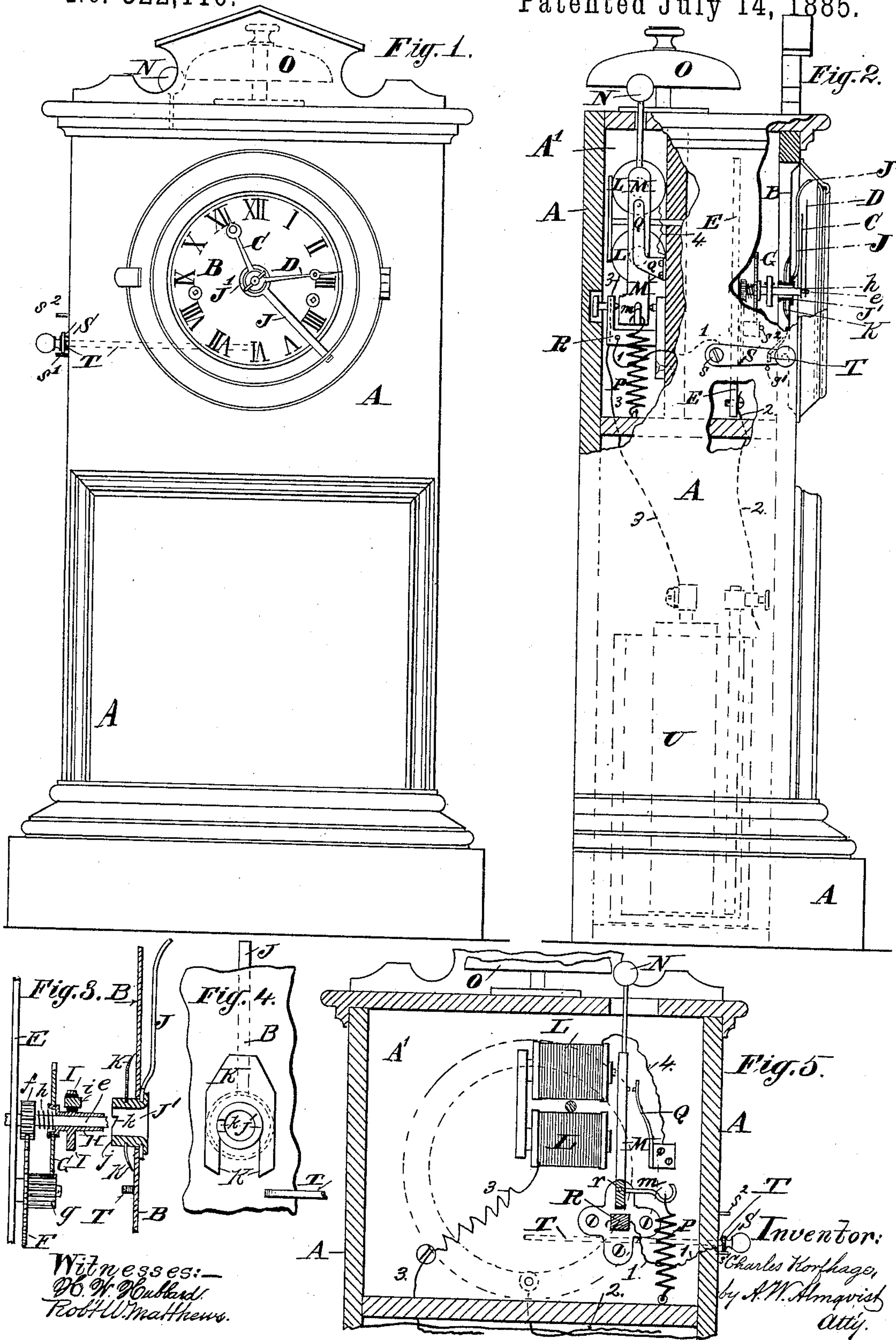


(No Model.)

C. KORFHAGE.
ELECTRIC ALARM CLOCK.

No. 322,110.

Patented July 14, 1885.



UNITED STATES PATENT OFFICE.

CHARLES KORFHAGE, OF BROOKLYN, NEW YORK.

ELECTRIC ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 322,110, dated July 14, 1885.

Application filed February 9, 1885. (No model.)

To all whom it may concern:

Be it known that I, CHARLES KORFHAGE, a citizen of Germany, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Alarm-Clocks, of which the following is a specification.

My invention relates to such clocks as are provided with a bell, a hammer, and actuating mechanism which may be set to operate and sound the said bell at any hour at which a person desires to be aroused, the object being to provide an improved alarm-clock in which the alarm, when started, will continue to sound until a person not only awakes, but actually gets up and stops it by moving a special device for that purpose.

My invention consists of an alarm-setting arm fitted to be moved over the face of the dial, and having a notch in its hub-bearing or central portion, with which notch an insulated stud, carried by or with a sliding hour-wheel, is adapted to engage for establishing an electric circuit to operate an alarm-bell by suitable connections to a battery carried preferably in the clock-case, the arrangement being such that the battery-current may be switched on and off for permitting the sounding of the alarm-bell and for silencing it.

The invention consists, also, in particular constructions and combinations of parts of the clock and its electric alarm devices and connections, all as hereinafter fully described and claimed.

Reference is had to the accompanying drawings, in which like letters of reference indicate like parts in the several figures.

Figure 1 is a front view of a clock embodying my improvements. Fig. 2 is a side elevation of the same, partly broken away and in section. Fig. 3 is a sectional side elevation of the setting-arm and circuit-closing connections, and with the parts separated, more clearly to show the construction. Fig. 4 is a detail view of the central back portion of the dial, looking in the direction of the arrow in Fig. 3; and Fig. 5 is a rear sectional elevation showing the electric connections to the alarm-bell.

The letter A indicates the clock-case; B, the

dial-plate, and C D the hour and minute hands, respectively.

E is the front plate of the clock-work frame, in which the spindle *e* of the minute-hand is journaled.

F and *g* are respectively a wheel and pinion fixed together and mounted to revolve upon a stationary stud on the frame E, to impart from a pinion, *f*, upon the minute-spindle *e*, the proper relative speed to the hour-hand, the wheel F meshing with the said pinion *f*, and the pinion *g* meshing with a wheel, G, fixed on a slightly-tapering sleeve, H, which turns loosely upon the spindle *e* and carries the hour-hand C in the usual manner. The sleeve H is also fitted to slide on the spindle *e*, and a spring, *h*, on the spindle or otherwise fitted, acts to force the sleeve outward, so as to carry a stud, *i*, fitted in a collar, I, fast on the sleeve H, against the inner face, *j*, of the central sleeve-bearing, J', of the alarm-setting arm J in the dial-plate B, and force the stud *i* into a notch, *k*, of the arm-bearing, to bring the collar I and face *j* of arm J into contact to close the electric circuit, as hereinafter described. The stud *i* is insulated from the collar I to break or open the circuit while it travels on the face *j* of the setting-arm. The pinion *g* is elongated to permit the shifting-wheel G always to mesh with it. The hole in the sleeve-bearing J' of the setting-arm J, through which the spindle *e* and sleeve H project, is sufficiently larger than the sleeve H to prevent contact with it, and a forked spring, K, entering an annular groove of the bearing, acts to hold the setting-arm J by its hub snugly against the face of the dial and with sufficient force to prevent rotation of the arm by the friction of the stud *i* against the face *j*.

Any other suitable spring may be used in place of the forked spring K, which, however, is preferred.

In a space or chamber, A', preferably in the top of the case A and back of the clock-movement, I place an electric magnet, L, having an armature, M, which carries the bell-hammer N, which strikes any suitable bell or gong, O, held, preferably, at the top and outside of the clock-case, as shown.

P is a spring connected to the clock-case and to an angle-arm, *m*, fixed to the armature M, and acting to carry the hammer N away from the bell and normally hold the armature into electric connection with a contact-piece, Q, fixed to the clock-case.

The bracket or bridge-piece R, in which the armature M is pivoted at *r*, is fixed to the clock-case and connects by a wire, 1, with a switch-arm, S, pivoted at *s* to the case. When the switch-arm is moved against a stop, *s'*, it is brought into electric connection or contact with an arm or bar, T, fixed to the metallic clock-dial B, which connects electrically through the works and frame-plate E of the clock by wire 2 with one pole of a battery, U, located at any convenient point, but preferably within the clock-case, in a compact or self-contained arrangement of the clock, as shown. When the switch-arm S is moved against the stop *s'*, it will be out of contact with the bar T and the circuit will be broken.

The other pole of the battery U connects by a wire, 3, with the magnet L, which latter connects by a wire, 4, with the contact-piece Q.

The operation is as follows: To set the alarm, the switch-arm S is brought against the arm T, and the setting-arm J is moved by turning it with the finger to indicate on the dial the time at which the alarm is to be given, (which, in Fig. 1 is half-past four o'clock,) at which time the stud *i* will have passed over the face *j* of the arm-bearing J' into line with the notch *k*, and the spring *h* will force the hour-wheel G forward and carry the stud *i* into the notch *k* and bring the collar I and bearing J' into contact to close the electric circuit with the battery U through the dial B, the bar T, the switch S, the wire 1, the armature M, the contact Q, the wire 4, the magnet L, the wire 3, the battery-wire 2, the frame-plate E, the spindle *e*, the sleeve H, and the said collar I. The magnet attracts the armature and causes the hammer N to strike the bell O, and when the circuit is broken by disconnection of the armature from the contact Q the spring P acts to draw the armature back for closing the circuit to again strike the bell, and the hammer N will thus be given a vibratory movement in a well-known manner for ringing the bell until the switch-bar S is shifted against the stop *s'* or away from the arm T to cut off the current from the battery. As the bell rings continuously until the switch is shifted, the alarm is effective in awakening persons from sleep, as

they must rise to adjust the switch to silence the bell.

It will be understood that the stud *i* may be fitted directly into the wheel G, the hub of which then would act against the face *j* of the setting-arm J, and the contact-piece I be dispensed with; but the construction shown is preferred.

My improved clock may be used for giving alarms for any special purpose at any hour of the day or night.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an alarm-clock, the combination of a setting-arm, a bell, a bell-hammer connected to the armature of an electro-magnet, a switch, an electric source and suitable circuit-connections, and means, substantially as described, for automatically closing the circuit when the hour-hand and the setting-arm both indicate the same point on the dial, for the purpose set forth.

2. The combination, in an electric alarm-clock, of the setting-arm J, having a notch, *k*, and connected with the dial B, and the insulated stud *i*, connected to the hour-hand wheel G of the clock-movement, the said wheel G and stud *i* being arranged to slide along the hand-spindle *e*, substantially as and for the purpose set forth.

3. The combination, with the dial B and the setting-arm J, notched at *k*, of the insulated stud *i*, fitted to slide along the post *e*, with the hour-hand wheel G, the said wheel having a sleeve, H, provided with a contact-piece, I, carrying the said stud *i*, and the spring *h*, acting to force the stud against the setting-arm, substantially as shown and described.

4. In a clock, the combination, with the dial B, the setting-arm J, notched at *k*, and the insulated stud *i*, connected to the hour-hand wheel G and arranged to slide along the hand-spindle *e*, of the electric alarm devices L M N O P Q, the arm T on the dial, the switch S, the wires 1 2 3 4, and the battery U, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 22d day of May, 1884.

CHARLES KORFHAGE.

Witnesses:

ROBT. W. MATTHEWS,
A. W. ALMQVIST.