

No. 685,279.

Patented Oct. 29, 1901.

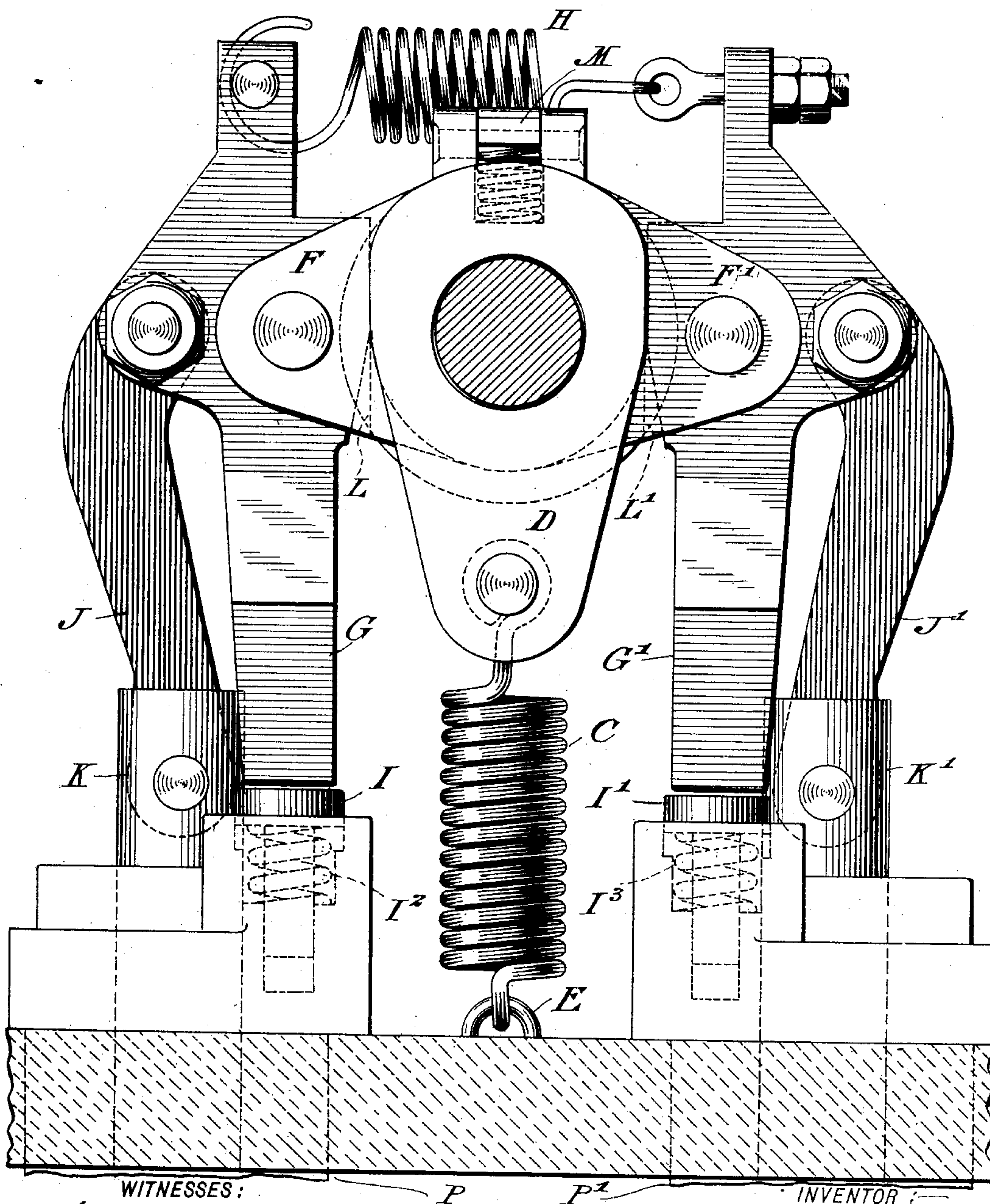
G. H. HILL.
SWITCH CONTROLLING DEVICE.

(Application filed Aug. 5, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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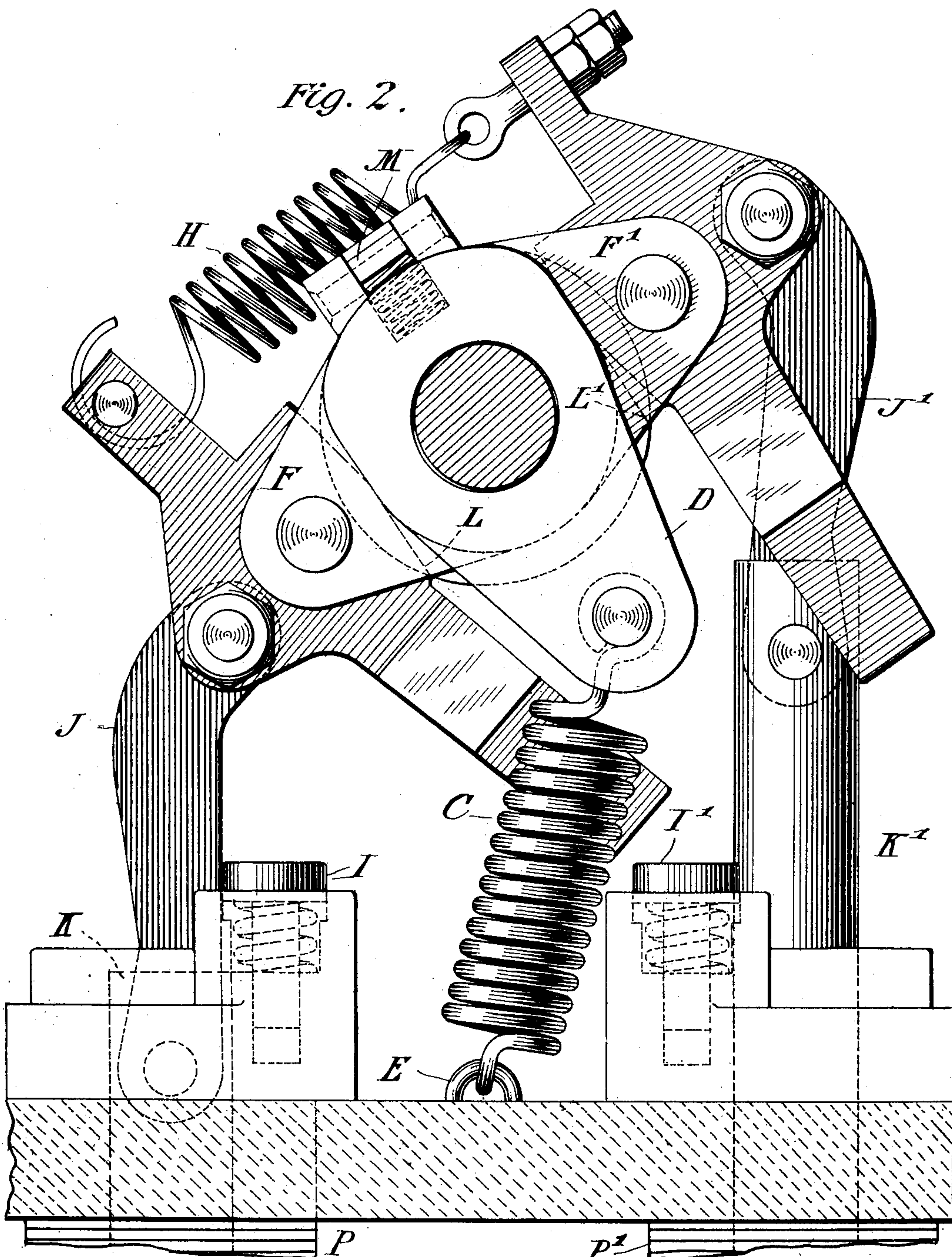
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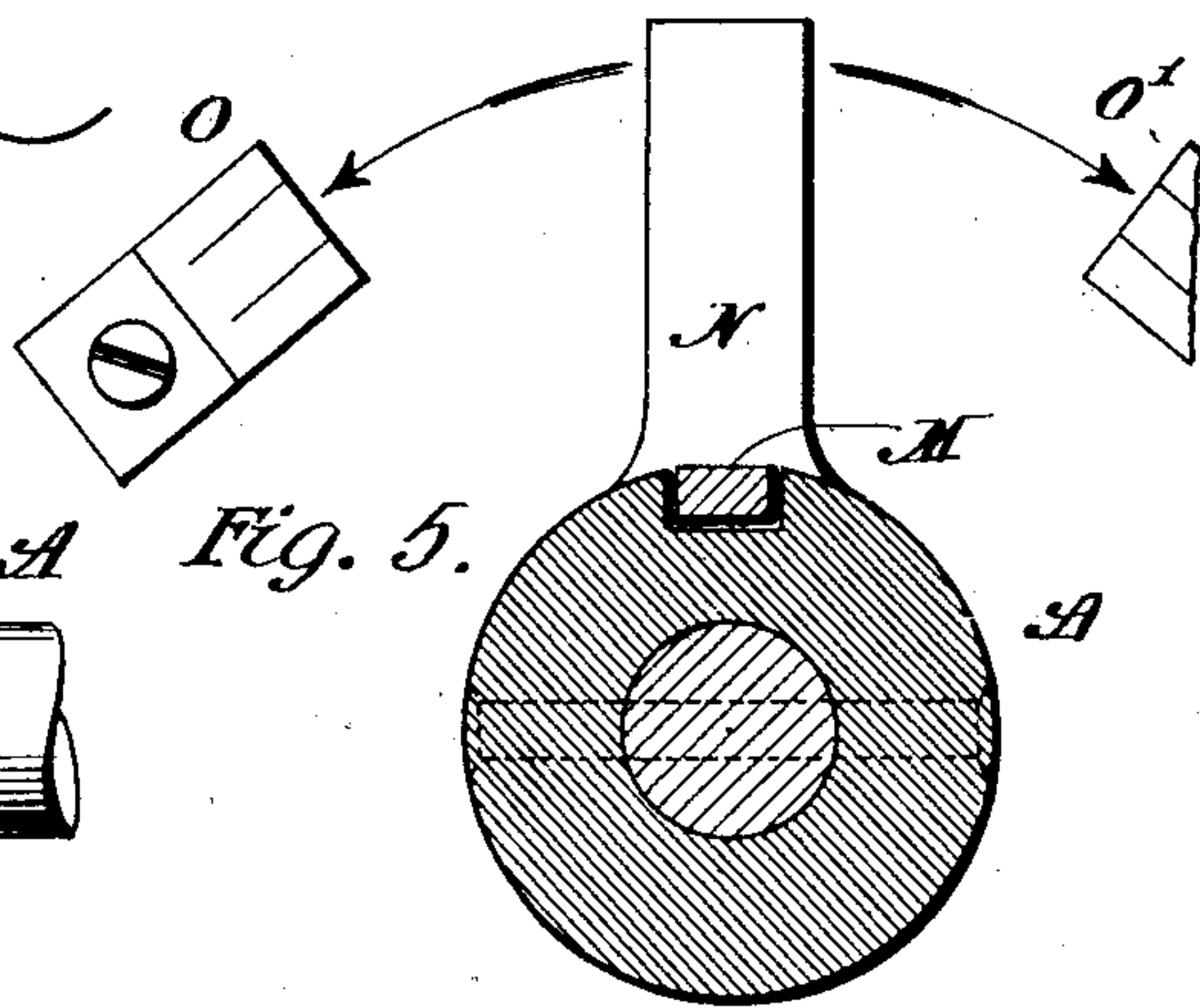
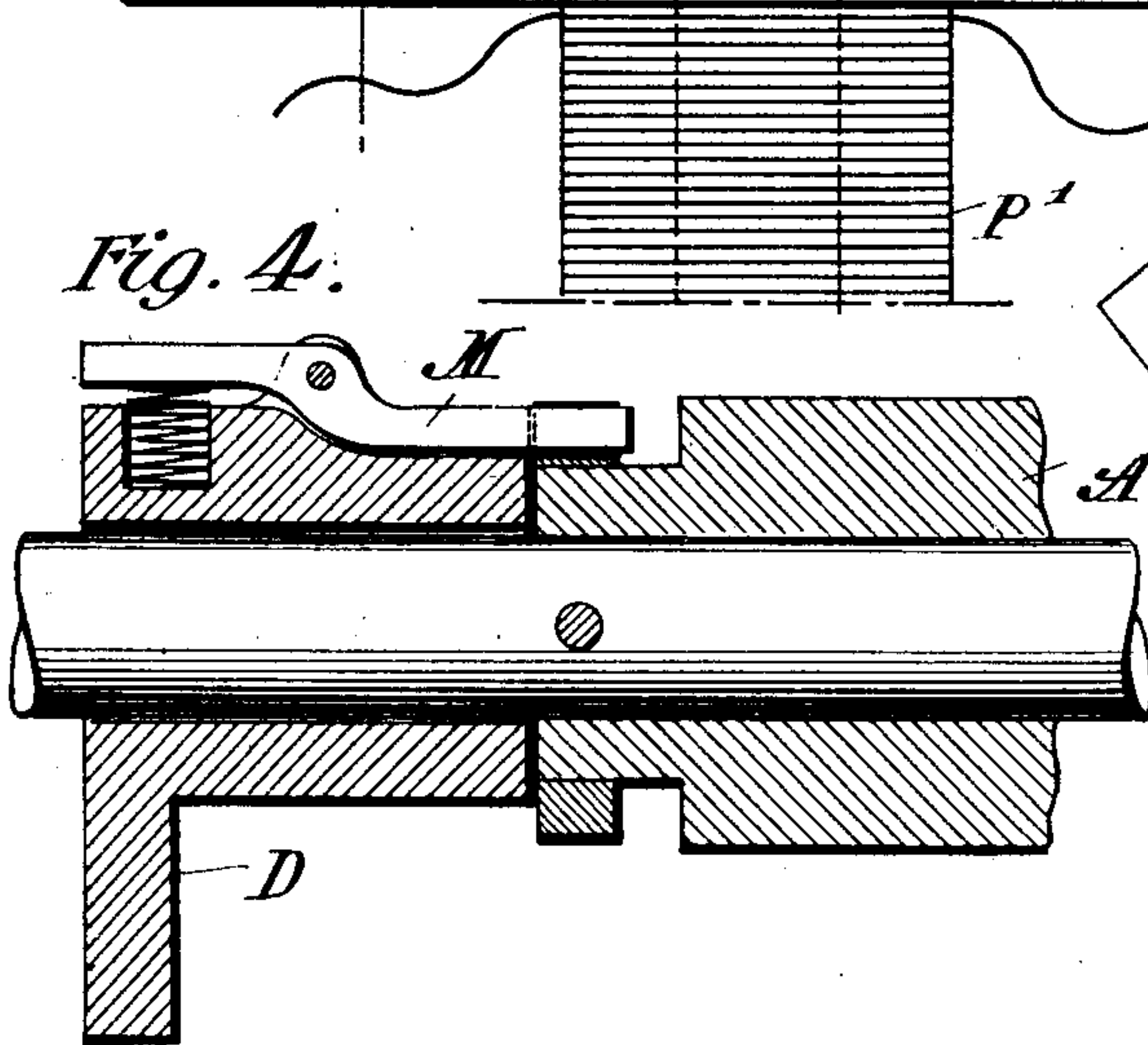
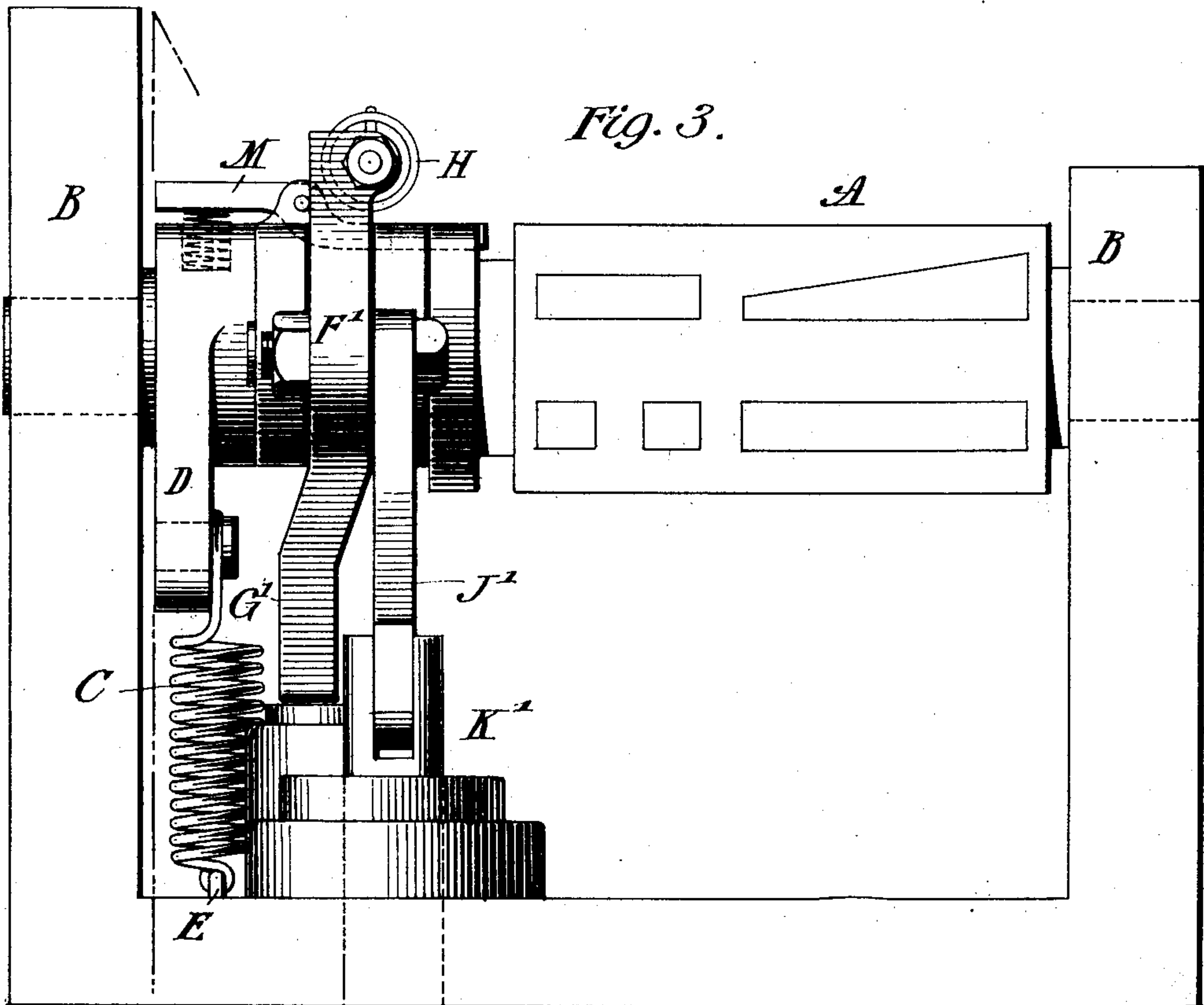
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

GEORGE H. HILL, OF GLENRIDGE, NEW JERSEY, ASSIGNOR TO SPRAGUE ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

SWITCH-CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 685,279, dated October 29, 1901.

Application filed August 5, 1901. Serial No. 70,872. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. HILL, a citizen of the United States, residing at Glenridge, Essex county, New Jersey, have invented certain new and useful Improvements in Switch-Controlling Devices, of which the following is a full, clear, and exact description.

My invention relates to improvements in means for controlling switches and the like.

The main object of my invention is to provide in a switch having a normal position and capable of movement to one side or either side of said normal position an actuating mechanism which will also perform the function of holding the switch locked in its normal position against any moving force not applied at a prescribed point. This latch mechanism also serves to prevent the switch going past its normal position when being returned thereto.

In the main views of the accompanying drawings I have illustrated the mechanism as applied to a motor-reversing switch built on the cylinder style.

In the drawings, Figure 1 is an elevation of the actuating and locking mechanism as it appears in its normal position. Fig. 2 is an elevation of the same parts, the positions of which are changed. Fig. 3 is a side elevation of the parts shown in Fig. 1. Figs. 4 and 5 are views of details, partly in section, the latter figure illustrating the use of an ordinary blade-switch.

While I have illustrated in the drawings mechanism as applied to electric switches, it is obvious that the invention is by no means limited thereto or to any particular field of usefulness, but that I intend that it may be applied wherever it is practicable and in whatever connection it may be useful.

In that particular form of mechanism shown in Figs. 1, 2, and 3, A is a cylinder in the form of a switch. B B are bearings therefor. Inasmuch as it is immaterial whether the cylinder A is so constructed that it may be a switch in itself or that it may carry a switch in the form of a blade, said part A will be referred to hereinafter as a "carrier."

The carrier A is usually held in a normal position (see Fig. 1) by means of a spring C,

which may be secured at one end to the arm D at the head of the carrier and at the other end to a suitable anchorage E.

F F' are arms, which may project from the carrier or the carrier-head, to which arms may be hinged what I shall term herein "stop-levers" G G'. The stop-levers G G' may be held in their normal position by means of a spring H. In their normal position the lower ends of the stop-levers G G' are located over suitable shoulders or stops I I', respectively, which, if desired, may have cushioning-springs I² I³, respectively.

J J' are links connecting the stop-levers G G' with plungers K K', respectively. The connection of each of the links J J' with the stop-levers G G' is preferably a hinged connection. These connections are located eccentrically to the pivotal connections between the stop-levers G G' and the arms F F' on the carrier-head.

L L' are stop-surfaces upon the head of the carrier adjacent to the inner edges of the stop-levers G G', respectively, so that when the lower end of either of the levers G G' shall swing inwardly it will be checked after it has moved sufficient to clear its respective stop I or I'.

The carrier A may be mounted so that it will revolve independent of the head portion carrying the projections D F F', in which event a suitable lock or latch M may be provided, by which the parts may be locked together, as shown in Figs. 3, 4, and 5.

In Fig. 5, N is a switch-blade carried by the carrier A and is illustrative of the fact that the type of switch employed is immaterial. In this figure, O O' are contacts, into engagement with either of which the blade N may be thrown.

The plungers K K' project into solenoids P P', respectively.

In describing the operation we will start from the normal position shown in Fig. 1, in which neither of the solenoids P P' is energized. By energizing the solenoid P the plunger K is drawn inwardly, in turn pulling down the link J, which by connection to the stop-lever G tilts the latter upon its bearing on the arm F until it engages with the stop surface or shoulder. This tilting of the stop-

lever G stretches the spring H, and the lower end of the lever is thrown inwardly and away from the stop I. When the lower end of the stop-lever G has cleared the stop I, a further
 5 downward movement of the plunger K tilts the entire frame, with its associated parts, (including the carrier A,) from the position indicated in Fig. 1 to the position indicated in Fig. 2. This movement increases the ten-
 10 sion of the spring C. In this manner the switch may be thrown to the "on" position and will be held there, as shown in Fig. 2, so long as the solenoid P is energized. When the solenoid P is deenergized, the spring C
 15 contracts and quickly throws all of the parts back to the normal position, Fig. 1. On the return the stop-lever G' comes in contact with the stop I', checking the parts at the normal point, at which instant the stop-lever G (un-
 20 der the influence of the spring H) is thrown into its normal position, so that its lower end will stand over the stop I. Thus the parts are instantly and positively locked in their normal position. The carrier may be shifted
 25 in an opposite direction—that is, to the position opposite to that shown in Fig. 2—by energizing the solenoid P'.

The shoulder L, above referred to, serves to stop or check the inward swing of the stop-
 30 lever G when the lower end thereof has sufficiently cleared the stop I. In the same way the stop-shoulder L' limits the swing of the stop-lever G' when its lower end has suffi-
 35 ciently cleared the stop I'.

By the use of the mechanism herein de-
 35 scribed and shown the momentum of the parts generated by the power of the spring C in shifting the parts back to their normal position is checked, so that the switch mechan-
 40 ism cannot run over, as would happen in the absence of an effective checking device. By the employment of this mechanism the device may be effectively operated with less power
 45 than has heretofore been required for operating a switch of this character and of the given size.

Manifestly the location and arrangement and direction of the action of the parts may be changed or modified in many ways with-
 50 out departing from the spirit or scope of my invention, and it should therefore be understood that I do not intend to limit myself to the specific thing illustrated in the drawings and particularly referred to in the specifica-
 55 tion.

What I claim is—

1. In a device of the character described, a carrier, a suitable bearing therefor, means for causing said carrier to assume a normal
 60 position, a stop-lever connected to the carrier or the head thereof, a link attached to said stop-lever eccentrically with its connection to said carrier, means for imparting movement to said link, and means for yield-
 65 ingly holding the operative end of said stop-lever in a normal position, and a stop coacting with said stop-lever.

2. In a device of the character described, a carrier, bearings therefor, a spring for caus-
 70 ing said carrier to assume a normal position, a stop-lever carried by the carrier or the head thereof, a link attached to said stop eccen-
 75 trically with its connection to the carrier-head, means for imparting movement to said link, and a spring for yieldingly holding the operative end of said stop-lever in a normal position and a stop coacting with said stop-lever.

3. In a device of the character described, a carrier, bearings therefor, means for causing
 80 the carrier to assume a normal position, a stop-lever pivotally connected to the carrier and eccentric to its bearing, a link pivoted to said stop-lever eccentrically with its pivoted connection to said carrier, means for impart-
 85 ing movement to said link, and a spring for yieldingly holding the operative end of said stop-lever in a normal position, and a stop coacting with said stop-lever.

4. In a device of the character described, a
 90 carrier, suitable bearings therefor, means for causing said carrier to assume a normal position, a plurality of stop-levers carried by the carrier or the head thereof and eccentric to its bearing, links connected to said stop-
 95 levers, means for imparting movement to said links and through the links to said carrier, and means for yieldingly holding the operative ends of said stop-levers in a normal position, and stops coacting with said
 100 stop-levers.

5. In a device of the character described, a carrier, pivotal bearings therefor, a spring for causing said carrier to assume a normal
 105 position, stop-levers carried by the carrier or an extension thereof, links attached to said stop-levers eccentrically with their connection to said carrier, solenoids for imparting movement to said links, and means for yield-
 110 ingly holding the operative ends of said stop-levers in a normal position.

6. In a device of the character described, a carrier, a bearing therefor, means to cause
 115 said carrier to assume a normal position, a stop-lever, means for tilting said stop-lever relatively to said carrier, and imparting movement to said carrier therethrough.

7. In an actuating and locking mechanism for switches and the like, a switch-carrier, suitable bearings therefor, means for causing
 120 said carrier to assume a normal central position, stop-levers pivotally carried by extensions from said carrier, links attached to said stop-levers eccentric with said pivotal connection, means for imparting movement to
 125 either of said links, means for yieldingly holding the operative ends of said stop-levers in a normal position, and stops adjacent the ends of said stop-levers.

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Witnesses:

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