

No. 675,643.

Patented June 4, 1901.

O. SPRINGER.
ELECTRIC TIME SWITCH.

(Application filed Oct. 16, 1900.)

(No Model.)

2 Sheets—Sheet 1.

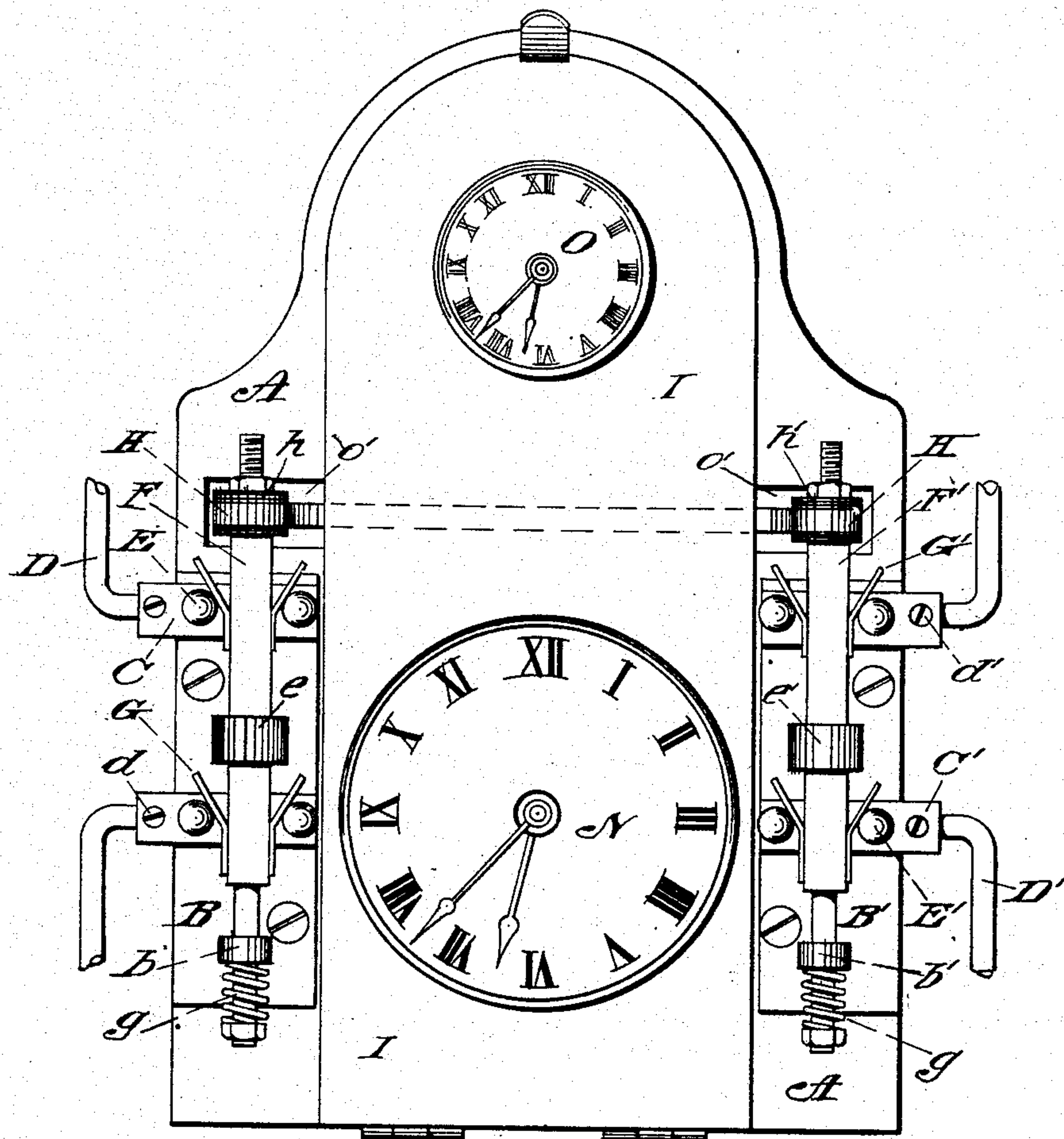


Fig. 1,

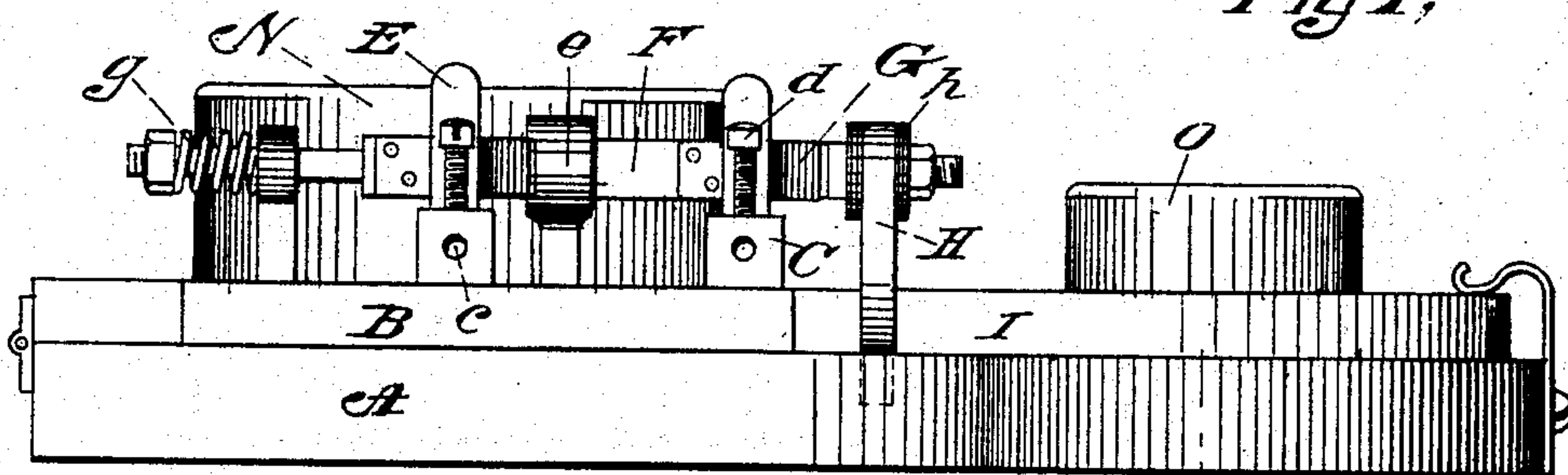


Fig. 2,

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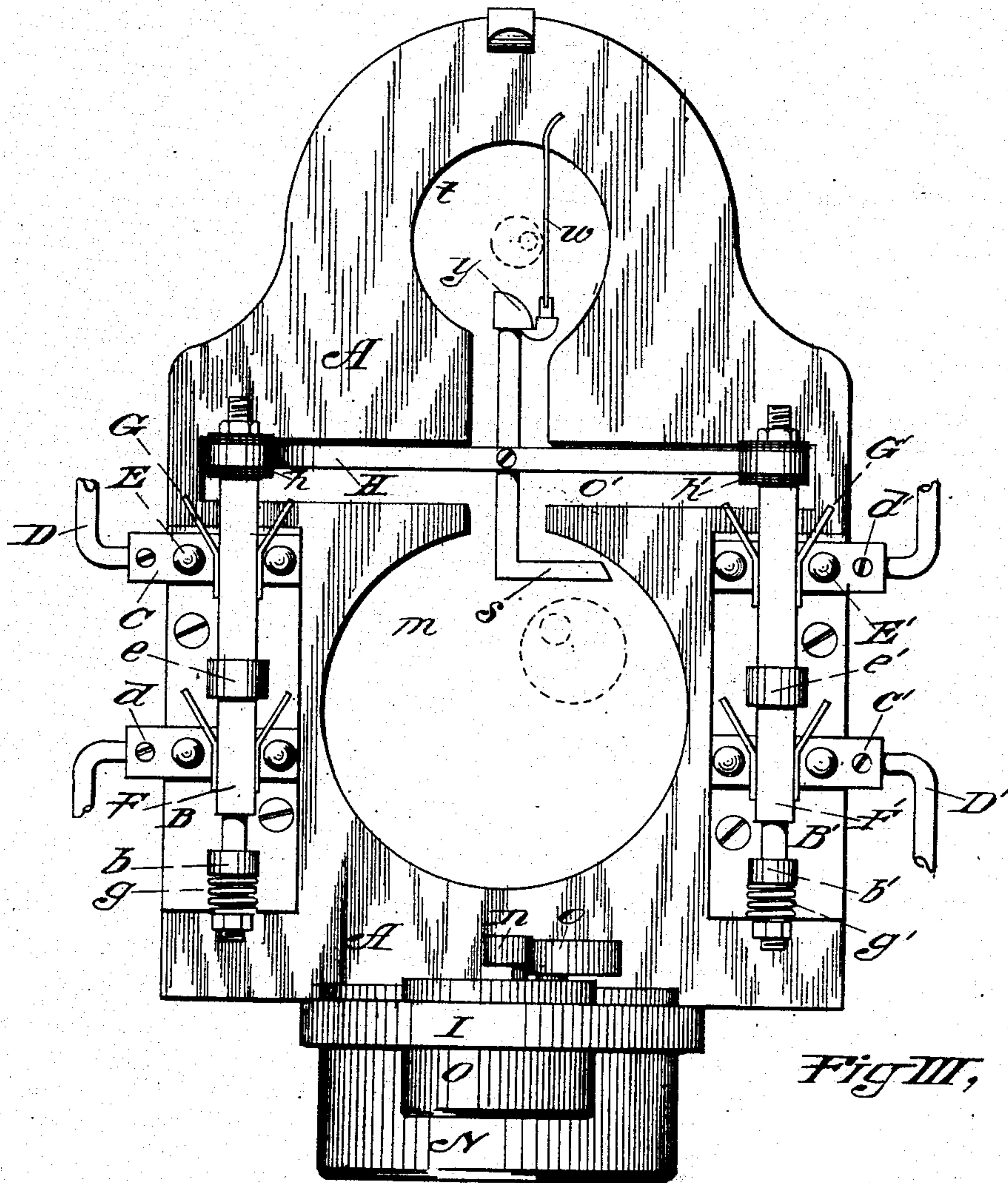
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UNITED STATES PATENT OFFICE.

OSCAR SPRINGER, OF SPRINGFIELD, MASSACHUSETTS.

ELECTRIC TIME-SWITCH.

SPECIFICATION forming part of Letters Patent No. 675,643, dated June 4, 1901.

Application filed October 16, 1900. Serial No. 33,304. (No model.)

To all whom it may concern:

Be it known that I, OSCAR SPRINGER, a citizen of the United States, residing at 92 Central street, in the city of Springfield, county of Hampden, and State of Massachusetts, have invented certain new and useful Improvements in Time Electric Switches, of which the following is a specification.

My improvements relate, in brief, in the first part to the construction of the switch proper, adapting it to be effectively operated by clock mechanism to close and open the electric circuit, upon which are lamps for illuminating purposes, by a reciprocation perfectly and instantly forming and breaking the contact, and in the second part to mechanism combined with the switch and clockwork, adapting the switch to be operated to both turn on and extinguish the lights at predetermined times; and the invention consists in the combination and arrangement, as hereinafter described, and more particularly set forth in the claims.

My invention is fully illustrated in the accompanying drawings, in which—

Figure I is a front elevation of my device. Fig. II is a side elevation of the same, with the parts in the position shown in Fig. I; and Fig. III is a front elevation with the movable parts shown in a different position from in Fig. I.

Referring to the drawings, A is a base adapted to be secured to any vertical wall at a height from the floor making it easily accessible and for the purposes of my invention is conveniently formed of wood, as indicated in Fig. III. Upon each side of the base A is secured an insulating-base B B', placed upon the edges of the base, as shown in Figs. I and III, to leave a space between them on the face of the base. These bases B B', supporting the duplicate contact-pieces of a return-current switch, are formed of a non-conducting material, preferably slate, and are securely bolted, as shown, to the base A. Upon the faces of the bases B B' are firmly secured blocks C C' of conducting material. These blocks are provided on their outside ends with sockets c c' to receive the ends of the conductor-wires D D' and are provided with binding-screws d d' for securing said ends.

Each block C C' is provided with two posts

E E', spaced with an interval between them. These posts E E', rising from the blocks C C', are of conducting material, so as to be in electric connection with the wires D D', and the spaces between the two posts E E' on one side are alined vertically, the posts E E' being arranged on both sides in sets, so that parallel contact-bars F F' have room between them, as shown in Figs. I and III. These posts E E' are preferably round in cross-section, as shown.

Between the posts E E' and supported in guides b e b' e' from the bases B B', so as to slide freely in said guides, are the contact-bars F F' of a diameter less than the distance between the two posts E E' on a block, so that at one point in their reciprocation, held by their guides, they would be out of electrical connection with the posts E E' on account of the intervening space. The contact-bars F F' for that part of their length extending between the posts E E' are preferably square in cross-section, so as to be held by their guides b b' from any rotation in reciprocating as well as to seat flat springs G G', extending their entire width and riveted to their flat sides, as shown in Fig. II. These springs are arranged on opposite sides of bars F F' at points opposite each other to form, in effect, spring-wedges above the posts E E', a wedge for each pair of posts, and the wedges and posts E E' are so relatively spaced or arranged that the two bars F F', sliding in unison, will have all of the posts E E' either in contact with the wedges or all of them out of said contact.

The bars F F', held by their guides b b' and e e' to slide vertically, are framed together at their tops by a cross-head H, formed of non-conducting material or insulated, as shown in the drawings, by non-conducting washers h h', so that said bars F F' will slide in unison. The upper guides, embracing the bars F F' where they are squared and so preventing any rotation of said bars F F', permit the lower ends of the bars F F' to be formed into round stems received through corresponding openings in the guides e e', and interposed between the guides e e' and nuts upon the free ends of bars F F' and inclosing the stems of the bars are coil-springs g g', with a tension assisting gravity in bearing the wedges on the bars F F' to a seat between the posts E E'.

The framed bars $F F'$, dropped from a distance above the posts $E E'$, will have all of the wedges formed by the springs $G G'$, leaving their sides at an acute angle wedged in between the posts $E E'$, so as to form a perfect electrical contact, and it will be seen that the tendency of the springs $G G'$, when the inertia of the framed bars was overcome by any force lifting them, would be to accelerate their upward movement. The object of springs $g g'$ (shown to reinforce the action of gravity) is simply to permit the reciprocating parts to be made lighter in weight.

The advantage of the wedges formed by flat springs having free ends is that whereas a rigid offset of any kind from the contact-bar F taking their place could not be made to form an equal contact with all four sets of posts $E E'$. The wedges adjust themselves to fill all of the spaces between all of the posts $E E'$, while the angle at which they are set holds the bars $F F'$ fast and, as above mentioned, accelerates their departure when finally unseated. The duplicated parts thus described are framed by the cross-head H , which is offset back to extend through a channel o' , cut transversely in the back or base A , having a width sufficient to permit the cross-head to reciprocate vertically with its bars $F F'$ and across a well or depression m , also sunk in the base A . Secured vertically and at right angles to cross-head H within the well m is a stem extending upward in a countersink in the base, where it is provided with a head forming one section of a catch y , and downward, where it is provided with a cam block or extension s , adapted to be acted on by a cam extension from clock mechanism. The object of the offset in cross-head is to bring it in the same plane with the cams from clocks extending into the scooped-out base. The other section of catch y is formed by a head dependent upon a spring extending downward in a well t , an extension from the one m , so that, as shown, when the stem on the cross-head is pushed up a certain distance its head will be engaged by the other section of the catch upon the free end of the dependent spring and normally borne in the path of the lower section. The dependent spring w is in the plane of a cam on a clock and so arranged relatively thereto as to be pushed by said cam to release the cross-head and fly back itself when released by the cam to resume its position in the path of the cross-head section. Hinged to the lower edge of base A is a frame I , carrying two clocks $N O$, arranged one above the other to extend through the frame I , which may be of plank bored out to receive them, and the frame I is arranged to swing up against base A , as more particularly shown in Fig. I, or down away from, as seen in Fig. III, where it is supposed to be swung down at right angles to the base. The frame I , arranged between the bars $F F'$, has upon the clocks $N O$ cams $n o$ therefrom, which are

wound up and set to go off in the well-known way in which the alarm mechanism is operated, and when so wound up and the clocks brought into the position shown in Fig. I the cams $n o$ come into the positions indicated in dotted lines in Fig. III, in which figure it will be seen the circuit is broken, and at any predetermined time the upper clock O is set to go off its cam o will release catch y and the framed contact-bars will fall to convey the current to the lamps. The clock N being set to go off at a later time will, by means of its cam n , raise the contact-bar frame until the catch y is operative to hold the current broken and the lights extinguished.

With this device it is thus possible to cause a store or large building to be lighted and the lights afterward put out without the attendance of any person, and by the construction of the switch as shown the action of the cams instantly breaks or closes the circuit, so that there is no spark at the time of breaking or closing the circuit.

Now, having described my invention, what I claim is—

1. The combination in an electric time-switch of a base adapted to be secured to a vertical wall, duplicate circuit-controllers arranged parallel to each other and at an interval apart and comprising each an insulating-base, conducting-blocks mounted at an interval apart on said bases and provided with binding-screws and sockets adapting them to secure the ends of conducting-wires, conducting-posts seated on said blocks, a pair to each block and removed from each other, contact-bars supported and guided to reciprocate between said posts and removed from contact therewith, and two sets of flat springs secured opposite each other to the contact-bars to extend upward at an acute angle and with free ends and adapted to be compressed between the two sets of posts upon the downward movement of the contact-bars—and an insulated cross-head uniting the tops of the contact-bars, all arranged to open or close the circuit from the conducting-wires, as set forth.

2. In an electric time-switch, the combination of a base, duplicate circuit-controllers secured thereon and comprising each an insulated base, a pair of conducting-blocks mounted thereon provided with means for clamping the ends of the conductor-wires, a pair of posts on each block set apart, a contact-bar arranged in guides to reciprocate between the posts without contact therewith, flat metal springs secured at ends opposite each other to the sides of the contact-bars to extend outward therefrom and form elastic wedges adapted to simultaneously enter and bind between the two sets of posts, an insulated cross-head framing the duplicate contact-bars—and means for reciprocating said bars.

3. In electric time-switches, a base or back adapted to be fixed vertically, duplicate cir-

cuit-controllers mounted upon its face and at an interval apart and comprising duplicate contact-bars framed to reciprocate in unison and in one direction by gravity, a frame 5 hinged to the back to swing outward, two clock mechanisms fixed in the frame to extend therethrough and provided on the rear of the case with time-operated cams, a cross-head to the contact-bars, a cross-bar fixed to 10 the cross-head provided upon its lower extremity with a cam-block and upon its upper with one section of a catch, a corresponding catch-section in the upward path of said cross-bar and provided with a spring-shank oper- 15 ating to release or permit the catch to engage, all arranged to bring the catch and cam-block in the paths of the clock-cams when the clock-frame is swung against the base to cause the

reciprocation of the contact-bars to take place at predetermined times.

4. In a time-operated electric switch a back seating circuit-controllers upon its face, a frame hinged to the back between said controllers to swing against or away from the back, two time-clocks fixed on said frame and 25 provided with rearward-extending cams, a cross-head framing the contact-bars, and mechanism connected with said cross-head and in the path of the cams adapting the cross-head with its contact-bars to be recip- 30 roated by the action of the clock-cams, as and for the purpose set forth.

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Witnesses:

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