Jan. 17, 1933. S. LIPPSTADT 1,894,611

MOTOR DRIVEN ALARM AND SIGNAL DEVICE

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Fig. 1.

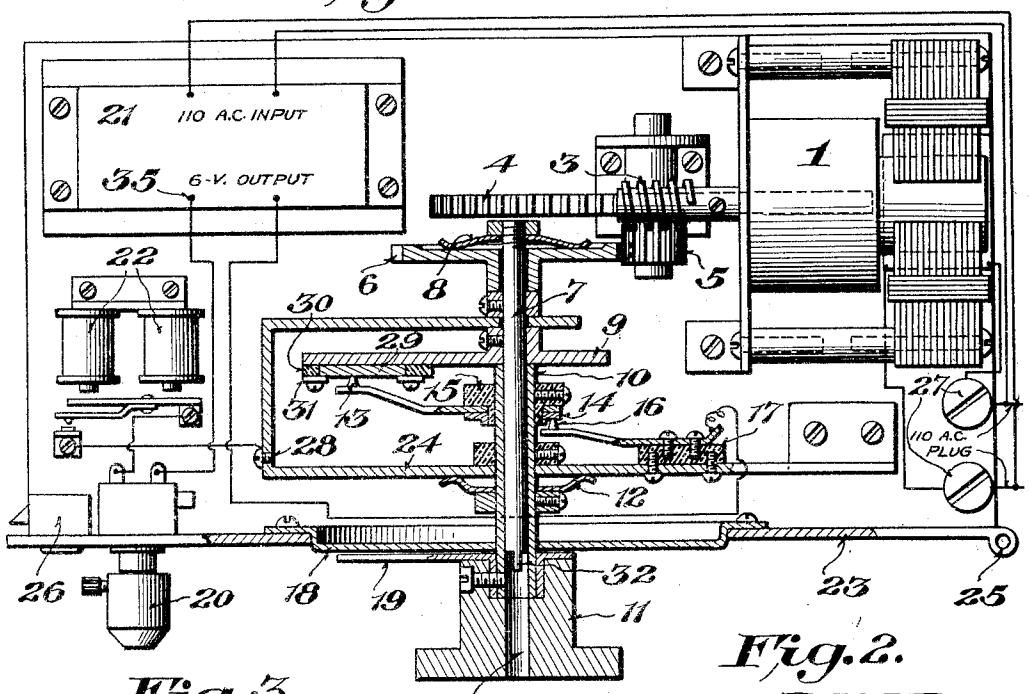


Fig. 2.

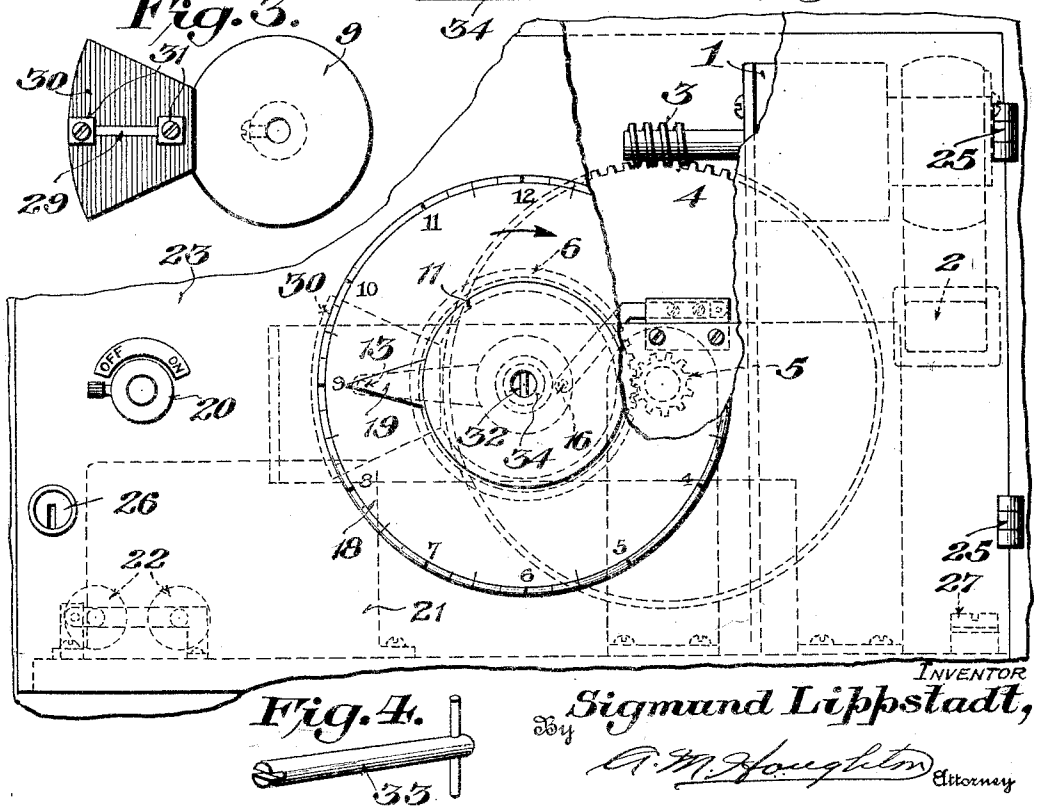


Fig. 3.

Fig. 4.

INVENTOR

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UNITED STATES PATENT OFFICE

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MOTOR DRIVEN ALARM AND SIGNAL DEVICE

Application filed January 17, 1931. Serial No. 509,468.

This invention relates to motor driven alarm and signal devices; and it comprises an apparatus wherein a contact making means of an electric switch is caused to rotate about a shaft at a uniform speed of one revolution in a given time, say in twelve hours, by means of a constant speed motor, such as a synchronous motor, at least one contact element of said switch being stationary but manually adjustable, the said rotating contact making means being adapted to close said switch and to thereby energize an electric circuit at a predetermined time, whereby an alarm is sounded, the said rotating contact making means of said switch being mounted on a shaft driven by a friction clutch, the said shaft acting as a bearing for a concentric sleeve upon which is mounted said adjustable contact element, the said shaft being capable of independent adjustment against said friction clutch by means of a concealed key seat; the whole being mounted on a unitary framework and forming a sturdy and easily manipulated device suitable for various purposes such as a signal device for school rooms, office buildings, guest rooms at hotels, etc.; all as more fully hereinafter set forth and as claimed.

In a certain prior and copending application, Serial No. 483,631, filed September 22, 1930, I have described devices suitable for operating signals or alarms at various call stations and at any desired or predetermined times. These devices were electrically driven from a central station or master clock and were suitable for placing in the guest rooms of a hotel or of a steamship, for example. The present invention comprises an advance or improvement over these prior devices, my new construction having certain obvious advantages thereover.

In the prior art, various types of annunciators and alarm controlling mechanisms have been suggested. These have generally consisted of a system of clocks distributed at various points, all being driven by one master clock. Frequently these devices have had delicate electrical contacts mounted on the hand of the clocks in order to operate bells or signals at predetermined times. These devices while appearing to be of considerable utility have never come into general use because of various mechanical difficulties. Due to the fact that the clock mechanism has been complicated with electrical contacts and contact setting devices, these instruments have invariably required frequent servicing. The cost has also been high.

The impracticability of various prior art devices has been largely overcome by the devices of my acknowledged copending application. These devices have eliminated the clock mechanism and, on account of various simplifications in the design, have proven practical for the service in question. My prior devices have, however, several obvious disadvantages. They require a central station or master clock for operation, this master clock operating timed electrical impulses which in turn drive the call station mechanisms. These devices are therefore not suitable for isolated installations, the cost of the master clock being so high that a large number of call stations are required before the average cost per call station becomes reasonable. It has also been found impossible to obtain a master clock suitable for sending out timed electrical impulses over long periods of time without failing. Moreover, the driving mechanism of my prior call stations has never been entirely silent, the intermittent "clicking" proving somewhat annoying to a person who is attempting to fall asleep.

In my new devices each call station is operated by its own individual motor, independently of any and all other call stations. A single installation is just as reliable and as cheap to install as a plurality of such stations. The constant speed motors which I employ have been found to be almost completely silent and their noise, if any, is monotonous and regular and of such nature that it induces sleep, rather than intermittent and disturbing as in my prior devices. The flexibility of installation of my new device is very important. Special electrical wiring running to a master clock is not required, it being possible to plug the call stations in from any ordinary lighting circuit. My de-

vices may even be made portable and of small size and can be carried in a suitcase by a traveler, for example, and plugged into the lighting circuit when he reaches his destination. This is highly preferable over the customary method of leaving a "call" at the desk of a hotel and then relying upon the memory of the hotel clerk. The portability of one form of my device greatly extends its range of usefulness. For example, my present device is suitable for individual installations, such as in private homes and offices, and in laboratories as well as in school rooms, office buildings, hospitals, apartment houses, steamship and hotel guest rooms, etc.

Another advantage of my present devices over those of my acknowledged copending application is that the time setting of my instruments is now continuous. Whereas in my prior devices an impulse from the master clock was transmitted to the call stations only once in five or ten minutes, this determining the accuracy of the time setting, in my present devices, the motion of the contact making means is continuous rather than intermittent. It is therefore possible to set the alarm to operate to an accuracy of somewhat less than a minute.

In the accompanying illustrations I have shown, more or less diagrammatically, certain organizations of structural elements within the purview of my invention. In this showing:

Fig. 1 is a plan view of my device, partly in section;

Fig. 2 is a front elevation with the time setting knob removed and with the front plate partially broken away to show details;

Fig. 3 is a detail view of the rotating contact disc, while

Fig. 4 shows a key for setting the timing of the instrument.

Referring to the figures, wherein like numerals refer to like elements, numeral 1 represents the constant speed motor, which in this showing is represented as a synchronous motor with a field coil 2. The worm gear 3 drives a train of gears 4, 5 and 6. The gear 6 is rotatably mounted on shaft 7 which shaft is driven by the gear 6 through the friction clutch 8. Upon the shaft 7 is also mounted the contact disc 9. This disc, shown in detail in Fig. 3, has an insulated fin 30 mounted thereon, a silver contact 29, being flush mounted in a groove provided in the insulation. The screws and plates 31 serve to fasten the silver contact in position and to make electrical connection with the metal of the disc 9. The silver contact 29 can be made to rotate once in any given period, such as 12 or 24 hours and serves as a contact making means, this contact forming one element of an electric switch.

Mounted on the shaft 7 is the concentric sleeve 10 which may be rotated by turning the knob 11 against the friction element 12. Mounted on this sleeve is the electric contact 13, which is manually adjustable by rotating the knob 11. The contact 13 is in electrical connection with the slip ring 14, both being mounted on the insulated bushing 15. Bearing on the slip ring 14 is a spring brush 16, which is insulated from the frame of the instrument by the bushing 17.

Referring to Fig. 2, a time scale 18 is mounted on the front panel 23 of the instrument, the index 19 cooperating therewith and being fastened to the knob 11 and sleeve 10, shown in Fig. 1. The switch 20 is likewise mounted on the front panel 23. The panel 23 supports the base of the instrument upon which the motor 1, transformer 21, the annunciator 22 and the frame 24 of the instrument are mounted. Attached to the front panel 23 are hinges 25, which may be concealed. The instrument as a whole may be mounted in a wall receptacle in such manner that the front panel is flush with the wall, the instrument being pivotally mounted by the hinges 25 in such manner as to swing outward from the wall, exposing the complete operating mechanism. A spring latch 26 may be provided on the front panel at the side opposite the hinges 25.

Current is supplied to the instrument at the plug 27. The motor itself is usually designed to operate on 110 volts A. C. or D. C. If alternating current is used, the transformer 21 is employed to supply a reduced voltage for operating the annunciator 22. The electric circuit for operating the annunciator includes the switch 20. The current leaves the transformer at 35, passes through the switch and through the annunciator and enters the frame 24 of the instrument at 28. The frame of the instrument is connected through the shaft 7 and the contact disc 9 to the silver contact 29 (Fig. 3) mounted on the contact disc 9, the silver contact 29 being mounted in a groove in the insulated fin 30 and being held in place by the plates and screws 31. When the silver contact 29 touches the contact 13 the current passes to the slip ring 14, leaving at the spring brush 16 and from thence passing to the other side of the transformer.

The shaft 7 is provided with a key socket 32 which cooperates with the key 33 shown in Fig. 4. The knob 11 is provided with the axial bore 34 through which the key 33 is inserted. This key turns the shaft 7 and consequently the contact disc 9 mounted thereon, against the friction clutch 8. The sleeve 10, with the contact 13 mounted thereon, is prevented from turning with the shaft 7 by means of the friction element 12 bearing against the frame of the instrument.

In order to place the described instrument in operation the ordinary lighting circuit is connected to the plug 27, which may be

mounted on the front panel of the instrument, or to which a flexible cord may be attached. This starts the motor operating and energizes the transformer. The timing of the instrument must first be adjusted by using the key of Fig. 4. This is done by snapping the switch 20 to the "on" position, setting the index 19 to read the time of day and then turning the shaft 7 by means of the key until the annunciator starts to operate. When the key is now removed, the shaft 7 continues to be driven at a speed amounting to one revolution in 12 hours. An alarm may be sounded by the instrument at any predetermined time merely by resetting the index 19 (and consequently the contact 13) to the time in question. When desired, the time of day can be determined by twisting the knob 11 until the annunciator operates and then reading the time scale opposite the index 19. The annunciator may be shut off by snapping the switch 20 to the "off" position.

When the device of my invention is mounted in a hotel room the motor is running continuously on the house current and it is only necessary for a guest upon retiring to set the index 19 to the time he wishes to be called and to snap the switch 20 to the "on" position. If the house current is interrupted for any reason it is necessary to reset the timing of the instruments, since the motor will, of course, stop when de-energized. Since the hotel management is obviously aware of any stopping of the house current it is a simple matter for an operator to reset the timing of the instruments throughout the house. If desired, the setting of the instruments can be accomplished from outside the guest rooms by having the instruments mounted in walls which face the hallway. An opening in the wall back of the instrument may be provided through which a key may be inserted for setting the shaft 7 from the rear. In resetting the instruments in this manner, the operator, knowing the length of time the house current had remained off, would merely advance the timing of the instruments a corresponding amount.

Various modifications of my device may be made without departing from the spirit of my invention. Thus, while I prefer a self-starting synchronous motor for my instrument, other motors can be used. Since it is necessary in any case for an operator to reset the timing of the instruments when the house current is interrupted, it is nearly as easy for him to start the individual motors at the same time. Hence a manually starting synchronous motor can be employed. If great accuracy is not desired, an induction motor can be used, the instruments being set daily and a friction or other device being used as a rough time regulator for the motors. A direct current motor can be used, provided this is equipped with a motor governor and a slip clutch which slows down the motor when it exceeds a standard speed, or with a somewhat similar governor which, when a certain speed is exceeded, throws into the motor circuit a series resistance. Such direct current, constant speed motors are known in the art. Instead of having one contact element rotated by the motor while the other remains stationary, the two contacts of the switch may be stationary and may be mounted on insulated bushings so as to nearly touch each other. In this case a stud, which acts as a contact making means, may be mounted on the disc 9, the stud operating to close the two contacts when coming into alignment therewith. Other optional changes can be made.

What I claim is:—

1. In a motor driven alarm and signal device, a shaft adapted to be rotated once in 12 hours, a contact disc mounted on said shaft, an insulated fin mounted on said disc, a flush mounted electrical contact in said fin electrically connected to said contact disc, and a second electric contact cooperating with and insulated from said first contact and adapted to be set to make electrical connection with said first contact at a predetermined time.

2. In an alarm and signal device, a shaft and a friction clutch cooperating therewith, means acting through said friction clutch for driving said shaft once in a given period of time, a contact element of an electric switch mounted on said shaft, a manually rotatable sleeve mounted concentrically on the end of said shaft, a second contact element cooperating with said first contact element mounted on said concentric sleeve, an alarm setting knob mounted on the end of said concentric sleeve, a key, a key seat adapted to fit said key on the corresponding end of said shaft and a socket in said knob adapted to receive said key; the said key and key seat being adapted to cause rotation of said shaft against said friction clutch, whereby the timing of said device may be adjusted.

3. In a motor driven alarm and signal device, a shaft, means including a motor for rotating said shaft once in a given period of time, a contact disc mounted on said shaft, an insulated fin mounted on said disc, a flush mounted electrical contact in said fin electrically connected to said contact disc, a concentric sleeve mounted on the end of said shaft, a second electrical contact cooperating with said first contact mounted on said concentric sleeve and a time setting knob mounted on the end of said concentric sleeve and adapted to rotate said second contact to a point at which it will make electrical connection with said first contact at a predetermined time.

4. The structure of claim 2 wherein elements of said alarm and signal device are

mounted on a panel, the said panel being pivoted and adapted to be mounted flush with a wall.

5. The structure of claim 3 wherein elements of said alarm and signal device are mounted on a panel, the said panel being pivoted and adapted to be mounted flush with a wall.

6. The structure of claim 3 wherein the said alarm and signal device is provided with a key, a key seat adapted to fit said key and a socket leading to said key seat; the said socket being located in said time setting knob and the said key seat being mounted in the corresponding end of said shaft, the said key and key seat cooperating to rotate said shaft against said friction clutch, whereby the timing of said device may be adjusted.

In testimony whereof, I have hereunto affixed my signature.

SIGMUND LIPPSTADT.