(No Model.)

C. H. POND.

CIRCUIT CLOSING DEVICE FOR ELECTRIC CLOCKS.

No. 383,655. Patented May 29, 1888.

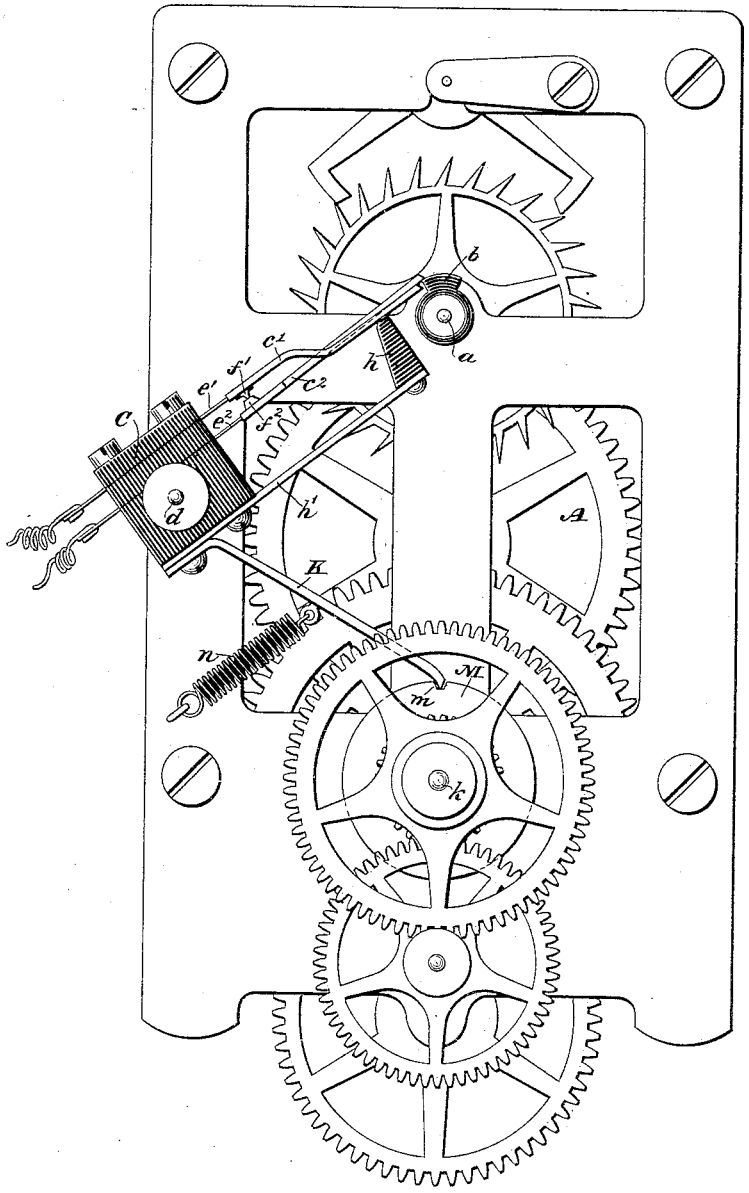
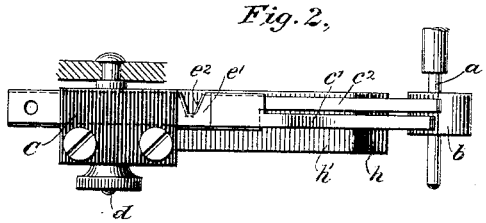


Fig. 1.

Fig. 2.



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CHESTER H. POND, OF BROOKLYN, NEW YORK.

CIRCUIT-CLOSING DEVICE FOR ELECTRIC CLOCKS.

SPECIFICATION forming part of Letters Patent No. 383,655, dated May 29, 1888.

Application filed December 21, 1887. Serial No. 258,570. (No model.)

To all whom it may concern:

Be it known that I, CHESTER H. POND, a citizen of the United States, residing in Brooklyn, in the county of Kings, in the State of New York, have invented certain new and useful Improvements in Circuit-Closing Devices for Electric Clocks, of which the following is a specification.

The invention relates to the construction of circuit-closing devices.

The special object of the invention is to provide convenient means for closing the connections of an electric circuit periodically through the instrumentality of any desired mechanical movement—such, for instance, as a clock mechanism—to cause the connections to be of any desired duration, and also, in the case of a clock mechanism, to relieve the fast-moving portions as much as possible from friction and unnecessary work.

The invention consists, generally, in mounting upon a movable support two contact-arms projecting into the path of an insulated cam or block upon some portion of the mechanism moving at a moderately-rapid speed—for instance, the second-hand arbor of a clock. One of the arms projects beyond the other, and one of them carries a contact-point, which is beneath a similar contact-point carried upon the other. These arms normally rest upon a supporting-block with their contact-points separated; but both arms may be raised by the cam upon the moving arbor. Then the one carrying the upper contact is first released by reason of its being shorter than the other. It will move toward the other contact-arm and cause the two contact-points to rest against each other. The subsequent releasing of the longer contact-arm carries its contact-point away from that of the shorter arm, thus interrupting the circuit. The difference in length of the two arms may be varied to secure a longer or a shorter contact. Thus, by making the difference very slight, the circuit will be closed during a very short period. It is frequently desired, however, to close a circuit with less frequency than the revolutions of the arbor operating the circuit-closing arms. Thus it may be desired to close the circuit once an hour only—as for synchronizing purposes—or at each half or quarter hour. In such case during all the intervening time that the circuit is to be kept open it is desirable not only to prevent the arms from being operated, but to relieve the regular moving portion of the mechanism from their weight and friction. For this purpose a disk is carried upon another arbor—for instance, the hour-hand or center arbor—against which there rests an arm fixed to the support of the circuit-closing arms. Normally the disk holds the arm in such position that the contact-arms are out of the path of the cam before referred to; but periodically the arm falls into a notch in the disk, allowing the contact arms to come into position where they will be operated by the cam. The circuit which is closed thus may be employed for any desired purpose. Other devices than clock-movements may be employed for operating the circuit-closer.

In the accompanying drawings, Figure 1 is a front view of such portion of a clock mechanism as is necessary to illustrate the invention, together with the circuit-closing device. Fig. 2 is a plan of the circuit-closing device.

Referring to the figures, A represents a clock mechanism of any suitable character. Upon the second-hand arbor *a* of this there is carried a cam or block, *b*, preferably of insulating material—as, for instance, ivory. Two circuit-closing arms, c' and c^2, supported in a pivoted block, C, project toward this cam. The block may be tilted upon its axis *d*, so that the ends of the arms will be out of the path of the cam when it is not desired to operate the circuit-closer. These arms are resilient or mounted on resilient springs e' and e^2, and are insulated from each other. The arms respectively carry contact-points f' and f^2, projecting toward each other, and the ends of the arms are brought into the same plane and rest upon an insulated block, *h*, carried upon an arm, h', which is secured to the pivoted block C. The arms are so adjusted that when they rest upon the block *h* the two points are out of contact with each other. The under arm, c^2, is slightly longer than the arm c', or projects farther toward the arbor *a*. If, therefore, both arms rest upon the cam or block and the latter is revolved, the shorter arm will be allowed to fall first, which it will do by reason of the resilience of its spring, and

afterward the longer arm, c^2. During the time between the escape of the two arms the contact-points will rest against each other, and an electric circuit connected with the two arms will be closed. It is evident that unless other means are provided the circuit will be thus operated at each revolution of the cam *b;* but in order to prevent this, and also to relieve the arbor of the unnecessary friction of the two arms at each revolution, the block C is tilted, carrying the arms back from the cam during such times as it is not desired to close the circuit. To accomplish this an arm, K, is secured to the block C, and it rests against the edge of a disk, M, placed, in this instance, upon the hour-hand arbor *k*. This disk M is provided with one or more notches or indentations, *m*, into which the end of the arm K falls when the notch comes beneath it. A tension-spring, *n*, normally holds the arm K against the periphery of the disk, and also tends to draw the contact-arms c' and c^2 toward the cam upon the second-hand arbor. When the notch *m* comes beneath the end of the arm K, the entire block C is turned, carrying the arms c' and c^2 toward the arbor of the second-hand, thus bringing them within range of the circuit-controlling cam *b*, and permitting them to be operated by the revolution of the second-hand arbor. Before another revolution, however, the arm K will have passed from the notch *m* and raised the arms c' and c^2 out of the path of the cam. As many notches as required may be placed upon the disk M, so as to close the circuit every half or quarter of an hour, or more frequently.

The slow movement of the hour-hand and the consequent greater power render it suitable for sustaining whatever slight friction may be caused by the pressure of the arm K, without materially influencing the movement of the clock. The circuit-closers may be employed for closing the connections every minute, if desired—as, for instance, for operating an advertising device.

I claim as my invention—

1. The combination, with a motor, of a circuit-controlling cam or block actuated thereby and two contact-arms projecting into the path thereof, so arranged that one will be released by the cam before the other, contact-points carried by the respective arms and brought into contact with each other during the time intervening between the release of the two arms, a support for the arms, and means for moving the support, thereby carrying the arms out of the path of the cam, substantially as described.

2. The combination of a circuit-closing cam, a circuit-controller operated thereby, a movable support for the same, a revolving disk, a mechanical connection between said support and said disk, whereby the circuit-controller is normally held out of operative position, and means whereby the revolution of the disk periodically brings the circuit-controller into operation.

3. The combination, with a clock-movement, of the cam, the circuit-closing arms c' c^2, the pivoted support C, carrying the same, the lever K, and the disk M, against which said lever rests, said disk having one or more notches, *m*.

4. In a circuit-closing device, the combination, with the pivoted support C, of the arms c' and c^2 and the resting-block or support *h*, secured to said block C, substantially as described.

5. A circuit-controlling attachment for clock-movements, consisting of two movable arms adapted to be released one at a time, contact-points carried thereby and brought into contact with each other by the release of one arm before the other, a resting-block upon which the arms rest out of contact with each other, and a tilting support for the arms, whereby they may be thrown out of operation.

6. A circuit-controlling device designed to be operated by a motor, consisting of a contact device applied to the arbor of the motor, a tilting support for the same, whereby it may be thrown out of operation, and a second arbor for turning the device upon its support, thereby throwing it temporarily out of operation.

7. The combination, with two revolving arbors, of two contact-arms projecting toward one of the arbors and actuated thereby to control the connections of an electric circuit, and mechanism operated by the second arbor to throw the arms out of range of the first-named arbor.

8. The combination, with the circuit-closing cam and the two contact-arms periodically engaged thereby, of the pivoted support for said arms, a revolving disk, and the lever or arm resting against said disk for normally holding said contact-arms out of the path of said cam, and having one or more notches or releasing-points for allowing said arms to be moved toward the cam.

In testimony whereof I have hereunto subscribed my name this 20th day of December, A. D. 1887.

CHESTER H. POND.

Witnesses:
DANL. W. EDGECOMB,
CHARLES A. TERRY.