(No Model.) 2 Sheets—Sheet 1.

J. O. NEWTON.

ELECTRIC ALARM CLOCK.

No. 458,372. Patented Aug. 25, 1891.

Fig. 1.

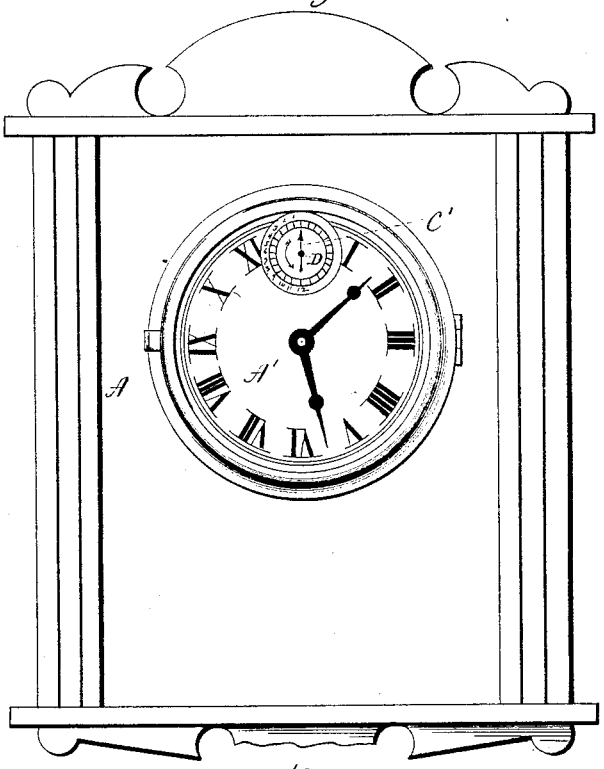
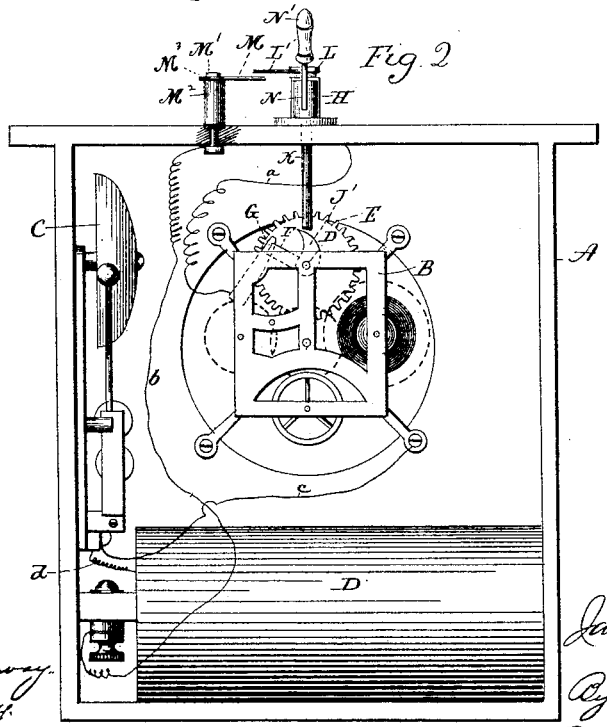


Fig. 2



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

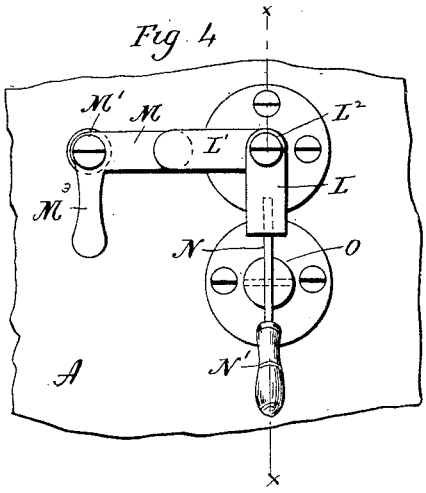


Fig. 3

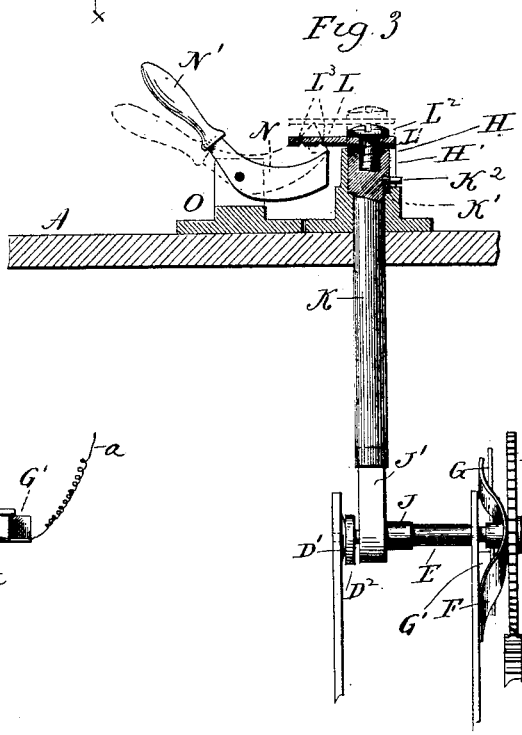
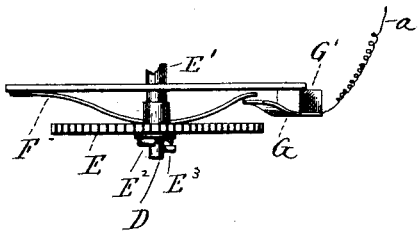


Fig. 5



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UNITED STATES PATENT OFFICE.

JAMES O. NEWTON, OF NEW HAVEN, CONNECTICUT.

ELECTRIC ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 458,372, dated August 25, 1891.

Application filed May 25, 1891. Serial No. 393,975. (No model.)

To all whom it may concern:

Be it known that I, JAMES O. NEWTON, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Electric Alarm-Clocks; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in front elevation of an electric alarm-clock constructed in accordance with my invention; Fig. 2, a view thereof in rear elevation with the back removed; Fig. 3 a view, partly in elevation and partly in vertical section, of the alarm mechanism, showing my improvement. Fig. 4 is a broken plan view showing the mechanism on the top of the clock-case; Fig. 5, a broken plan view looking down upon the large cam-wheel and the two contact-springs with which it co-operates.

My invention relates to an improvement in electric alarm-clocks, the object being to produce a simple, reliable, convenient, and effective device.

With these ends in view my invention consists in an electric alarm-clock having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

As herein shown, the clock-case A is designed to be hung upon the wall, and is adapted to contain the movement B, the bell C, and the battery D, all of which may be of any approved construction. If desired, however, the bell and battery may be located outside of the clock-case, although it will be more convenient to arrange them as shown.

The upper edge of the clock-dial A′ is provided with a small circle divided into twenty-four compartments, numbered from right to left, and swept by a small pointer C′, mounted in the outer end of an arbor D, journaled in the front and rear plates of the movement and normally held against rotation by means of a spring D′, interposed between the inner face of the rear movement-plate and a collar D^2 mounted upon it. A large cam-wheel E, secured to the outer end of a sleeve E′, is mounted upon the said arbor D at a point directly behind the dial, the said wheel being provided upon its outer face with the ordinary sleeve-releasing cam E^2, which co-operates with the pin E^3, mounted in the forward end of the said arbor. A spring F, also of ordinary construction and secured to the front movement-plate, is arranged to press against the rear face of the wheel E, so as to keep the edge of the said cam E^2 in constant engagement with the pin E^3. The said spring F is arranged to engage, when the wheel E is thrown forward by it, with a contact-spring G, insulated from the movement by the block G′ and connected by a wire *a* with the upright bearing H, mounted in the top of the case A. The wheel E meshes into a wheel I, mounted on the center arbor of the clock, and makes one complete rotation once in twenty-four hours. As herein shown I accomplish this by making the wheel E of large size; but obviously by suitable gearing I could make this wheel of ordinary size and still rotate it only once a day, instead of twice a day, as the corresponding wheels of the ordinary alarm-clocks are rotated. The rear end of the sleeve E′ receives the sleeve J of an operating-cam J′, which is thus frictionally coupled with the sleeve E′, whereby the cam may be adjusted in any desired position with reference to the cam E^2, projecting from the outer face of the wheel E. The said operating-cam engages with the lower end of a perpendicular operating-rod K, the upper end of which plays up and down in the bearing H, before mentioned, the said end of the rod being provided with a shoulder K′, limiting its downward movement, and with a pin K^2, extending into an open slot H′, formed in the said bearing, and preventing the said rod from turning on its longitudinal axis, but not interfering with its vertical reciprocation. A lifting-finger L and a contact-finger L′ are secured to the upper end of the rod by means of a screw L^2, the said fingers being arranged at a right angle to each other and the lifting-finger having two transverse slots L^3 L^3 formed in its under face. The contact-finger L′ is arranged to engage with a corresponding contact-finger M, pivoted so as to swing in a horizontal plane by a screw

M′ upon the upper end of a post M^2, also mounted in the case and connected with the battery D by means of a wire *b*. The contact-finger M has a small handle M^3, preferably made in the same piece with it, whereby it may be swung around to clear it from the finger L′ in case it is desired to cut off the alarm altogether. The notches L^3 L^3 in the lower face of the lifting-finger L co-operate with the sharp edge of a manual lifting-lever N, having a handle N′ and pivoted in a slotted post O, also mounted in the top of the clock-face, the inner end of the said lever being weighted, so that its pointed end will tend to drop out of the notches in the lifting-finger. The spring F is placed in the circuit of the battery through the clock-movement by means of a wire *c*, leading thereto, and to the bell C, which is connected with the battery D through a short wire *d*, or the equivalent thereof.

When under the construction shown and described the alarm is set by turning the pointer C′ against the number on the dial corresponding to the hour at which it is desired that it should go off, the large wheel E is pushed inward and the spring F disengaged from the spring G. Then sometime before the time for sounding the alarm is reached the operating-cam J′ is engaged with and gradually lifts the operating-rod K, so that the pointed inner end of the operating-lever N is disengaged from the lifting-finger L and drops by gravity into the position in which it is shown by Fig. 3 of the drawings. Now as the cam passes the said rod the same will drop and engage its finger L′ with the contact-finger M, and thus close the circuit at this point. Now when the clock-movement has rotated the wheel E so as to bring the drop of the sleeve-cam E^2 into line with the pin E^3 the said wheel is thrown forward by the spring F, which engages with the spring G and closes the circuit of the battery, whereby the bell is sounded. This circuit having been closed, the bell continues to ring until the lifting-lever N has been manually operated to lift the operating-rod K and disengage the fingers M and L′, the rod being supported in its lifted position by the entrance of the end of the lever into one of the transverse notches formed in the lower face of the lifting-finger L. The next revolution of the cam lifts the rod still higher, as before described, and disengages the said finger L from the lifting-lever, leaving the same free to drop back and engage its contact-finger L′ with the finger M preparatory to the alarm being sounded again.

It will be particularly observed that inasmuch as the alarm or cam wheel rotates only once in twenty-four hours the alarm if set, for instance, to sound the bell at six o'clock in the morning, will not also sound it at six o'clock in the evening, as would be the case were the ordinary alarm mechanism employed.

By frictionally coupling the operating-cam with the sleeve of the cam-wheel the said parts may be adjusted relatively to each other, so as to have their respective operations succeed each other in any desired order of time. In case it is desired to cut the alarm out entirely, so as to use the device simply as a time-piece, the handle M^3 is employed to swing the finger M out of range of the finger L′.

I would have it understood that I do not limit myself to the precise arrangement herein shown and described, but hold myself at liberty to make such changes and alterations therein as fairly fall within the spirit and scope of my invention.

I am aware that an alarm mechanism adapted to be released for sounding the alarm only once in twenty-four hours is old, and I do not therefore broadly claim such a construction.

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

1. In an alarm-clock, the combination, with a time-movement, of an alarm mechanism comprising a cam-wheel arranged to be rotated once in twenty-four hours and carrying a sleeve-releasing cam, and an arbor frictionally held against rotation and provided with a pointer and with a pin, which engages with the said cam, substantially as described.

2. In an alarm-clock, the combination, with a time-movement, a bell, and a battery, of an alarm mechanism driven by the said movement and released once in twenty-four hours, and comprising two contact-springs, a cam-wheel for operating one of them, an operating-cam, a vertically-movable rod actuated thereby and provided at its upper end with a contact and a lifting finger, a stationary finger arranged for engagement with the said contact-finger, and a manual lifting-lever for lifting the said rod and locking it in its lifted position, substantially as described.

3. In an electric alarm-clock, the combination, with a time-movement, a bell, and a battery, of alarm mechanism comprising two contact-springs, a cam-wheel for operating one of them, provided with an inwardly-projecting sleeve, an operating-cam frictionally coupled with the said sleeve and so as to be adjusted relative to the said wheel, a vertically-movable rod operated by the said operating-cam and provided at its upper end with a lifting and a contact finger, a manual lifting-lever engaging with the said lifting-finger, and a stationary contact-finger for engagement with the contact-finger carried by the rod, the said lever, vertically-movable operating-rod, and stationary contact-finger being mounted in the top of the clock-case, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAMES O. NEWTON.

Witnesses:
CHAS. W. LANE,
GEO. D. SEYMOUR.