q, directly under the rider p, and also including the guide b', around which the bare wire a passes before it enters the insulating-head. Each branch circuit, therefore, is normally open, but will be completed if the rider p comes into electrical contact with either the plate q or the bare wire a.

Figs. 3, 4, and 5 illustrate the structure and mode of mounting the rider or contact-piece q in a machine which I have constructed. Said contact-piece is pivoted to a pin p', which is fastened in a block of insulating material p^2, mounted upon the frame of the machine. Said pin is threaded, and a binding-nut p^3 is provided for attaching the terminal wire. A wooden or fiber backing p^4 is provided for the contact-piece to serve as a handle by which the attendant may manipulate it without danger of receiving an electric shock. A guard-plate p^5 is also provided to prevent accidental contact. By turning the rider back upon its pivot it can be thrown over out of the way while the wire is being strung or while a break is being repaired.

As the wire is insulated it is fed forward, being passed several times around the feeding-drum c^2 and thence down to the spool c^3, upon which it is wound. The feeding-drum is driven by the rotating head c through the agency of a worm-gear and belt, as shown.

When the machine is in operation, if the insulating-thread should break or be imperfectly wound upon the wire, so as to leave a portion of the wire bare, as soon as this bare portion comes under the rider electrical contact is made and the branch circuit of that section of the machine is completed. The magnet of such branch circuit thus receives current and acts, as described, to stop the machine. The same result is accomplished when the wire breaks, for then the rider is no longer supported by it and falls down upon the plate q, thus completing the circuit. As soon as the magnet m is energized and allows the arm k' to fall the rod n is drawn down, and the button n' thereon being thrown out of alinement with the other buttons of the machine constitutes a signal to the attendant to indicate the stopping of that section. The attendant after repairing the injury grasps the rod n by its handle or button n' and pulls it up until the idler-arm k' is raised sufficiently to catch the detent l'.

It will be appreciated that my invention is of especial value in connection with the insulating of very fine wire, which would not be strong enough to withstand the strain or weight of a rider controlling a purely mechanical stopping device.

It is obvious that many modifications can be made in the machine illustrated without departing from the spirit of my invention, and I do not desire to be understood as limiting myself to the precise construction shown; but,

Having described the preferred embodiment of my invention, I claim as new, and desire to secure by Letters Patent, the following:

1. In a wire-insulating machine, the combination with an insulating-head, mechanism for driving the same and for feeding the wire through the machine, of a magnet and mechanism controlled thereby for stopping the ma-

chine, a circuit including said magnet and a source of current, and a pair of contact-pieces controlling said circuit, normally separated by the wire passing through the machine, said contact-pieces being adapted to close together when the wire breaks, as set forth.

2. The combination with the wire *a* and mechanism for feeding the same through the machine, a magnet controlling the operation of the feeding mechanism, a circuit including said magnet and a source of current, and a pair of contact-pieces controlling said circuit, normally held out of engagement with one another by the wire and adapted to close together when relieved, substantially as set forth.

3. In a wire-insulating machine, the combination with a rotating insulating-head, mechanism for feeding the wire through said insulating-head, a driving-wheel *h* and a driving-belt connecting the same with the insulating-head, an idler *k* tending to swing away from the belt to loosen the same, a magnet *m*, mechanism controlled by said magnet for holding the idler against the belt, a circuit including said magnet and a source of current, and a pair of contacts mounted upon the stationary framework of the machine controlling said circuit, normally held out of engagement by the wire but adapted to close together when relieved of the wire, substantially as set forth.

4. In a wire-insulating machine, the combination with a rotating insulating-head, mechanism for rotating the same and for feeding the wire through the machine, a magnet controlling the operation of the machine, a circuit including said magnet and a source of current, a pivoted rider carrying an electrical contact forming one terminal of said circuit, said rider being adapted to swing or rotate in a plane at an angle with the wire, the rider normally lying across the wire as it emerges from the insulating-head, and a plate *q* opposite the rider, against which said rider is adapted to strike, the wire normally holding the rider out of engagement with said plate, said plate and the wire being both connected with the other side of the circuit, substantially as set forth.

5. The combination with a wire-insulating machine, of an electrical testing-circuit therefor, a responsive device and a source of current in the circuit, a rider pressing upon the wire as it is fed through the machine, a contact-piece coöperating with said rider to control the aforesaid circuit, the wire in its normal tension maintaining the rider and contact-piece in predetermined relations, such relations being changed to alter the condition of the circuit and affect said responsive device when the rider is relieved of the wire, substantially as set forth.

6. The combination with a wire-insulating machine, of an electrical testing-circuit therefor, a responsive device and a source of current in the circuit, a rider having an electrical contact portion forming one terminal of said circuit, said rider pressing upon the wire after it has received its coating of insulation, and a contact-plate *q* opposite the rider against which said rider is adapted to strike, the wire at its normal tension holding the rider out of engagement with the plate, said plate and the wire constituting multiple terminals for the other side of the circuit, whereby the circuit is closed and the responsive device actuated when the wire or the insulating material breaks, as set forth.

7. In a wire-insulating machine, the combination with a plurality of insulating-heads, each insulating a different wire, and means for independently operating said insulating-heads and feeding the wires through them, of a magnet associated with each of said insulating-heads and mechanism controlled thereby for stopping the operation of the head with which it is associated, an electric circuit including a source of current and having several branches, one for each of said insulating-heads, each branch including the magnet which is associated with the same insulating-head, and a pair of contacts controlling each branch, normally held out of engagement with one another by the wire which is being insulated, but adapted to close together when relieved of the wire, as when the wire breaks, substantially as set forth.

In witness whereof I hereunto subscribe my name this 8th day of October, A. D. 1900.

CHESTER H. THORDARSON.

Witnesses:

DE WITT C. TANNER,

W. W. LEACH.