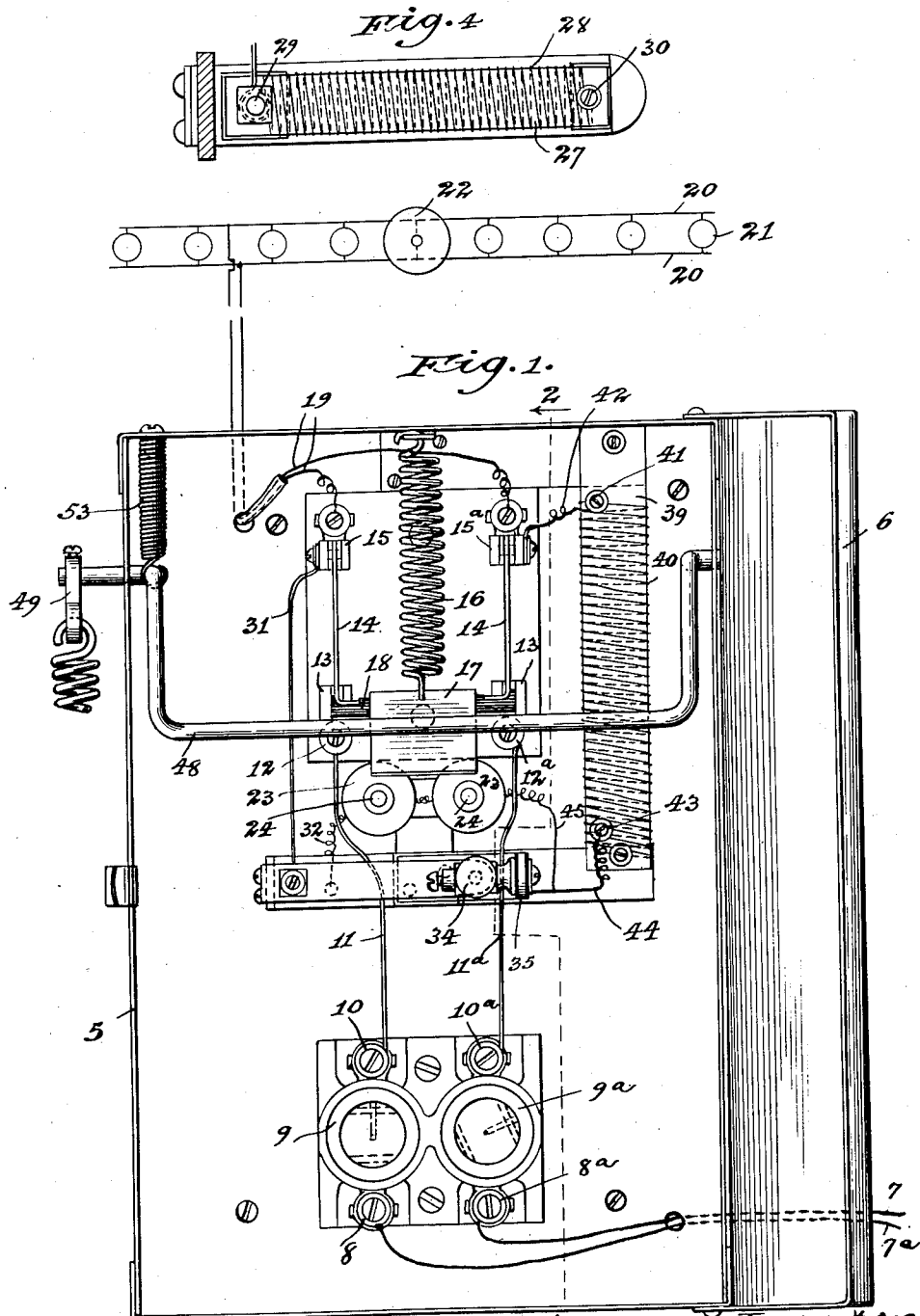


R. M. MILLAR.
AUTOMATIC SIGNAL.
APPLICATION FILED APR. 22, 1912.

Patented Dec. 10, 1912.

2 SHEETS-SHEET 1.

1,046,626.



Witnesses,

S. N. Pond

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Inventor,

Robert M. Millar.

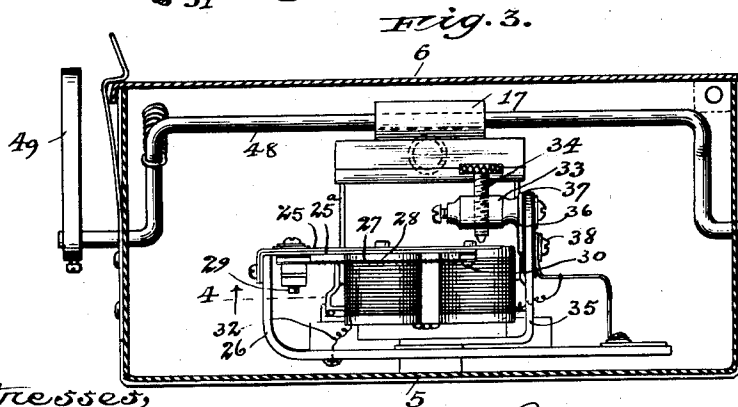
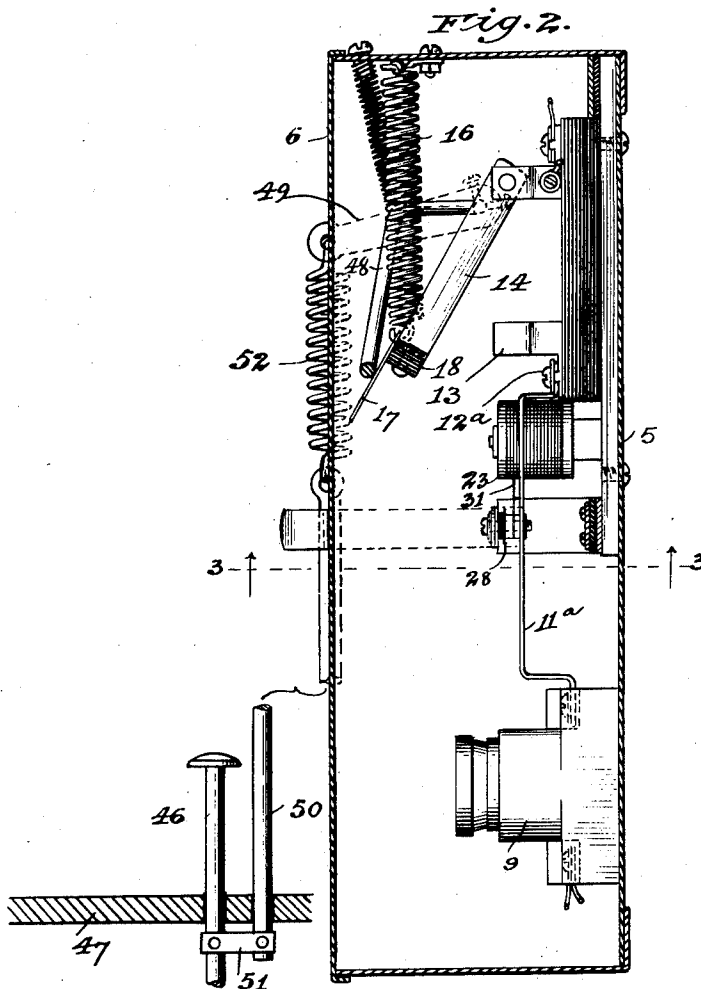
By Atfield, Towle, & Grant Attorneys.

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Witnesses,
S. Mann

Inventor,
 Robert M. Millar

S. N. Pond, By *Offield, Towle, Yeaves Offield* Attys.

UNITED STATES PATENT OFFICE.

ROBERT M. MILLAR, OF CHICAGO, ILLINOIS.

AUTOMATIC SIGNAL.

1,046,626.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed April 22, 1912. Serial No. 692,356.

To all whom it may concern:

Be it known that I, ROBERT M. MILLAR, a subject of the King of Great Britain, now residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Signals, of which the following is a specification.

While my invention is capable of being used for all signaling purposes, it has, however, been primarily constructed for giving either an audible or visible signal adjacent the doorway of fire stations, for the purpose of warning persons outside of the fire station that the fire apparatus is about to come out of the station.

Many accidents have occurred by the fire engines and other apparatus dashing out of the fire station and striking either pedestrians or vehicles immediately in front of the station. I am aware that signals have been provided which will begin to sound the alarm when the doors of the station are opened, but in the event that the signal is not turned off, it is of common occurrence for such signals to ring for a long period of time, due to the fact that there are no automatic means for cutting them off after all the occupants of the station have left.

The primary object of my invention, therefore, is to provide an automatic signaling device, whereby an alarm will be given at the instant the doors of the station are opened and will continue to signal for a sufficient period of time to allow all of the apparatus to vacate the barn and which will then automatically shut off. While the length of time that the signal may ring is a matter that may be provided for when constructing the apparatus, it is the rule in substantially all fire stations that the fire apparatus shall all be out of the station within sixty seconds from the time that the alarm is sounded in the station and I therefore so construct my present device that it will continue to signal for a period of four minutes. It is essential in signaling apparatus and particularly for the uses just described, that it shall be positive in its operation; that it shall be free from mechanical difficulties so as to give long use without attention; that it shall operate in any position in which it may be placed and that it will not be affected to any great extent by atmospheric changes.

To the foregoing ends I have devised a

signaling apparatus shown in the accompanying drawing, in which—

Figure 1 is a front view of my improved apparatus; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a section on the line 3—3 of Fig. 2; Fig. 4 is an enlarged detail view of the thermostat element taken on the line 4 of Fig. 3.

Referring now more particularly to the drawings, the casing 5, having a cover 6 capable of being locked, is designed to contain the following mechanism: The electrical conductors 7 and 7^a are connected at one end to a suitable source of supply of electrical energy and secured at their other ends to the terminals 8 and 8^a of suitable fuse plugs 9 and 9^a interposed between the terminals 8 and 8^a and 10 and 10^a. Conductors 11 and 11^a lead from the terminals 10 and 10^a to the terminals 12 and 12^a, the latter of which are connected to and form a part of the switch jaws 13. A knife switch 14 which is pivoted to the terminals 15 and 15^a is normally held away from the jaws 13 by a spring 16 secured at one end to the plate or armature 17 that is fastened to the bar 18 and to which bar the side members of the knife switch 14 are secured. The spring 16 is secured at its other end to the casing 5 or any other suitable point. The electrical conductors 19 lead from the terminals 15 and 15^a to the conductors 20 having a number of lamps 21 and a bell 22 arranged in circuit and comprising the signaling device. It is obvious that either the lamps or the bell may be employed independently or together, as herein shown. The electro-magnets 23 are so arranged relative to the plate or armature 17 that said plate will be forced in contact with the core 24 of the magnets when the switch is thrown into closed position and the circuit completed, as when the side members thereof are in contact with the jaws 13.

One feature of my invention resides in the thermostat member by means of which the electrical circuit is short-circuited, thereby cutting off the magnetic influence of the magnets upon the plate 17, thus allowing the spring 16 to pull the movable part of the switch 14 from the jaws 13 and thereby open the circuit. This thermostat element consists, in the preferred form, of two sections of metal 25 and 25^a, which are similar in shape and have different co-efficients of expansion. In the preferred form I preferably make the section 25 of steel and the

section 25^a of brass and secure both sections firmly to the plate 26.

Arranged adjacent the thermostat member is a heating element herein shown (Fig. 4) as consisting of a strip of mica 27 having a resistance wire 28 coiled thereabout, one end of which is connected to the terminal 29 and the other end to the terminal 30, the former terminal being insulated from the thermostat member. A suitable electrical conductor 31 connects the jaw 15 with the terminal 29 while the electro-magnet 23 is connected with the plate 26 by the conductor 32; it being of course understood that the heating element is not insulated from the plate 26. Arranged adjacent the free end of the thermostat element is the post 33 carrying the contact set-screw 34, said post being mounted upon a bracket 35, which is insulated both from the post 33 and the bar 26. A plate 36 is interposed between the insulation 37 and the post 33 and held in place at one end by the terminal 38 which is insulated from the bracket 35 but not from the plate 36.

It is desirable to have a resistance element interposed in the circuit and to these ends I secure a strip of mica 39 at any suitable point within the casing and about which is coiled the resistance element 40, one end of which is connected to the terminal 41 to which terminal the conductor 42 leads from the jaw 15^a. The other end of the resistance element 40 is connected to the terminal 43, which terminal is in turn connected to the terminal 38 by means of the conductor 44. A conductor 45 also leads from one of the electro-magnets 24 to the conductor 44.

It is customary in fire stations to throw open the station doors as soon as an alarm is received, which is generally done by the person answering the alarm call, whose duty it is to throw a lever to operate the doors. In the accompanying drawing I have shown such a lever 46 operating through the floor 47 and it is my intention to so connect my signaling device with the lever 46 as to set my signaling device in operation simultaneous with the throwing open of the doors. This I accomplish as follows: A bail 48 is pivoted in the side walls of the casing 5 to one end of which a lever 49 is connected. A rod 50 is connected to the lever 46 by means of the link 51 which is pivoted to both the rod 50 and the lever 46 and I preferably interpose a spring 52 between one end of the rod 50 and the lever 49, thereby providing a flexible connection. I deem it also desirable to secure a spring 53 to the bail 48 at one end and to any other suitable point at its other end for returning the bail to its normal position as shown in Fig. 2.

The operation of the device is as follows: When an alarm is turned in at the fire station the person receiving the alarm throws

the lever 46 which opens the doors and the movement of such lever moves the rod 50 downwardly, thereby causing the bail 48 to engage the plate 17 and forcing the movable part of the switch 14 into the jaws 15. The electrical circuit is thus established by the closing of the switch and the magnetic influence of the magnets 23 upon the plate 17 holds the switch in its closed position. The bail returns to its normal position. The electrical energy from the main conductors 7 and 7^a is thus passing through the circuit operating the lights 21 and the bell 22 if desired, it being of course understood that either the lights or the bell, or both, are outside of the station door. The electrical energy in the meantime is passing through the heating element adjacent the thermostat and as the co-efficients of expansion of the two metals comprising the thermostat are different and as the two metals are secured together so that one cannot move longitudinally relative to the other, and as the expansion of the part 25^a is more rapid than the part 25, it is obvious that both members will warp since they do not expand equally longitudinally.

As I have before stated, it is the custom for all the apparatus to be out of the station within sixty seconds from the time that the alarm is sounded, and since there may possibly be some delay, I have allowed a period of four minutes to elapse before the signaling is discontinued, but I desire it understood that the period during which the alarm operates may be varied by so proportioning my heating element or thermostat member as to make it warp to greater or less extents in shorter or longer periods of time as may be desired. In approximately four minutes, however, from the time that the circuit is closed the heating element will heat the thermostat member sufficiently causing it to warp until it comes in contact with the adjusting contact screw 34 which causes a short circuiting of the magnets, thus cutting off their magnetic influence upon the plate 17, whereupon the spring pulls the movable part of the switch 14 from the jaws 15, opening the circuit and discontinuing the alarm. It is also possible to regulate the period during which the alarm may ring by means of the set-screw 34, since by moving it away from the end of the thermostat member the alarm will operate for a greater period of time than when the end of said screw is only a very small fraction of an inch from the end of the thermostat member, in which case a slight warping of the thermostat member will cause a short circuit.

I do not wish it to be understood that I am limited to the particular details of construction herein shown, as it is obvious that there may be many modifications without

departing from the general broad spirit of my invention.

Therefore, without confining myself to such details as would obviously come within the province of the invention, I claim:

1. In electric signaling, the combination of switch blades adapted for mechanical actuation, means tending to resist closure of said blades and to effect opening thereof, a source of current, a signaling circuit connection including signaling devices, holding electro-magnet mechanism for said switch blades and a circuit connection therefor, said switch blades connecting both circuit connections with said source upon closure of the switch blades whereby said electro-magnet mechanism becomes effective to hold the switch blades in circuit closing position, a thermostat device connected in circuit with said source upon closure of said switch blades and a disabling circuit for said electro-magnet mechanism closed by said thermostat device upon current flow there-through of predetermined duration whereby said electro-magnet mechanism will release the switch blade to open all circuit connections with said source.

2. In electric signaling, the combination of a main switch, means tending to resist closure of said switch and to effect opening thereof, a source of current, a signaling circuit connection including signaling devices, holding electro-magnet mechanism for said switch and a circuit connection therefor, closure of said switch connecting said source with both circuit connections whereby said signaling devices are operated and said switch held in closed position by the electro-magnet mechanism, a thermostat device having a winding included serially in the electro-magnet mechanism connection and a short circuit for said electro-magnet mechanism closed after a predetermined interval of current flow through said winding to disable said electro-magnet mechanism whereupon said switch is released and opened and all circuit connections disconnected from said source.

3. In electric signaling, the combination of a main switch having switch blades and switch contacts, an armature carried by said switch blades, an electromagnet and a circuit connection therefor with switch contacts of said switch, a signaling circuit connection with switch contacts including signaling devices, a source of current connected with switch contacts, closure of said switch causing connection of said source with both circuit connections whereby said signaling devices are operated and said electro-magnet energized to hold the switch closed, a thermostat device having a winding included in the electro-magnet circuit, and a disabling circuit for said electro-magnet closed after a predetermined interval of current flow through said winding whereupon said switch is released from said electro-magnet, and means for opening said switch after such release.

4. In electric signaling, the combination of a main switch, means for mechanically actuating closing of said switch from a distance, means tending to resist closure of said switch and to effect opening thereof, a holding electro-magnet for said switch, a current connection with said switch for said electro-magnet, a signaling circuit connection including signaling devices, a source of current, said switch when closed connecting said source with both circuit connections whereby said signaling devices are operated and said electro-magnet energized to hold the switch in closed position, a thermostat device having a winding connected with said switch to receive current flow upon current flow from said switch, a disabling circuit for the electro-magnet closed after a predetermined interval of current flow whereupon said switch is released by the electro-magnet and opened to disconnect the source of current flow from the various circuit connections.

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Witnesses:

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