

(No Model.)

A. RAMEL & W. W. DEAN.  
CIRCUIT CLOSER FOR PRIMARY ELECTRIC CLOCKS.

No. 346,863.

Patented Aug. 3, 1886.

Fig. 1.

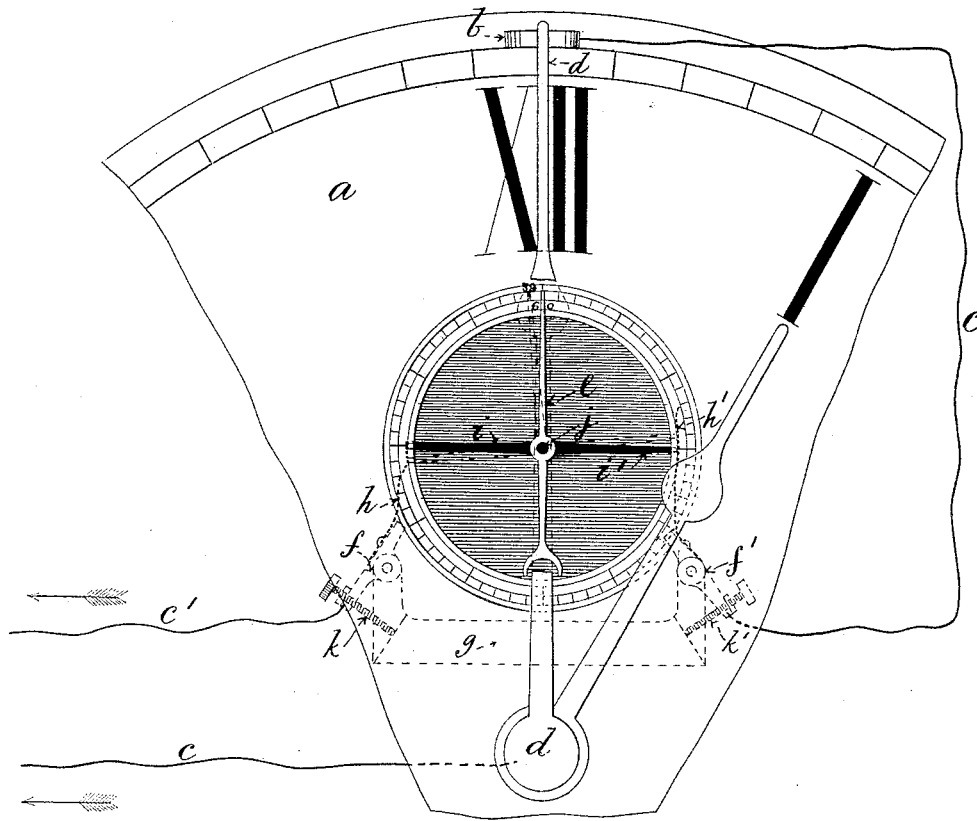
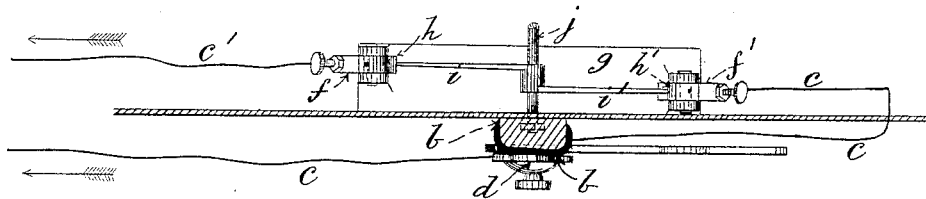


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## CIRCUIT-CLOSER FOR PRIMARY ELECTRIC CLOCKS.

SPECIFICATION forming part of Letters Patent No. 346,863, dated August 3, 1886.

Application filed March 19, 1886. Serial No. 195,851. (No model.)

*To all whom it may concern:*

Be it known that we, ALFRED RAMEL and WILLIAM W. DEAN, both of the city of St. Louis, State of Missouri, have invented a certain new and useful Circuit-Closer for Primary Electric Clocks, of which the following is a full, clear, and exact description.

Our invention relates to improvements in apparatus used in connection with any central clock, which is presumably on correct time, for synchronizing one or more secondary clocks, ringing a signal-bell, or other analogous purpose periodically (preferably every hour) by closing an electric circuit at such times, whereby the desired purpose is effected on correct time. The essential requirements of any arrangement of this description are, that a signal shall be given by a firm, positive contact of the circuit-closer, such contact being maintained for a definite length of time, and only once at each proposed closing, that it shall be made at the precise time as indicated by the central clock, and that this definite time shall be invariable with respect to the time indicated by the central clock.

Our invention has for its object to remedy defects in existing devices; and it consists in causing the minute-hand of the central clock to rub over a contact-plate extending through a minute-space on the dial, (one-half minute, approximately, on each side of the point of twelve,) thereby closing one of two breaks in an electric circuit—that is to say, this closing is not used, as in the present system, above described, to close an outside circuit, but merely to prepare a circuit—the remaining break in which is closed by a secondary device, which we combine with the seconds-hand for closing the circuit at the hour only.

In the accompanying drawings, Figure 1 is a front elevation broken away, representing our invention as applied to a central clock; and Fig. 2, a plan thereof, partly in section, like letters of reference denoting like parts in both figures.

*a* represents portion of a clock-dial, on which is attached, for the length or space of half a minute on each side of the hour or point of twelve, a metal contact-plate, *b*, placed in

the electric circuit *c c'*, and inclined on its outer face, which projects from the plane of the dial *a*, so that the minute-hand *d*, which is also in the circuit *c c'*, when passing over the plate *b* makes contact therewith for the entire length of the plate *b*, and closes that part of the circuit *c c'* (which is broken at other times) during the space of time of one minute.

Behind the opening in the dial *a* for the seconds-hand *e* are arranged arms or levers *f f'*, hinged to the frame-work *g*, one on each side of the said opening, and having attached thereto, respectively, light contact-springs *h h'*, which, with the arms or levers *f f'*, constitute the terminals of the second break in the circuit *c c'*. This break in the circuit *c c'* is closed once every minute by arms *i i'*, which are attached to the spindle *j* of the seconds-hand *e*, one on each side of and at right angles to the latter, as shown. The arms *i i'* and contact-springs *h h'* are so arranged relatively to each other that while the arm *i'* is allowed to make contact with the spring *h'* during some seconds before and after the seconds-hand *e* indicates the minute, the arm *i* is only allowed to make contact with the spring *h*, and so close the circuit *c c'* during the sixtieth second—that is to say, it commences to touch the spring *h* when the seconds-hand *e* is at the fifth-ninth second, (see dotted lines in Fig. 1,) and leaves the spring *h* when the seconds-hand *e* is at the sixtieth second. *h h'* are set-screws for accurately adjusting the levers *f f'* and springs *h h'* to the above requirements.

In order to prevent the arms *i i'* from closing the second break in the circuit *c c'* every half-minute, they are arranged on the spindle *j* of the seconds-hand *e* in different planes, so that they only come in contact with their respective springs *h h'* once in every revolution. In this arrangement it will be noted that the minute-hand *d* will begin to touch the metal contact-plate *b*, and so close the first break in the circuit *c c'*, at half a minute from the hour or point of twelve on the dial *a*, the seconds-hand *e* being at the same time at its thirtieth second, and the arms *i i'* out of contact with their respective springs *h h'* of the second break in the circuit *c c'*. On the sec-

onds-hand *e* arriving at the fifty-ninth second, and the minute-hand *d* still in contact with the plate *b* within one second of the hour, the arm *i* will begin to touch the spring *h*, and the arm *i'* having previously come in contact with spring *h'* the circuit *c c'* will be closed and the electric current transmitted for synchronizing the secondary clocks or other purpose until the seconds-hand *e* is at the sixtieth second and the minute-hand *d* at the hour or point of twelve, when the arm *i* will leave the spring *h*, and the circuit *c c'* be again broken until its various closing elements are again in conjunction, which can only be once, and during the last second of every hour.

By this invention the closing is firm and positive, being made by a rubbing contact, and positively for a definite length of time.

If desired, the time regulating or signaling may be performed every minute, instead of every hour, by dispensing with the break formed in the circuit *c c'* by the minute-hand *d* and contact-plate *b*, and closing a circuit by the contact of the arms *i i'* of the seconds-hand *e* with the springs *h h'*, as takes place every minute at the second break of the circuit *c c'* in the above-described arrangement.

We claim—

1. In a clock, the minute-hand *d*, making contact every hour with metal plate *b*, which extends over a minute-space of the dial *a* and placed in an electric circuit, *c c'*, in combination with arms *i i'*, connected with seconds-hand

*e*, and making contact every minute with springs *h h'*, attached to arms or levers *f f'*, pivoted to frame-work *g*, and provided with set-screws *k k'*, for closing circuit *c c'* once only every hour, substantially as shown, and for the purpose described.

2. In a clock, the minute-hand *d*, making contact every hour with metal plate *b*, which extends over a minute-space of the dial *a*, and is placed in an electric circuit, *c c'*, in combination with arms *i i'*, connected with seconds-hand *e*, and making contact every minute with springs *h h'*, carried by frame-work *g*, for closing circuit *c c'* once only in every hour, substantially as shown, and for the purpose described.

3. In a clock, the arms *i i'*, connected with seconds-hand *e*, in combination with springs *h h'*, attached to arms or levers *f f'*, hinged to frame-work *g*, and provided with set-screws *k k'*, for closing an electric circuit every minute, substantially as set forth.

In testimony whereof we affix our signatures, in presence of two witnesses, this 22d day of February, 1886.

ALFRED RAMEL.  
WILLIAM W. DEAN.

Witnesses:

PAUL BAKEWELL,  
EDWARD U. FARRELL.

Witnesses to William W. Dean's signature:

JOS. W. CROOKES,  
EDWIN SAUTER.