

(No Model.)

2 Sheets—Sheet 1.

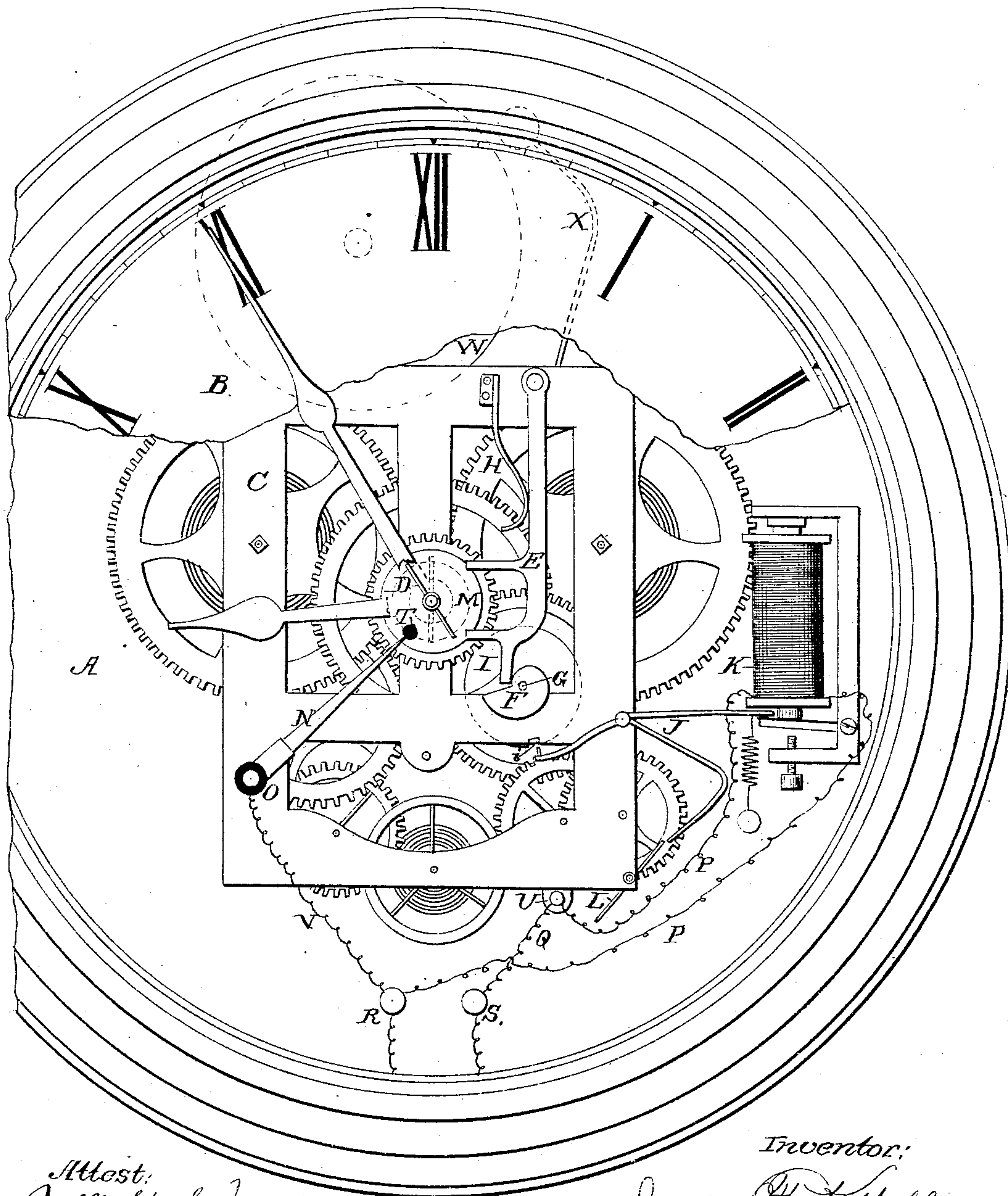
J. F. KETTELL.

ELECTRIC CLOCK SETTING MECHANISM.

No. 290,894.

Patented Dec. 25, 1883.

Fig. 1.



Attest:
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(No Model.)

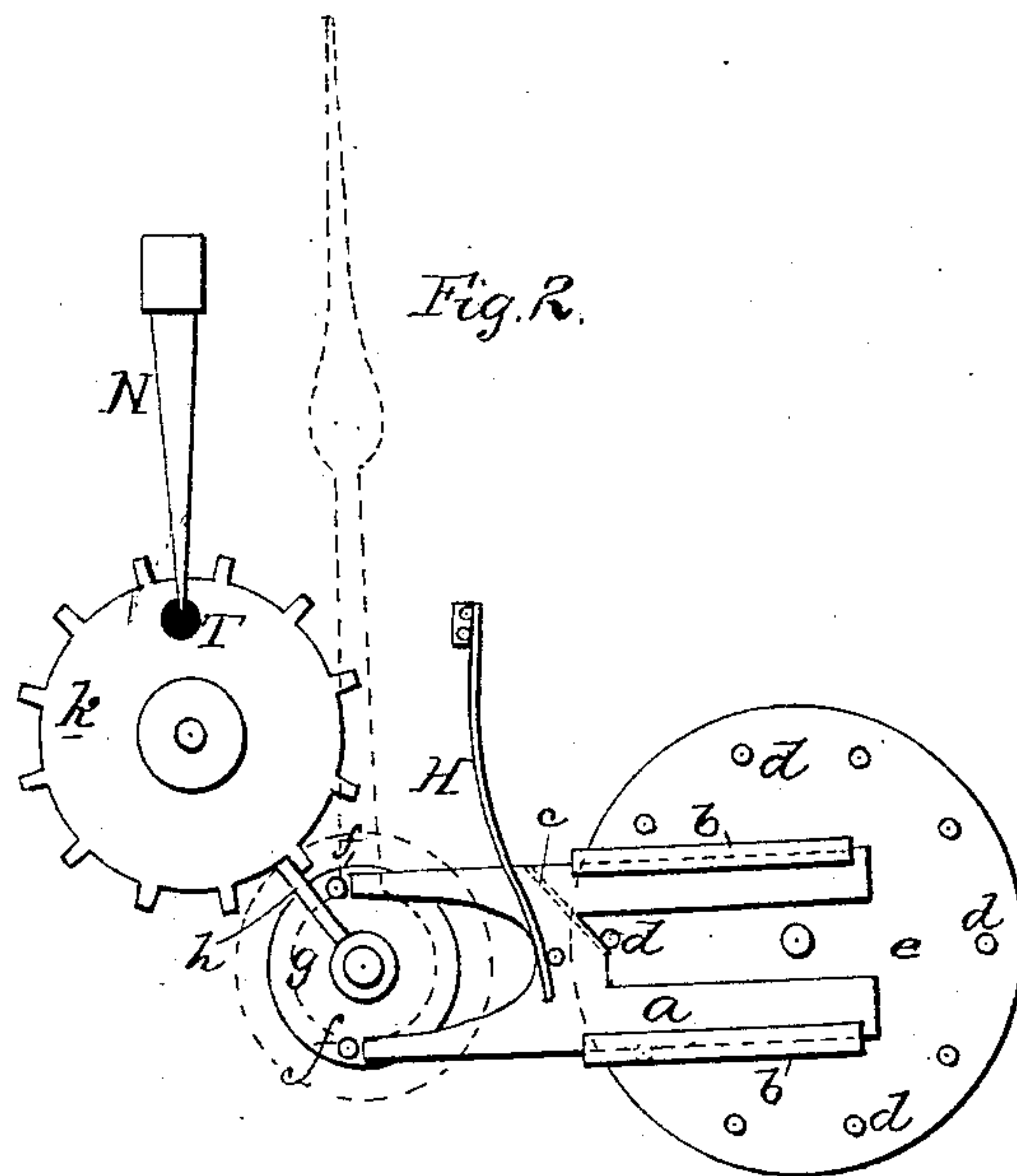
2 Sheets—Sheet 2.

J. F. KETTELL.

ELECTRIC CLOCK SETTING MECHANISM.

No. 290,894.

Patented Dec. 25, 1883.



Attest:

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UNITED STATES PATENT OFFICE.

JAMES FREDERICK KETTELL, OF WORCESTER, MASSACHUSETTS.

ELECTRIC CLOCK-SETTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 290,894, dated December 25, 1883.

Application filed February 23, 1883. (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 Electric Clock-Setting Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 represents a front elevation of a clock to which I have applied my improved setting device. Fig. 2 represents a modification of the manner in which I carry out my invention.

My present improvement relates to a method of setting one or a great number of clocks; and its object is to secure such result by a novel mechanism in connection with electricity, whereby I am enabled to synchronously set a given number of clocks with a far less degree of battery-power than is possible by clock-setting mechanism in common use which employ electricity as a motive agent.

A further object of my invention consists of an automatically-acting cut-out or switch, whereby I am enabled to use the electric conducting-wires, if desired, for telephonic or telegraphic purposes, except during a brief period or periods of the day when the clocks are to be regulated or set.

For these purposes, therefore, my invention consists in the following construction and arrangement of devices, which will first be fully described, and the points of novelty then pointed out in the claims.

To enable those skilled in the art to make and use my invention, I will now proceed to describe it in detail, omitting a particular description of such parts of the clock-setting mechanism as are old and not necessary to be minutely described.

In the drawings A represents the clock-casing, having the dial-face B. This dial-face is broken away in order to show the works of the clock and my improved setting device.

G represents the clock-work, of the usual construction, it being provided with an alarm mechanism on the right-hand side, also of the usual construction.

In clock-setting devices heretofore constructed employing the use of electricity the

power necessary to set the hands either forward or backward has been usually due to the direct force of the electric current. In consequence thereof, when a number of clocks were arranged upon the same circuit, the battery-current necessary to shift the hands through their respective mechanical devices had to be powerful to accomplish such result, it being impracticable to arrange any great number of clocks upon a single circuit. To avoid these objections I employ electricity merely as a let-off to the alarm mechanism of the clock, which mechanism, by means of my improved device, is made to operate the setting of the hands.

D represents a diametrically-arranged rod secured to or passing through the arbor of the minute-hand, so as to revolve with it.

E is a vibrating lever, having two projecting arms on the side nearest the arbor of the minute-hand, and which are arranged to operate the rod D when it is necessary to set the clock. The lower end of this lever E normally bears against the cam F, mounted on the arbor G, it being held in that position by the spring H. The vibration of this lever is attained by means of this cam. The arbor G is rotated by the alarm side of the clock through its mainspring. This arbor carries also a flat disk, I, having a notch, i, cut in its periphery.

J is a rock-lever, one end of which carries a tooth adapted to enter the notch in the disk I, and the other end of which is bifurcated, one fork passing above the armature of the electro-magnet K, and the other arranged so as to normally arrest the movement of the fan L of the alarm movement, so as to stop its train of wheels.

M is another disk, carried by the hour-hand of the time-movement, so as to revolve therewith. It is provided with a small insulated disk in its outer circumference.

N is a contact-arm arranged to rub the face of the disk, so as to make electrical contact. The other end of the arm N is insulated by an insulating-piece O from the clock-frame. The diameter of the insulated plug T in the disk M is preferably made of such dimensions as to traverse the point of the contact-arm N in a stated interval of time—say fifteen minutes, or

seven before and seven after the hour of twelve, or such hour as may be deemed preferable to set the clock. The disk or switch M shown in the drawings, moving with the hour-hand, it will be seen, will bring the insulated plug under the contact-arm N once in every twelve hours. I may, if desired, arrange two or more plugs T in the disk.

P is the inleading-wire, and Q the outleading-wire, connecting with the posts R and S, respectively. The wire P passes through the electro-magnet K and out again to the post U in electrical connection with the clock frame and mechanism.

V is a branch wire leading from the post R to the insulated contact-arm N.

W is the usual alarm-gong, sounded by the hammer X of the alarm.

The operation of my invention is as follows: The drawings show the clock five minutes slow at the hour at which it is to be set. The disk or switch M has its insulated plug in contact with the arm N, thereby cutting out the line V. The drawings, moreover, are represented to show a condition of the apparatus at the very moment of the hour and when the current is just thrown onto the line-wire. The line V being cut out, the current passes through post R into the magnet K, thereby attracting its armature and oscillating the rock-lever J against its retractile spring. This oscillation causes the lever J to release the fan L and to withdraw its projecting tooth from the notch *i* in the disk I. The alarm mechanism being thus set free, it will cause the disk I to rotate during one full revolution before it is again arrested by the lever J, the magnet K being only momentarily excited. During this revolution of the disk I the cam F, carried by the same arbor, makes also one revolution, during which it impinges against the lever *H*, moving it gradually toward the arbor of the minute-hand. During this movement the lower lateral arm of the lever will strike the lower end of the bar D and force it into the position shown in dotted lines, Fig. 1, thereby moving the minute-hand forwardly to XII. In like manner, were the minute-hand fast by several minutes, the upper end of the bar D would be operated on by the upper lateral arm of the lever F and the hand set backwardly to XII. After the insulated spot on the switch-disk M has passed beyond the arm N, the circuit through the line V passes through said disk, through the clock-frame, and out to the line-wire Q through post U, it constituting a short circuit of less resistance than that through the electro-magnet.

The object of the short-circuit and automatic cut-out switch is that I may be enabled to use the line-wire for telegraphic or telephonic purposes during the day, with the exception of about fifteen minutes, or such other stated diurnal periods as may be found desirable.

I do not confine the use of my invention in connection with a short circuit through each clock, for I may use the line-wires P Q solely

for the setting of the clocks, in which case I might dispense with the short circuit and switch and operate the electro-magnets by throwing the battery onto the main wire at the stated periods, either automatically, by a central regulating-clock, or by hand.

I contemplate the use of a novel central regulating device for the clocks on the circuit or circuits, for which I intend to make application.

A modified device for setting the clock and for making a short circuit is shown in detail, Fig. 2.

a represents a slide working in ways *b*, and having lateral arms similar to lever F, Fig. 1, it serving the same purpose.

c is an incline projecting piece, against which the pins *d* on the wheel *e*, mounted on the shaft of the mainspring of the alarm mechanism, impinge. This impinging of the pins *d* against incline *c* of slide *a* forces the latter's lateral arms against the pins *f* on the disk *g*, mounted on the arbor of the minute-hand, thereby setting the hand at the stated periods. The disk I, lever J, and magnet K, during this operation, serve to start and stop the action of the mainspring, as described in connection with Fig. 1. After a pin, *d* has passed the incline *c*, the spring H throws the slide back to be in readiness for operation again.

h is a pin carried by the minute-hand, which engages every hour one of the twelve teeth on the switch-wheel *k*, which carries an insulated plug, T, within the path of the contact-arm N, as in Fig. 1. This arrangement, like that shown in the first figure, acts to cut out the short circuit for a limited time during regular periods.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a clock-setting system, one or more clocks, each provided with hand-setting mechanism, a shunt-circuit at each clock, including the electro-magnet of the hand-setting mechanism, a line-wire connecting each shunt-circuit, and means whereby each clock on the line-wire automatically and synchronously cuts out its hand-setting device and allows the line to be used for other purposes, except during a brief predetermined period or periods of the day, when the short circuit is broken to allow the current to pass through the magnet for the setting of the hands of the clock.

2. A series of clocks provided with setting devices, connected by a line-wire having a series of shunt-circuits, and means for automatically and synchronously making and breaking said shunt-circuits, so that the current may pass at the same time through all the shunt-circuits for a predetermined length of time in order to accomplish the setting of the clocks, and also over the main wire during the greater part of the day for telegraphic or telephonic purposes, as described.

3. In a clock-setting device, the combination of one of the hands of a clock, having a

lever attachment to its arbor, a revolving cam rotated by the clock, means for controlling the rotation of the cam, consisting of a shunt-circuit having an automatic switch or cut-out 5 attached to the clock-work, and a vibrating lever, arranged for operation between the cam and the lever attachment of the hand.

4. A clock provided with a setting device, arranged within a shunt-circuit which is automatically connected to or cut out of the main 10 wire by a disk or switch attached to the hour-hand, substantially as described.

5. The combination, in a clock provided

with means, substantially as described, for setting its hands, of the minute-hand carrying a 15 lever-setting attachment, and the hour-hand carrying a disk or switch arranged within a shunt-circuit, whereby the said circuit is automatically connected to or cut out of the main wire, substantially as described. 20

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

JAMES FREDERICK KETTEL.

Witnesses:

JOHN J. UPHAM,
E. A. LONGLEY.