

(No Model.)

3 Sheets—Sheet 1.

C. H. SHAFFER.  
ELECTRIC ALARM.

No. 460,287.

Patented Sept. 29, 1891.

Fig. 8.



Fig. 1.

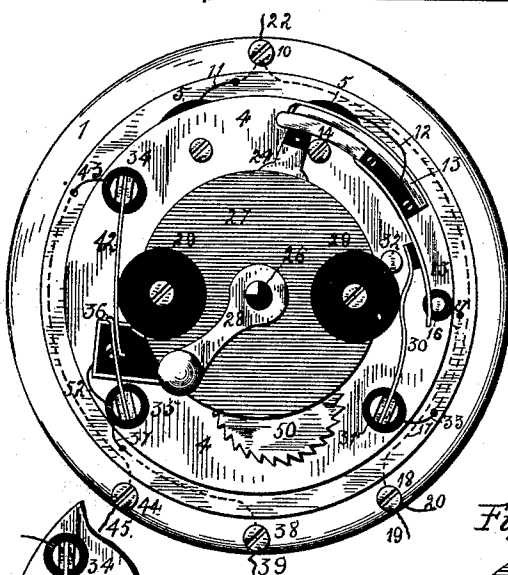


Fig. 2.

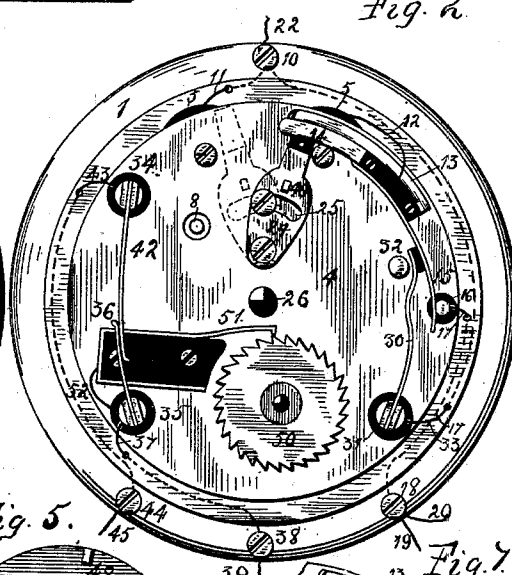


Fig. 5.

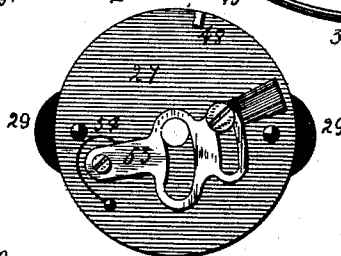


Fig. 6.

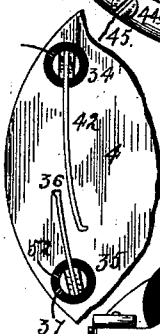


Fig. 4.

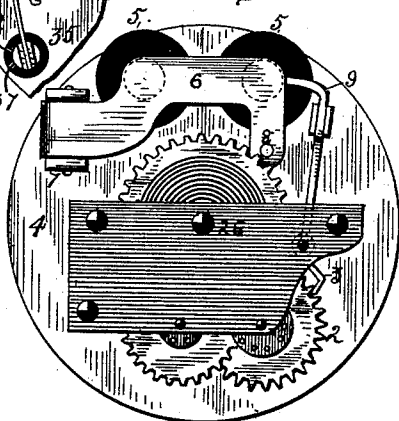
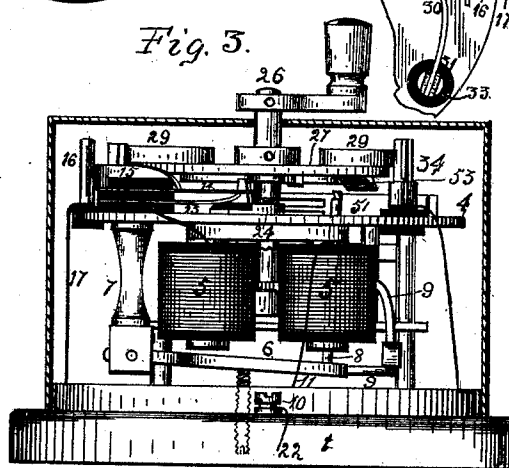


Fig. 3.



Witnesses:  
J. A. Southworth,  
E. O. Debel.

Inventor:  
Charles H. Shaffer  
By: A. O. Debel  
attys.

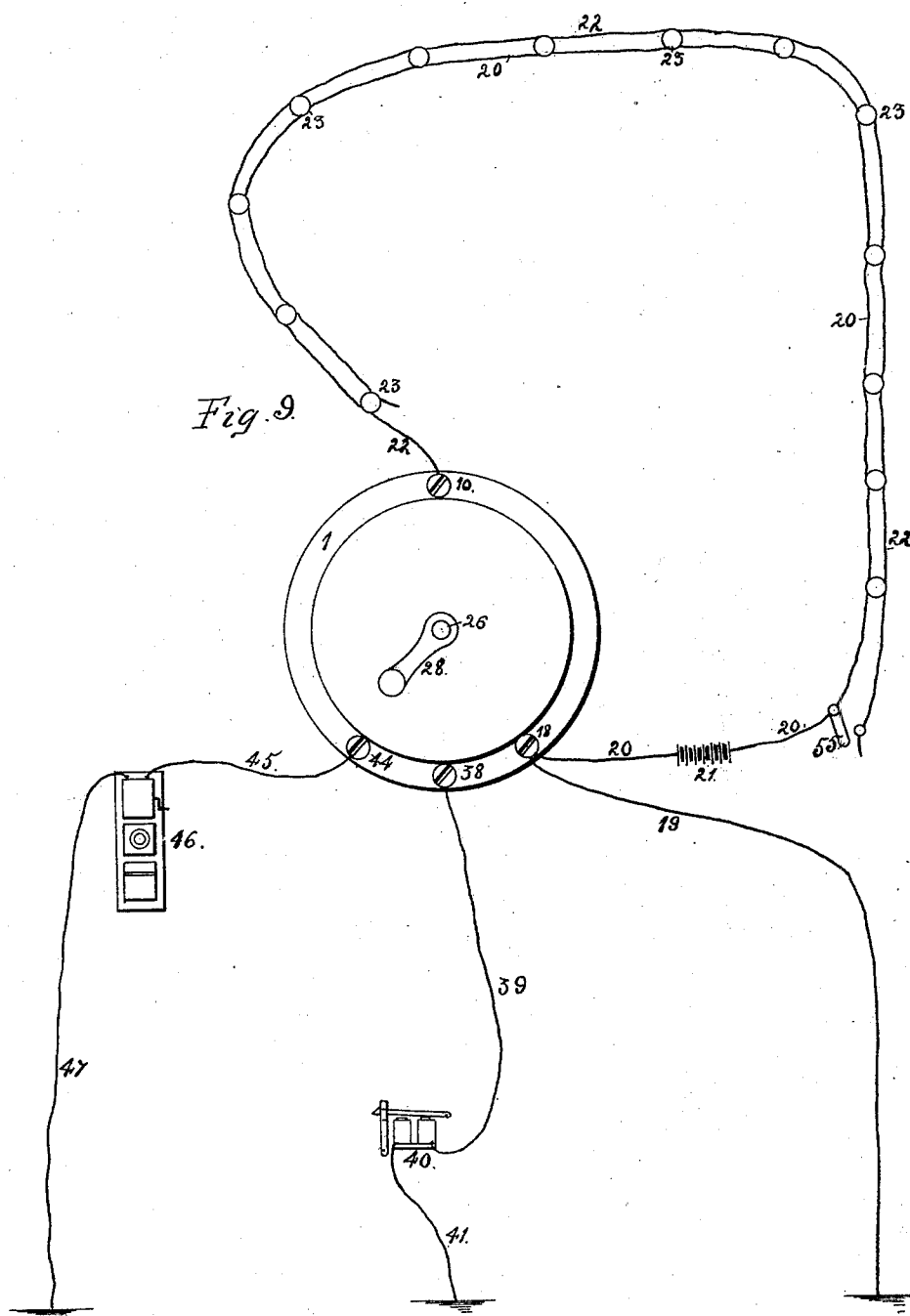
(No Model.)

3 Sheets—Sheet 2.

C. H. SHAFFER.  
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No. 460,287.

Patented Sept. 29, 1891.



Witnesses:  
J. A. Southworth.  
E. Behel.

Inventor:  
Charles H. Shaffer.  
By A. O. Beck  
Att'y.

(No Model.)

3 Sheets—Sheet 3.

C. H. SHAFFER.  
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Fig. 10.

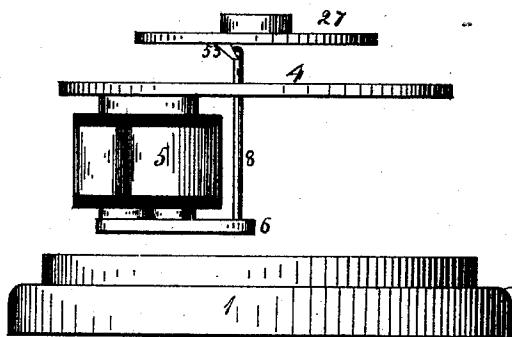


Fig. 11.

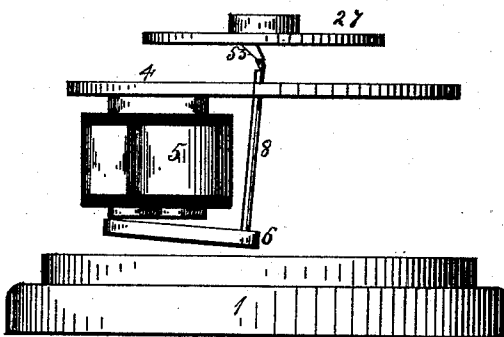


Fig. 12.

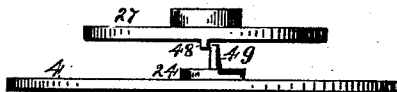


Fig. 13.

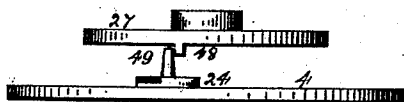
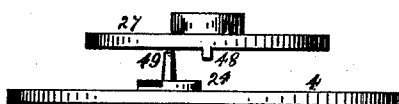


Fig. 14.



Witnesses:  
L. L. Miller  
E. Behel.

Inventor:  
Charles H. Shaffer  
By A. O. Behel  
attys.

# UNITED STATES PATENT OFFICE.

CHARLES H. SHAFFER, OF ROCKFORD, ILLINOIS, ASSIGNOR TO THE ELECTRIC ALARM COMPANY, OF MUSKEGON, MICHIGAN.

## ELECTRIC ALARM.

SPECIFICATION forming part of Letters Patent No. 460,287, dated September 29, 1891.

Application filed June 20, 1890. Serial No. 356,063. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. SHAFFER, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Combined Alarm and Telephone Circuits, of which the following is a specification.

The object of this invention is to construct a box, to which is attached the line-wires of any open-circuit alarm system, also a wire running to the central telephone-station and a wire running to the subscriber's telephone, whereby, upon the closing of the alarm-circuit, the mechanism of the box will be set in position, which will automatically cut out the subscriber's telephone, transfer the battery force onto the main telephone-line, and transmit an alarm to the central telephone-station, and upon the completion of the signal the main line will be restored to its normal condition and the thermostat-circuit broken.

In the accompanying drawings, Figure 1 is a face view of the box containing my improvements. Fig. 2 is a similar view, but in which the disk 27 has been removed to more clearly show the location of the various parts of the box. Fig. 3 is a side elevation of the box with the outer casing in section, which shows the position of the clock-work-releasing electro-magnets and their armature. Fig. 4 is a rear face view of the box, showing the train of gearing, electro-magnets, armature, and the connection between the train of gearing and armature for holding the clock-work wound up. Fig. 5 is an under face view of the plate 27. Fig. 6 is a face view of a portion of the box to which the telephone-line wire and wire leading to the subscriber's telephone are connected. Fig. 7 is also a face view of a portion of the box with which the thermostat-line has a connection. Fig. 8 is a side elevation of a portion of the box, which shows the contact-points, which are closed when the box is in its normal position, and which are automatically separated when the box has turned in its signal, thereby breaking the thermostat-line. Fig. 9 shows the application of my improved box and the connection of the thermostat, main, and subscriber's lines thereto.

Fig. 10 is an elevation of a portion of the box in which the armature is held up or in engagement with the electro-magnet. Fig. 11 is also a partial elevation showing the manner in which the armature is reset. Fig. 12 is a view showing the pivotal arm 24, in which the stud 48 engages the stud 49, which position the parts occupy when the box is run down. Fig. 13 is a view of the same parts as shown at Fig. 12, but in which the parts occupy their positions therein shown when the box is wound up. Fig. 14 is a similar view of Figs. 12 and 13, but in which the stud 48 has retracted after placing the arm 24 in position and the box is wound up ready to be released.

In cities where a telephone system is in operation and in which a separate line runs from the central station to each subscriber it is my object to attach a thermostat-line which may be extended through the building in which the subscriber's telephone is located or any other building which the subscriber is desirous of protecting from fire and by the use of the subscriber's telephone-line to automatically notify the central telephone-station should a fire occur in the building in which a thermostat-circuit is located, when the central station will immediately notify the various fire departments that there is a fire at the buildings of the telephone-subscriber, thereby utilizing a single line-wire for the purpose of a telephone and fire-alarm system, and after the completion of the fire-alarm the main line will be automatically restored, and the subscriber's telephone is cut out during the transmission of the signal.

The box which I have designed and constructed to accomplish the results above set forth consists of a base 1, of any suitable material, upon which is secured clock-work, which is regulated in its unwinding by an escapement device consisting of an escape-wheel 2 and pallet 3. Over this clock-work is placed a circular plate 4, and beneath this plate, but secured thereto, is located an electro-magnet 5, having an armature 6, pivoted to the support 7, depending from the under side of the circular plate. This armature has its free end turned inward, to which is secured a rod 8, which extends through the circular

plate, having its ends notched for a purpose to appear hereinafter. This armature is so located that the free end of the pallet-arm 9 will rest against it when the box is wound up, thereby preventing the running down of the box until the armature is raised. A binding-post 10 is connected to the base 1, from which a wire 11 connects with one coil of the electro-magnet. The other coil of the electro-magnet is connected by the wire 12 to the spring-plate 13, located on the upper surface of the circular plate. A plate 14 is located over the last-named plate, both of said plates insulated from each other and from the top plate. This upper plate is provided with an extension 15, which when the box is wound up is held in contact with the post 16, which is insulated from the main frame. This post is connected by a wire 17 to binding-post 18 and by wire 19 with the ground. From this post 18 extends a wire 20, in which is located an open-circuit battery 21. This wire forms one of the wires of the thermostat-line. The other wire 22 of the thermostat-line runs parallel with the wire 20 and is connected to binding-post 10. Open-circuit thermostats 23 of any known construction are located in the thermostat circuit. Thus far, as described, it will be seen that I have a metallic circuit through the thermostat line and box—that is, when the thermostat located in the thermostat-circuit is closed. The circuit, however, stands open by reason of the spring-plates 13 and 14 not touching. On the upper surface of the circular plate 4 is pivoted an arm 24, which is limited in its movements by a slot 25. On the upper surface of the free end of this arm is placed a block of insulating material, which, when this pivoted arm is in the position shown at Figs. 1, 2, and 3, will come in contact with the under surface of the spring-arm 13, thereby forcing the spring-arm in contact with the plate 14, located above it, which will hold the thermostat-circuit closed through the box.

To the center shaft 26 of the clock-work is secured a disk 27, and on the extreme outer end of the shaft is pinned a crank 28 for the purpose of winding the spring which operates the clock-work. On the upper face of this disk 27 are located two rollers 29, of insulating material, and which are free to rotate in their connection with the disk. When the box is wound up, this disk will stand in the position shown at Fig. 1, and one of these rollers will press against a spring-plate 30, having one end connected to the post 31, which is connected to but insulated from the circular plate 4. The free end of this spring-arm 30 has a block of insulating material attached thereto, which presses against the arm 15, thereby holding it in contact with the post 16. A metallic post 32 is connected to the circular plate and is located in close proximity to the free end of the arm 30. A wire 33 is connected to the post 31 and to the binding-post 10 for a purpose to appear hereinafter.

To the upper surface of this circular disk are connected posts 34 and 35, but insulated therefrom. To the post 35 is connected a short spring-arm 36, and a wire 37 connects the post with a binding-post 38, to which is connected a wire 39 which leads to a drop 40, located in the central telephone-station, and from the drop a wire 41 runs to the ground. From the post 34 extends a spring-arm 42, which overlaps the free end of the spring-arm 36. A wire 43 connects this post with a binding-post 44, which by wire 45 is connected to the subscriber's telephone 46, and from the telephone a wire 47 runs to the ground.

When the box is wound up, one of the insulating-rollers 29 will force the spring-arm 42 in contact with the spring-arm 36, thereby making a circuit through the box, subscriber's telephone, and central telephone-station.

From the under face of the disk 27 projects a stud 48, which will come in contact with a stud 49, rising from the upper face of the pivoted arm 24. A break-wheel 50 is connected to one shaft of the gearing of the clock-work, and a brush 51 engages the teeth of the break-wheel. A wire 52 connects this brush with the post 35. On the under side of the disk 27 is pivoted an arm 53, which is limited in its movements by a slot therein. The free end of this arm is inclined, and a spring 54 holds the arm in one end of the slot.

When the parts are in the position shown at Figs. 1, 2, 3, and 4 and the circuit-wires connected to the box, as shown at Fig. 9, the box is in position to transmit an alarm to the central telephone-station. It will, however, be seen that there is a circuit through the box from the subscriber's station to the central telephone-station, and the telephone is capable of use the same as though my improved box was not included in the circuit.

Should a fire occur in the building in which the thermostat-circuit is placed, the heat will close one or more of the open-circuit thermostats, which will cause the battery force to energize the electro-magnets, which will cause the armature to be raised. This movement of the armature will release the pallet-arm of the clock-movement, which will cause the various wheels of the clock-movement to revolve. It will be seen, however, that a metallic circuit is formed through the box and the thermostat-line at the instant the thermostat-circuit is closed. As the clock-works revolve the disk 27 will revolve. This movement of the disk will carry the arms 29 with it, one of said wheels will move from its engagement with the spring-arm 30, releasing 15, and thereby breaking or cutting out the resistance of the electro-magnet in the thermostat-circuit, and the spring-arm 30 will engage the pin 32, which has an electric connection with the frame-work of the box. At the same time the resistance of the electro-magnet is cut out the spring-plates 36 and 42 will be separated, thereby breaking the main

telephone-line. The circuit will then be from the battery through line 20 to the thermostat, which has been closed by the action of heat, through said thermostat to the wire 22 to binding-post 10, by wire 33 to post 31, by spring-plate 30 to post 32, through the clock-work to the break-wheel 50, through the brush 51 of the break-wheel, by wire 52 to post 35, and by wire 37 to post 38, thence by the main telephone-wire to the central telephone-station, and by wire 41 to ground, through the ground to wire 19 to binding-post 18, and by wire 20 to battery. Thus we have a closed circuit through the thermostat line and box to central telephone-station. By the unwinding of the clock-work the break-wheel will also be revolved and the brush 51 will engage the teeth of the break-wheel, thereby making and breaking the circuit, causing the armature of the drop located in the central telephone-station to be alternately attracted and released, corresponding to each tooth of the break of the break-wheel, which will also cause the drop in the central station to fall, notifying the operator that a fire is at the number indicated by the drop, and, owing to the peculiar signal given by the break-wheel, the operator will readily distinguish it from an ordinary telephone-call and will pay attention to said signal the instant it is turned in. This signal will continue until the disk 27 has made a complete revolution, when one of the wheels 29 will press the springs 36 and 42 in contact with each other, thereby restoring the original condition of the telephone-line. The other wheel will at the same time restore spring-arms 15 and 30 to their original position; but before this last restoration takes place the stud 48 on the under side of the disk 27 will engage the uprising stud 49 on the pivoted arm 24, and the continued movement of the disk will cause the arm to assume a position shown in dotted lines at Fig. 2 and solid lines at Fig. 8. The object of this movement is to break the thermostat-circuit, which is accomplished by the spring-arms 13 and 14 being separated when the arm 24 moves from engagement therewith, thereby saving battery power as the alarm has been completed, and no further use is required of the battery until the box is again wound up; but before the box is wound up the thermostat which has turned in the alarm must be repaired. Near the finish of the rotation of the disk 27 the free end of the pivoted plate 53 will engage the notched end of the rod 8, connected to the armature and projecting through the circular plate 4, which will hold the armature in contact with the electro-magnets. After the thermostat-line has been repaired by means of the handle 28 the clock-work is wound up and the disk 27 will make one revolution, which will restore the arm 24 and close the thermostat-circuit through the electro-magnets and will cause the inclined face of the arm 53 to engage the free end of the armature-rod 8, which will force the armature

from its engagement with the electro-magnets, and upon the releasing of the handle the recoil of the disk 27 will allow this plate to move out of engagement with the armature-rod, but not until the plate-rod 9 rests against the armature, which will prevent the clock-work running down until the armature is raised by the closing of the thermostat-circuit.

At 55 I have shown a switch which may be used in connection with or in place of the open-circuit thermostats, which when closed will accomplish the same result as the thermostats.

I claim as my invention—

1. The combination of an alarm-circuit, a battery, a telephone-line connecting a subscriber's telephone with the central telephone-station, a signal-box having connections with the alarm-circuit and telephone-line, a device for forming a communication between the alarm-circuit and central telephone-station, and means controlled by the box for operating the device when the box is released by a sufficient change in the alarm-circuit.

2. The combination of an alarm-circuit, a battery, a telephone-line connecting a subscriber's telephone with the central telephone-station, a signal-box having connections with the alarm-circuit and telephone-line, a device for cutting out the subscriber's telephone, and means controlled by the box for operating said device and forming a communication between the alarm-circuit and central telephone-station when the box is released by a sufficient change in the alarm-circuit.

3. The combination of an alarm-circuit, a battery, a telephone-line connecting a subscriber's telephone with the central telephone-station, a signal-box having connections with the alarm-circuit and telephone-line, devices for forming a connection between the alarm-circuit and central telephone-station and forming a ground for the alarm-circuit, and means controlled by the box for operating said devices when the box is released by a sufficient change in the alarm-circuit.

4. The combination of an alarm-circuit, a battery, a telephone-line connecting a subscriber's telephone with the central telephone-station, an annunciator-drop located at the central station, a signal-box having connections with the alarm-circuit and telephone-line, a device for forming a communication between the alarm-circuit and central telephone-station, and means controlled by the box for operating the device when the box is released by a sufficient change in the alarm-circuit.

5. A signal-box consisting of suitable gearing, an electro-magnet, an armature for the electro-magnet, a telephone-line passing through the box, an alarm-wire passing through the box, a rotatable disk carrying wheels which when in their normal positions hold the telephone-line and alarm-wire intact, and a movable part holding the electro-magnet in the alarm-circuit, and a circuit-break-

ing wheel which will transmit its signal over the telephone-line.

6. A signal-box consisting of suitable gearing, an electro-magnet, an armature preventing the starting of the box and permitting the  
5 starting of the box when attracted by the electro-magnet, a portion of the mechanism

of the box made movable for freeing the armature from its engagement with the electro-magnet upon the rewinding of the box.

CHARLES H. SHAFFER.

Witnesses:

F. L. MORGAN,

A. O. BEHEL.