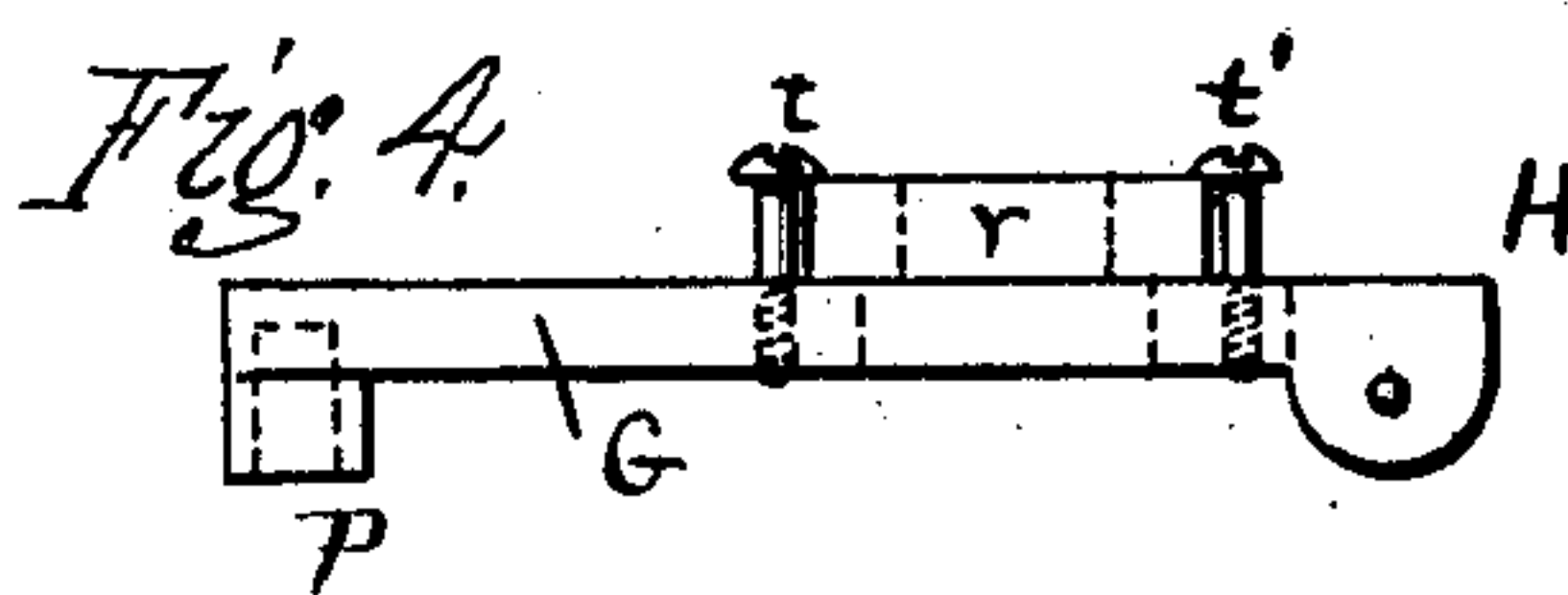
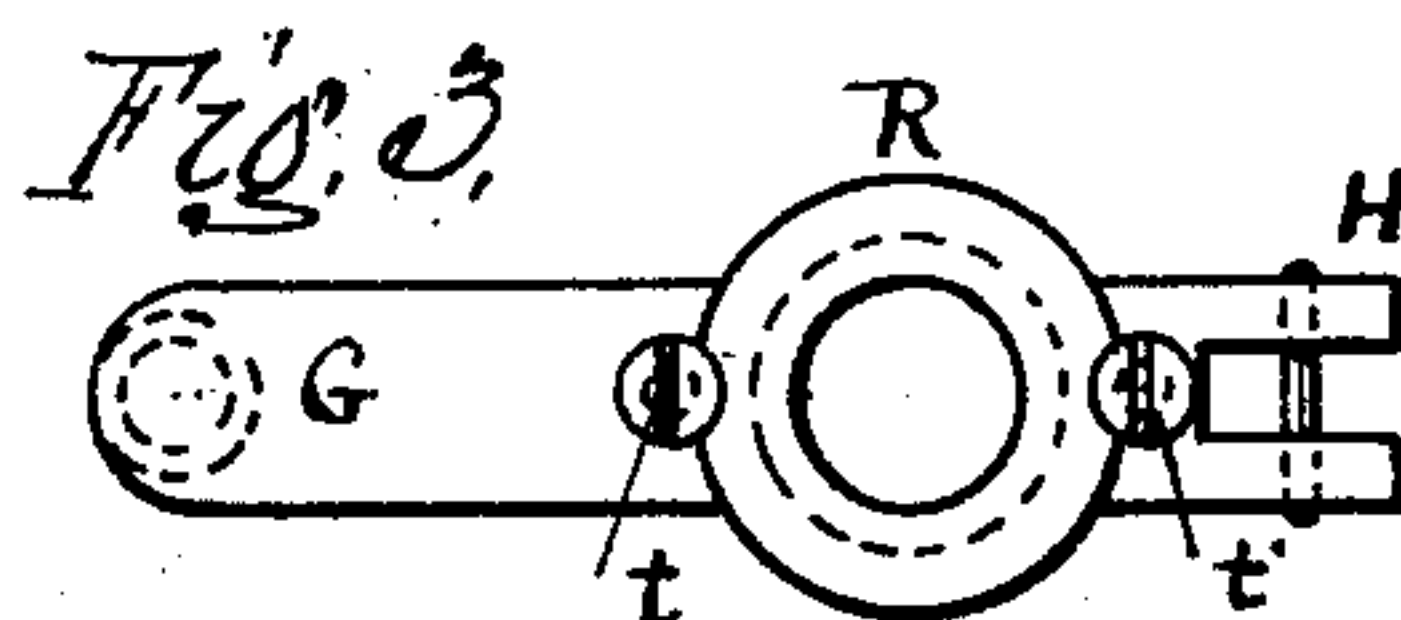
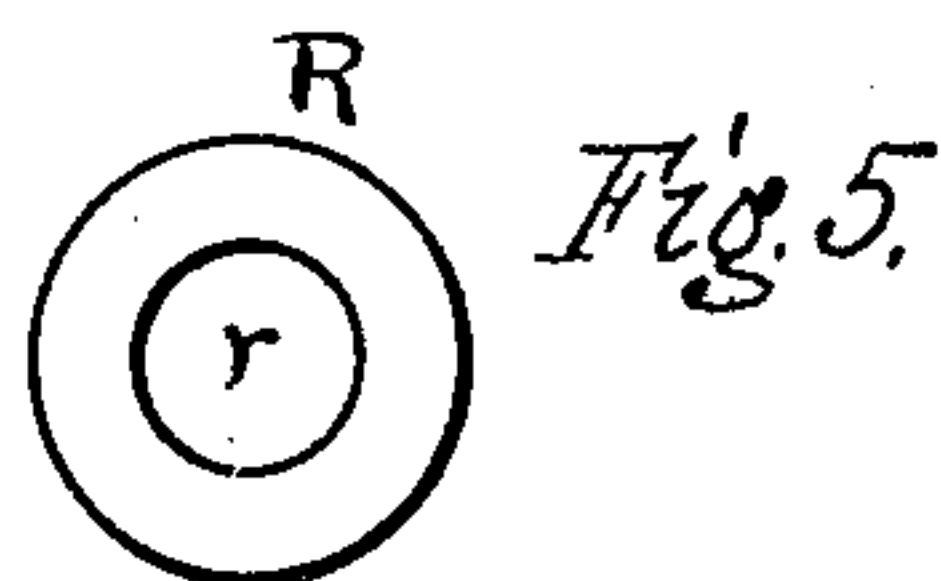
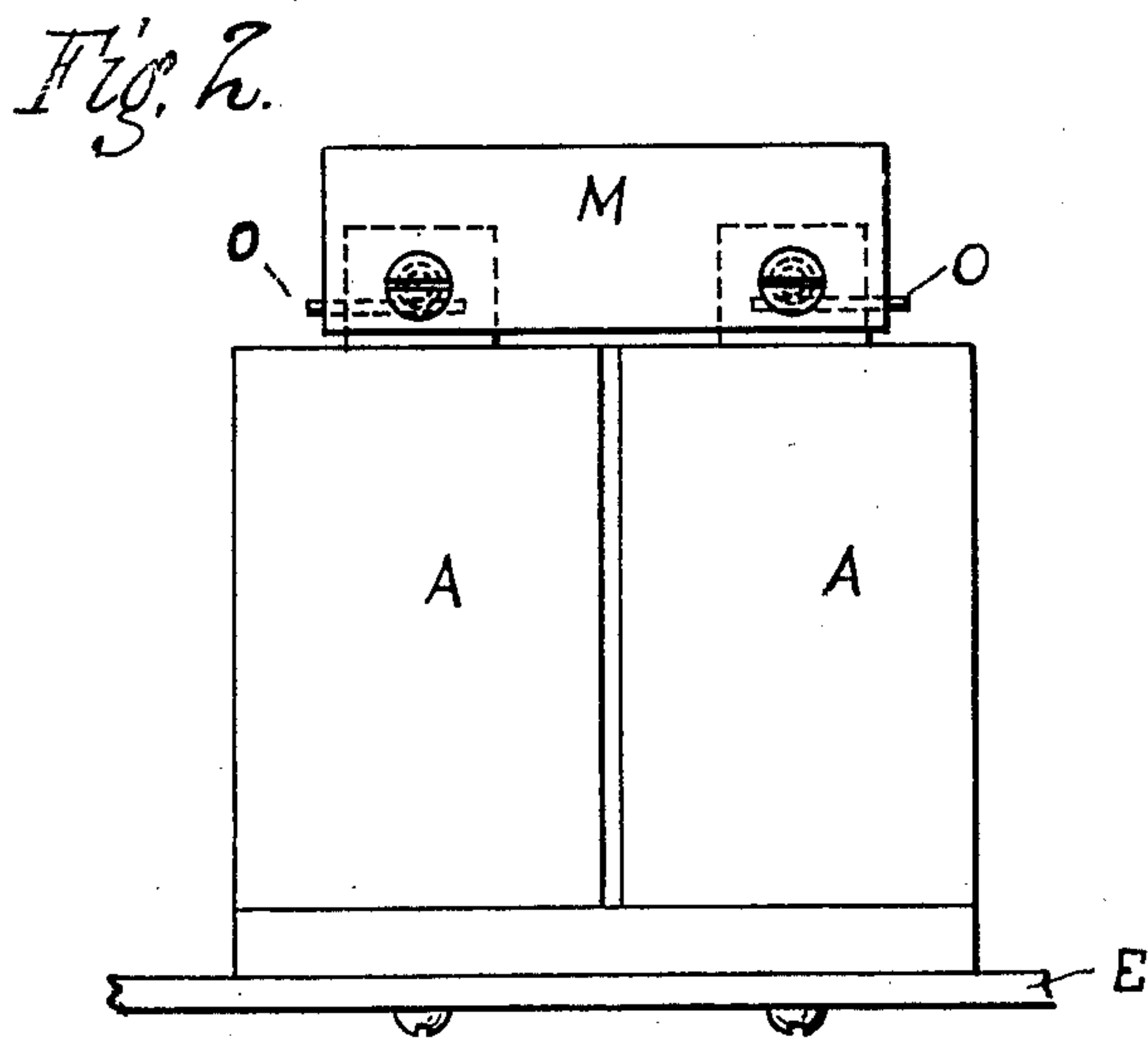
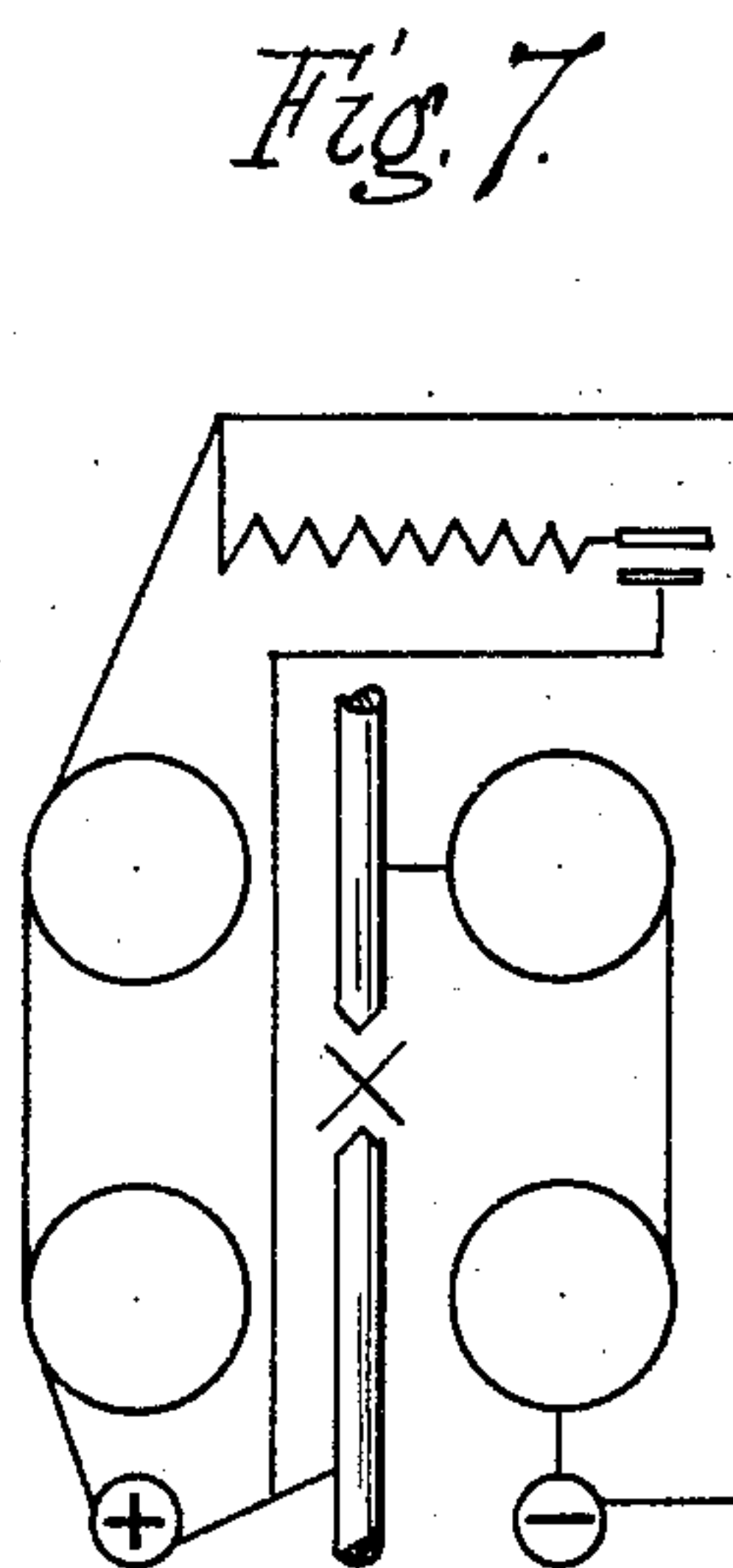
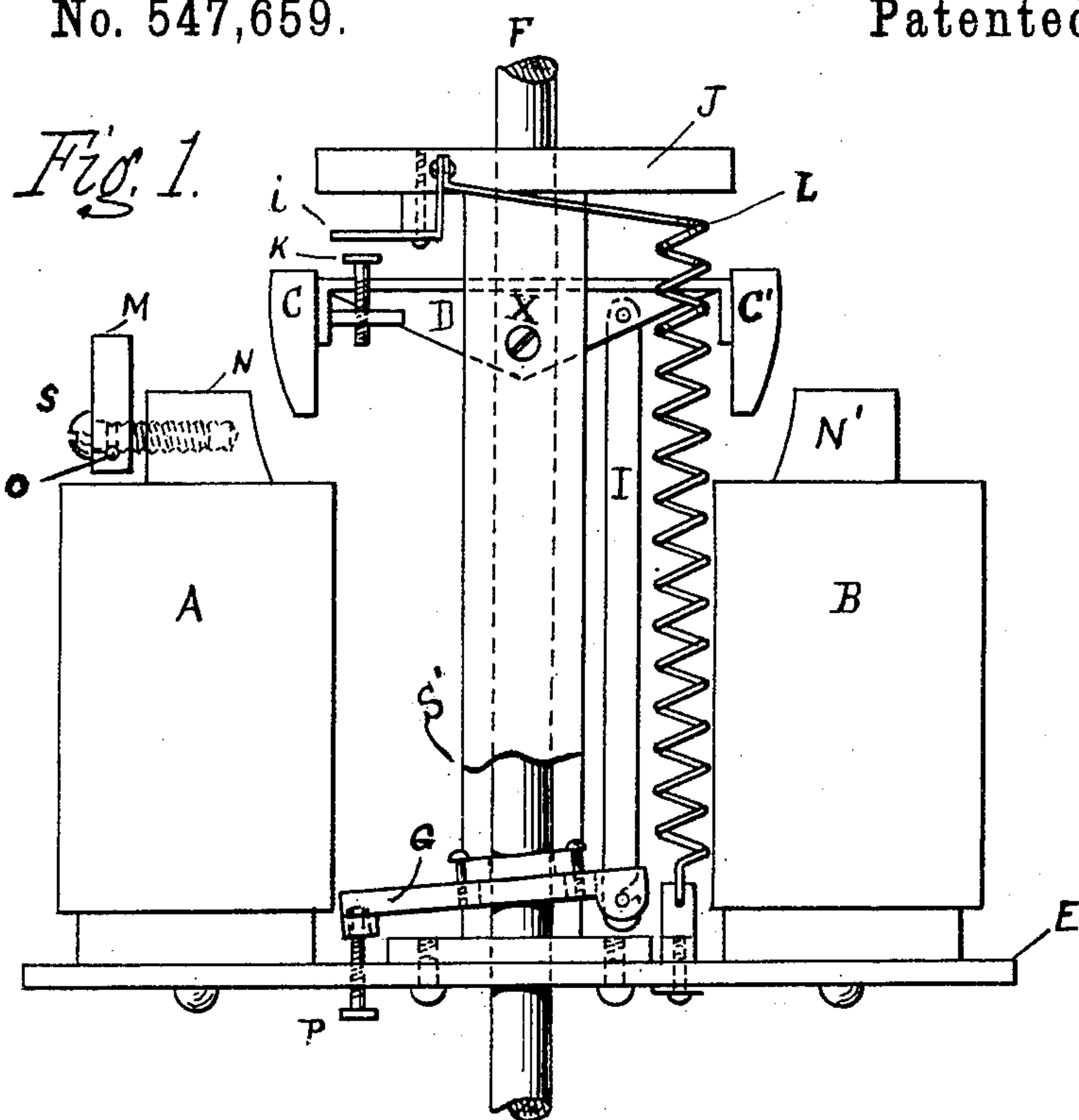


(No Model.)

H. E. BRADLEY.
ELECTRIC ARC LAMP.

No. 547,659.

Patented Oct. 8, 1895.



Witnesses.

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Att'y.

UNITED STATES PATENT OFFICE.

HAROLD E. BRADLEY, OF PAWTUCKET, RHODE ISLAND.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 547,659, dated October 8, 1895.

Application filed July 1, 1895. Serial No. 554,566. (No model.)

To all whom it may concern:

Be it known that I, HAROLD E. BRADLEY, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Electric-Arc Lamps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that species of arc lamp in which the movement of the upper carbon is regulated by a magnetically-controlled lever through the agency of a suitable clutch; and the purpose of my invention is to produce a lamp of increased steadiness of burning and which admits of adjustment under varying currents, and in which the clutch is also adjustable with reference to its points of contact with the feed-rod. These objects are realized in the device shown in the accompanying drawings, in which—

Figure 1 is a vertical view of my invention; Fig. 2, a vertical view of a portion thereof from a point at right angles to that shown in Fig. 1; and Figs. 3, 4, 5, and 6 are details of my clutch. The diagram of the circuit is seen in Fig. 7.

In Fig. 1, E is the metallic base of the lamp, to which the magnets and other parts of the lamp are attached. A and B are respectively the series and shunt magnets having the respective poles N and N' and principal armatures C C' attached to opposite extremities of the tilting lever D, which is pivoted at X. J is the cap-plate of the lamp, connected rigidly with the base E by uprights, one of which is shown broken away at S' to display the clutch G. F is the upper feed-rod, and L a resistance-coil insulated from the other parts of the lamp and included in the cut-out circuit. The clutch G is pivoted upon P, and at the other end is connected with D by the link I. K is a screw by which, through contact with *i*, the lamp may be short-circuited when not in use, as hereinafter shown. M is a secondary armature, adjustable with reference to the poles N by means of the

screw S and the pin O, which binds M close to the head of the screw S without interfering with the rotation of the screw.

Figs. 3, 4, 5, and 6 are details of my improved clutch, Fig. 4 being a vertical and Fig. 3 a horizontal view, while Figs. 5 and 6 are respectively a plan and vertical section of the clutch-ring.

The end of the lever D which is nearest N' is made a little heavier than the other end, so that when no current is passing C' is tilted downward toward N' and K and *i* are in contact, the upper and lower carbons also being in contact. When the current is introduced, the series magnet A exerts a pull upon its armature C, thus tilting the lever D and raising the feed-rod F through the link I and clutch G, thus separating the carbons and creating the arc. The shunt-magnets prevent too great separation of the carbons, for as these burn away the resistance of the lengthening arc diverts a greater proportion of the electric current to the shunt-magnets, thus causing the depression of C' and the consequent dropping of the upper carbon. In case of the breaking of the carbons or of its entire consumption a much greater current passes through the shunt-magnets, and C' is depressed until K and *i* are brought in contact and the current passes on to the other lamps of the circuit.

The particular feature of the lamp shown, and which constitutes the principal element of my invention, is the secondary armature M. This is made from soft iron and is connected to the poles N by brass screws S. The pins O O fit into a groove in the shank of the screw and keep M close to the head of the screw without preventing the rotation of the latter. It is not absolutely necessary that the secondary armature M should be fixed to the poles as shown, as it may be mounted upon a suitable standard fixed beside the magnets; but I prefer the method shown for its compactness and convenience. The function of M is to strengthen or weaken the magnets by magnetic absorption, according as it is moved away from or nearer to the poles N by the screws S. This secondary armature is shown only on the series magnet; but it may also be applied to the shunt-magnet as well. The purpose of thus varying the strength of the

magnets is to avoid the necessity of removing the magnets and inserting new ones under changed conditions of ampérage, and my device admits of rapid and easy adjustment to any practical variation of current without in any manner interfering with the light—*i. e.*, the adjustment can take place while the lamp is burning.

I am aware that prior to my invention means of adjustment designed to accomplish the same or nearly the same results as my device have been used upon arc lamps; but so far as I am aware they have consisted of means for changing the distance between the magnets and the armatures by making either the armatures or the magnet movable; but I am not aware that any device operating by magnetic absorption has ever been used for the purpose specified prior to my invention.

The second feature of my invention is the clutch which operates the feed-rod, and is seen in detail in Figs. 3, 4, 5, and 6.

The clutches in common use consist of a flat metallic strip perforated for the feed-rod and engaging the same by the longitudinal tilting of the clutch, the holder being released as the clutch returns to a horizontal position. The contact of the feed-rod with the opposite edges of the perforation in the clutch gradually wears the hole in the clutch into an elliptical shape, so that it will no longer grip the feed-rod, and the entire clutch becomes useless.

My invention consists in a flattened ring R, preferably of hardened metallic alloy, attached to the upper side of the clutch and retained in position by the screws *t t'*. As this

ring becomes worn it may be rotated, so as to bring new portions in contact with the feed-rod F, thus greatly prolonging the life of the clutch, and when the ring R becomes finally worn out it may be easily replaced by another, the clutch G remaining unimpaired.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric arc lamp, the combination of an electro magnet having a secondary adjustable armature, non-magnetic screws for adjusting the same, pins for holding said screws in the armatures, and pole-pieces tapped to receive said screws, all for the purpose specified.

2. In an electric arc lamp, the combination of an electro magnet having a secondary armature adjustable in a plane at right angles to the direction of the feed rod, non-magnetic screws for adjusting the same, pins for holding said screws in the armature and pole pieces tapped to receive said screws, all for the purpose specified.

3. In an electric arc lamp, a clutch having attached thereto a flattened ring R in electric contact with said clutch and so rotatable with reference to the surface thereof as to present new points of contact with the feed-rod, as described.

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

HAROLD E. BRADLEY.

Witnesses:

THEODORE M. MORGAN,
JAMES L. JENKS.