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2,626,662

ALARM CONTROL FOR CLOCKS AND PHOTOELECTRIC SWITCHES

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Fig. 1.

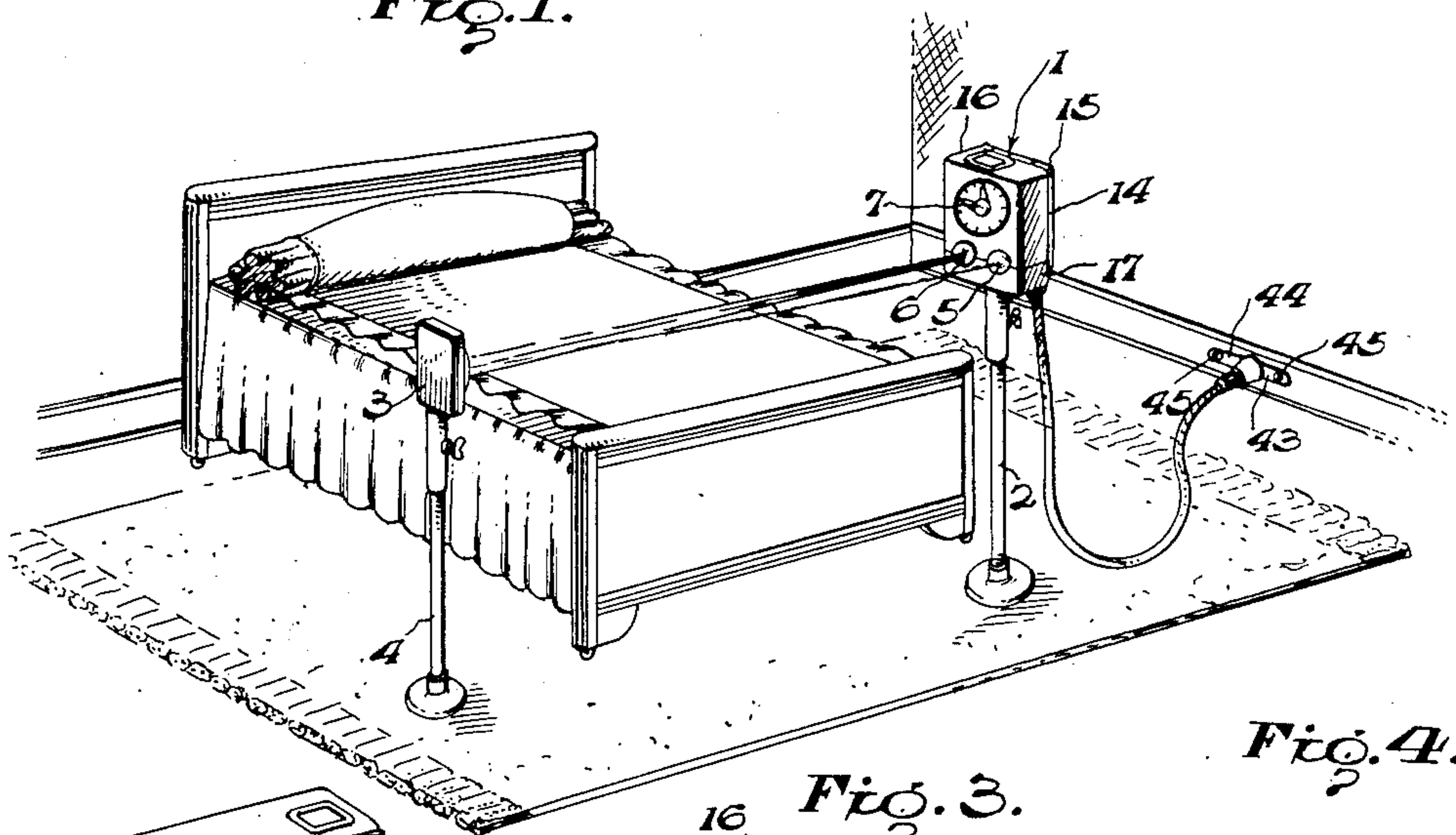


FIG. 4.

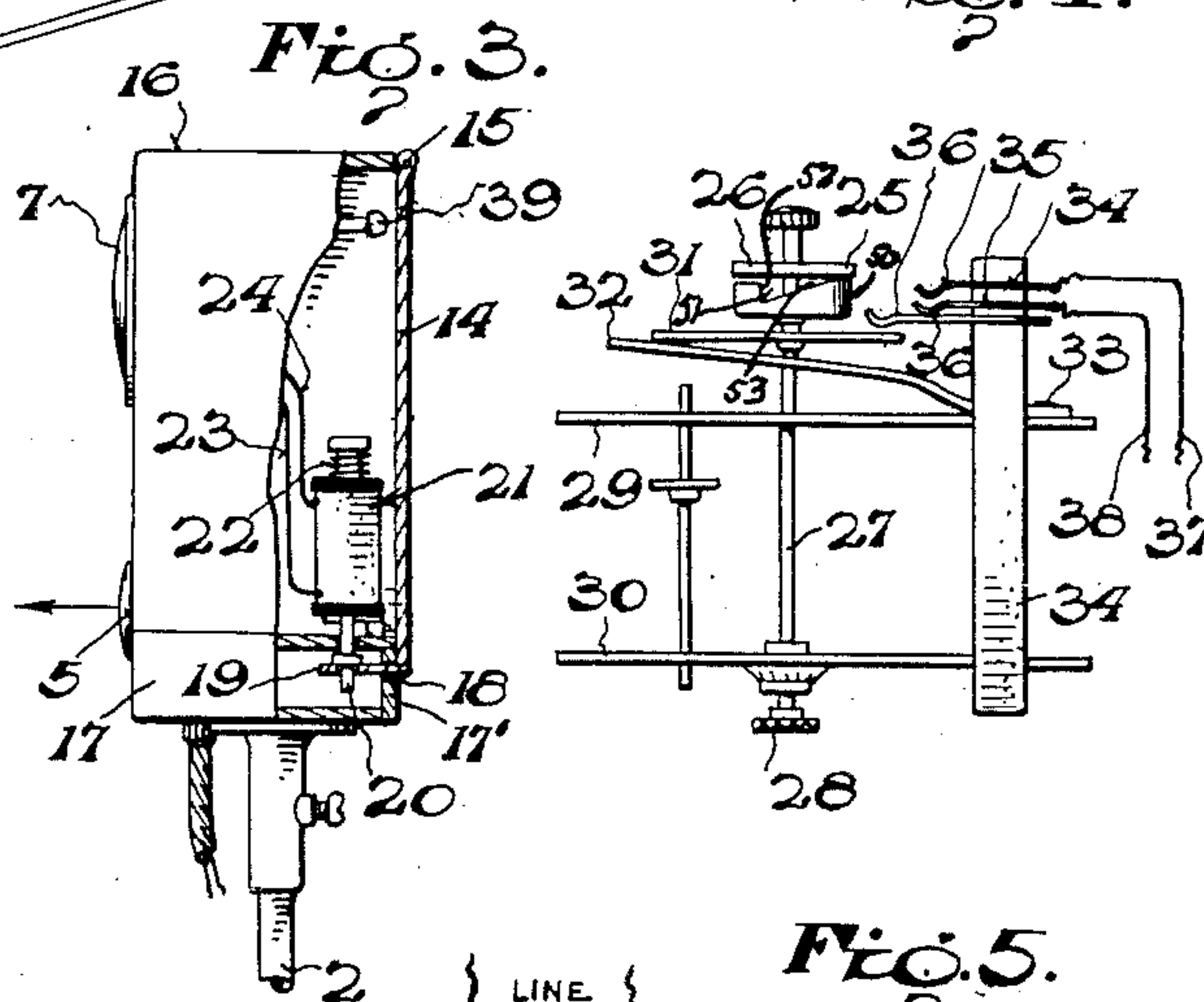


Fig. 2.

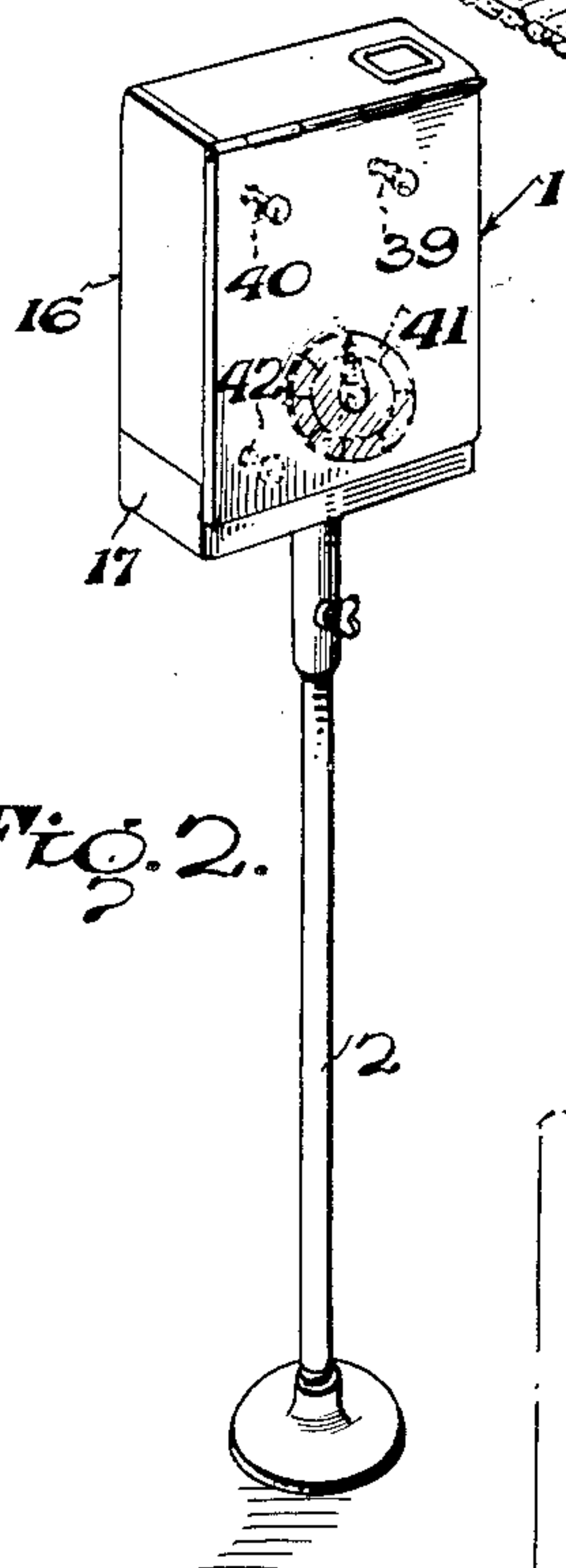
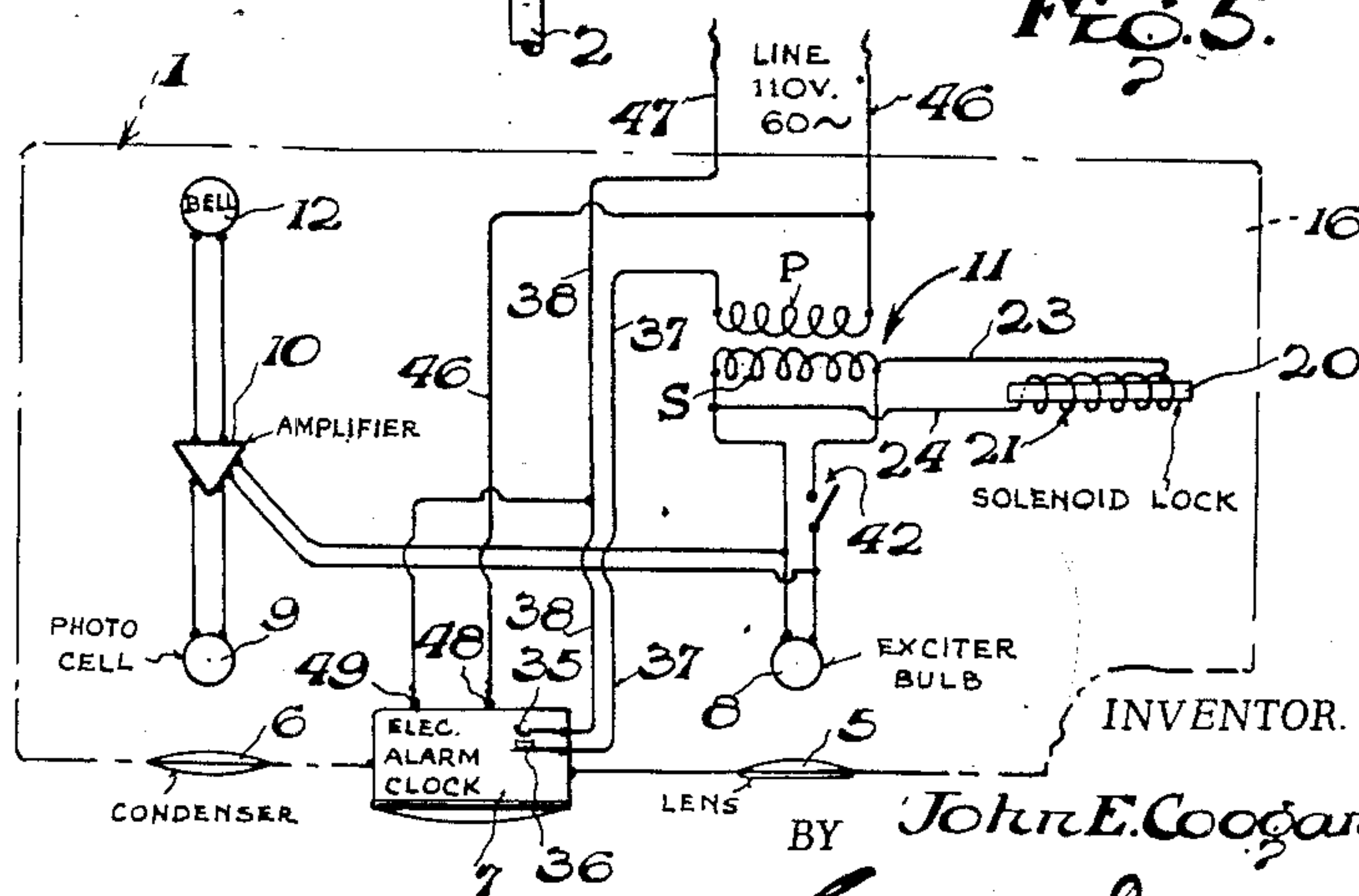


FIG. 5.



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ALARM CONTROL FOR CLOCKS AND
PHOTOELECTRIC SWITCHES

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2 Claims. (Cl. 161—22)

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My invention relates to alarm systems and more particularly to an improved alarm control for clocks and other timing devices.

In Patent No. 1,957,390, issued to me May 1, 1934, there is described and claimed an alarm control for clocks, wherein access to the alarm control mechanism, during certain predetermined periods of operation, is prevented by means of a closure member pivotally mounted at the rear of the clock casing. The closure member is provided with a lock device, constructed and arranged whereby to lock the cover in closed position for a predetermined time, during certain intervals of operation of the clock, and thus prevent tampering with the controls, during the period that the lock is in locking position.

The device of my above noted patent involves suitable electrical and/or mechanical connections between the bed and the clock whereby the alarm mechanism proper is, as indicated above, rendered operative when the bed is occupied and rendered inoperative when the bed is unoccupied. In addition, the invention comprehends the use of means for preventing access to the controls of the alarm clock, said means including locking mechanism associated with the alarm releasing mechanism so that the controls cannot be reached during the period when the alarm should normally be operative, i. e., for about one hour after the time set for the alarm.

The present invention relates generally to a control arrangement of the type disclosed in my aforementioned patent, but differs therefrom in that the clock is not designed for permanent attachment to a bed, and in lieu of electrical connections between the bed and the clock, a photo-electric switch mechanism is used, in combination with the electrical circuits of the system, whereby to arrest operation of the audible signal or alarm associated with the clock, without affecting the actuation of the alarm control mechanism.

An object of my invention is to provide an improved alarm control for clocks.

Another object of my invention is to provide an alarm system, including a clock and a photo-electric switch mechanism, wherein access to the alarm and other controls, at certain predetermined times, is prevented.

Yet another object of my invention is to provide an improved alarm system, including a clock and a photo-electric switch mechanism, having a cover or closure overlying the controls, adapted to be locked in the closed position, whereby to prevent tampering with the controls during certain periods of the system.

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Still another object of my invention is to provide an improved alarm system, including a clock and a photo-electric control device, wherein interruption of the light beam emanating from the photo-electric control device initiates action to place the alarm circuit in the operative condition, and upon the restoration of the beam the alarm circuit is rendered inoperative.

Yet still another object of my invention is to provide an improved alarm system, including a clock and photo-electric control device, constructed and arranged whereby when the light beam emanating from the photo-electric control device is uninterrupted, the alarm circuit is rendered inoperative or arrested, without affecting actuation of the alarm control mechanism associated with the clock.

With these and other objects in view, which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements, comprising my invention, may be varied in construction, proportions and arrangement, without departing from the spirit and scope of the appended claims.

In order to make my invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect, without limiting the improvements in their useful applications to the particular constructions, which for the purpose of explanation, have been made the subject of illustration.

In the drawings:

Figure 1 is a perspective view, showing the alarm control system in the operative position.

Fig. 2 is a perspective rear view of the housing adapted to contain the clock and the photo-electric switch mechanism, and the standard upon which the housing is adjustably mounted.

Fig. 3 is a side elevational view of the housing, partly in section, showing the locking means associated with the rear cover or closure member of the housing.

Fig. 4 is a detail view of the alarm control mechanism of the clock; and

Fig. 5 is a diagrammatic view of the elements contained within the housing, including schematic wiring diagram showing the arrangement of the electrical circuits.

Referring to the drawings, and more particularly to Fig. 1, the alarm control system comprises a housing or cabinet, designated generally by numeral 1, adjustably mounted upon a suitable standard 2. The cabinet is adapted to contain a clock 7, and a photo-electric control device,

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not shown, having a lens 5, through which a beam of light is projected across the bed to a reflector or mirror 3, adjustably mounted upon a standard 4. The light rays emanating from an exciter bulb within the cabinet, are reflected from mirror 3 to a light condensing lens 6, and thence to a photo-electric cell, operatively connected to an alarm or signal circuit, as will be described more fully hereinafter.

Referring to Figs. 2 and 3, a cover member 14, is hingedly secured as at 15, to the top wall 16 of the cabinet, the free end of the cover being bent inwardly to form a flange portion or tongue 19, adapted to seat in slot 18 formed in lower wall portion 17' of the housing extension 17. The tongue member 19 is apertured to receive a bolt like extension 20, formed integral with the plunger or core of a solenoid 21. The solenoid plunger is provided with a coiled spring 22 adapted to normally urge the extension 20 upwardly out of the aperture in the tongue member 19, and thus permit the cover to be raised, so that access may be had to the various controls associated with the clock and photo-electric device. With reference to the clock controls (Fig. 2), the control for setting the time is effected by knob 39 and the alarm may be set by control knob 40. Suitable leads 23 and 24 are provided, which leads are connected to a source of current adapted to energize the solenoid, as will be described later. It will also be noted that the bottom of the cabinet 1, is formed with an extension 17, in the form of a compartment, adapted to provide space for transformer and other electrical apparatus of the system.

As will be seen in Fig. 4, the alarm control mechanism of the clock comprises a disc 25, having an integral tooth or projection 26 formed thereon. The disc 25 is mounted for rotation by means of a control shaft 27 having an adjusting knob 28, the shaft being rotatably supported on plates 29 and 30. A gear 31, meshes with the main driving mechanism of the clock, not shown, and is adapted to be driven in the usual manner. Between the gear 31 and disc 26, there is provided a bushing 50, having a notched portion 51 therein, said portion being shaped with a perpendicular side or face 52 and a slanting face 53, for purposes to be described more in detail hereinafter.

The tooth 26 may be set at any desired angular position by means of knob 28, the angular position thereof determining the hour when the alarm is to function. When the gear 31 has rotated to the point where the straight side 52 of the notch passes the tooth 26, the gear and its associated parts will be forced outwardly by a spring member 32, attached to plate 29 by means of a screw or other fastening device 33. The alarm mechanism will continue to function while the tooth rests in the notched section, and upon continuance of its travel, the sloping portion 53 of the notch tends to rise on the tooth, thus forcing the gear 31 and its associated mechanism inwardly towards the clock frame, to put the alarm mechanism in the arrested or off position.

Referring again to Fig. 4, the switch mechanism associated with the above described alarm control comprises contact members 35 and a tongue member 36 adapted to bear on the upper surface of gear 31 and to be urged upwardly and close contacts 35, attached to suitable leads 37 and 38, which are connected in series with

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the primary of a transformer and the supply line. The contacts 35 and tongue 36 are mounted upon a spacer post 34 and suitably insulated from each other and from the post.

Referring to Fig. 5, leads 46 and 47 are adapted to be connected to an electrical source, and to the primary P of a transformer 11, and through leads 37 and 38 to contacts 35. The secondary S of the transformer is connected to an exciter bulb 8, and also to the solenoid 21, through leads 23 and 24. The exciter bulb circuit is provided with a switch 42, and between the switch and bulb, taps lead to an amplifier 10, connected between a light sensitive cell 9 and a bell or other audible signal 12. The amplifier is provided with a suitable relay or switch, not shown, adapted to open or close the circuit to the bell. The line voltage is applied to terminals 47 and 48 of the electric clock through leads 38 and 46.

It will thus be seen that upon closure of contacts 35, 36 a circuit through the primary P of the transformer is completed and that the core of solenoid 21 is moved to locking position. Switch 42 is normally closed, and accordingly, the exciter bulb 8 is energized and current is supplied to the photo-cell and its associated amplifier. Light rays emanating from bulb 8 pass through the lens 5 and are reflected back by means of mirror 3, through lens 6 to the cell 9, at which time the circuit to the bell is in the off or arrested position. If the light beam passing through lens 5 is broken or obstructed, as for example, when the bed (Fig. 1) is occupied, cell 9 then functions to operate the relay associated with the amplifier 10 whereby to close the signal circuit and place the bell in alarm condition, that is to say, in condition to ring at the hour for which the alarm has been set.

The bell circuit is adapted to remain closed, that is, in ringing condition during the period that the detent or finger remains in the notched portion of 51 of the bushing 50 of the alarm gear. This period being approximately one hour, however, the period may be varied by changing the configuration of the notch, and during this interval it will be impossible for a person to open the cover to disconnect the alarm mechanism or manipulate the other controls, switches or the like, to the rear of the housing and adjacent the cover.

In connection with leads 46 and 47 (Fig. 5), they may be connected through a cable and plug to a suitable outlet, as shown in Fig. 1. The plug, or the cap portion thereof, is preferably provided with a strap 43 adapted to be secured to the outlet box or to the base-board by means of screws 44. By fastening the cap in this fashion, it is securely held in seated position, and cannot be readily removed, as by pulling.

While I have shown and described the preferred embodiment of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth, by way of illustration, as it is apparent that many changes and variations may be made therein, by those skilled in the art, without departing from the spirit of the invention or exceeding the scope of the appended claims.

I claim:

1. An alarm system of the character described, comprising a housing adapted to contain an alarm clock and photo-electric switch mechanism, said housing having a front wall, top and

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side walls, and a rear wall, said rear wall being hingedly secured to the rear of the top wall, a clock mounted in the front wall of the housing, said clock having an alarm control mechanism and means for adjusting the same to operate at predetermined times, a photo-electric switch mechanism, including a light sensitive cell, an exciter bulb, an amplifier, a switch, and associated circuits, mounted within the housing, a lock for the rear wall, a signal device, and electrical means actuated by said alarm control mechanism for operating the signal and said lock, the lock being maintained in locking position during the operation of the alarm control mechanism, said light sensitive switch mechanism being operatively connected with said signal for arresting operation of the same without affecting the actuation of the alarm control mechanism.

2. An alarm system of the character described, comprising a housing adapted to contain an alarm clock and a photo-electric switch mechanism, said housing having a front wall, top, bottom, and side walls, and a rear cover hingedly secured to the top wall, a clock mounted in the front wall, said clock having an alarm control mechanism and means for adjusting the same

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to operate at predetermined times, a lock for said rear cover, an audible signal device, electrical means operated by said alarm control mechanism for actuating said signal device and the lock, said lock being in locking position during the operation of the alarm control mechanism, and a photo-electric switch mechanism, including, a light sensitive cell, exciter bulb, an amplifier, a switch and associated circuits mounted within the housing, said photo-electric switch mechanism being operatively connected with said signal for arresting operation of the same without affecting the actuation of the alarm control mechanism.

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