

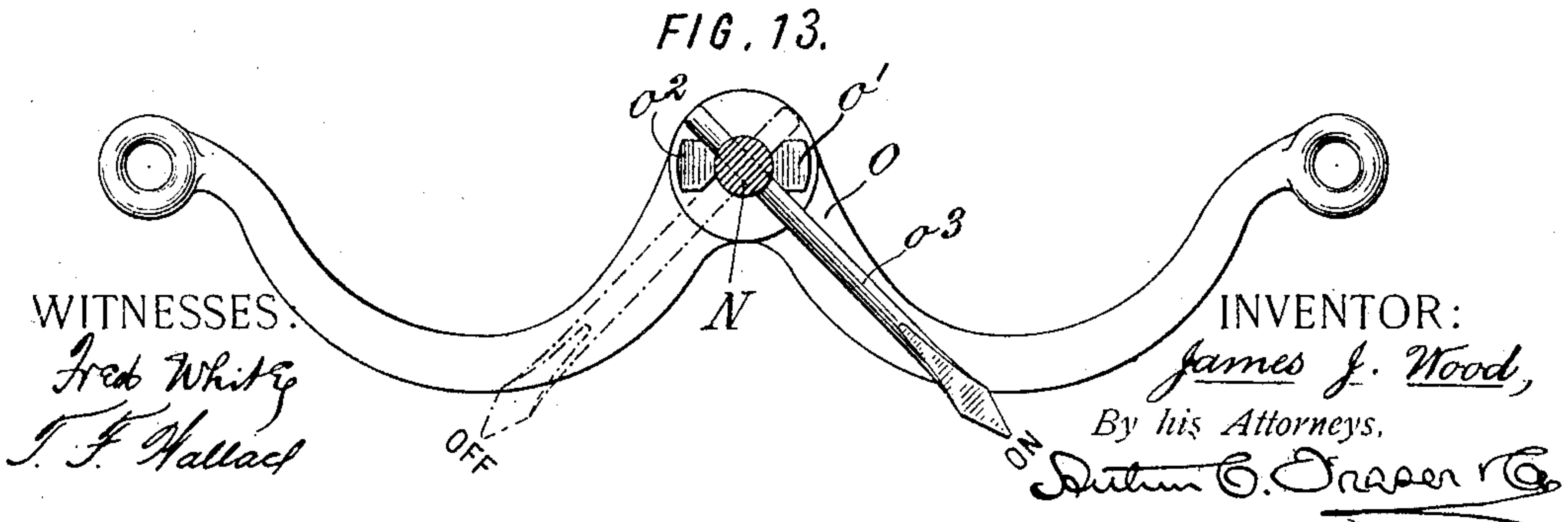
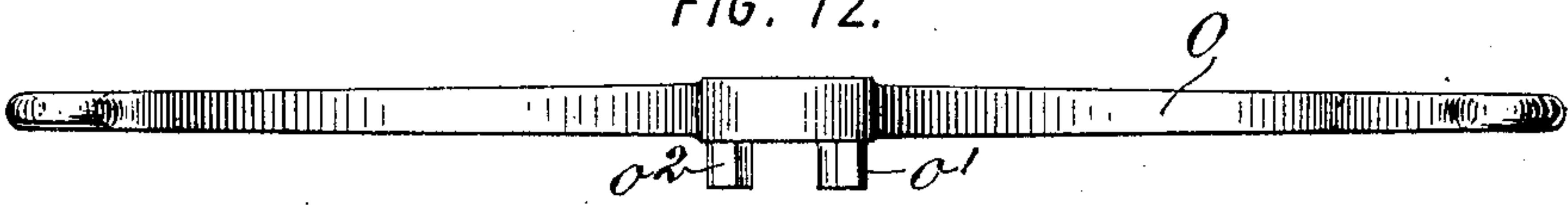
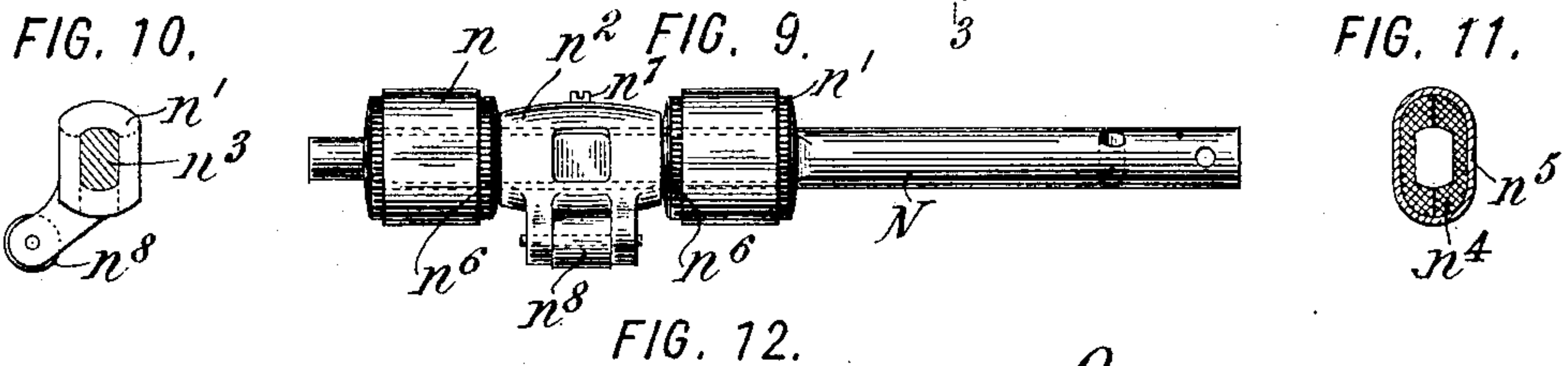
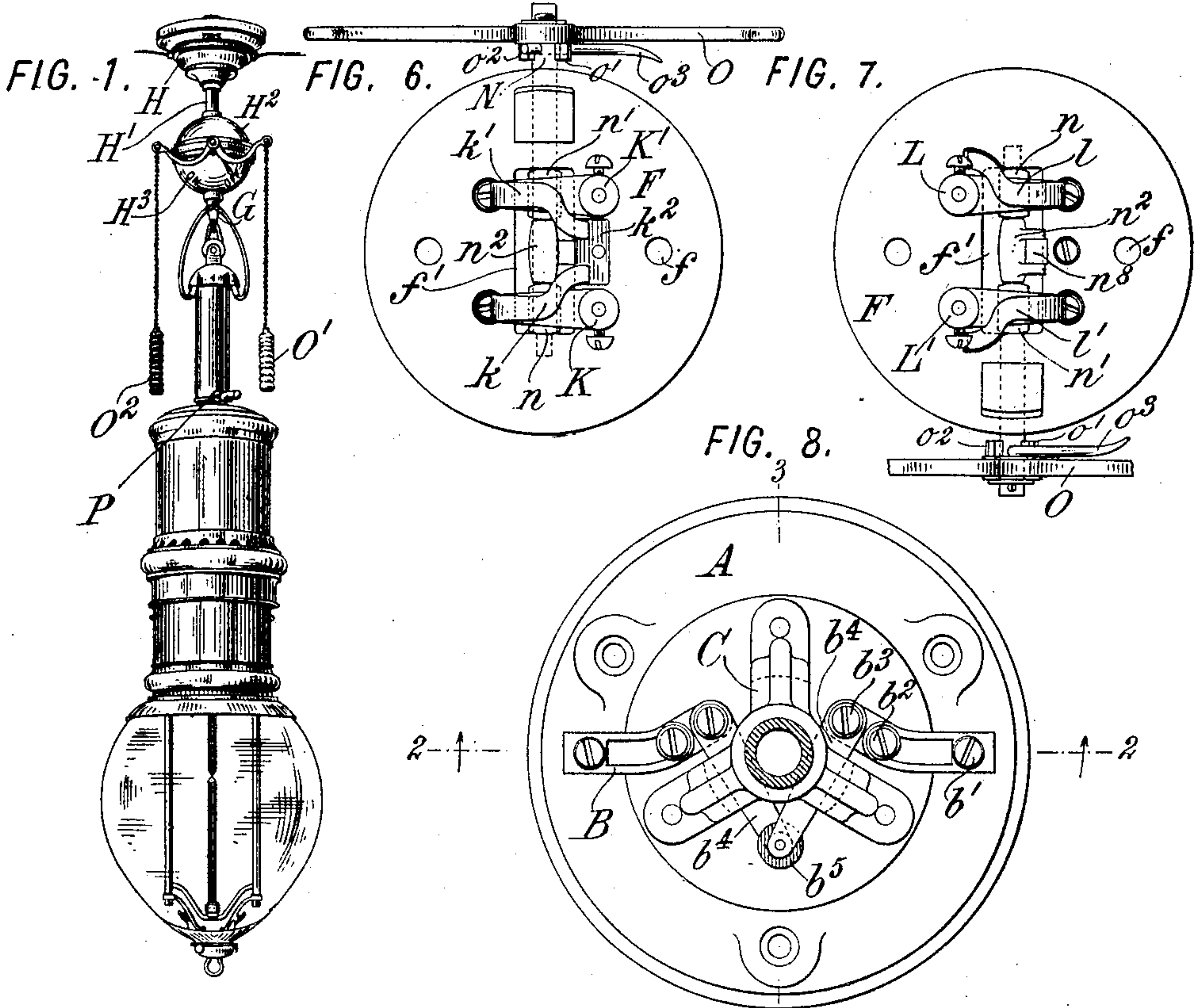
No. 670,573.

Patented Mar. 26, 1901.

J. J. WOOD.
SUSPENSION CUT-OUT.
(Application filed Dec. 19, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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3 Sheets—Sheet 2.

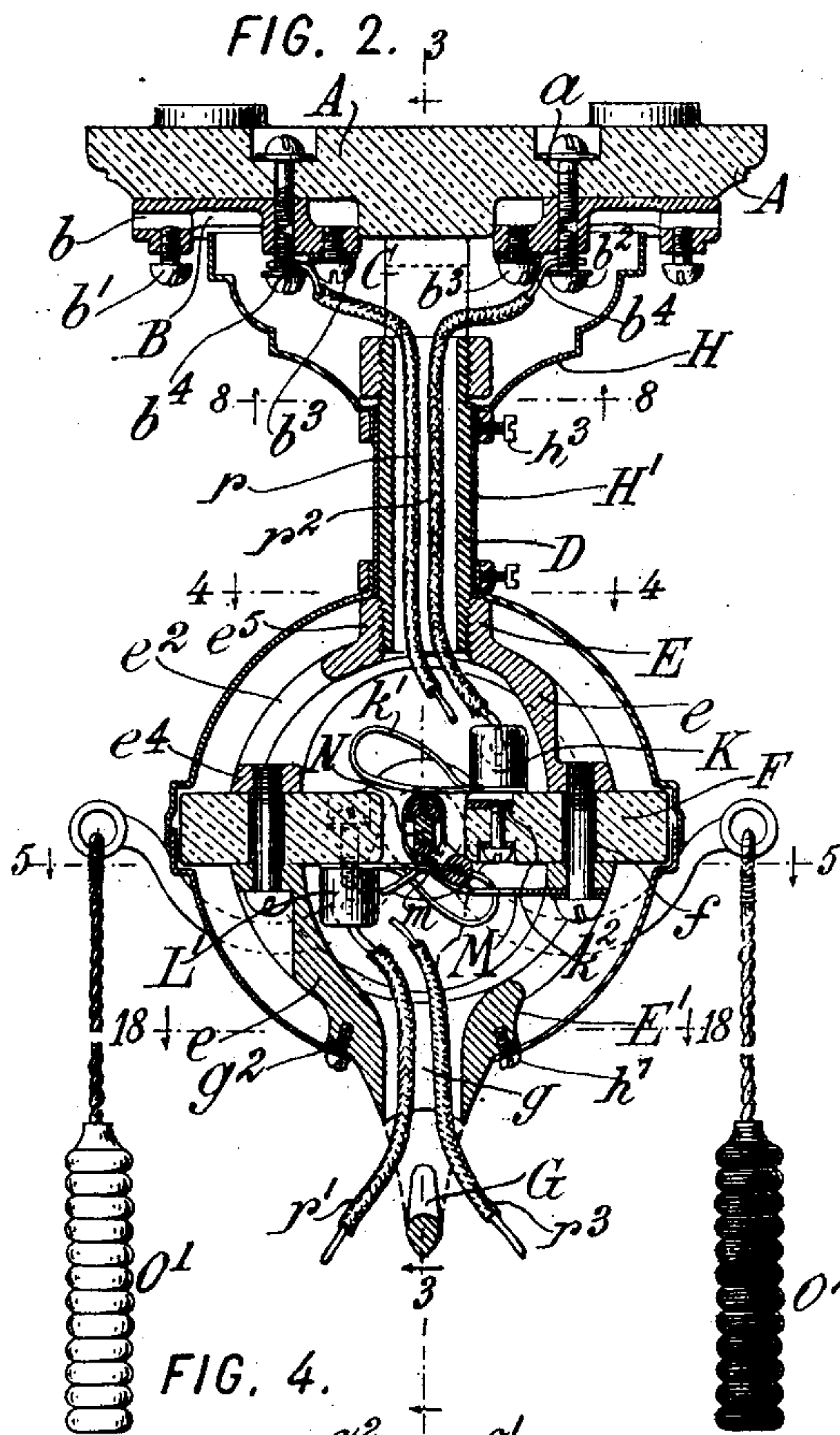


FIG. 2.

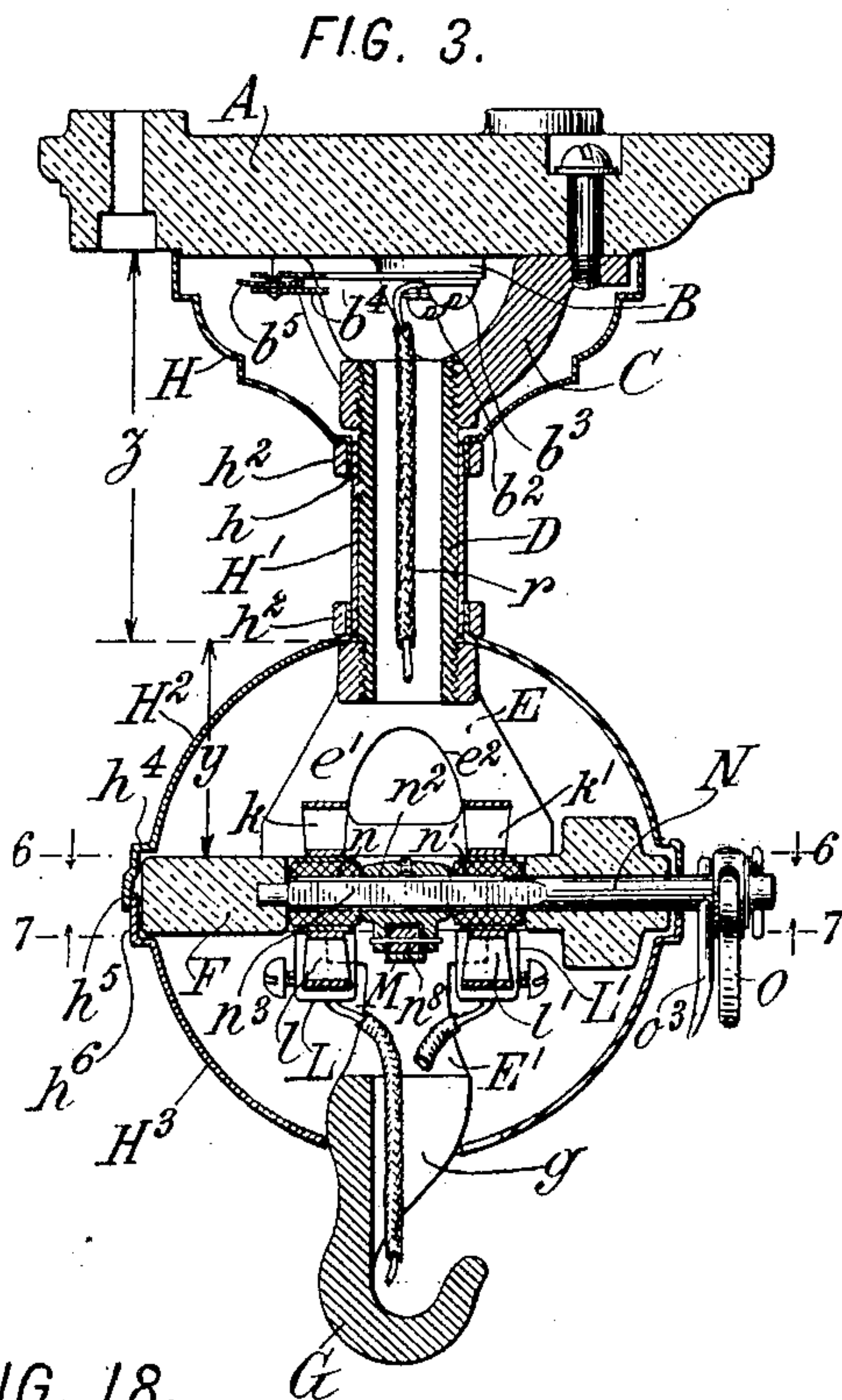


FIG. 3.

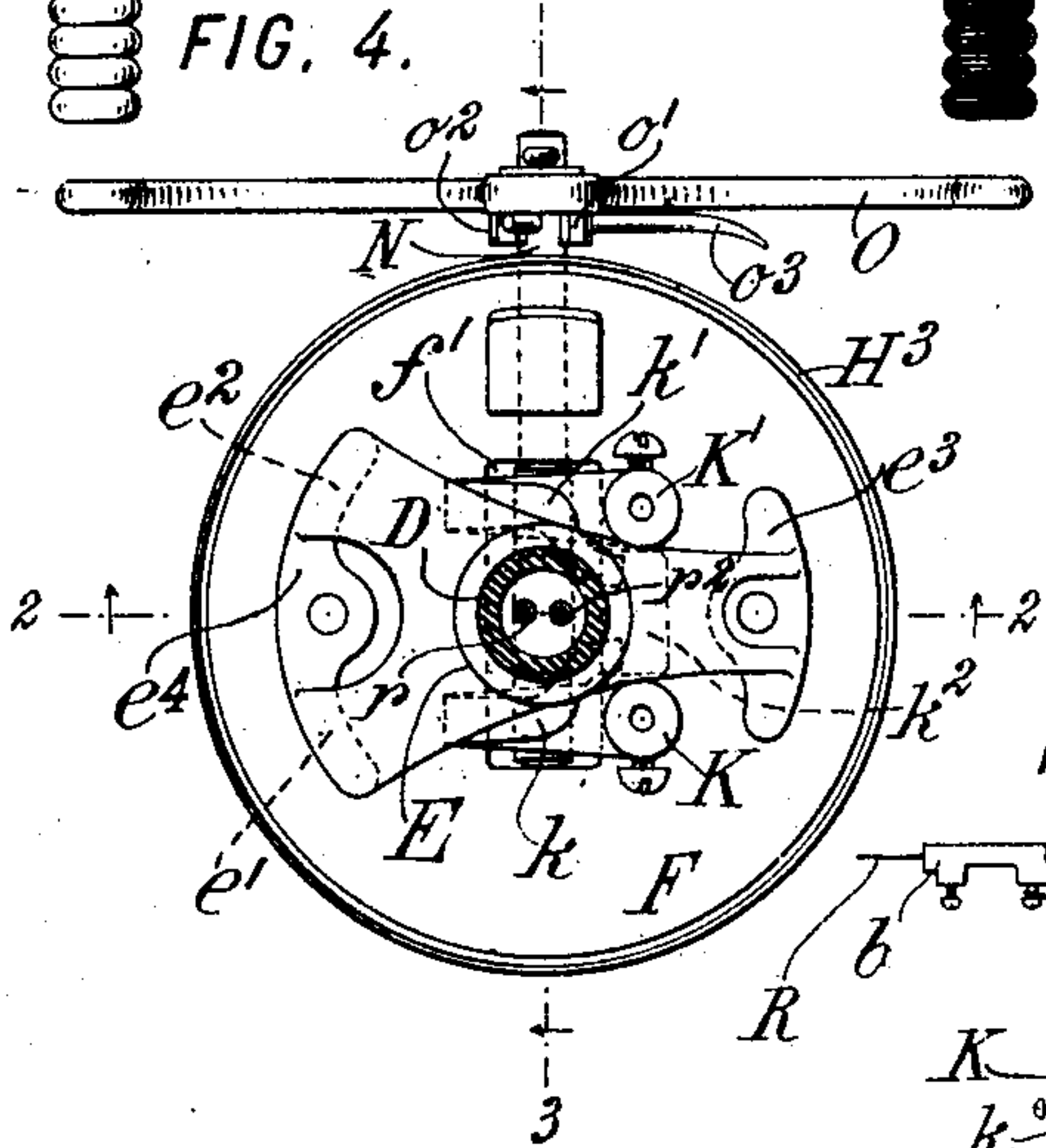


FIG. 4.

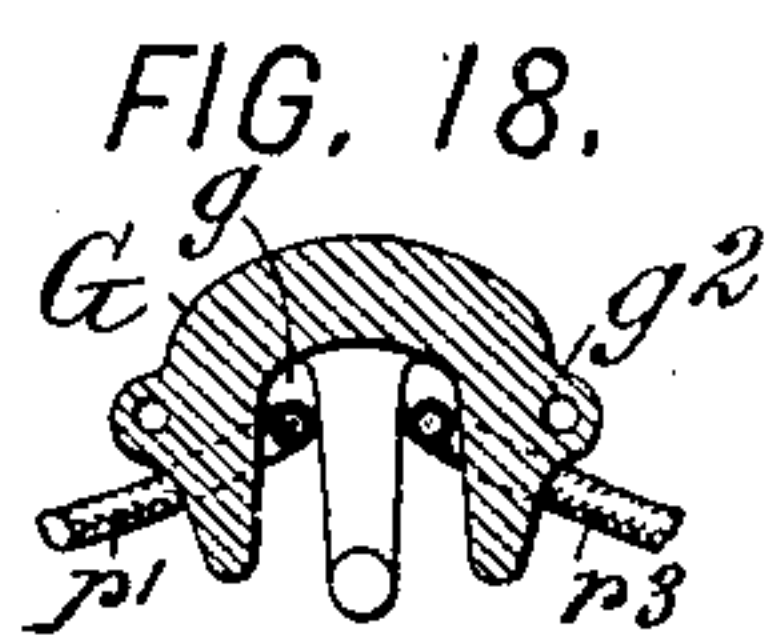


FIG. 18.

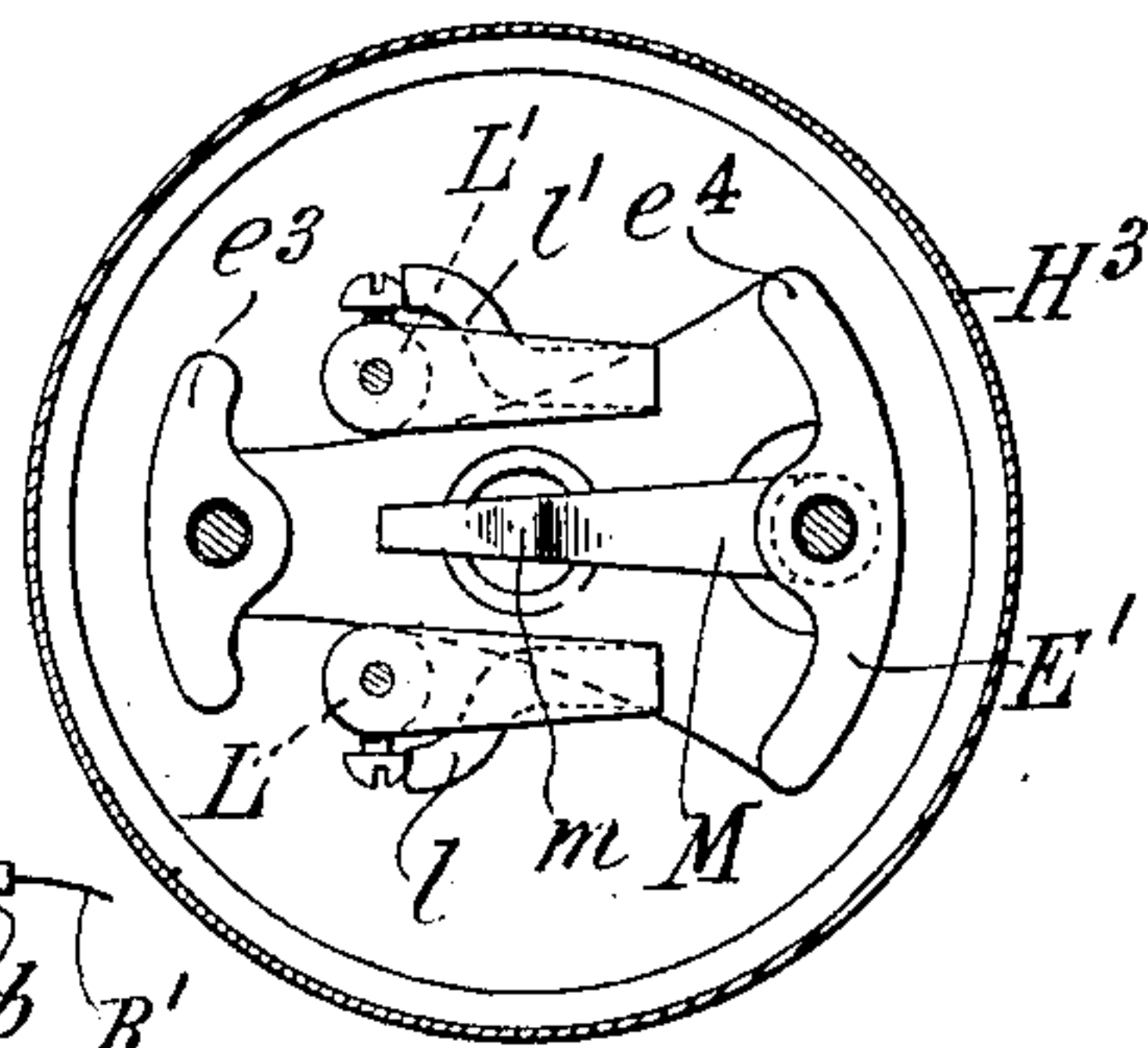


FIG. 5.

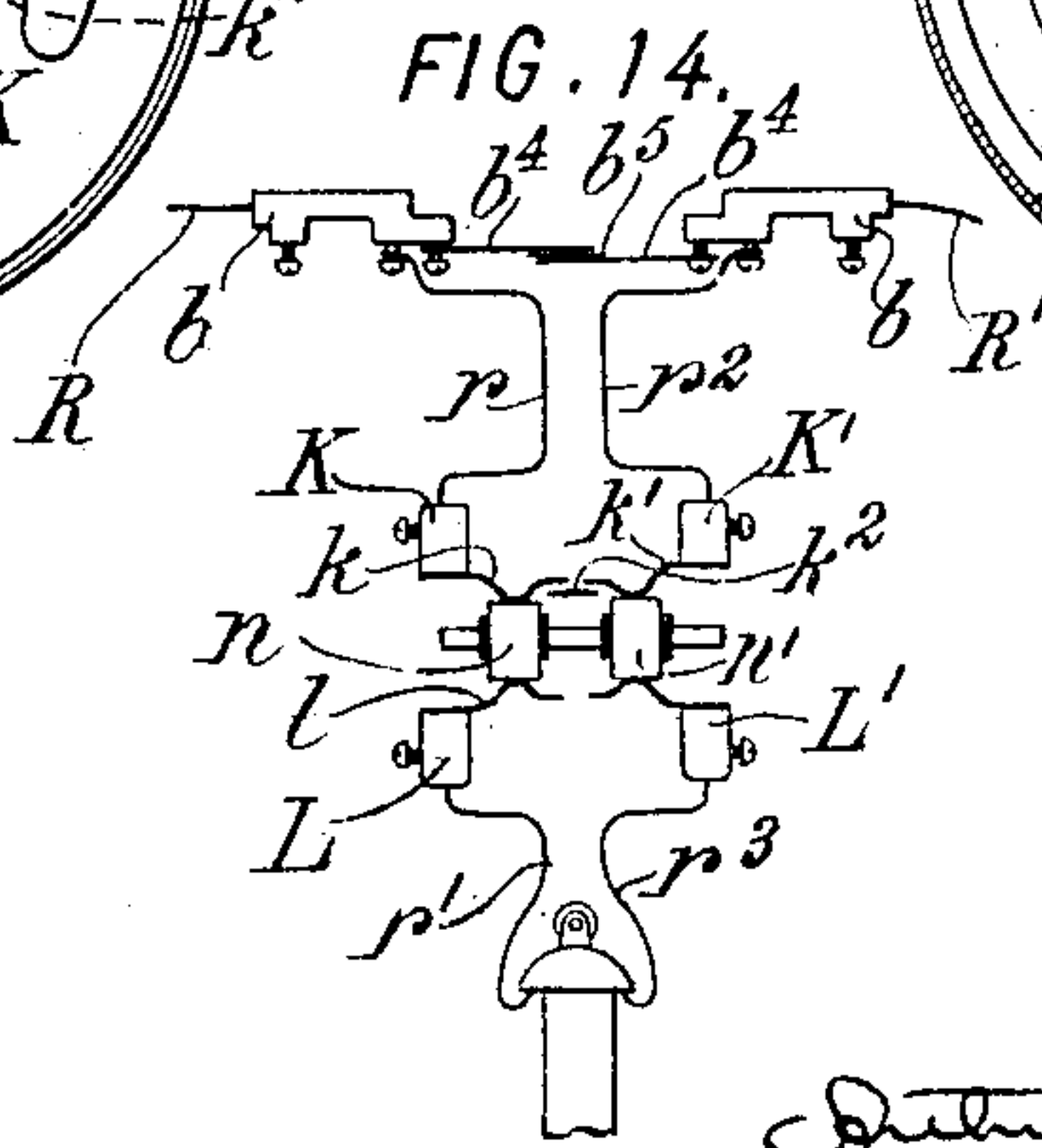


FIG. 14.

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3 Sheets—Sheet 3.

FIG. 15.

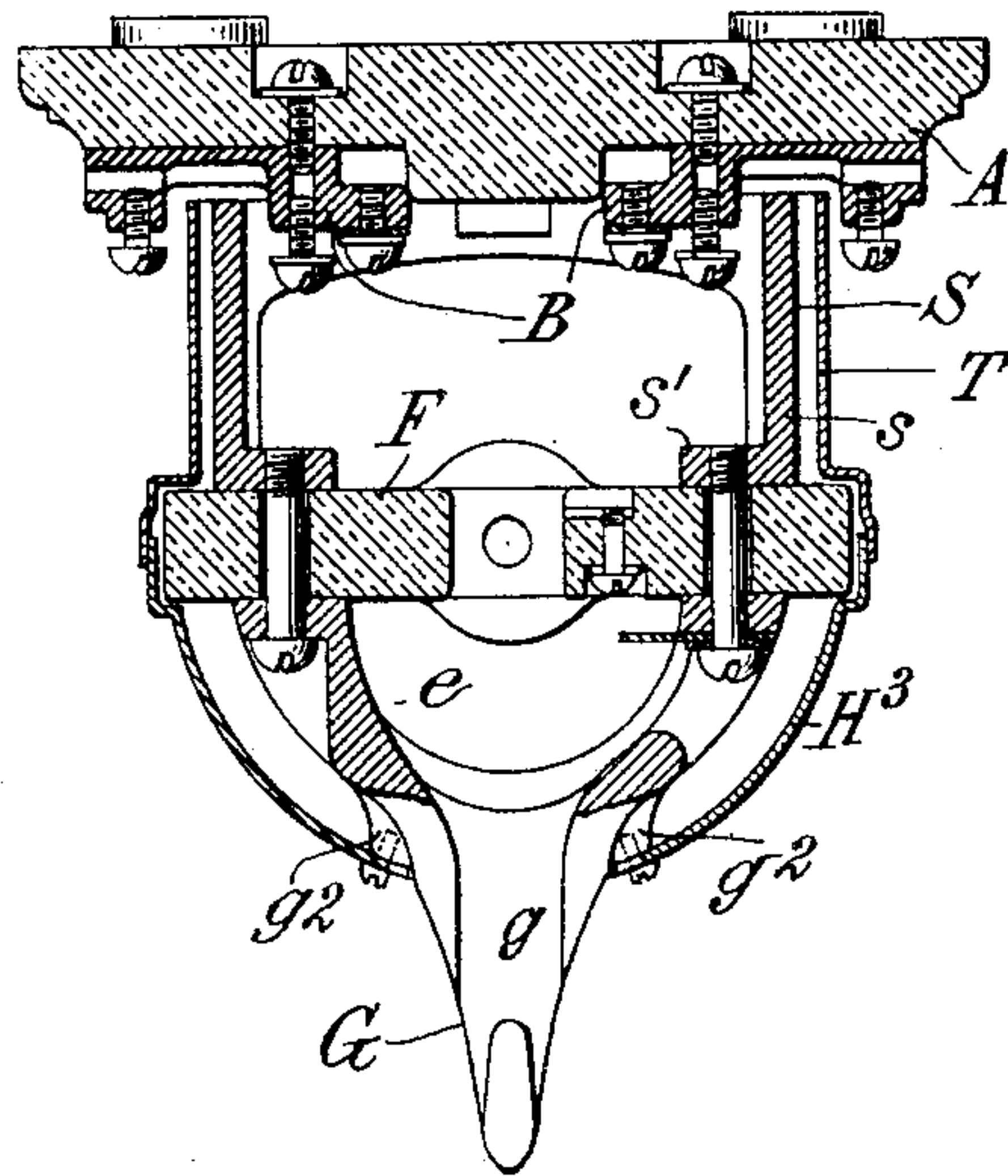


FIG. 16.

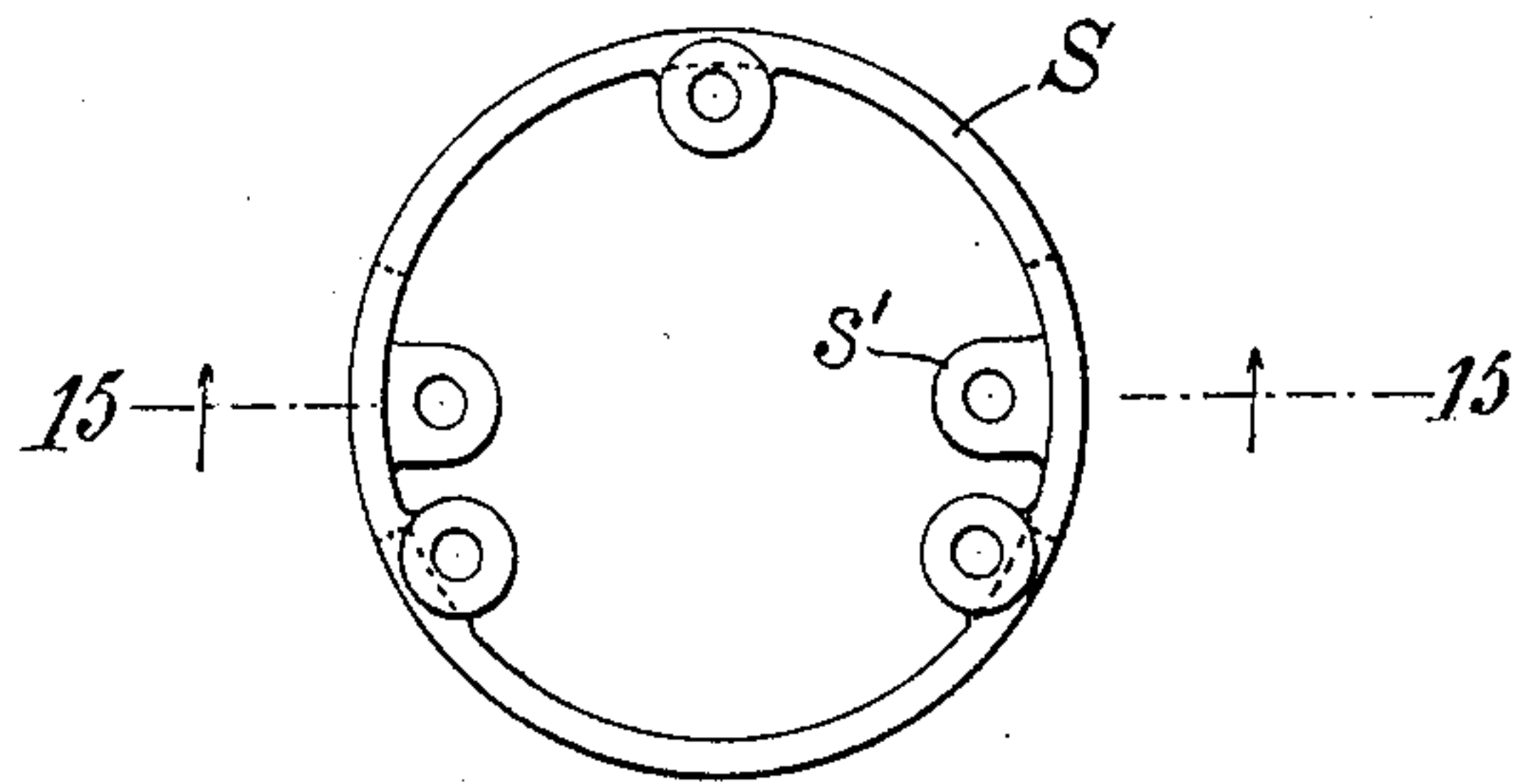
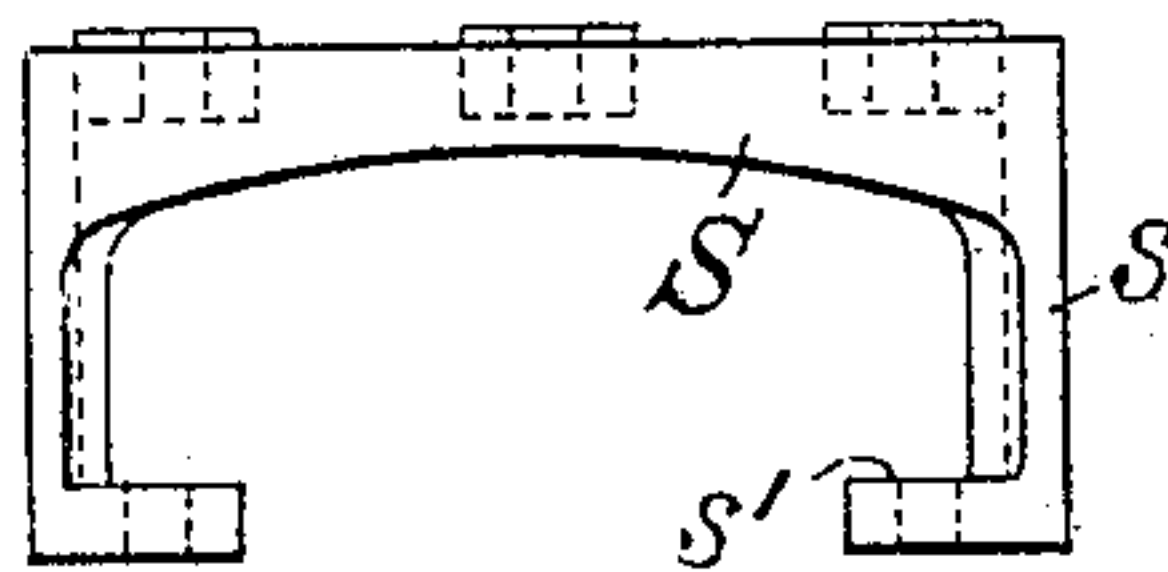


FIG. 17.



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JAMES J. WOOD, OF FORT WAYNE, INDIANA.

SUSPENSION CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 670,573, dated March 26, 1901.

Application filed December 19, 1899. serial No. 740,919. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. WOOD, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Suspension Cut-Outs, of which the following is a specification.

My invention relates to suspension cut-outs for electroreceptive devices, such as arc-lamps. It is customary to hang these lamps loosely by a hook from a hanger fastened to the wall or ceiling, the circuit passing from the line into the hollow hanger, through a cut-out device therein, and by flexible connections outside of the hooks to the loop passing through the lamp.

My invention introduces various improvements in the hanger and cut-out by which ease of manufacture and repair, facility of erection, certainty of proper operation, and attractiveness are secured.

In the accompanying drawings, Figure 1 is an elevation of the preferred form of my completed invention in use with the lamp depending therefrom. Figs. 2 and 3 are longitudinal sections on the lines 2-2 and 3-3 of Fig. 4. Figs. 4, 5, 6, 7, and 8 are sections on the correspondingly-marked section-lines of Figs. 2 and 3 and in the directions of the arrows. Fig. 9 is a side elevation of the shaft with its cam-bridges and its throwing and locking cam in position. Fig. 10 is an end view of the throwing and locking cam; Fig. 11, a cross-section of the cam-bridge; Fig. 12, a top view of the operating-lever; Fig. 13, a side view of the operating-lever and the end of the operating-shaft, with the pointer thereon. Fig. 14 is a diagrammatic view showing the arrangement of parts when the lamp is in circuit. Figs. 15, 16, and 17 are respectively a longitudinal section, a plan, and an elevation of a modified form of hanger; and Fig. 18 is a section on the line 18-18, Fig. 2.

A base of insulating material (shown at A) carries terminals B for attachment of the line-wires and is itself adapted for attachment to the supporting structure. Suspended from this base is a second plate F, of porcelain or other insulating material, carrying the cut-out mechanism proper. Depending from the base and carrying the cut-out plate is a frame of any suitable construction. Connections r

and r^2 pass from the line-terminals to the cut-out. The lamp is suspended from a hook supported beneath the plate F, and the entire framework above the hook is protected by an ornamental casing.

Various modifications in the details of my invention are possible to a skilled mechanic; but I will now describe that embodiment of it which appears to me to be the best.

Referring first to the form shown in Figs. 1 to 13, inclusive, A is the base-plate, of insulating material, which is fastened to the wall or ceiling by screws in the usual way. Fastened in grooves in the face thereof by means of screws a are the line-terminals B. (Shown most clearly in Figs. 2 and 8.) At their outer ends are sockets b for receiving the wire and clamping-screws b' or other connecting means therefor. At one point the terminals are thickened and internally screw-threaded entirely through to receive the holding-screws a and the binding-screws b^2 for the cut-out connections. The inner ends are brought downward, so that the springs leading therefrom to the film cut-out, hereinafter described, may be below the under side of the base-plate. Fastened to the inner end by screws b^3 are springs b^4 , which bear toward each other at their outer ends, being separated by a piece of paraffin-paper b^5 , forming the usual film cut-out. This arrangement of its parts makes the terminal a most convenient one in practical use, the construction being very compact and at the same time easily accessible at every point. Also suspended from the base-plate is a hanger C, having a screw-threaded socket, into which is screwed a tube D, the latter carrying at its lower end a bracket E, formed with two depending legs. The leg e is of approximately the same width throughout its length and is flattened at the base, as shown at e^3 . The other leg is divided into two parts e' and e^2 , which are carried close together and connected at the base by means of a flat portion e^4 . These two base portions constitute a broad firm bearing and a sufficient number of points of attachment for the structure supported from it, at the same time permitting ready access to the various parts. A bracket E' , similar to bracket E, is supported therefrom by screws, as shown. Held firmly by the

broad bearing-faces of these brackets and between said faces is a plate F, of insulating material, in the present case circular in plan and provided with holes f for the passage of the screws connecting the two brackets. Attached to the hub of the bracket E' and preferably integral therewith is a hook G, having its shank hollowed out, as indicated at g , to form a passage open at one side, (see Fig. 18,) said passage g forming a continuation of the central passage in the hub of the bracket E'. The entire framework is easily assembled, of graceful proportions, light without sacrificing stiffness, is well suited for attachment of the outer casing, and affords protected passages for carrying the wires and ready access to wires and terminals for purposes of disconnecting or connecting them. Furthermore, it is apparent that the plate F carries no weight, though held intermediate of the brackets. If it be desired to remove the lamp, the lower half of the outer casing being let down a short distance the wide side openings in the bracket E' present the screws of the lower binding-post to the workman without any obstruction, as shown in Fig. 5, and they being loosened the lamp may be taken off the hook and lowered without any danger of tangled wires or other difficulty. It is quickly connected up in a similar manner. At the point at which the insulation of the wires is most apt to become worn they are protected from outside abrasion by passing through the hollow shank of the hook, so as to reduce the wear to a minimum. The arrangement of the tube D has a similar function, entirely inclosing the wires.

The manner of attaching the ornamental protecting-casing is simple and expeditious. The upper shell H contacts with the base along a circle a sufficient distance from its outer edge to give free access to the binding-screws b' , but to protect the other binding-screws on the terminals B. It is attached at its lower end by a neck h , bearing on its inner side against the tube D or an ornamental sleeve or coating H' and fastened at any point on the length of said tube by a ring h^2 , carrying a set-screw h^3 . Attached to the lower end of the tube D by a similar flange and ring is a hemispherical shell H², carrying a rabbet h^4 at its lower end to fit on the plate F and a flange h^5 to extend outside of a flange h^6 on a similar lower hemispherical shell H³. The latter is fastened by screws, as shown at h^7 , to lugs g^2 on the hook. These screws have portions of their heads cut away, so that by turning them half around the casing may pass over said heads in the well-known way. The tube D is of such a length that if it be necessary to get at the inner ends of the line-terminals B the set-screw h^3 is loosened and the shell H may be lowered so far as to be out of the way, but in a convenient position for quick return to its original position. Similarly when access to the upper or the under side of the plate F is necessary the shell H² or H³ is

slid up or down on the tube H' or over the hook G, and all the required parts are immediately accessible and in convenient position for quick restoration to their original positions. The shell H² may of course be fastened at any height desired.

The cut-out mechanism is carried by the plate F, and in its most practical form said plate carries on its upper face a pair of binding-screws K K' for the reception of the connections from the line-terminals, a bridge-piece of any convenient type, here shown as a strip of metal k^2 , set into the plate and fastened by a screw from the under side, and a pair of spring-terminals $k k'$, extending from the binding-posts across an opening f' in the plate and then bent backwardly and toward each other and downward, so as normally to bear on the bridge-piece k^2 . On its lower face the plate carries a pair of binding-posts L L' for attachment of the connections from the lamp and a pair of springs $l l'$, extending across the opening f' at points opposite the springs $k k'$ and then passing downward and back again and terminating on the outer sides of their binding-posts, so as to seat on the under face of the plate F. Attached to the bracket (E preferably by one of the screws that hold the brackets E and E' together) is a throwing and locking spring M, extending over the opening f' and projecting upwardly at a point m opposite the center thereof, bending downwardly on both sides of said point. The plate F is thickened at one end of the opening f' and has a bore, as shown, for the reception of a horizontal shaft N.

The shaft N carries an operating-lever at its outer end, and on the portion of the shaft lying inside of the opening f' in the plate F is fixed a pair of bridge-cams n and n' for establishing connection between the terminals K and L and between K' and L', respectively, and intermediate of these there is fixed on the shaft a throwing and locking cam n^2 for coöperation with the spring M. The inner end of the shaft N is smaller than the bore of the cams n , n' , and n^2 and is circular. The cam-carrying portion n^3 of the shaft is non-circular in cross-section, being preferably flattened or oblong, with rounded ends, as shown. The cam-bridges are built up (see Fig. 11) of a core of insulating material composed of two parts n^4 , with an opening between them of similar section to that of the cam-carrying portion of the shaft, and a metallic skin n^5 , holding the parts of the core together and in shape. The ends of the cores project beyond the edges of the skin for more perfect insulation and their faces are approximately conical with the apex outward, as shown at n^6 in Fig. 9. The throwing and locking cam n^2 is slid on the shaft and is held at the desired point by the set-screw n^7 . Projecting from it is a roller or other projecting surface n^8 , Fig. 10, at approximately an angle of forty-five degrees from the lowest point of the shaft in the position shown in Fig. 2.

The parts n , n' , and n^2 are very quickly, accurately, and rigidly mounted on the shaft, as follows: The three parts are held in the opening f' while the shaft is forced through them, the cam n^2 is clamped by the set-screw in its proper position, and the assembling is finished. The projecting conical ends of the insulating-cores protect the central cam from electrical contact with the bridges at the same time that they insulate the shaft therefrom, and the bridges acting against the ends of the opening f' resist any tendency to longitudinal movement of the shaft. The shaft fits tightly in the cores of the cam-bridges.

Journalled on the outer end of the shaft N, so as to be capable of oscillation in a vertical plane, is a two-armed lever O, the arms being dipped, so that the greater portion of its weight will be below the point of suspension and the lever will tend to maintain always a horizontal position. On said lever are a pair of studs o' and o^2 , Figs. 12 and 13, and passing through said shaft at a point opposite said studs is a pointer o^3 . As shown, the pointer o^3 projects beyond the shaft at both ends; but the projecting butt-end may be omitted, or the projecting butt-end being retained one of the studs o or o' may be omitted. The pointer is turned inward at its end, as shown in Fig. 3, and on the casing H^3 are marked the words "On" and "Off" at points corresponding to the extreme positions of the pointer to the left or right. From the ends of the lever are suspended two pulls or tassels O' O^2 of contrasting colors, O' being white and O^2 black in the present case. The trimmer or other operator desiring to cut off the current has only to operate the black pull without the necessity of thinking, experimenting, looking, or finding out in any other way whether the current is on or off. If the current is off, no action of the cut-off takes place. If the current is on, it is cut off, and in each case the lever returns to its original position, ready for a subsequent operation. This cut-off is in addition to the usual cut-off within the lamp structure (shown at P, Fig. 1) and serves to carry the point of cut-off nearer to the main line than the lamp cut-off, which is very desirable for obvious reasons.

Though I have described with particularity an apparatus embodying my invention, so as to enable others to make or use the same, it is not to be inferred that my invention is limited strictly by the form shown. Many modifications of the apparatus are possible to the skilled constructor without departing from my actual invention.

The operation of the various details having been sufficiently indicated in connection with the description of their construction, I will now describe the operation of the cut-off proper. The parts being in the position shown in Figs. 2 and 14, the current enters from the line-wire R, passes through the terminal b , connection r , binding-screw K, terminal k , bridge n , terminal l , and connection r' to the

lamp and in an inverse direction through the bridge n' to the line R' on the other side, the film cut-out $b^4 b^5$ carrying the current directly from R to R' in case of accident. Now let the black pull be operated. The stud o^2 bears against the pointer o^3 , carrying it a little beyond the lowest position, and upon being released itself returns to its original position. The pointer has carried with it the shaft N, turning the latter so far that the roller n^8 has just passed the point m of the spring M. The end portion of the spring then bearing up against the roller forces it to the limit of its throw and the shaft with it, the pointer also being moved all the way over to "Off." In the first position the cam-bridges held the terminals k k' up from contact with the bridge k^2 and established the connections stated. Now the shorter diameter of the cams being vertical they no longer form a connection between the spring-terminals, but allow the free ends of k and k' to make connection with the bridge k^2 , and so with each other. The cam-face is below the face of the plate, so as to avoid accidental contact. The passage of the current is then from R to k , to k^2 , to k' , and finally out at R' without including the loop in which the lamp is installed.

In Figs. 15, 16, and 17 I have shown a section, a plan, and an elevation, respectively, of a modification of my hanger useful in places where there is not sufficient head-room for the form shown in Fig. 1. The hook end of the lower bracket is shown in front elevation in Fig. 15. The entire frame from the base-plate to the cut-off plate is reduced to the distance indicated at y in Fig. 3, the portion z being eliminated. In place of the frame C, D, and E, I substitute a single annular frame S, having depending legs s , with flat bases s' , and screw-threaded openings registering with the openings in the plate F, and in place of the sheet-metal casings H, H', and H², I substitute a cylindrical casing T, depending outside of the casing H³ and held in place by screws or in any other convenient manner. The remaining portions of the device are identical with those already described.

Having now described an apparatus embodying my invention, what I claim, and desire to secure by Letters Patent, are the following-defined elements and combinations, all substantially as described:

1. In a cut-out, a pair of loop-terminals, an insulating-plate, a pair of line-terminals on said plate, a stationary bridge on said plate, said line-terminals being continually spring-pressed toward said bridge so as normally to make connection with each other through said bridge, and means for interrupting said connection and throwing the loop into the line-circuit.

2. In a cut-out, a pair of loop-terminals, an insulating-plate, a pair of line-terminals consisting of springs on said plate, a stationary bridge on said plate, said line-terminals being continually spring-pressed toward said

bridge so as normally to make connection with each other through said bridge, and means for interrupting said connection and throwing the loop into the line-circuit.

5 3. In a cut-out, an insulating-plate, a pair of loop-terminals and a pair of line-terminals thereon, said line-terminals being normally connected electrically together, and a pair of conducting cam-bridges between the line-
10 terminals and the loop-terminals for electrically connecting the respective line and loop terminals to throw the loop into the line-circuit, said cam-bridges being connected to operate simultaneously.

15 4. In a cut-out, loop-terminals, line-terminals, a bridge adapted to connect the line-terminals, and separate cam-bridges adapted to throw the loop into the line-circuit.

5. In a cut-out, loop-terminals, line-terminals, a bridge adapted to connect the line-terminals, and separate cam-bridges adapted to throw the loop into the line-circuit and to break the circuit through the first-mentioned bridge.

25 6. In a cut-out, a pair of loop-terminals, an insulating-plate having an opening therein, a stationary bridge on said plate, a pair of line-terminals on the face of said plate normally electrically connected together through
30 said bridge, and means in said opening for disconnecting said line-terminals from said bridge and throwing the loop into the line-circuit.

7. In a cut-out, a pair of loop-terminals, an
35 insulating-plate having an opening therein, a stationary bridge on said plate, a pair of line-terminals on the face of said plate extending over said opening and normally electrically connected together through said
40 bridge, and means in said opening for disconnecting said line-terminals from said bridge, and throwing the loop into the line-circuit.

8. In a cut-out, an insulating-plate having
45 an opening therein, terminals on said plate, a stationary bridge on said plate, and means in said opening for connecting the appropriate terminals with each other and for disconnecting said bridge from its circuit.

50 9. In a cut-out, a pair of loop-terminals, an insulating-plate having an opening therein, a pair of line-terminals on said plate and projecting over said opening, contact-making members in said opening adapted to contact
55 with said line and loop terminals respectively to throw the loop into the line-circuit and said members lying below the face of the plate in the contact-breaking position, whereby the possibility of accidental contact is
60 avoided.

10. In a cut-out, in combination, an oscillating shaft, an operating member adapted to return automatically to one determined position, and means whereby the operation of
65 said shaft in one direction connects it to said operating member for operation in the opposite direction.

11. In a cut-out, the combination of an oscillating operating-shaft, a pair of pulls for operating said shaft, and means for oper- 70
atively connecting the shaft with either pull and simultaneously disconnecting it from the other, whereby either pull may be operated at all times, regardless of the position of the shaft, and but one pull will operate the shaft. 75

12. In a cut-out, in combination, an operating-shaft, and means independent of said shaft and moving in a vertical plane for oscillating said shaft in either direction, said means being arranged to return automatic- 80
ally to its operative position when released.

13. In a cut-out, the combination of an oscillating operating-shaft, means adapted to turn said shaft in either direction and then to release the same and return to its original po- 85
sition.

14. In a cut-out, in combination, an operating-shaft, shaft-operating means turning independently of said shaft on a horizontal axis, said means being balanced so as to stand 90
normally in a middle position, and pulls for turning said means in either direction from said middle position.

15. In a cut-out, in combination, an oscillating shaft, an operating member movable 95
in a vertical plane and balanced to return automatically to one determined position, and means whereby the operation of said shaft in one direction connects it to said operating member for operation in the opposite direc- 100
tion.

16. In a hanger for an electroreceptive device such as an arc-lamp, a bracket attached to the main support, an insulating-plate carrying cut-out mechanism, and a second bracket 105
carrying the electroreceptive device, the second bracket being supported from the first and the plate being held in place by said brackets without itself carrying any of the weight of the electroreceptive device. 110

17. In a hanger for an electroreceptive device such as an arc-lamp, a bracket attached to the main support, an insulating-plate carrying cut-out mechanism, and a second bracket 115
carrying the electroreceptive device, the second bracket being supported from the first and the plate being held between the two brackets without itself carrying any of the weight of the electroreceptive device.

18. A bracket, consisting of a hub and legs 120
extending from said hub, one leg being of substantially uniform cross-section throughout its length, and the other forming two branches with a web connecting their outer ends, and an opening in said web, so as to afford easy 125
access to the interior on the side of the single leg and easy access to the opening on the side of the branched leg.

19. In an arc-lamp suspender, a hook having a shank, and a vertical passage through 130
said shank, said passage being open at one side and being adapted to receive and carry the connections to the lamp.

20. In an arc-lamp suspender, a bracket

having a hub, legs extending from said hub and adapted to be attached to a support, and a hook forming an integral extension of said hub and adapted to carry the lamp, said hub having a passage therethrough, and said hook having a vertical passage through its shank open at one side and forming with the passage through said hub one continuous passage adapted to carry the connections to the lamp.

21. In a cut-out, an operating-shaft, a pair of bridges on said shaft, and a locking member between said bridges, each bridge consisting of a core of insulating material and a metallic skin, said cores projecting beyond the edges of said skin whereby the bridge is effectively insulated from the locking member.

22. In a cut-out, the combination of an insulating-plate, a pair of line-terminals thereon continually spring-pressed to make electrical connection with each other, a pair of loop-terminals, and a cam adapted to be moved to connect the loop-terminals to the respective line-terminals and to displace the latter to break the connection between the line-terminals.

23. In a cut-out, the combination with line-terminals, of an independent conducting member normally connecting the same, loop-terminals, and contacts normally disconnected from the line and loop terminals, and adapted to be moved to connect the line-terminals with the loop-terminals, and to open the line-circuit through the independent conducting member.

24. In a cut-out, the combination with line-terminals, of an independent conducting member normally connecting the same, loop-terminals, and a rotatable switch-spindle carrying contacts which are adapted to be moved to connect the line-terminals with the loop-terminals, and to open the line-circuit through the independent conducting member.

25. In a cut-out, the combination with movable line-terminals, of an independent conducting member, which normally connects said terminals, loop-terminals, and independent switch-contacts normally disconnected from the line and loop terminals, and adapted to be moved to connect the line and loop terminals and move the line-terminals away from the independent conducting member.

26. In a cut-out, the combination with line-terminals, of an independent conducting member normally connecting the same, loop-terminals, and independent contacts normally disconnected from the line and loop terminals, and adapted to be moved to connect the

line-terminals with the loop-terminals, and to open the line-circuit through the independent conducting member, and means for imparting a snap movement to said contacts.

27. In a cut-out, the combination with springs serving as line-terminals, of an independent conducting member against which said springs normally bear, springs serving as loop-terminals, a rotatable spindle, and substantially elliptical contacts carried by the spindle, whereby when the latter is rotated, said contacts will connect the line-terminals with the loop-terminals, and force the line-terminals out of contact with the independent conducting member.

28. In a cut-out, the combination with line-terminals, of an independent conducting member normally connecting the same, loop-terminals, a rotatable switch-spindle carrying contacts which are adapted to be moved to connect the line-terminals with the loop-terminals, and to open the line-circuit through the independent conducting member, a projection from the spindle, and a spring bearing on the projection to impart a snap movement to the spindle.

29. In a cut-out, the combination with line-terminals, of an independent conducting member normally connecting the same, loop-terminals, a rotatable switch-spindle carrying contacts which are adapted to be moved to connect the line-terminals with the loop-terminals, and to open the line-circuit through the independent conducting member, a projection from the spindle, a friction-wheel journaled in the projection, and a spring bearing on the friction-wheel to impart a snap movement to the spindle.

30. In a cut-out, the combination with line-terminals, of an independent conducting member normally connecting the same, loop-terminals, a rotatable switch-spindle carrying contacts which are adapted to connect the line-terminals with the loop-terminals, and to open the line-circuit through the independent conducting member, a projection from the spindle, and a bent spring bearing on the projection to impart a snap movement to the spindle, and to hold the latter in the position to which it may have been moved.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES J. WOOD.

Witnesses:

DOMINGO A. USINA,
FRED WHITE.