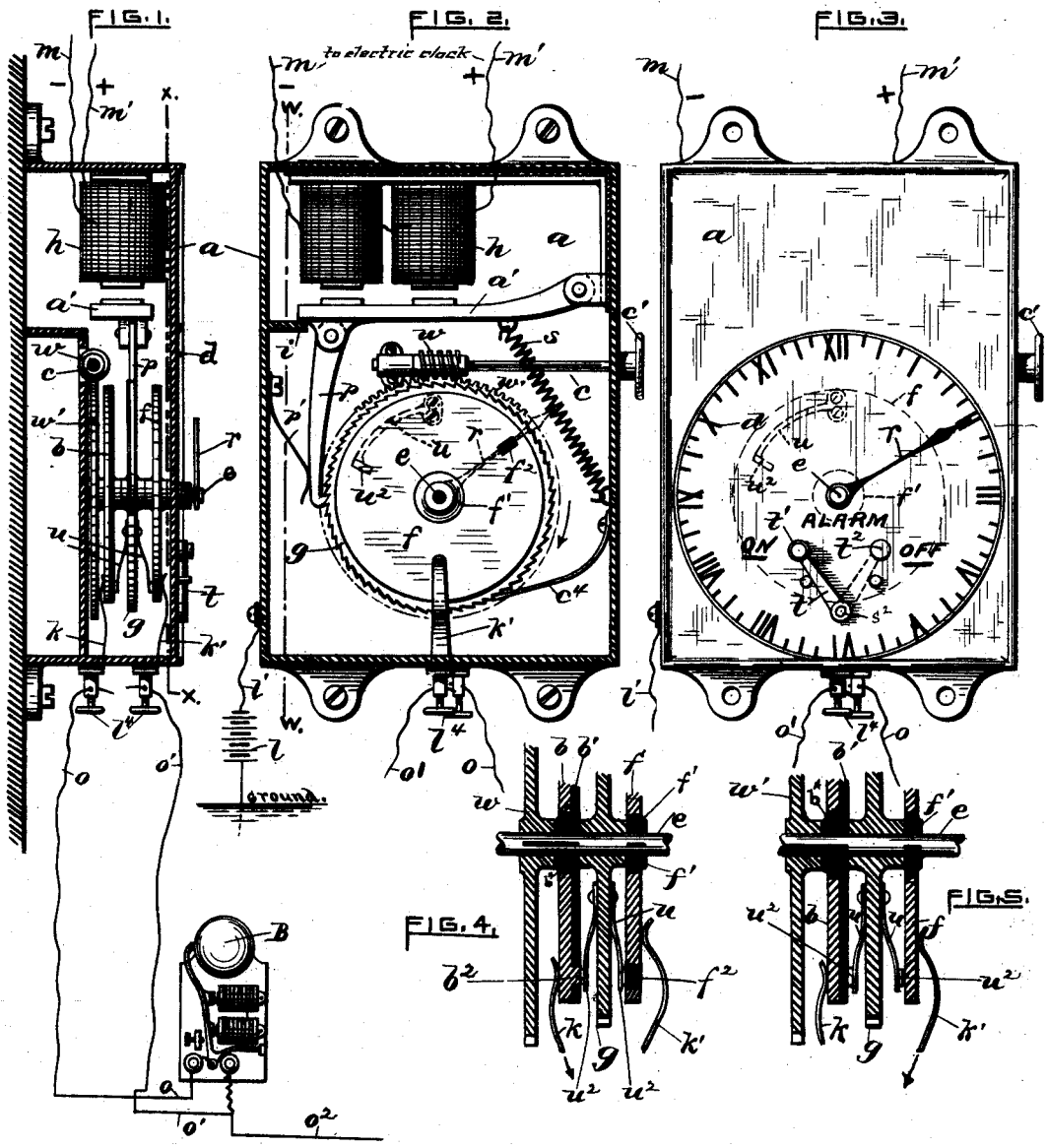
(No Model.) 2 Sheets—Sheet 1.

G. H. STRAIGHT.

TIME ALARM.

No. 421,530. Patented Feb. 18, 1890.



WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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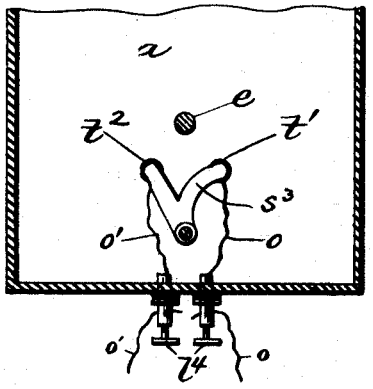

FIG. 7.

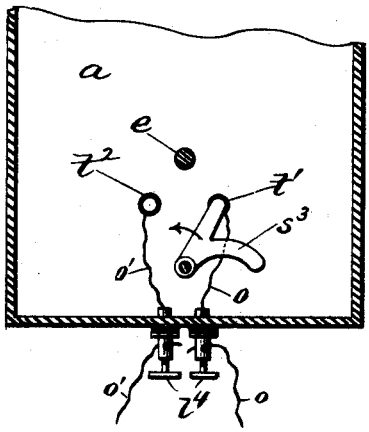

FIG. 6.

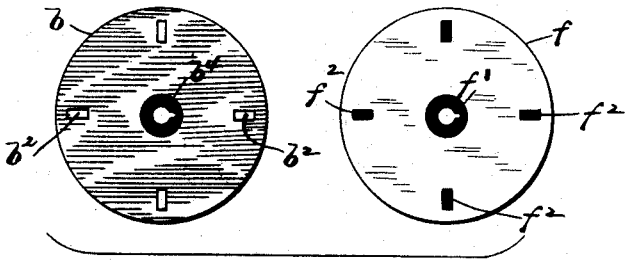

FIG. 8.

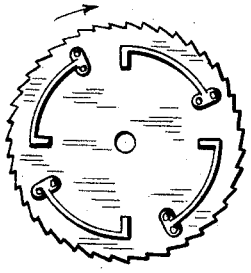

FIG. 9.

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UNITED STATES PATENT OFFICE.

GEORGE H. STRAIGHT, OF KINGSTON, RHODE ISLAND.

TIME-ALARM.

SPECIFICATION forming part of Letters Patent No. 421,530, dated February 18, 1890.

Application filed August 13, 1889. Serial No. 320,587. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. STRAIGHT, a citizen of the United States, residing at Kingston, in the county of Washington and State of Rhode Island, have invented certain new and useful Improvements in Time-Alarms; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The invention forming the subject of my present application relates to an automatic time-alarm adapted more particularly to be combined with a series of bells or other electrically-connected signaling apparatus and an electrically-connected clock.

My invention consists, essentially, of a relay or station having an electrically-connected loosely-mounted wheel revolving in unison with the hour-hand of an electric time-piece or central clock, conducting and non-conducting disks secured to a central shaft, springs connecting said wheel and disks, a dial and pointer, means for revolving the shaft, an alarm-circuit electrically connected with said disks, and a switch for short-circuiting the current passing through the alarm-circuit, all as will be more fully hereinafter set forth and claimed.

The object I have in view is to provide hotels or other places where it is desirable to announce an alarm or signal with a series of simple and comparatively inexpensive substations adapted to be placed in the several rooms, portions of the mechanism of the stations being electrically connected with and actuated by the main or office clock, or in fact with any electric clock more or less remotely located.

By means of my invention (assuming, for example, it is located in a hotel) a guest may be awakened at any predetermined time without depending upon the clerk or other employés of the hotel, and in fact without their knowledge, the occupant of the room simply having to turn the pointer of the apparatus to the hour (or minute, if necessary) he desires to be awakened, at the same time "switching on" the alarm-circuit. From the fact that the relation of the pointer and the two disks to each other is always the same and in a position to shunt the current through the alarm-bell, it follows that when the contact-springs of the time-wheel arrive opposite the pointer the current, as just stated, will be deflected through the bell to sound the alarm, the ringing of which may be continued, say, one minute. The next movement of the time-wheel breaks the current and short-circuits it, thereby cutting out the bell, the latter automatically ringing again twelve hours later. To provide against a repetition of the alarm, I provide the device with a common movable switch. In case the guest does not wish to be awakened by the alarm, he simply turns the switch in the proper direction, or vice versa.

In order to clearly illustrate my invention, I have prepared the annexed sheet of drawings, in which—

Figure 1 represents a vertical transverse sectional view of the apparatus, taken on line *w w* of Fig. 2, and also showing a portion of an alarm-circuit in which one of a series of electric bells is located. Fig. 2 is a vertical sectional view taken on line *x x* of Fig. 1. Fig. 3 is a front view. Fig. 4 is an enlarged transverse sectional view taken through the wheels and disk, the relation of the parts thus represented being that at the instant of sounding an alarm, as through the bell. Fig. 5 is a similar sectional view, the parts being, however, in the normal position—that is, the current is short-circuited and does not excite the electro-magnets of the bell. Figs. 6 and 7, Sheet 2, represent detail views of a switch or cut-out viewed from the back of the dial, the case being in section; and Figs. 8 and 9 represent modified forms of the disk and time-wheel, respectively.

A more detailed description of the apparatus is as follows:

a indicates the frame or casing, which may have any desired form adapted to receive the mechanism, &c. As drawn, it has the form of a small rectangular metallic box open at the back and provided with lugs or ears, by which it may be secured to the wall of a build-

ing. A current of electricity passes through the case and its non-insulated mechanism by means of a battery l and conducting-wire l', thereby keeping the case continuously charged with electricity. To the upper portion of the case is secured and properly insulated a pair of common electro-magnets h, which attract a pivoted armature-lever a' through the medium of an intermittent current passing through the positive and negative conductors m' m. This current may be that passing from a centrally-located electric clock. At or near the center of the case is mounted a short transverse shaft or spindle e, the same extending from the front sufficiently to receive a hand or pointer r. To the rear or opposite end of the spindle is secured a gear-wheel w'. This wheel, and consequently the spindle, may be revolved in either direction, as desired, by means of the shaft c, worm w, and exterior hand-wheel c'. Spur or bevel gearing for revolving the spindle may be readily substituted in lieu of the worm-gearing shown. Intermediate of the front of the case and said wheel w' is loosely mounted upon the spindle a ratchet-wheel g. This wheel is intermittingly revolved by means of the spring-pawl p, pivoted to the armature a', as clearly shown in Fig. 2. A light spring s serves to retract the pawl to its normal position or against a stop i. At the same time a check-pawl c^4 prevents the wheel from revolving in an opposite direction. By means of this arrangement it is obvious that the wheel g will revolve in unison with the clock-wheel or other source from whence the current passes to the electro-magnets h, thereby, in case the current is controlled by the hour-hand, causing the wheel to revolve once in twelve hours. Obviously by slight changes in the mechanism it may be made to revolve slower or faster, as desired. Near the periphery of the wheel g conducting-springs u are secured at opposite sides thereof, as shown. These springs (two) are slightly enlarged at their free ends, as at u^2. (See Figs. 4 and 5.)

b indicates a metallic disk having an insulated or non-conducting hub b^4 secured to the spindle and located at the rear of the ratchet-wheel. The entire face of the disk adjacent to the wheel g is covered with vulcanite or otherwise insulated, except a small uncovered spot or plug b^3 near the periphery, the same being so located and arranged that it fairly engages the corresponding free end u^2 of the spring u once while the ratchet-wheel makes one revolution. In lieu of the disk thus constructed it may be made entirely of insulating material and provided with the metallic or conducting plug b^2. Another metallic disk f is secured to the spindle, this one being in front of the wheel g. The center portion f' of this disk is also insulated, so that the current cannot pass from the spindle and ratchet-wheel to the disk, and vice versa. The disk f is provided near its edge with an insulated plug f^2, arranged with relation to the corresponding spring u, as just described, with reference to the plug b^2, all as clearly shown by Fig. 4. Practically the plugs and pointer r are substantially in line transversely.

To the base of the case are secured two insulated binding-posts l^4, which retain the positive and negative poles or conducting-wires o o' of an alarm-circuit. From these posts extend suitably-insulated contact springs or brushes k k', the former being always in direct contact with the disk b and the latter in direct contact with the disk f, all being so constructed and arranged that when the several parts stand as shown in Fig. 4 the current is forced momentarily to pass down the brush k and conductor o, and thence through the ordinary electric bell B, Fig. 1, thereby sounding an alarm. Immediately succeeding the alarm—that is, after the springs u have left the plugs b^2 f^2—the current is then short-circuited from the wheel g *via* the spring u, disk f, and brush k' (see Figs. 1 and 5) to the negative pole or conductor o', communicating with the continuous line o^2, connecting a series of bells or signals, thereby cutting out the individual bell or signal, the current now being continuous until the completion of the next revolution of the wheel g, when the operation before described is again repeated, and so on continuously.

In order to render the alarm inoperative at any time I provide the station with a common lever or push-button switch t, having insulated contact-pins t' t^2, (see Figs. 3, 6, and 7,) the same being so arranged that when the switch-lever t, which is secured to a pin s^2 passing through the front end, having, say, a Y-shaped lever s^3 secured at the rear end of the pin, rests against the pin t', which is electrically connected with the conductor o the alarm is "on"—that is, the electric current passes through the alarm apparatus to sound an alarm or signal—the corresponding position of the levers being represented in Figs. 3 and 6. Now, by moving the switch-lever in the arrow direction, Fig. 6, to the position shown in Fig. 7 the current is "off," thereby closing or short-circuiting the current, the latter then passing without resistance from the conductor o to o', or vice versa, through the medium of the Y-shaped lever s^3, as shown in said Fig. 7.

I would add that the construction of the switch may be modified materially from the arrangement represented without impairing the efficiency of the apparatus.

From the foregoing it is plain that if the ends u^2 of the springs u, secured to the ratchet-wheel g, be located or placed to coincide, say, with the hour-hand of a clock electrically connected with the station, the said ends u^2 will, upon simultaneous contact with

the previously-adjusted normally-stationary plugs b^2 f^2, (in the drawings the plugs are set at the hour of two, as indicated by the dial d of the case in Fig. 3 and by the dotted pointer in Fig. 2,) cause the current to pass from the charged wheel g through the left spring u, Fig. 4, and plug b^2 to and through the contact spring or brush k, thence through the conductor o to the helices of the bell B, thus sounding an alarm. After the current is broken by the passage or advance travel of the springs u the current resumes its normal or short-circuit course through the wire o', which connects with the line-conductor o^2 beyond the bell.

It is obvious that the number of stations and bells may be extended or multiplied, as desired, without departing from the spirit of my invention, the entire series of ratchet or time wheels g being operated and controlled by an intermittent current of electricity flowing from a remotely-located central clock.

The bells or signals are located and arranged in another circuit, each bell being entirely independent of its neighbor, although, obviously, a number of bells may be simultaneously operated by the current passing from one sub-station.

I do not limit the use of my invention simply to hotels, nor its combination with alarm-bells, substantially as represented and described, as the device is equally adapted to be employed as an electric annunciator, and also for railroad and other forms of signaling.

By providing the disks b and f with a series of plugs b^2 f^2, respectively, as shown in Fig. 8, a corresponding number of signals or alarms may be given at intervals by means of the contact-springs u during each revolution of the time-wheel g. The same result may be attained, however, by simply attaching a like series of springs u to the time-wheel, (see Fig. 9,) the same in revolving them consecutively engaging the single set of disk-plugs shown in Fig. 4. When thus used, the pointer r would be unnecessary, although the switch t might be retained.

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

1. An automatic electric time-alarm having an electrically-charged loosely-mounted wheel revolving and controlled by an independent circuit, in combination with a normally-stationary spindle provided with adjusting mechanism, conducting-disks secured to the spindle, provided with non-conducting material, contact-springs secured to said wheel, arranged to be in continuous engagement with the disks, and insulated stationary metallic brushes also in continuous engagement with said disks and located in an alarm or signal circuit, substantially as hereinbefore described, and for the purpose specified.

2. The combination, with an electrically-charged and electrically-operated loosely-mounted wheel having oppositely-mounted contact-springs u secured thereto, and a normally-stationary adjustably-mounted spindle passing through said wheel, of conducting-disks secured to and insulated from said spindle and arranged to continuously engage the springs u, one disk having a conducting-plug b^2, and the other a non-conducting plug f^2, metallic conductors or brushes k k', continuously engaging the disks and communicating with an alarm or signal circuit, and a switch for cutting out the alarm or signal, substantially as hereinbefore set forth.

3. In an automatic time-alarm, the combination of an electrically-charged time-wheel g, actuated by an electric clock, oppositely-arranged contact-springs u, secured to said wheel, a spindle having the wheel mounted thereon, a pointer carried by the spindle, mechanism for revolving the spindle, a conducting-disk b, carried by the spindle and insulated therefrom and provided with a non-conducting face b', adjacent to and in contact with a spring u and having a conducting-plug b^2, extending through the surface b', a conducting-disk f, also carried by said spindle and insulated therefrom and provided with a non-conducting plug f^2, arranged so that as the disk revolves it engages the other spring u, insulated brushes or metallic conductors k k', continuously engaging the said disks b f, respectively, a signal or alarm actuated by the current passing from the said wheel g, disk b, brush k, and conducting-wire o, a conductor o', connecting the brush k' and the line-wire o^2 at a point beyond the helices of the alarm, and a cut-out switch t, all combined, arranged, and operating substantially as shown and hereinbefore described, and for the purposes set forth.

4. In an automatic electric time-alarm, the combination of two conducting-disks secured to and insulated from the operating-spindle, one being provided with a non-conducting plug f^2, the other having an insulated face exposing a conducting-plug b^2, a loosely-mounted electrically-charged time-wheel g, located intermediate of said disks and intermittingly actuated by an electrical clock, conducting-springs u, secured to opposite sides of the time-wheel to simultaneously engage said plugs f^2 b^2, a cut-out switch, and brushes or conductors in continuous engagement with said disks, one brush being electrically connected with an electric bell or signal and the other connected with a circuit-line leading from the bell, substantially as hereinbefore described.

5. The combination, in an electric time-alarm having an electrically-charged case and conductors, as o o', leading therefrom, of an electrically-actuated charged time-wheel provided with conducting-springs, a normally-stationary wheel w', a spindle having the

wheel w' secured thereon, means for effecting the axial adjustment of the spindle, disks b f, also secured to the spindle and in contact with said conducting-springs and conductors, and pins or plugs b^2 f^2, mounted in the disks, respectively, all arranged and adapted for operation substantially as hereinbefore described, and for the purpose set forth.

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

GEORGE H. STRAIGHT.

Witnesses:
CHARLES HANNIGAN,
GEO. H. REMINGTON.