

No. 671,258.

Patented Apr. 2, 1901.

A. H. ARMSTRONG.
ATTACHMENT FOR CONTROLLER HANDLES.

(Application filed Jan. 22, 1901.)

(No Model.)

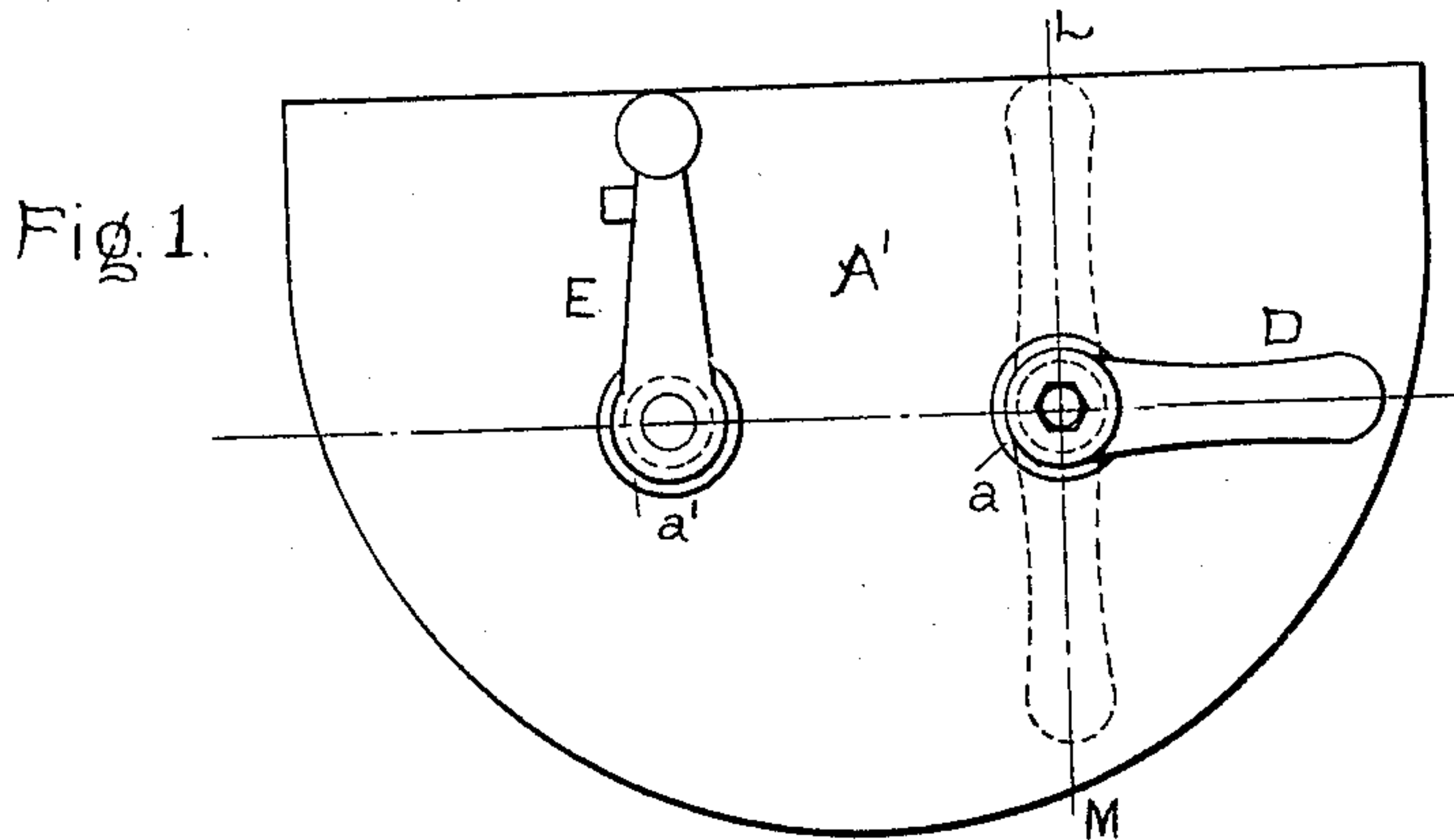


Fig. 2.

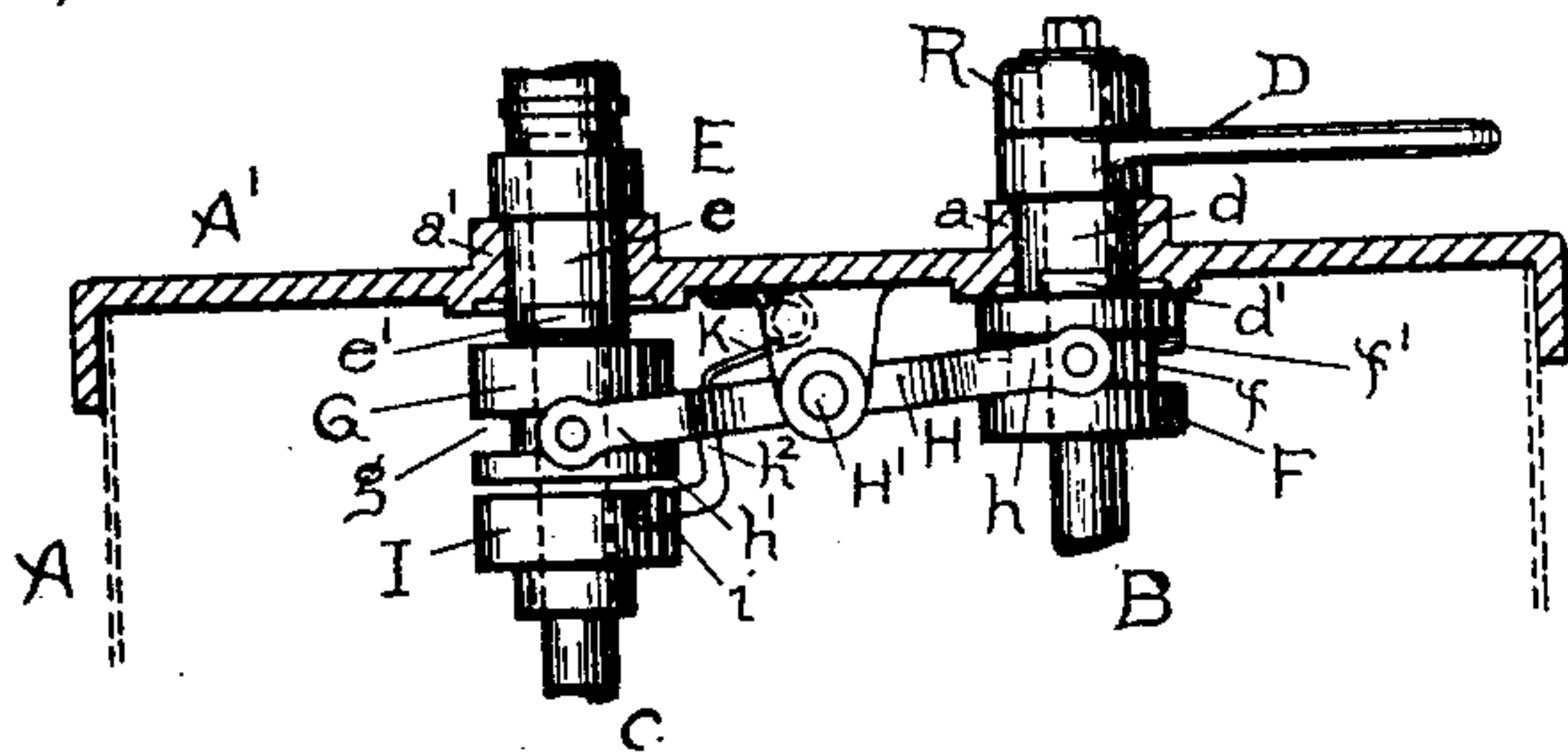


Fig. 5.

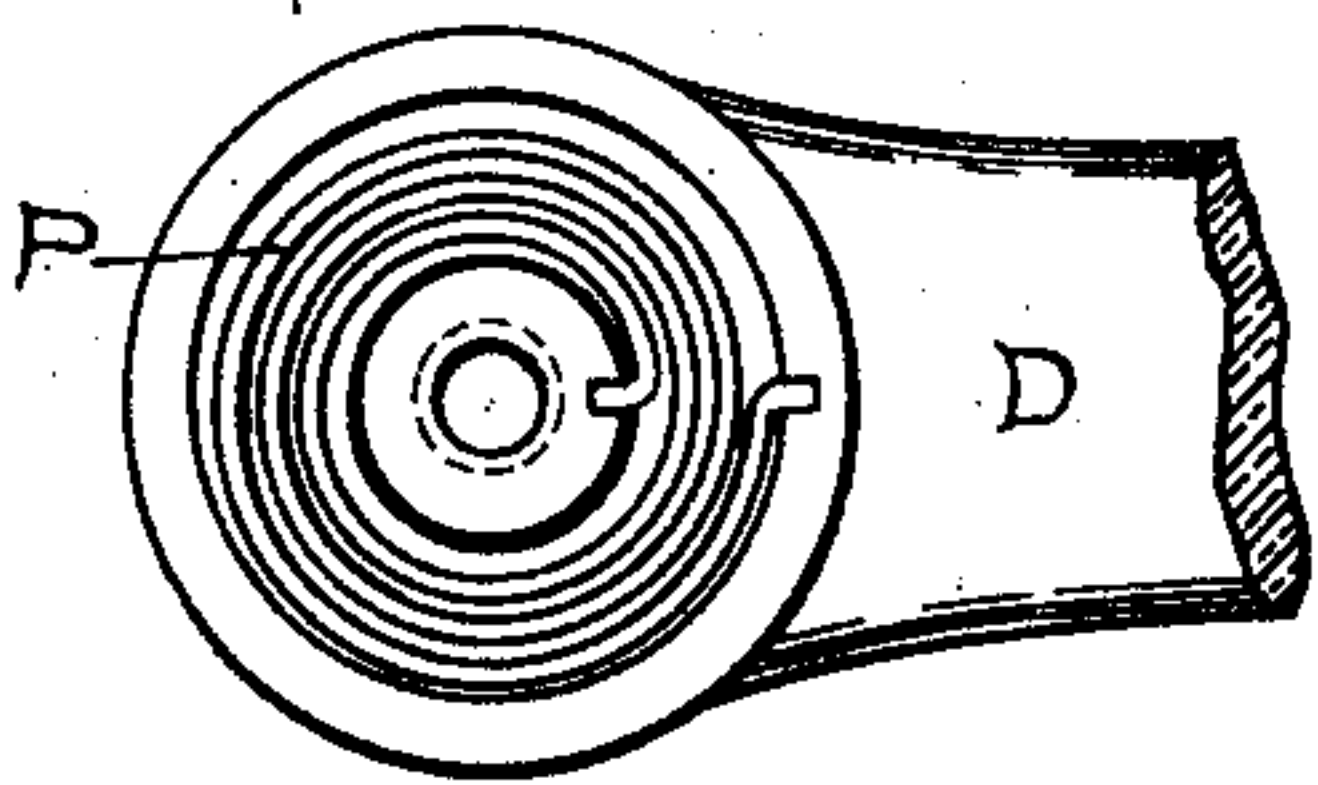
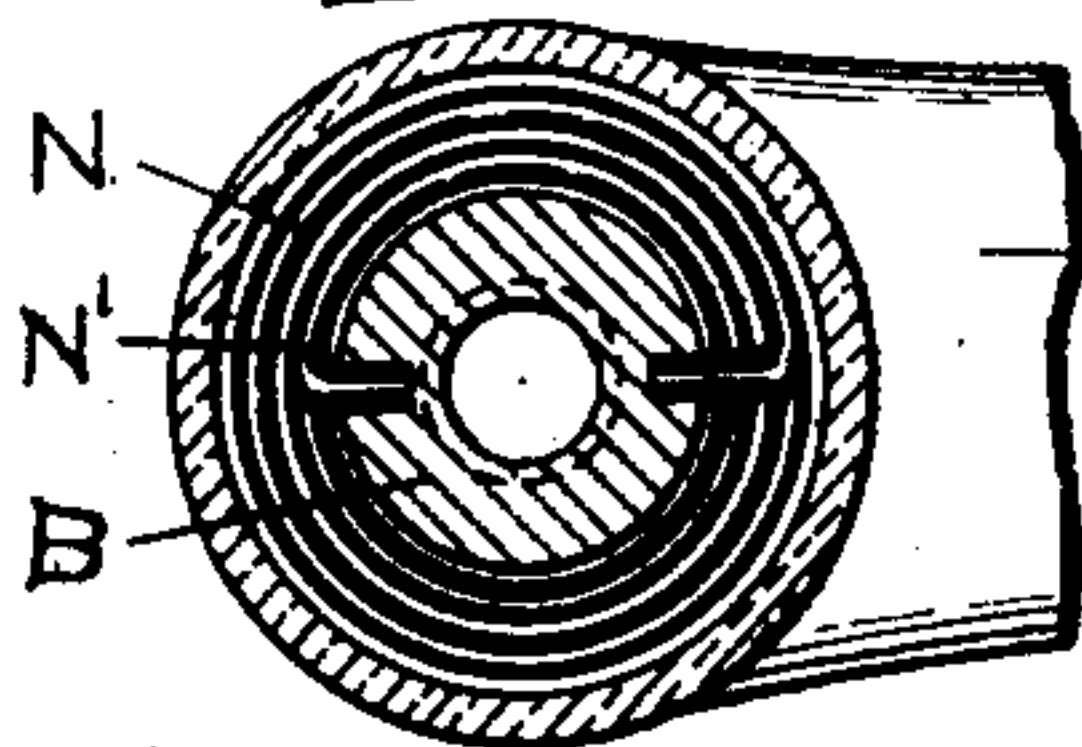
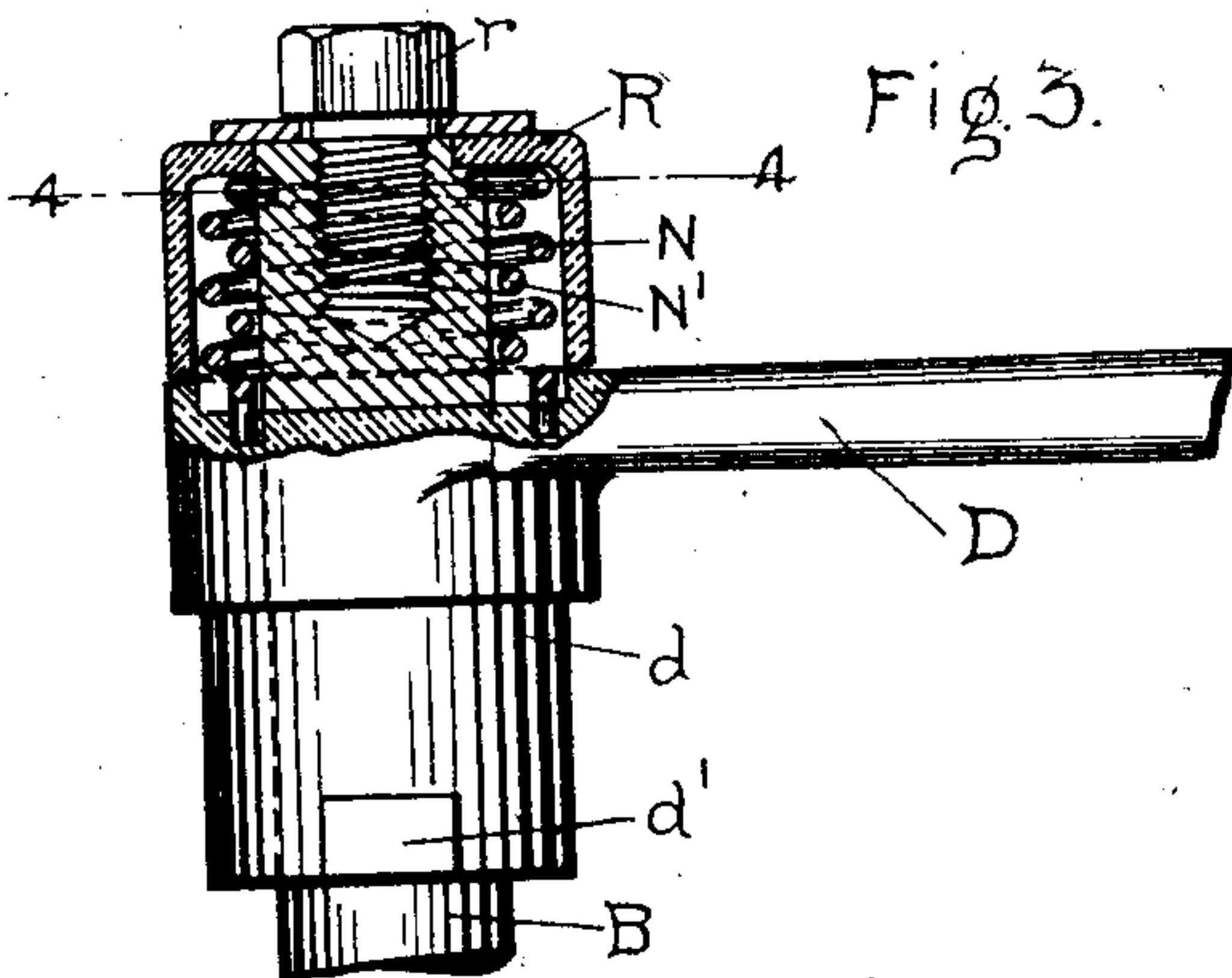
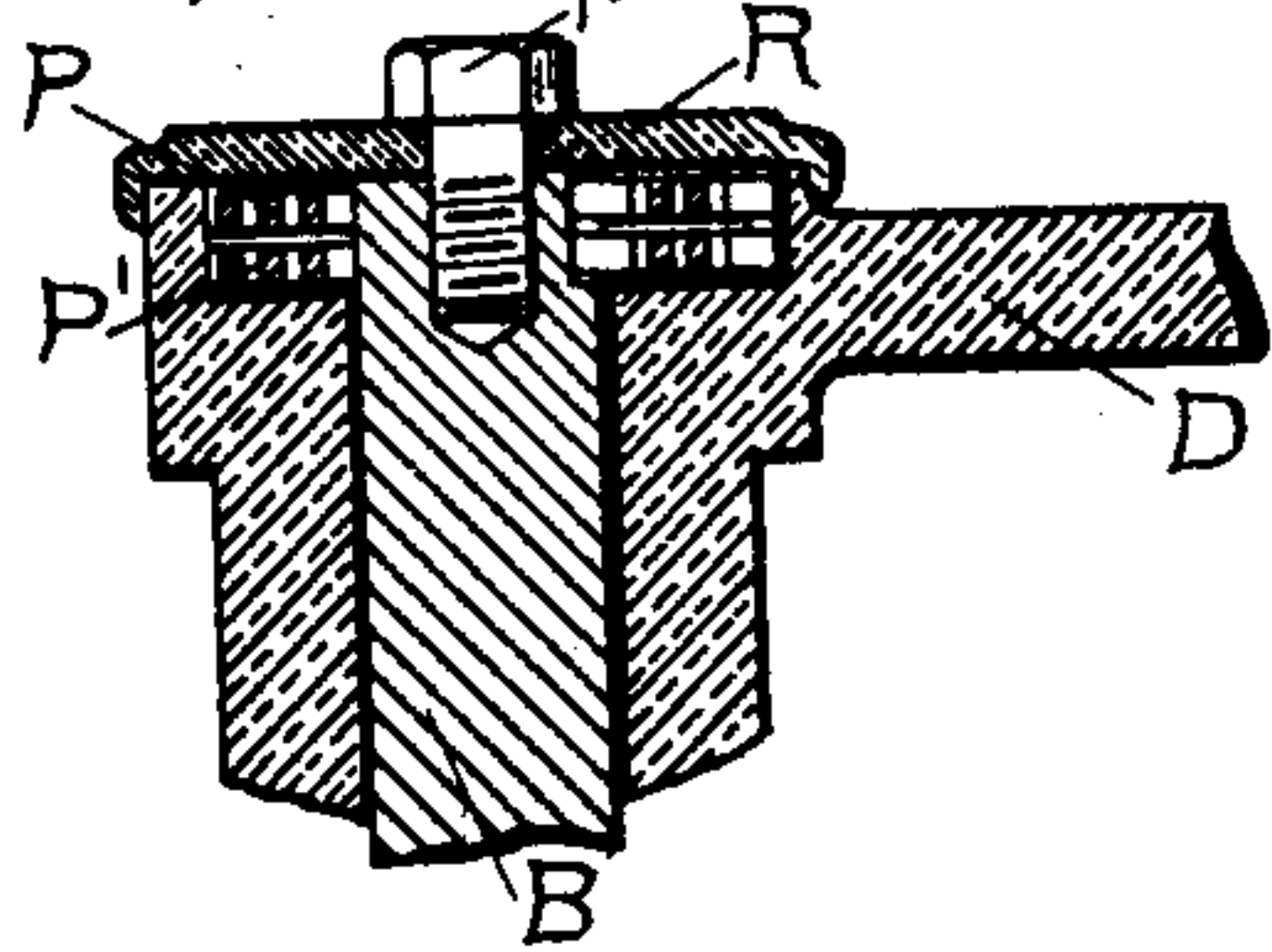


Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

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ATTACHMENT FOR CONTROLLER-HANDLES.

SPECIFICATION forming part of Letters Patent No. 671,258, dated April 2, 1901.

Application filed January 22, 1901. Serial No. 44,306. (No model.)

To all whom it may concern:

Be it known that I, ALBERT H. ARMSTRONG, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Attachments for Controller-Handles, (Case No. 1,815,) of which the following is a specification.

This invention relates to switches for controlling electric motors, and especially to controllers in which a rotary drum having a plurality of contacts for effecting predetermined changes in the motor-circuit is combined with a separate rotary reversing-switch. In order to prevent the reversing-switch from being operated while the current is flowing through the motor, it is customary to provide a device connecting the two switches and so arranged that the reversing-switch cannot be moved until the power-controlling switch has been brought to the "off" position. Such an invention forms the subject-matter of a patent to J. B. Heller, No. 650,010, in which the rotary shaft of each switch has a loose handle freely rotatable on the shaft and arranged to be clutched to the shaft by mechanism actuated by the other handle. The operation of the device is such that when the reversing-switch is brought to either its "forward" or "back" position the main controller-handle is clutched to its shaft, and the first movement of the main controller-handle away from its off position serves to unclutch the reversing-switch handle, so that it can be rotated freely on its shaft without actuating it. Conversely, when the controller-handle is brought to the off position it permits a spring or gravity to unclutch its shaft and at the same time clutch the reversing-switch handle, so that the latter can actuate its shaft and drum. During such movement of the reversing-switch from forward to back the controller-handle cannot actuate its drum, although it can be rotated freely on its shaft. In this organization, however, the loose handle can be moved to any position, and hence it does not correctly indicate the actual position of its drum. The reversing-switch handle, for instance, may swing around so as to point backward, while the reversing-switch itself is really in the forward position. This ob-

viously leads to confusion and possibly to disaster in operation. Moreover, as soon as the handle is moved away from its forward or back position it displaces the clutch-faces, so that they will not coöperate, and this will prevent the proper operation of the two clutches until the reversing-switch handle has been positively brought to the position from which it was moved. Inasmuch as the clutch will operate in either the forward or the back position of the handle it would be possible to completely reverse the handle and then clutch it to its shaft, in which position it would be inoperative, or if forcibly moved it might wreck the reversing-switch. If the car is standing still and the reversing-switch handle should become thus reversed, the motor-man might turn on the current, expecting to go backward, and the car would start forward, possibly causing serious disaster.

My invention aims to remedy these defects; and to this end it consists in an attachment whereby the loose handle while free to be moved independently of the shaft when unclutched therefrom will yet be automatically returned to a normal position when released, said position being that in which the clutch-faces are in line for engagement. The device which I prefer for this purpose is a coiled spring attached at one end to the shaft and at the other end to the handle, the tension of the spring being sufficient to overcome the friction and inertia of the handle, so as to revolve it on the shaft, but not sufficient to overcome the friction and inertia of the shaft, so that the latter will not be rotated when the unclutched handle is moved.

My invention is shown in the accompanying drawings, in which—

Figure 1 is a top plan view of a controller. Fig. 2 is a vertical section of the upper part thereof. Fig. 3 is a vertical section, on a larger scale, of the reversing-switch handle and its spring attachment. Fig. 4 is a horizontal section of the same on the line 4 4, Fig. 3. Fig. 5 is a horizontal plan view of a modification, and Fig. 6 is a vertical section of the same.

The controller-casing A is of any desired form and size, its top A' being provided with bosses *a a'*, having cylindrical holes through

them in line with the shaft B of the reversing-switch and the shaft C of the controller. Each shaft has a handle, (lettered D and E, respectively,) located above the top of the controller-casing and having a hub $d e$ fitting the cylindrical hole in the boss $a a'$. These hubs fit loosely on the upper ends of their respective shafts and extend down into the casing. Each hub has a laterally-projecting clutch-lug $d' e'$, adapted to engage with a clutch-sleeve F G, splined on its respective shaft B C, so as to be longitudinally movable thereon. In each sleeve is a groove $f g$, engaged by a fork $h h'$ on a lever H, fulcrumed at H' between the two shafts. The groove f has two opposite bends or cam-surfaces f' . Rigidly secured to the shaft C, below the sleeve G, is a collar I, having a notch i in its upper surface. Projecting from the lever H is an arm h^2 , whose lower end rests on the collar I and is adapted to enter the notch. A spring K may be used to forcibly depress this end of the lever.

When the handles D E are in the off position, (shown in Figs. 1 and 2,) the sleeve G is disengaged from the clutch-lug e' on the handle E, while the sleeve F is in engagement with the clutch-lug d' of the lever D. The controller-handle E is therefore loose and can be turned freely without moving its shaft. The reversing-switch handle D, however, is clutched to its shaft. When it has been moved to the position L or M, the engagement of the cams f' with the fork h rocks the lever H enough to lift the sleeve G into engagement with the clutch-lug e' . The shaft C can now be rotated by the controller-handle E, carrying with it the collar I, whose notch rides out from under the arm h^2 , thereby rocking up the lever still farther and disengaging the sleeve F from the clutch-lug d' . The reversing-switch handle is thus left free to turn on the shaft B without actuating it. However, to prevent a permanent displacement of the reversing-switch handle from its normal position of forward or back, I attach to the handle and shaft one or more coiled springs, preferably two, opposed to each other in order to give an equal turning movement in both directions of movement. They may be helical springs N N', one inside the other, as shown in Figs. 3 and 4, or spiral springs P P', one above the other, as shown in Fig. 5. In either case one spring is right-handed and the other left-handed. A cap R may be secured to the shaft by a screw r to inclose and protect the springs.

The tension of the springs is only sufficient to overcome the inertia and friction of the handle, so that it will be returned to the same angular position if moved after being unclutched, and thus always indicate the position of the reversing-switch.

While this invention is of special value in connection with the reversing-switch, as hereinbefore described, yet it is applicable to any shaft of a controller on which a loose handle is mounted which it is desirable to retain yieldingly in a predetermined angular position with reference to the shaft.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an electric controller, the combination with a handle loose upon its shaft, of means for clutching it to the shaft, and means for retaining it in a predetermined angular position when unclutched.

2. In an electric controller, the combination with a handle loose upon its shaft, of means for clutching it to the shaft, and means for yieldingly retaining it in a predetermined angular position when unclutched.

3. In an electric controller, the combination with a handle loose upon its shaft, of means for clutching it to the shaft, and means for returning it to any given angular position it may occupy when unclutched, in case it is moved away from said position.

4. In an electric controller, the combination with a handle loose upon its shaft, of means for clutching it to the shaft, and a spring connecting it with the shaft.

5. In an electric controller, the combination with a handle loose upon its shaft, of means for clutching it to the shaft, and a light coiled spring attached at one end to the shaft and at the other to the handle.

6. In an electric controller, the combination with a handle loose upon its shaft, of means for clutching it to the shaft, and right and left handed springs connecting said handle and shaft.

7. In an electric controller, the combination with a handle, of a shaft extending freely through the same, one or more coiled springs surrounding said shaft and attached to the shaft and the handle, and a cap secured to the shaft and inclosing the springs.

In witness whereof I have hereunto set my hand this 21st day of January, 1901.

ALBERT H. ARMSTRONG.

Witnesses:

BENJAMIN B. HULL,
MARGARET E. WOOLLEY.