

(No Model.)

F. E. SMITH.

CONTACT FOR ELECTRIC PROGRAMME CLOCKS.

No. 459,917.

Patented Sept. 22, 1891.

FIG. 1.

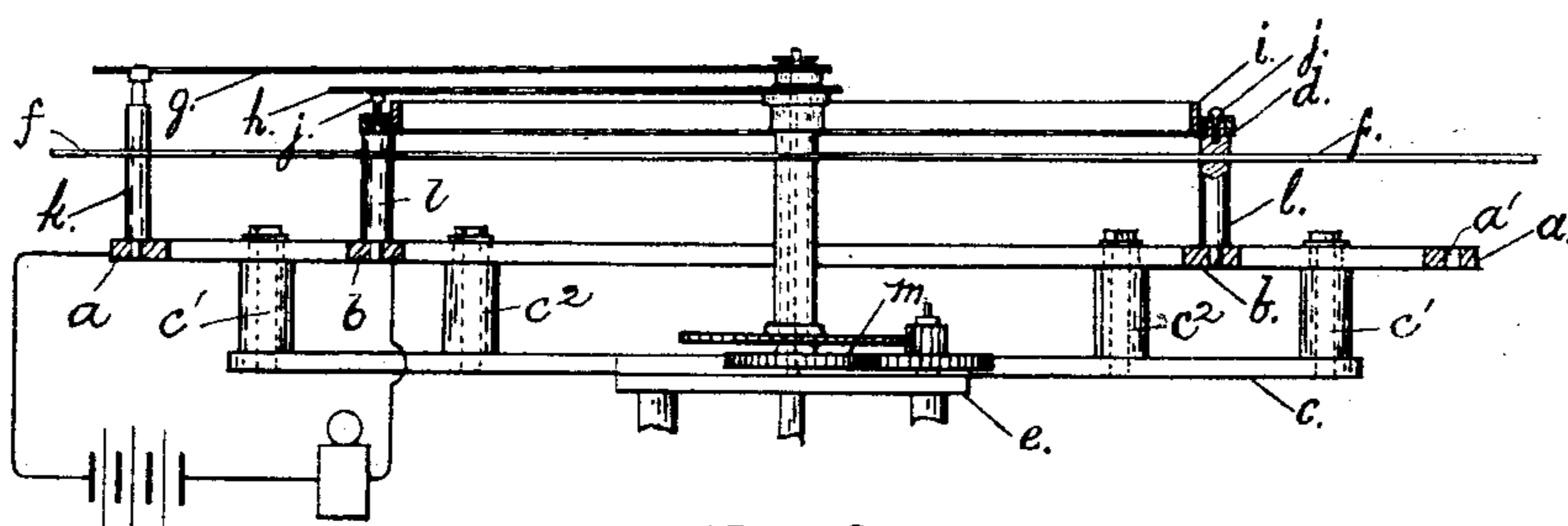
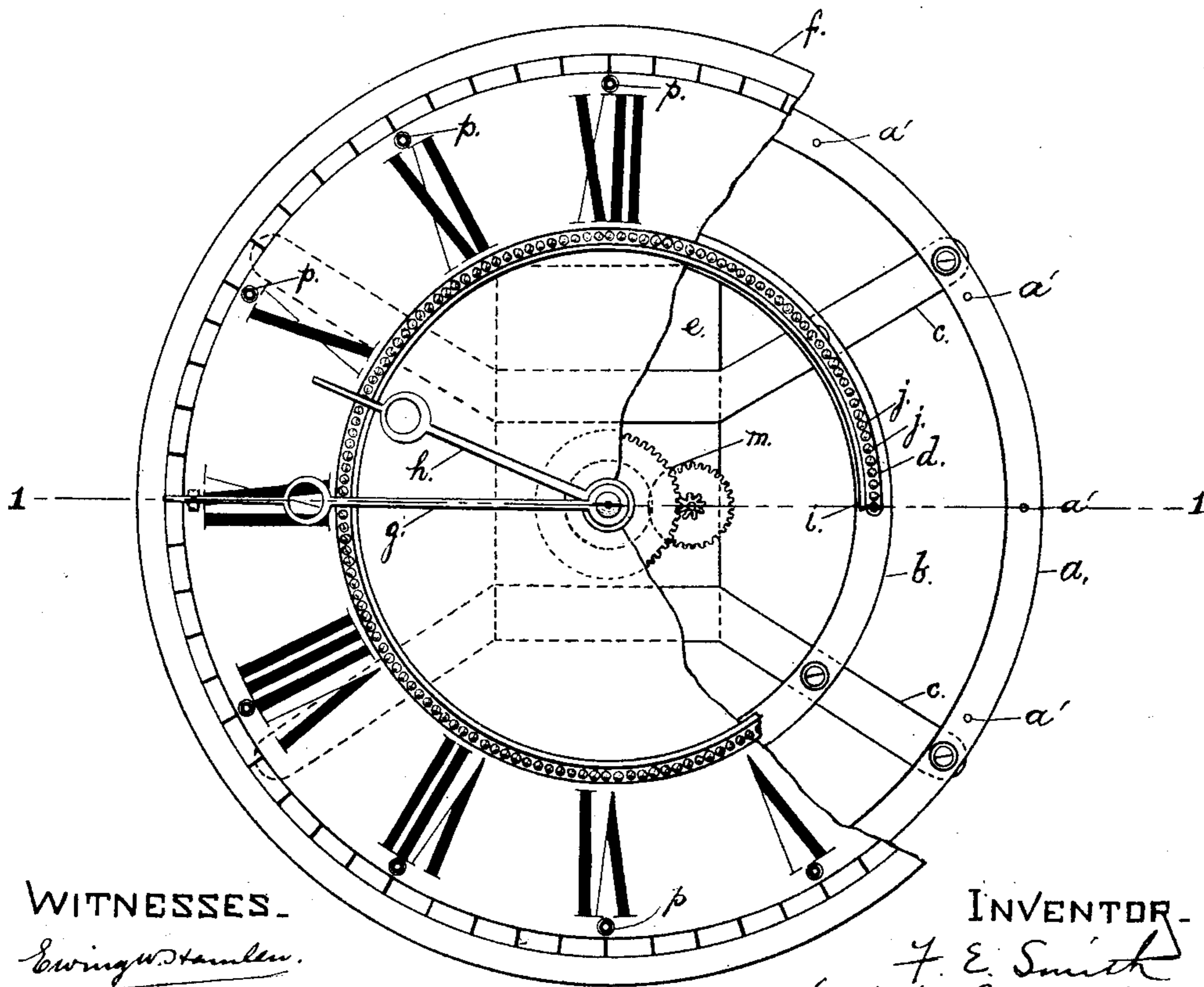


FIG. 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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CONTACT FOR ELECTRIC PROGRAMME-CLOCKS.

SPECIFICATION forming part of Letters Patent No. 459,917, dated September 22, 1891.

Application filed February 21, 1891. Serial No. 382,284. (No model.)

To all whom it may concern:

Be it known that I, FRANK EDWIN SMITH, of San José, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Electric Programme-Contacts for Time-Pieces, of which the following is a specification.

My invention relates to a device the purpose of which is to complete an electric circuit at any predetermined time, said circuit including any instruments designed to be operated or released or otherwise operated by an electro-magnet, and it has for its object to provide an improved clock which shall be capable of ringing an alarm-bell or of actuating any other suitable device operated by a current of electricity, the circuit being closed by the said clock at predetermined intervals; and it consists in the improvements which I will now proceed to describe and claim.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a horizontal section of the front portion of a clock provided with my improvements, the section being taken on the line 1 1 of Fig. 2. Fig. 2 represents a front view of the same, part of the dial and the rings thereon being broken away.

The same letters of reference indicate the same parts in both figures.

In the drawings, *e* represents the plate of the clock-movement, to which are affixed the supports *c*, of which there may be any suitable number. To the outer ends of the supports *c* are affixed supporting-pillars *c'* *c'*, of insulating material, the said pillars being attached to and supporting a metallic ring *a*. The supports *c* are also provided with another series of supporting-pillars *c*², which are attached to and support another metallic ring *b*.

d represents a metallic ring, which is supported in front of the dial *f* of the clock by three or more pillars *l*, the said pillars *l* establishing metallic contact between the rings *d* and *b*, and being preferably covered with insulating material at the points where they pass through the dial, in order to prevent metallic contact with the same should it be of a conducting material.

g represents the minute-hand, and *h* the hour-hand, of the clock.

k represents a pin or stud, which is adapted to be put in one of the holes *p* with which the dial *f* is provided. The dial *f* has twelve holes *p*, one on each radial line, on which the hour numbers are written. The plugs or studs *k* are formed to pass through the dial *f* and enter one of the holes *a'* in the ring *a*, the said plug or stud being of metal and being covered or surrounded with insulating material at the point where they come in contact with the dial, thus insulating the plug or stud *k* from the dial. The studs *k* are so formed that when they are inserted in the holes *p* and have their inner ends resting in the holes *a'* in the ring *a* their outer ends will project in front of the dial *f*, so that they will come in contact with the inner side of the minute-hand when said hand arrives at the point where said stud is placed.

The ring *d* is provided with a series of holes, one hundred and forty-four in number, or one for every five-minute division in the circle of said ring. The said holes in the ring *d* are adapted to receive pins or screws *j*, and to this end the holes are preferably tapped and the pins *j* screw-threaded to fit said holes, the said pins being therefore adjustable in said holes to vary the distance which their heads project from the said ring *d*.

i represents a ring of insulating material in front of the dial, and which is so affixed that its edge is always about the same distance from the face of the dial *f*. The hour-hand *h* is adapted to rest upon the outer edge of said insulating-ring *i* during its movement around the dial.

When it is desired to make contact and complete the electric circuit at any given time, a pin or stud *k* is inserted in one of the holes *p* in the dial, and the pin *j* corresponding to the five-minute division in which the plug *k* is inserted, is turned out of its hole, so that its head will project slightly beyond the line of the outer edge of the ring *i*, so that when the hour-hand *h* reaches said pin it will come in contact therewith, and the minute-hand *g* will at the same time come in contact with the outer end of the stud *k*, thus making circuit through the pin *k*, minute-hand *g*, hour-hand *h*, pin or screw *j*, ring *d*, and pillars *l* between the rings *a* and *b*. One end of the wire leading

from one pole of an electric battery is connected to the ring *a* at any suitable point, and the wire leading from the other pole is connected to the ring *b* at any convenient place, so that when contact is made by the two hands, as above described, the electric circuit will be completed and a bell or other device included in said circuit will be operated. The inner faces of the hands *g* and *h* are suitably beveled or inclined at the points where they come in contact with the studs *k* and pins *j*, respectively, so that they are enabled to pass easily over said studs or pins, at the same time making contact therewith and completing the electric circuit. When the hands have passed away from their respective studs or pins, the circuit will again be broken and the operation of the bell or other device which may be connected with the circuit will be stopped, as will be readily seen.

The gear-wheels (represented at *m*) are the usual dial gear-wheels of the clock.

From the foregoing description it will be readily seen that by the use of my improvements the electric circuit can be closed on any of the five-minute divisions of the twelve hours that may be desired. It will also be seen that the clock may be so arranged as to close the circuit, and thus operate the alarm-bell or other device at any number of said five-minute divisions without danger of the studs or pins used to cause one such closing of the circuit interfering with those used for another such act. In other words, the clock may be arranged to close the circuit at a number of different times, and it will do so at these said times and at these only.

I consider the non-conducting ring *i* a feature of some importance in my invention. As before stated, the hour-hand *h* rests upon said ring during its entire revolution, except when it may be lifted off the same for a short period by passing over a pin or screw *j*, which has been arranged to make contact with the said hand, as already described. The motion conveyed to the hour-hand of a clock by the gear-wheels (shown at *m*) which operate the same is, to a certain extent, intermittent, owing to the well-known and necessary form of the said gears. This intermittent movement of the hour-hand might cause it to remain somewhat longer in contact with a pin *j* than is desirable, or to delay making such contact till later than is necessary, unless some device were provided to equalize the movement of the said hour-hand. To this end I have provided the ring *i*, the slight frictional contact of the edge of said ring with the hour-hand taking up the backlash of the same, thus equalizing its movement around the dial to some extent.

I do not limit myself to the division of the ring *d* into one hundred and forty-four contact-points, corresponding to the five-minute divisions of the twelve hours, but may provide said ring with any other number of holes that

may be found to be suitable, and may also provide holes *p* to correspond with the number of holes in the ring *d*, my invention not being limited to the providing of the contact-making studs and pins at the five-minute divisions only of the twelve hours.

I claim—

1. The combination, with a clock mechanism, of the metallic rings *a* and *b*, insulated from each other, the one being connected with one pole and the other with the other pole of an electric battery, the ring *d*, supported by and having metallic connection with the ring *b*, and means whereby the hour and minute hands of the clock may be simultaneously caused to make electrical connection with the ring *d* and the ring *a*, respectively, thereby closing the electric circuit, as set forth.

2. The combination, with a clock mechanism, of the metallic rings *a* and *b*, insulated from each other, the one being connected with one pole and the other with the other pole of an electric battery, the ring *d*, supported by and having metallic connection with the ring *b*, each of said rings *a* and *d* having a series of holes, contacts *j*, adjustable in the holes of the ring *d*, so that they may or may not come in contact with the hour-hand in its movement around the dial, and contacts *k*, adapted to be placed in the holes in the ring *a*, said contacts *k* when so placed being adapted to project into the path of travel of the minute-hand of the clock, as set forth.

3. The combination, with a clock mechanism, of the metallic rings *a* and *b*, insulated from each other, the one being connected with one pole and the other with the other pole of an electric battery, the ring *d*, supported by and having metallic connection with the ring *b*, said ring *a* having a series of holes, the ring *i*, so arranged that the hour-hand bears thereon during its normal movement around the dial, the contacts *j*, adjustable in the holes in the ring *d*, so that they may or may not project beyond the edge of the ring *i* to make contact with the hour-hand, and contacts *k*, adapted to be inserted in holes in the ring *a*, said studs when so placed projecting into the path of travel of the minute-hand of the clock, as set forth.

4. The combination, with a clock mechanism, of the ring *d*, the ring *i*, screws *j j*, and hour-hand *h*, said screws being adjustable in the ring *d*, so that said hour-hand may or may not make contact with said ring, and means for connecting the said hand with one pole and the said ring *d* with the other pole of an electric battery, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of February, A. D. 1891.

FRANK EDWIN SMITH.

Witnesses:

D. T. PAYNE,
P. F. GOSBEY.