

G. H. HILL.
CONTROLLER.

APPLICATION FILED MAY 2, 1904.

Fig. 1.

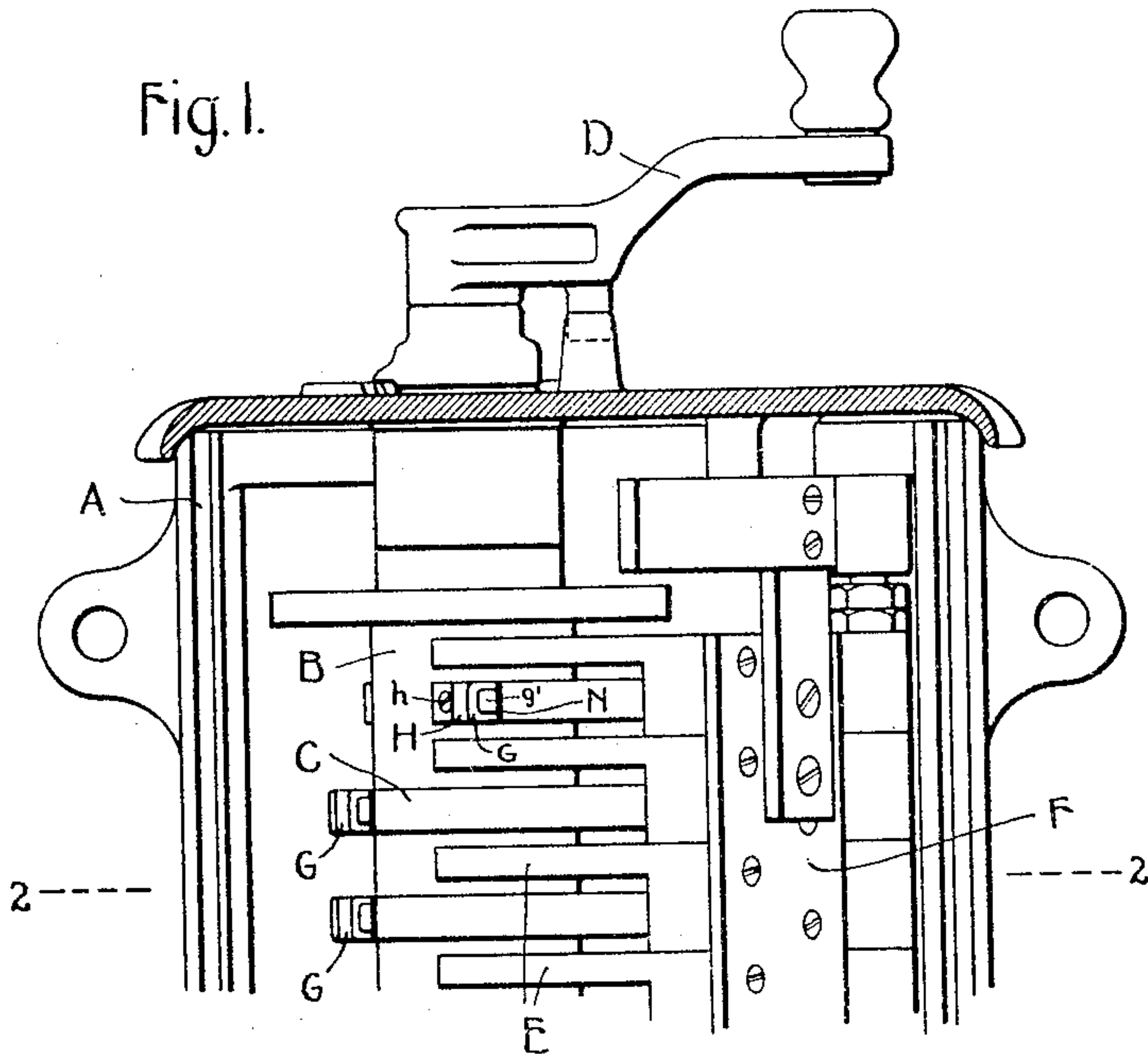


Fig. 2.

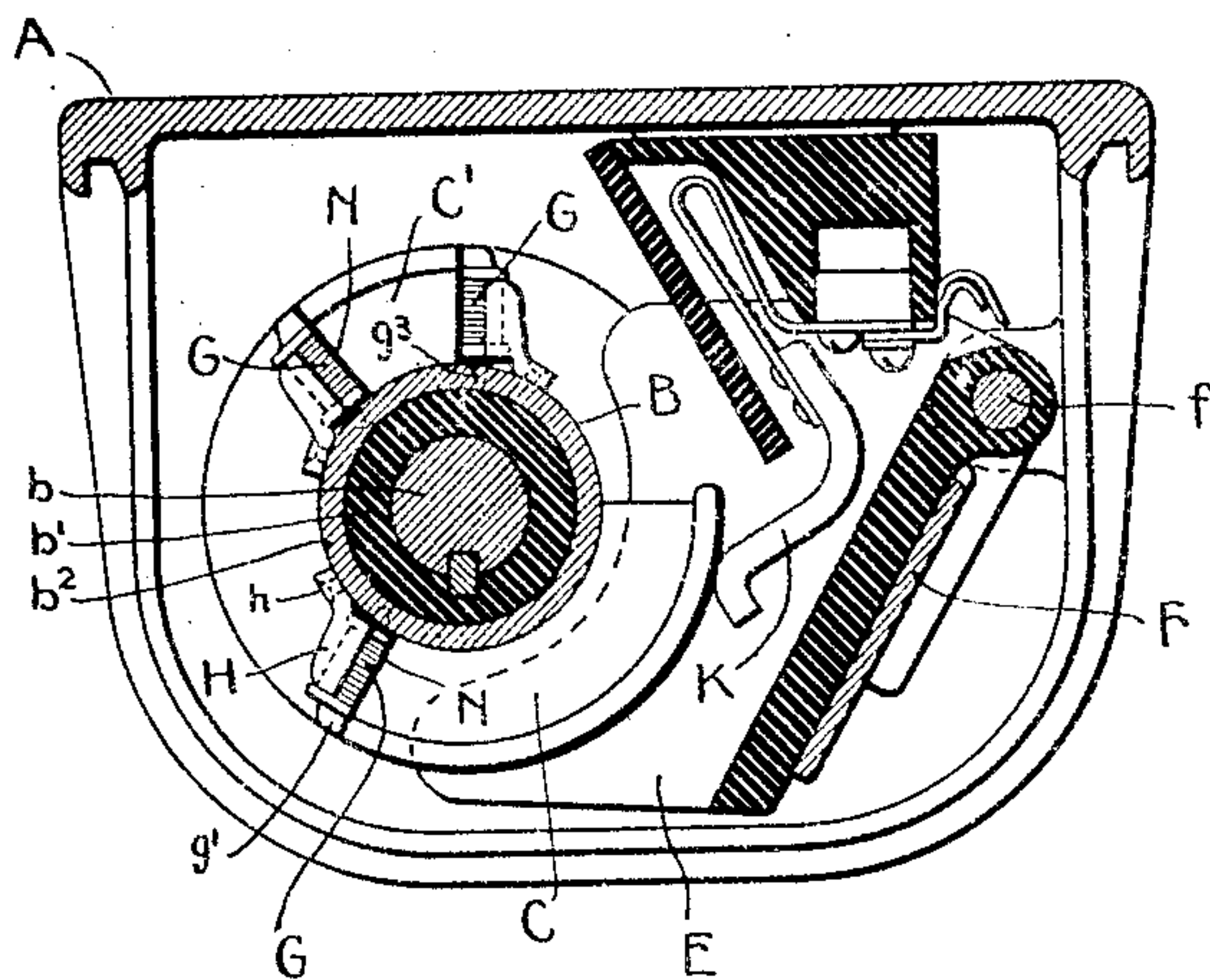


Fig. 3.

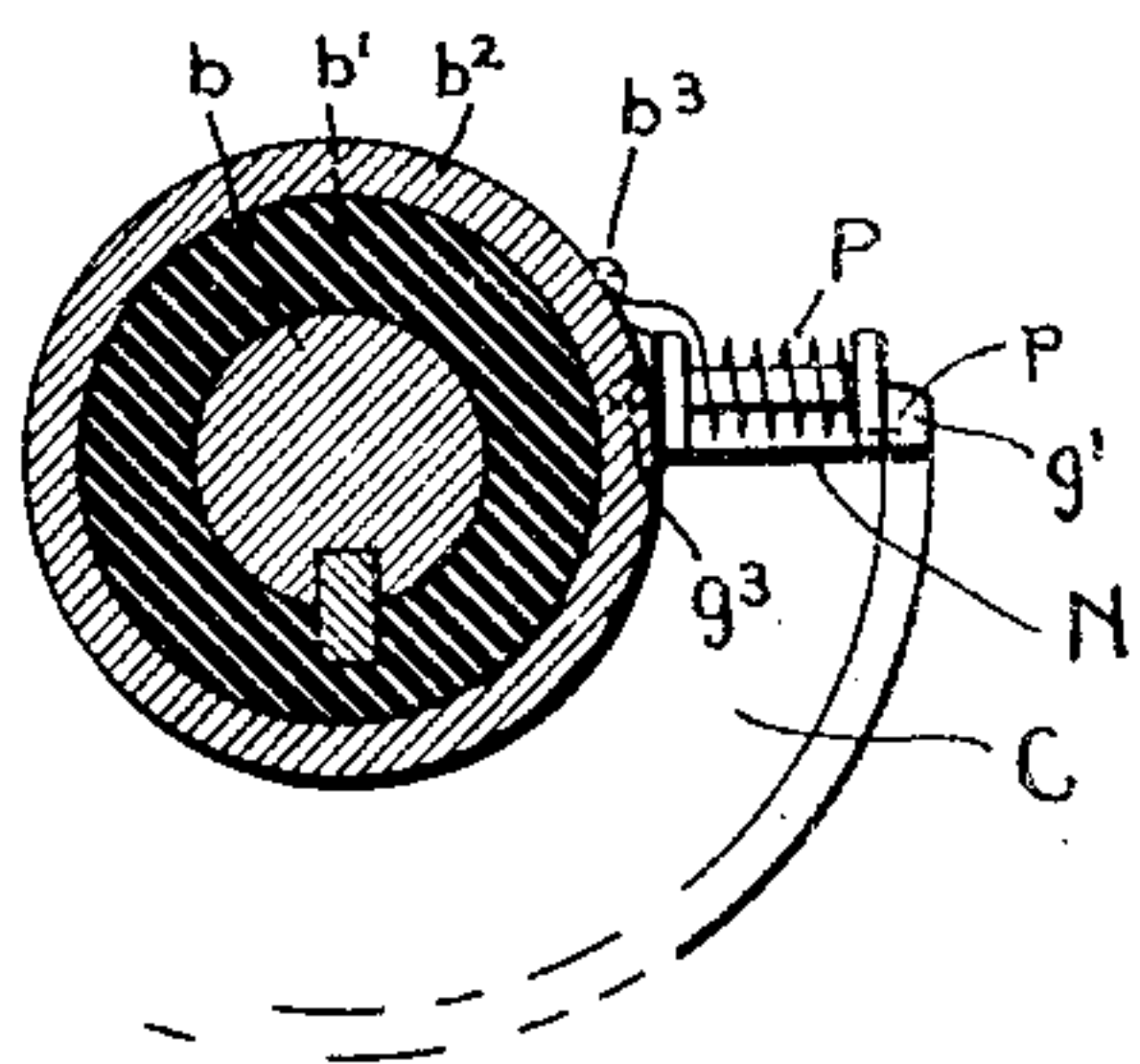


Fig. 4.

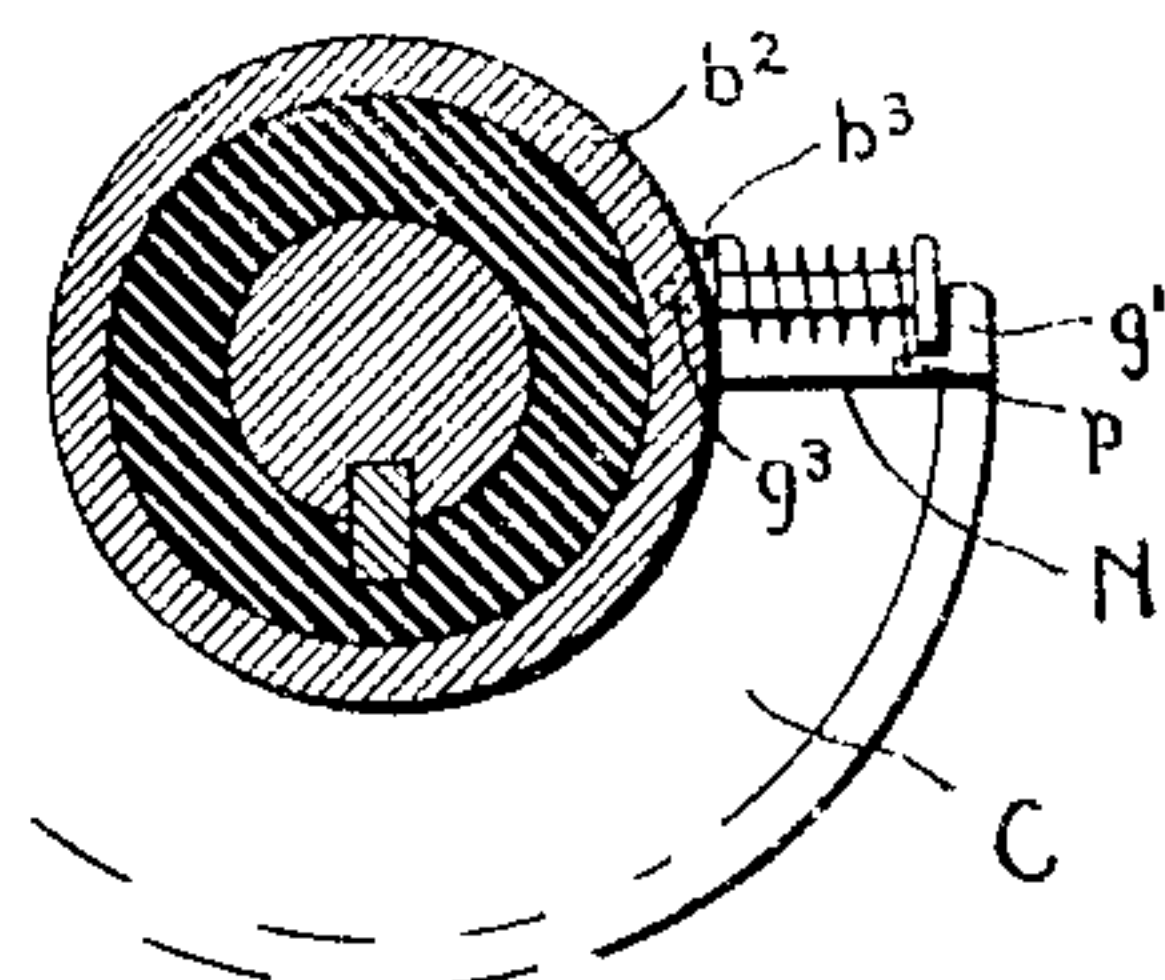
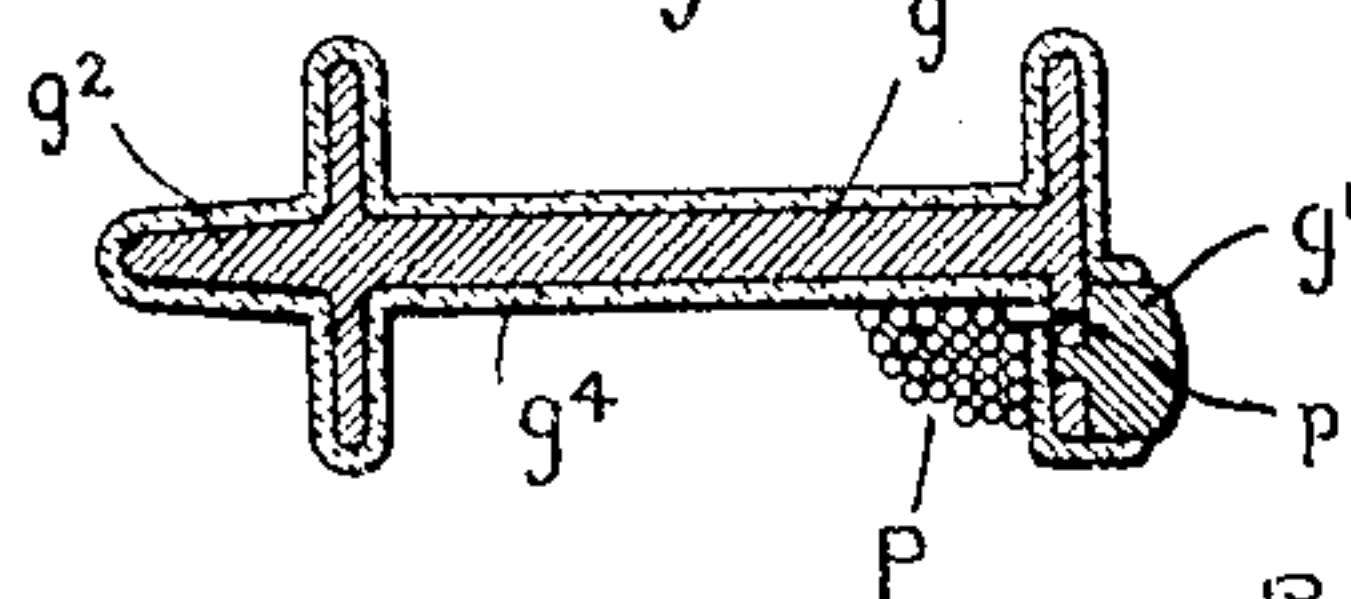


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE H. HILL, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

CONTROLLER.

No. 798,410.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed May 2, 1904. Serial No. 205,965.

To all whom it may concern:

Be it known that I, GEORGE H. HILL, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Controllers, of which the following is a specification.

My invention relates to improvements in controllers, and has especial reference to the magnetic arc-disrupting or blow-out devices employed in motor-controllers of the drum or cylindrical type.

Heretofore in motor-controllers of the cylindrical type, in which a plurality of contact-segments mounted upon a rotatable drum or cylinder are adapted to engage a plurality of relatively fixed contact-fingers connected in the controlled circuit, it has been customary to provide a single blow-out magnet and to have the magnetic circuits of said magnet so arranged that the flux produced when the magnet-coil is energized will blow out the arcs which tend to form between the contact-fingers and contact-segments. In controllers for certain uses, and especially in master-controllers as used to control motor-controllers in train systems, printing-presses, &c., where the main motor-current does not pass through the master-controller, it is not necessary to have such a bulky and expensive blow-out magnet construction, as above described.

It is therefore the object of my invention to reduce the cost and size of a motor-controller by producing a small, inexpensive, and at the same time very efficient and effective arc-disrupting or blow-out device to be employed therewith. To this end I employ, in connection with each contact-segment on the movable member or cylinder of the controller where arcing is likely to occur, a small blow-out magnet the coil of which is normally out of circuit, but is connected in circuit just as the contact-finger is leaving the end of the contact-segment, the core of the magnet being so constructed and arranged that the flux produced blows out the arc which tends to form between the segment and finger.

My invention further consists of details of construction and arrangement of the blow-out magnet relative to the contact-segment, as will be hereinafter more clearly explained, and fully set forth in the claims hereto appended.

In the accompanying drawings, which illustrate the preferred embodiments of my invention, Figure 1 represents a front elevation of the upper part of a cylindrical controller with the casing-cover removed. Fig. 2 is a sectional plan view of the controller on the line 2 2 of Fig. 1 with the cylinder in its final operative position. Fig. 3 represents a sectional plan view of the controller-cylinder, showing one arrangement of the blow-out magnet with the clamping device removed. Fig. 4 is a view similar to Fig. 3, but shows a slightly-modified arrangement of blow-out magnet; and Fig. 5 is a longitudinal section through the core of the blow-out magnet shown in Fig. 3.

Referring now to Figs. 1 and 2, A represents the casing of a controller. This casing contains a cylinder B, carrying the customary contact-segments C C', &c., the cylinder being operated by means of the handle D. Mounted on the member F, pivoted at f, are the insulating-strips or arc-deflectors E, which project between the contact-segments of the cylinder. Located between these deflectors E when they are in their proper operative position are the contact-fingers K, which are adapted to engage the contact-segments. The cylinder is built up in the customary manner, having a core b, around which is formed the annular piece of insulating material b', upon which in turn is mounted the cylindrical shell b², carrying the webs of the contact-segments. Mounted upon the shell b², adjacent to the ends of the contact-segments, are the separate and readily-removable blow-out magnets G, which are held in place by means of the clamping devices H, screwed or bolted in position at h. The segment C has a blow-out magnet located at but one end, since the finger leaves the segment at this point only, while the segment C' is provided with a blow-out magnet at each end, as the finger is adapted to leave said segment at either of these points. The cores g, on which the blow-out coils are wound, are substantially spool-shaped, as shown in Fig. 5. Each end or pole tip of the core is provided with a projection. The projection g² is adapted to enter the recess g³, formed in the shell b², when the blow-out magnet is locked in its operative position by the clamping device H. The core is so mounted that it projects substantially radially from the cylinder,

and the pole-tip g' forms a contact member having its contacting surface preferably flush with the contacting surface of the segment, so as to be engaged by the contact-finger as the latter leaves the contact-segment. The entire core, with the exception of the contacting face of the pole-tip g' , is covered with an enamel or other insulating material g^4 . The pole-tip g' may be formed integral with the core, if so desired, but is preferably made of bronze and riveted to said core, as shown in Fig. 5. When in position on the cylinder, the blow-out magnet is separated from the end of the contact-segment by the insulating-strip N, and the coil P, as shown in Fig. 3, is connected between the shell b^2 at b^3 and the pole-tip g' at p . It will of course be understood that the shell b^2 is electrically connected with the contact-segment C, and said shell, together with the web of the contact-segment, is preferably made of magnetic material.

In Fig. 4 I have shown a slight modification of the blow-out-magnet construction. The coil of the magnet is, as before shown, connected between the shell b^2 at b^3 and the pole-tip g' at p ; but the pole-tip g' is made replaceable and is insulated from the magnet-core. This pole-tip may be constructed of brass, copper, carbon, or any other desired conducting material.

The operation of the preferred form of my invention is as follows: Considering that the contact-finger K is in engagement with the contact-segment C, as shown in Fig. 2, and it is desired to move the controller-cylinder in a counter clockwise direction toward its "off" position, the contact-face of the pole-tip g' of the blow-out magnet G will be brought into engagement with the contact-finger K. It will thus be seen that if the controlled circuit has been completed through the contact-finger K and the contact-segment C engaged thereby to the cylindrical shell b^2 the coil of the blow-out magnet will now be connected in said controlled circuit between the shell b^2 or segment C and the contact-finger, thereby energizing said blow-out magnet and producing a magnetic field of force concentrated at the point at which the contact-finger K and the contact-segment C separate, said magnetic field being of sufficient strength to blow out any arc tending to form between the finger and the segment at this point.

In the appended claims I aim to cover all modifications of my invention which do not involve a departure from its spirit and scope.

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

1. In a controller, a relatively movable member having a plurality of contact-segments, a plurality of relatively fixed contact-fingers adapted to engage said segments, and a separate normally deenergized blow-out

magnet mounted on said movable member for each contact-segment.

2. In a controller, a relatively movable cylinder having a plurality of contact-segments, a plurality of contact-fingers for engagement with said segments, and a separate blow-out magnet for each segment, each blow-out magnet having its core arranged substantially radially on said cylinder adjacent to a segment.

3. In a controller, a cylinder having a plurality of contact-segments, a plurality of fingers adapted to engage said segments, a blow-out magnet mounted on said cylinder at the end of each segment, and means for connecting the coil of each magnet in circuit with a finger just as said finger leaves its corresponding segment.

4. In a controller, a cylinder having a plurality of contact-segments, a plurality of fingers adapted to engage said segments, a blow-out magnet mounted on said cylinder at the end of a segment, each blow-out magnet having one of its pole-tips arranged to be engaged by the finger which engages that segment and its coil connected between the pole-tip and the segment, whereby the coil is included in circuit with the fingers as said finger leaves said segment and engages the pole-tip.

5. In combination, a controller-cylinder, a contact-segment mounted thereon, and a normally deenergized and readily-removable blow-out magnet carried by said cylinder adjacent to said segment.

6. In combination, a controller-cylinder, a contact-segment mounted thereon, a normally deenergized and readily-removable blow-out magnet carried by said cylinder adjacent to said segment, and a clamping device for holding the blow-out magnet in position on the cylinder.

7. As an article of manufacture, a blow-out magnet for a controller-cylinder, comprising a spool-shaped core of magnetic material provided with a projection or pole-tip at one end, insulating material entirely covering said core except at the contact-face of said pole-tip which is adapted to be engaged by a contact-finger, and a coil mounted on said core.

8. In combination, a controller-cylinder, a contact-segment mounted thereon, a contact-finger adapted to engage said segment, and a blow-out device mounted at the end of said segment, the said device comprising a contact member forming a continuation of, but insulated from, the said contact-segment, and a blow-out coil connected between the contact member and the contact-segment.

9. In combination, a controller-cylinder, a contact-segment mounted thereon, a contact-finger adapted to engage said segment, and a blow-out device mounted at the end of said segment, the said device comprising a core

mounted on said cylinder at the end of the
contact-segment, a contact member carried
by said core and arranged to form a continu-
ation of, but insulated from, said contact-seg-
5 ment, and a blow-out coil surrounding said
core and connected between the contact mem-
ber and the contact-segment.

In witness whereof I have hereunto set my
hand this 29th day of April, 1904.

GEORGE H. HILL.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.