

(No Model.)

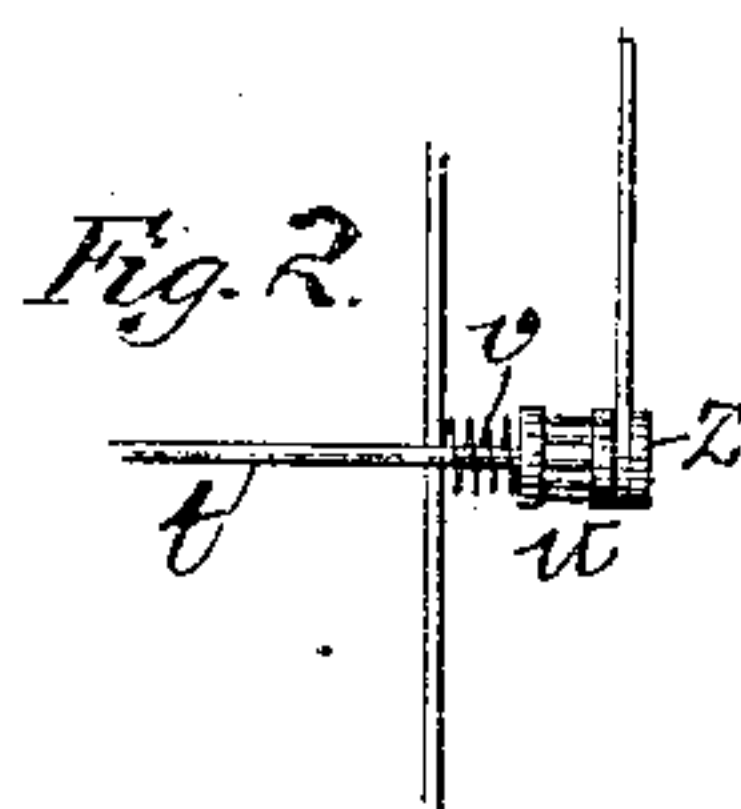
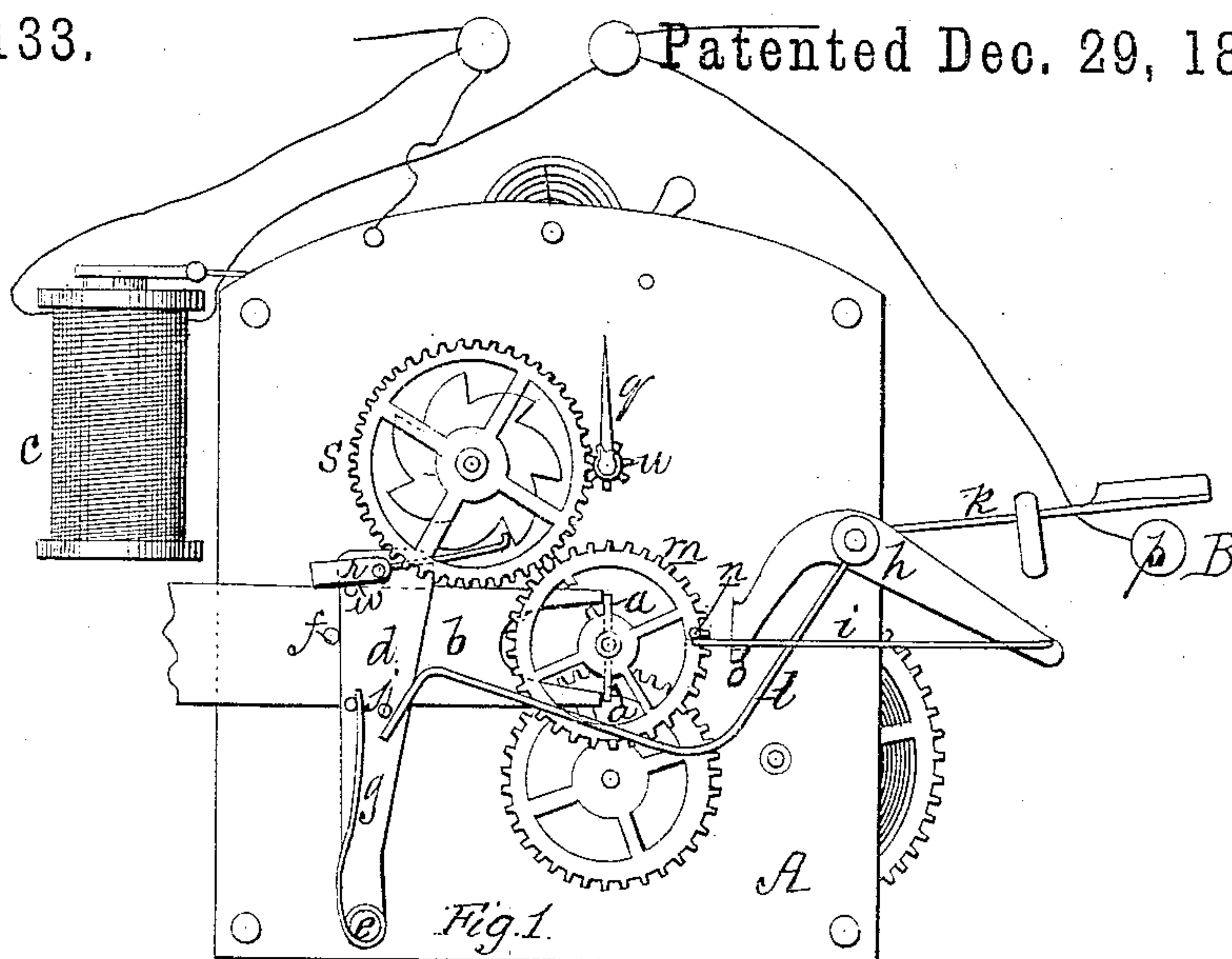
J. F. KETTELL, Dec'd.

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ELECTRIC DEVICE FOR SETTING CLOCKS.

No. 333,133.

Patented Dec. 29, 1885.



Attest:

*J. W. Lawrence*

Inventor:

*J. F. Kettell,*  
*by O. B. Brock,*  
*Atty*

# UNITED STATES PATENT OFFICE.

JAMES F. KETTELL, OF WORCESTER, MASSACHUSETTS; SARAH J. KETTELL, ADMINISTRATRIX OF SAID JAMES F. KETTELL, DECEASED, ASSIGNOR OF ONE-FOURTH TO CHARLES W. SHERBURNE, OF BOSTON, MASSACHUSETTS.

## ELECTRIC DEVICE FOR SETTING CLOCKS.

SPECIFICATION forming part of Letters Patent No. 333,133, dated December 29, 1885.

Application filed June 16, 1884. Serial No. 135,037. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. KETTELL, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Synchronizing Clocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide a means for setting any one or all of the hands of a clock by the employment of electricity, and also to instantly shunt the electric circuit, which controls the synchronizing of the clocks, upon the clocks being set. Mechanical means are employed to set the clocks, and the electric current merely controls or regulates the times at which the mechanism shall be operated. A great number of clocks may thus be successfully set by the employment of a comparatively low battery-power.

To accomplish these objects my improvement consists in a new means for setting the hands of the clock.

It also consists in the employment of a novel shunt-circuit at each clock in connection with the line-wire, whereby the line-wire may be used for telegraphic or telephonic purposes, except at a certain brief interval or intervals of the day.

My invention further consists of a novel arrangement for instantly short-circuiting the line-wire while the setting mechanism is in operation, whereby the train of gears is prevented from running down should the battery-power be unduly thrown upon the lines in an open circuit, and in a closed circuit to prevent the same effect by an accidental or undue breaking of the current immediately after the setting of the hands shall have been accomplished.

The drawings herewith illustrate this construction.

Figure 1 is an elevation of a clock-work having my improvements applied thereto. Fig. 2 is a detail view of the second-hand and arbor, showing the friction-pinion attached.

Referring to the drawings, A represents the clock-frame and train of an ordinary spring or weight driven time-piece. It is provided with a mechanically-operating setting mechanism for both the minute and second hands, and indirectly the hour-hand, and which is controlled by electricity.

The device consisting of the double lever *a*, keyed to the minute-hand arbor, the bifurcated slide *b*, for operating the lever *a*, and the electro-magnet *c* and connecting mechanism for imparting a reciprocating movement to the slide, are set forth in a patent granted to me December 25, 1883, and also in an application filed January 17, 1884, now pending. They need not therefore be particularly shown or described.

Connected to the slide *b* is a device for short-circuiting the line-wire, except at predetermined periods, when the line-wire connection is made, and upon the setting of the clocks instantly short-circuiting the line till the clocks are required to be set again. This device comprises the lever *d*, pivoted to the frame at *e*. A pin, *f*, on the slide *b* forces it to the right when the slide is operated, and a spring, *g*, working against a pin on lever *d*, serves to retract it, together with slide *b*.

*h* is a rock-lever pivoted to the frame, one arm of which carries an arm, *i*, the outer end of which has normally a tendency to spring upward. Keyed to the same pivot-shaft as the lever *h* is an extension-arm, *l*, arranged to be operated by a pin, *j*, on the lever *d*. A weighted arm, *k*, is keyed to the same pivot-shaft and forms one electrode of a cut-out, B. Upon either the minute or hour gear-wheel *m* is a pin or stud, *n*, arranged to contact the spring-arm *i* some time before the clock is to be set.

The drawings show the setting impulse to have just been received by the clock at the instant before the line is automatically short-circuited. The throwing in of the line-wire and the cutting out of the short circuit do not take place until the pin *n* has forced down the arm *i*, so that the latter bears against the ledge *o* on the rock-lever *h*. The continued movement of the pin against this lever raises the electrode *k* of the cut-out B from contact with



the other electrode, *p*, as shown in the drawings, and throws the line-wire in direct connection with the magnet *c*. In this position the clock is ready to receive the liberating impulse to its setting mechanism. When this impulse is received and the slide *b* and lever *d* are moved, the pin *j* of the latter strikes the arm *l*, which, imparting, as it does, a still further movement to the lever *h*, withdraws the arm *i* from contact with the pin *n*, when the weighted electrode *k* will contact electrode *p* and the shunt-circuit will be instantly re established.

Acting simultaneously with the setting of the minute hand and the re-establishment of the short circuit upon the line is a device for setting the second-hand *q* by the same motive power. To effect this object a pawl device, *r*, is mounted upon the lever *d*. *s* is a gear carrying upon the same shaft a ratchet-wheel operated upon by the pawl *r*. Instead of the ratchet-wheel a series of pins attached to the gear may be used. The second-hand arbor *t* carries a frictional spring clutch-pinion, *u*, carrying the hand *q*. The spring *v* holds the pinion and hand normally against the arbor with a frictional contact sufficient to turn the hand with its arbor. This is effected by the arrangement of the spiral spring upon the arbor between the pinion and the frame of the clock, where it has a constant normal tendency to force the loose pinion and its hand against a button or washer, *z*, which is keyed to the arbor and revolves with it; but when the setting mechanism is operated this arrangement allows of the hand being set independent of its arbor. The

pawl *r* is swiveled, and normally rests against a pin, *w*, on the lever.

The arrangement and relative dimensions of the ratchet-gear and pinion for setting the second-hand are such that whenever the device is operated the second-hand will be set to 60 on the dial, no matter in what position the hand may be before the device was actuated.

Instead of a separate slide, *b*, and lever *d*, they may be combined in one to do the work required.

What I claim is—

1. In a clock-synchronizing system, in which the train of each clock carries its own setting mechanism, a short-circuit cut-out for controlling the setting mechanism, provided with means, substantially as described, for re-establishing the shunt-circuit without perceptible interval upon the setting of the hands of the clock.

2. In a clock-synchronizing system a hand having a frictional clutch-pinion, and a second gear connected therewith provided with actuating devices, substantially as described, whereby the latter gear is rotated to that degree which will set the clutch-pinion and its hand to the required point upon the dial.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES F. KETTELL.

Witnesses:

F. B. BROCK,  
L. C. YOUNG.