

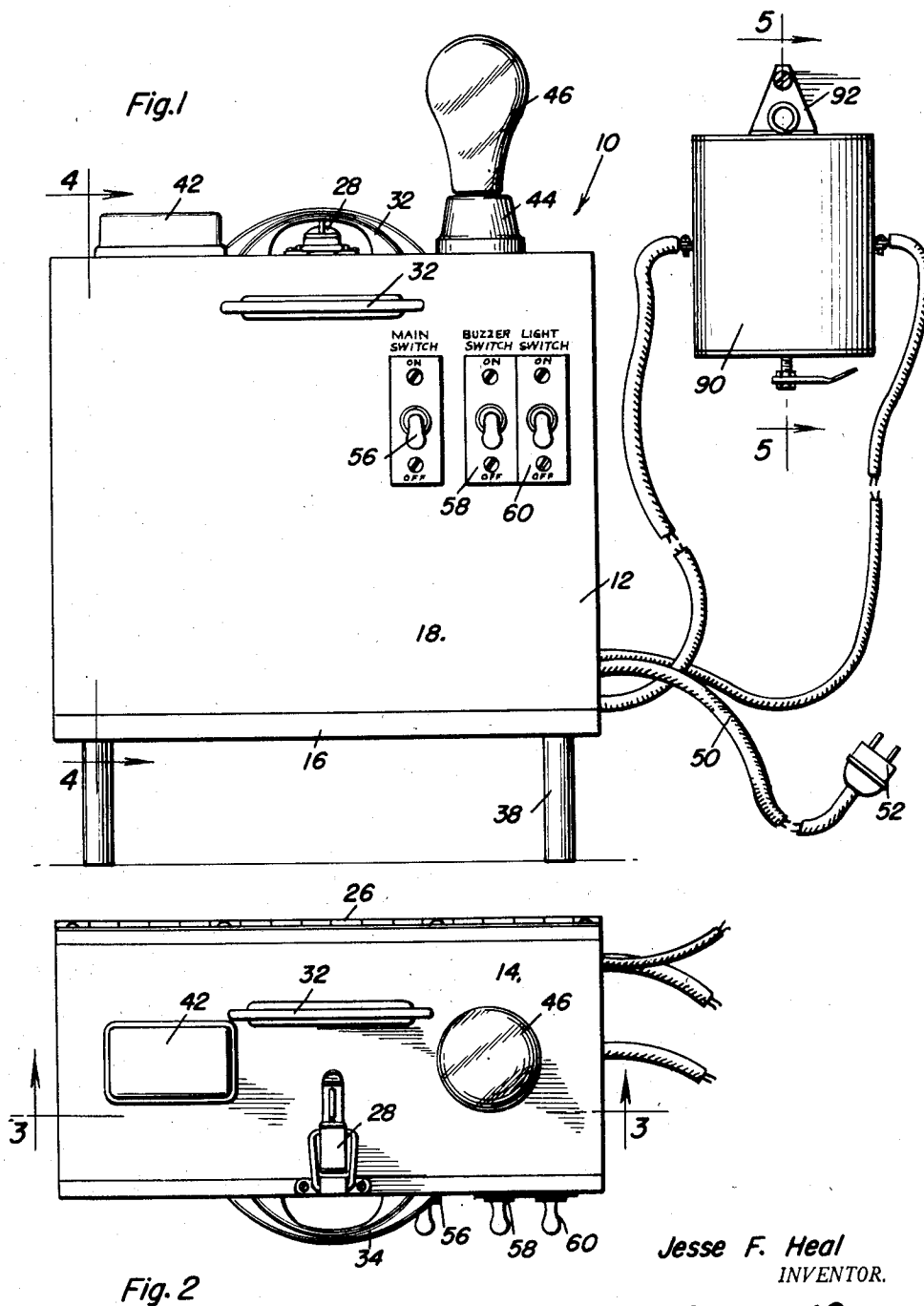
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J. F. HEAL
AUTOMATIC FIRE ALARM

2,870,296

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3 Sheets-Sheet 1



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3 Sheets-Sheet 2

Fig. 3

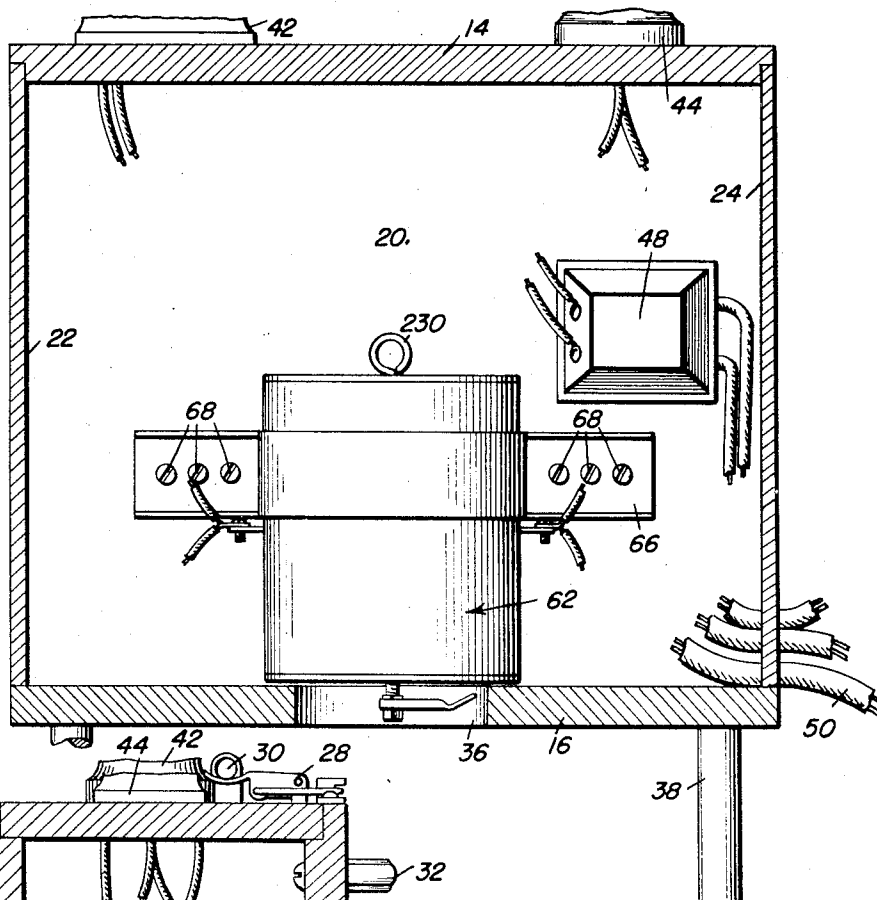
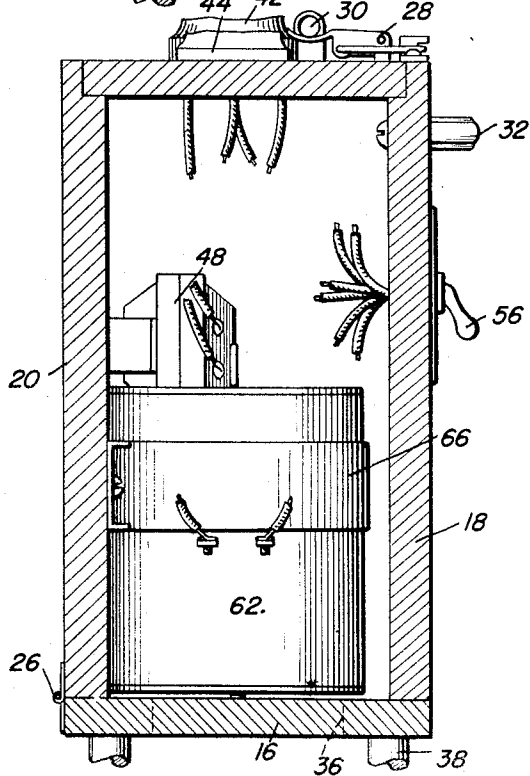


Fig. 4



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3 Sheets-Sheet 3

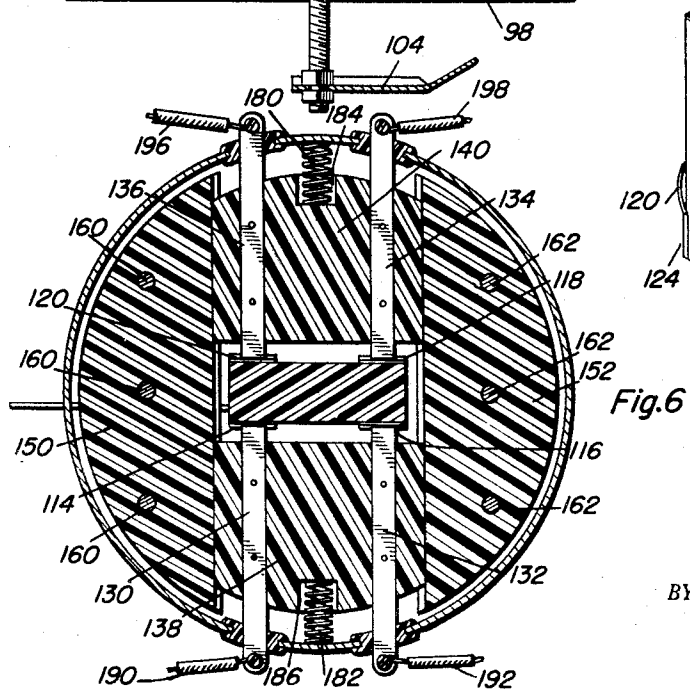
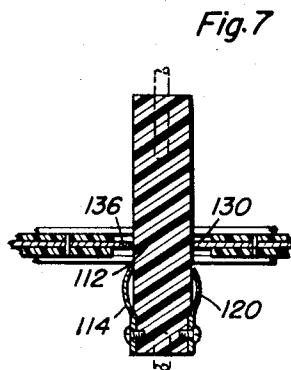
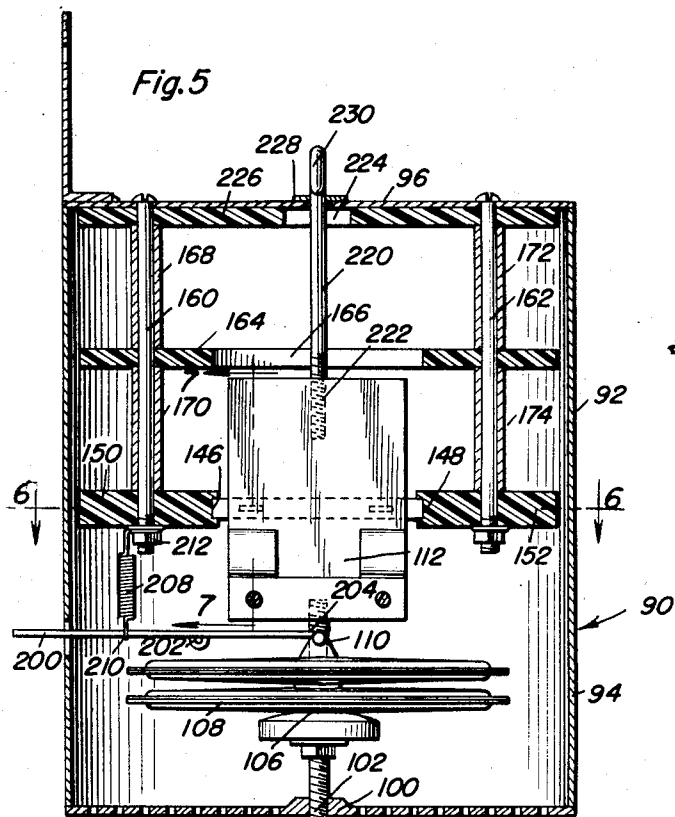
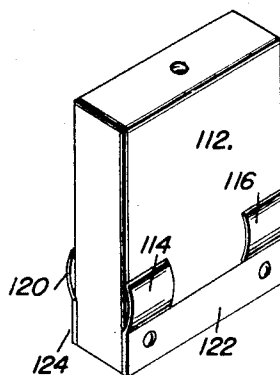


Fig. 8



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1

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AUTOMATIC FIRE ALARM

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7 Claims. (Cl. 200—140)

This invention relates to an automatic fire alarm and more particularly to novel actuation devices adapted to be used in conjunction with audible and visual signal means as well as a supply circuit controlled by suitable switches whereby a home or the premises of other types of buildings may be readily and easily protected against fire.

The concept of this invention features the use of a novel actuation device for automatically actuating the visual and audible signal devices, or the like with the actuation devices being responsive to the presence of heat and being located remote from the signalling device or mounted within a casing on which the signalling devices are secured.

Another object of the present invention resides in the provision of an actuation device for an automatic fire alarm that is simple in construction, which employs the use of bellows for actuating a contact block carrying contacts engageable with contact strips carried by slides which normally are urged into engagement with the contact block to complete operative electrical circuits from a source of electrical power to audible and visual signal devices.

Still further objects and features of this invention reside in the provision of an automatic fire alarm that is simple in construction, inexpensive to manufacture, substantially foolproof in operation, yet which may be arranged so as to be portable from one location to another as desired.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this automatic fire alarm, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is a side elevational view of an automatic fire alarm constructed in accordance with the concepts of the present invention;

Figure 2 is a plan view of the invention;

Figure 3 is a vertical sectional view as taken along the plane of line 3—3 of Figure 2 illustrating in particular the manner of mounting and location of the actuation device which is located within the casing;

Figure 4 is a transverse sectional view as taken along the plane of line 4—4 of Figure 1;

Figure 5 is an enlarged sectional detail view as taken along the plane of line 5—5 in Figure 1 illustrating in particular the construction of one of the actuation devices;

Figure 6 is a horizontal sectional view as taken along the plane of line 6—6 of Figure 5 illustrating in particular the construction of the guides and slides mounted therein.

Figure 7 is a sectional detail view as taken along the plane of line 7—7 in Figure 5 illustrating the relative position of the contact strips and the contacts on the contact block; and

Figure 8 is a perspective view of the contact block.

2

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 generally designates the automatic fire alarm comprising the present invention. This fire alarm includes a casing 12 of any suitable design which may be provided with top 14, bottom 16, front 18, back 20, and sides 22 and 24. The front and bottom may be hinged as at 26 to the back 20 and a latch 28 provided with means 30 for enabling a lock to be used for locking the device to hold the casing in a closed position. Handles as at 32 and 34 may be provided for the casing 12. The casing is provided with an opening 36 in the bottom thereof and may be mounted on legs as at 38 as desired. Mounted on the casing and secured to the top is an audible alarm in the form of a buzzer or bell as indicated at 42 as well as an electric lamp socket 44 in which an electric lamp 46 may be positioned. A transformer 48 is mounted in the casing 12 and a cable 50 having a plug 52 is connected to the transformer for connection to a suitable source of electrical current. Mounted on the front 18 of the casing 12 are switches 56, 58 and 60 in the form of toggle switch, the switch 56 controlling flow of electrical power to the transformer 48, the switch 58 controlling the circuit to the buzzer 42, while the switch 60 controls the circuit to the lamp 46. Circuits will be completed to the signal devices 42 and 46 should the actuating device as indicated at 62 mounted in the casing 12 in alignment with the opening 36 be actuated and in a circuit closed position. The actuation device 62 is mounted in place by a suitable bracket 66 and held in position by fasteners as at 68. Conductors from the transformers 48 are connected to the actuation device 62 before they are connected to the buzzer 42 whereby the actuation device 62 controls an operative electrical circuit through the transformer 48 to the buzzer 42. The circuit to lamp 46 is directly controlled by actuation of device 62 through leads 190 and 192 or 196 and 198.

In addition to the actuation device 62 other actuation devices 90 of similar construction are provided and the only difference between the actuation device 62 and the actuation device 90 is that in lieu of the bracket 66 which secures the actuation device in the casing 12, there is provided a bracket 92 for supporting the actuation device 90 in a position remote from the casing 12. It is to be understood that any number of the actuation devices 90 may be employed and that these devices are connected in parallel circuits between the source of electrical power such as the transformer 48 and the signal devices 42 and 46 so that upon operation of any of the actuation devices 90 or the actuation device 62, the signal devices 42 and 46 will be excited.

The actuation device 62 as well as the actuation devices are therefore of similar construction which can be best seen in Figure 5 wherein the actuation device 90 is shown in detail. Referring now more particularly to Figures 5 through 8, it will be seen that the actuation device 90 includes a housing 92 of substantially cylindrical shape having cylindrical side walls 94, a top 96 and a perforated bottom 98 having an internally threaded boss 100 in which a threaded adjustment member 102 is engaged having a handle 104 outwardly of the housing 92 whereby the adjustment member 102 may be readily rotated. The rotation of the adjusting member 102 will cause the adjusting member to advance or retract carrying the convex surface cap forming an engaging member 106 towards away from the perforated bottom 98 and thereby raising or lowering the bellows 108 which the engaging member 106 engages. The bellows 108 are pivotally connected as at 110 to a contact block 112. This contact block whose construction can be best seen

in Figures 7 and 8 is formed of an insulative material and has secured thereto pairs of contacts 114, 116, 118, and 120.

The contacts 114 and 116 are centered as at 122 as are the contacts 118 and 120 which are synchronized at 124. The contacts 114, 116, 118 and 120 are arcuate in shape and are resilient and are adapted to be engaged by contact strips 130, 132, 134, and 136. The contact strips 130 and 132 are embedded in an insulative plastic slide 138 while the contact strips 134 and 136 are embedded in slide 140 of similar construction to the slide 138. The slides 138 and 140 slide within the grooves 146 and 148 formed in guides 150 and 152 which guides are constructed from an insulative plastic material and which are suspended from the top 96 by means of tie rods as at 160 and 162 which tie rods pass through a spacer guide 164 having an aperture 166 therethrough through which the contact block 112 may pass with spaces of a tubular construction as indicated at 168, 170, 172, and 174 being disposed about the tie rods 160 and 162 respectively. The contact strips are normally urged into engagement with the contact block 112 by means of coil springs 180 and 182 which seat within recesses 184 and 186 in the slides 140 and 138 respectively and urge the slides 140 and 138 toward the block 112 along the grooves 146 and 148, the springs also engaging the cylindrical walls 94 of the housing 90. The contact strips have terminals whereby when conductors 190 and 192 are connected to an operative electrical circuit, when the contact strips 130 and 132 engage the contacts 114 and 116 respectively an operative electrical circuit may be completed. Likewise, conductors 196 and 198 are provided for completing other operative electrical circuits.

In order to test the device, there is provided a lever 200 which is pivoted as at 202 on a fulcrum within the housing 90 and which is attached as at 204 to the connection between the bellows 108 and the contact block 112. A spring 208 is terminally connected as at 210 to the lever and to one of the tie rods 160 as at 212 whereby the lever 200 is normally urged into a lowered position and normally urging the bellows 108 into engagement with the contact surface 106. However, should the lever 200 be depressed, it will raise the contact block so that the contacts mounted thereon engage the contact strips. In addition, a further test device is provided which includes rod 220 which is threadedly engaged in the contact block 112 as at 222 and which extends through an aperture 224 in the upper insulative plate 226 attached to the top of the housing. A stop 228 is carried by the rod 220 which terminates in an eye 230 which provides an enlarged stopping surface for limiting the position of the rod 220 and of the contact block 112 while also providing means whereby the rod 200 may be grasped more easily to raise the contact block 112.

In operation, the handle 104 is rotated until bellows 108 is set for operation at a specific temperature. The heat passing through the apertures 98 into the housing 90 will cause the bellows 108 to expand raising the contact block 112 and causing a bridging of the contact strips whereby operative electrical circuits to the signal devices such as the audible and visual signals are completed.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. For use in a fire alarm an actuation device automatically responsive to the presence of heat comprising a housing, a contact block having contacts thereon, a bellows in said housing pivotally connected to said contact block, contact strips mounted in said housing, said con-

tact strips being engageable by said contacts, and an adjusting member threadedly engaged in said housing engaging said bellows to position said bellows, a pair of spaced guide blocks in said housing, slides slidably engaged in said guide blocks, said slides carrying said contact strips.

2. For use in a fire alarm, an actuation device automatically responsive to the presence of heat comprising a housing, a contact block having contacts thereon, a bellows in said housing pivotally connected to said contact block, contact strips mounted in said housing, said contact strips being engageable by said contacts, and an adjusting member threadedly engaged in said housing engaging said bellows to position said bellows, a pair of spaced guide blocks in said housing, slides slidably engaged in said guide blocks, said slides carrying said contact strips, springs engaging said slides and said housing urging said slides towards said contact block.

3. For use in a fire alarm, an actuation device automatically responsive to the presence of heat comprising a housing, a contact block having contacts thereon, a bellows in said housing pivotally connected to said contact block, contact strips mounted in said housing, said contact strips being engageable by said contacts, and an adjusting member threadedly engaged in said housing engaging said bellows to position said bellows, a pair of spaced guide blocks in said housing, slides slidably engaged in said guide blocks, said slides carrying said contact strips, said contact block, said guide blocks and slides being formed of an electrically insulative material, said contact strips being embedded in said slides.

4. For use in a fire alarm, an actuation device automatically responsive to the presence of heat comprising a housing, a contact block having contacts thereon, a bellows in said housing pivotally connected to said contact block, contact strips mounted in said housing, said contact strips being engageable by said contacts, and an adjusting member threadedly engaged in said housing engaging said bellows to position said bellows, a pair of spaced guide blocks in said housing, slides slidably engaged in said guide blocks, said slides carrying said contact strips, said contact block, said guide blocks and slides being formed of an electrically insulative material, said contact strips being embedded in said slides, springs engaging said slides and said housing urging said slides toward said contact block.

5. For use in a fire alarm, an actuation device automatically responsive to the presence of heat comprising a housing, a contact block having contacts thereon, a bellows in said housing pivotally connected to said contact block, contact strips mounted in said housing, said contact strips being engageable by said contacts, and an adjusting member threadedly engaged in said housing engaging said bellows to position said bellows, a rod secured to said contact block extending upwardly therefrom and outwardly through said casing, and stop means on said rod for limiting the position of said contact block.

6. For use in a fire alarm, an actuation device automatically responsive to the presence of heat comprising a housing, a contact block having contacts thereon, a bellows in said housing pivotally connected to said contact block, contact strips mounted in said housing, said contact strips being engageable by said contacts, and an adjusting member threadedly engaged in said housing engaging said bellows to position said bellows, a lever extending outwardly of said housing and having an end connected to said contact block, spring means in said housing normally urging said contact block to a lowered position, and a fulcrum for said lever in said housing.

7. For use in a fire alarm, an actuation device automatically responsive to the presence of heat comprising a housing, a contact block having contacts thereon, a bellows in said housing pivotally connected to said contact block, contact strips mounted in said housing, said contact strips being engageable by said contacts, and an

5

adjusting member threadedly engaged in said housing engaging said bellows to position said bellows, a pair of spaced guide blocks in said housing, slides slidably engaged in said guide blocks, said slides carrying said contact strips, said contact block, said guide blocks and slides being formed of an electrically insulative material, said contact strips being embedded in said slides, springs engaging said slides and said housing urging said slides towards said contact block, a rod secured to said contact block extending upwardly therefrom and outwardly through said casing, and stop means on said rod for limiting the position of said contact block, a lever extending

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6

outwardly of said housing and having an end connected to said contact block, spring means in said housing normally urging said contact block to a lowered position, and a fulcrum for said lever in said housing.

References Cited in the file of this patent

UNITED STATES PATENTS

2,247,277	Cid	June 24, 1941
2,406,443	Stein	Aug. 27, 1946
2,658,968	Janos	Nov. 10, 1953
2,755,361	Hertan	July 17, 1956