

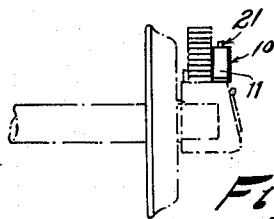
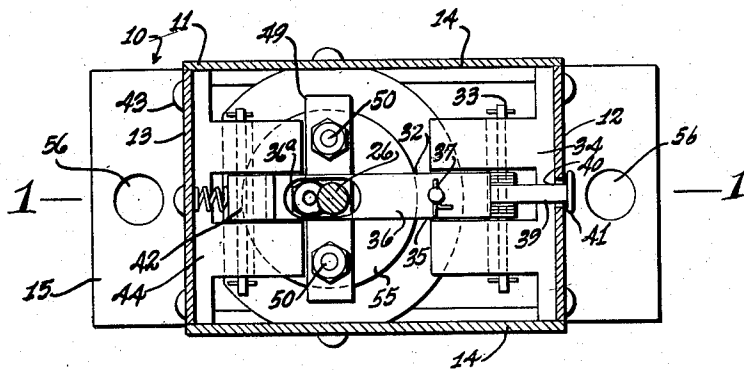
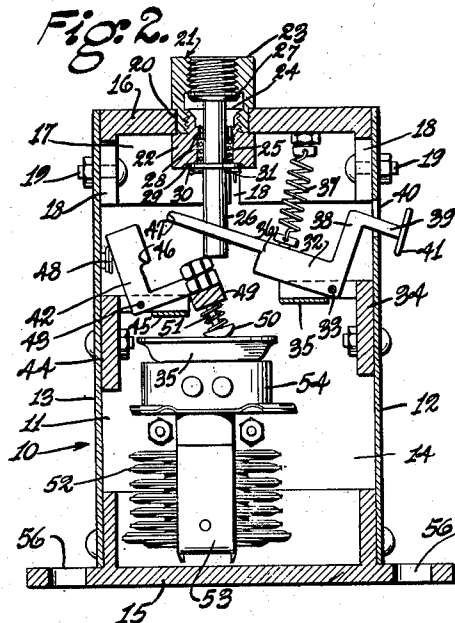
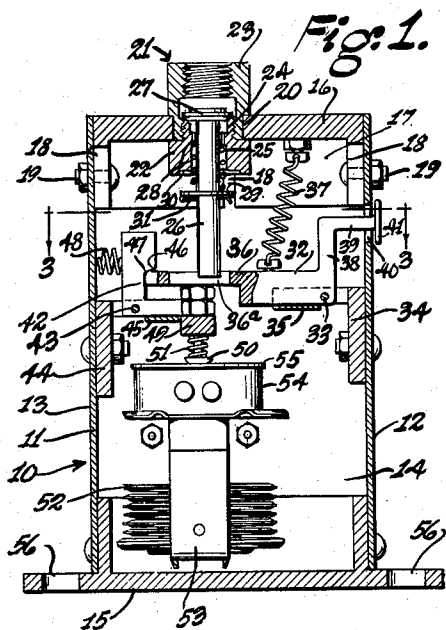
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T. MARKS, JR

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HOTBOX INDICATOR AND SIGNAL

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INVENTOR.
Theodore Marks Jr.

BY

W. W. Williams
Att'y.

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HOTBOX INDICATOR AND SIGNAL

Theodore Marks, Jr., Drexel Hill, Pa.

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1 Claim. (Cl. 236-94)

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My invention relates to a new and useful hot box indicator and signal and especially to improvements on the structure disclosed in my co-pending application, Ser. No. 64,569, filed December 10, 1948, which is now Patent No. 2,521,469, dated September 5, 1950.

An object of the invention is to provide a signal actuator for use in connection with an individual journal box of a railway car or the like, the several actuators adapted to be in communication with the signal system of a train whereby the operator will become aware of a hot box on the train and to provide an indicator as a part of the actuator whereby a person may readily locate the position of the actuator which has caused a signal and thereby be in a position to remedy the cause of the hot box which induced the signal.

Another object of the present invention is to increase the sensitiveness of the actuator mechanism.

A further object of the invention is to provide, in an indicator and signal, an actuator for connection with the signal air system of a railway car or train, said actuator including a valve to control the flow of air, a thermostatic means influenced by the heat from a journal box, means between said thermostatic means and the valve to transmit motion to said valve for opening the same, and an indicator to show that some function has occurred within the housing of the actuator that is about to or has resulted in a signal to the operator.

A still further object of this invention is to provide for causing either the valve or indicator to be actuated just prior to the other during the time subsequent to a complete operation.

With the above and other objects in view this invention consists of the details of construction and combination of elements hereinafter set forth and then designated by the claim.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same I will describe its construction in detail referring by numerals to the accompanying drawing, forming a part hereof, in which:

Fig. 1 is a vertical sectional elevation of the actuator of my apparatus in a neutral position, taken on the line 1-1 of Fig. 3.

Fig. 2 is a similar view after an operation of said actuator.

Fig. 3 is a slightly enlarged section on the line 3-3 of Fig. 1.

Fig. 4 is a fragmentary elevational view of a

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railway vehicle axle, one wheel and journal box with one of the hot box indicator and signal units installed on said journal box.

The actuator or control unit 10, which is mounted on an individual journal box of a railway vehicle and suitably connected with the signal air line of the vehicle or train, as the case may be. Although a vehicle with its journal boxes and signal air line is not shown the manner of connection will be explained below.

An actuator or control unit includes a casing 11 consisting of front and back walls 12 and 13, respectively, side walls 14, either or both of which may be detachable, a base 15 and a crown wall 16. The crown wall has an intumed flange 17 with vertical slots 18 registering with fastening devices 19 whereby said crown wall is both adjustably and detachably held in place.

The outer end or crown wall 16 has a hole 20 therein in which is mounted the valve housing 21 comprising inner and outer end members 22 and 23, respectively, screwed together so as to clamp the valve housing, as a whole, to the crown plate within the hole 20. A flexible tube or hose from the signal air system is adapted to be attached to said valve housing, especially the outer member 23 thereof to provide a communication between said signal air system and the valve housing or interior of the actuator casing.

The inner end member 22 of the valve housing 21 has a valve seat 24 surrounding the opening 25 for the valve stem 26 of the valve 27 for co-action with said seat. As the valve stem snugly fits the opening 25 in which it reciprocates, a number of small apertures 28 are formed in the valve housing member 22 in spaced surrounding relation to the opening 25 and provide communications between the inside of the valve housing below the valve seat and the exterior of the valve housing member 22 within the actuator casing.

The valve is urged towards its seat 24 by a spring 29 between the inner end of the inner valve housing member 22 and a collar 30 retained in place on the valve stem by a pin 31. The valve housing member 22 is preferably recessed to partly enclose the spring 29, especially when the latter is compressed.

A bell crank lever 32 is pivoted at 33 to a bracket 34 secured to the front wall 12 of the casing and said bracket has a rest or stop 35 to limit the downward movement of the lower arm 36 of said bell crank lever, which lower arm is urged upwardly by a spring 37, having one end secured to said lower arm and the other

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end to a portion of the casing, as the crown wall thereof. The upper arm 38 of said bell crank lever has an outwardly projecting finger 39 that extends through an opening 40 in the front wall 12 and on the outer end of said finger is an indicating member or semaphore 41 that may be of a color in contrast to that of the casing.

The lower arm 36 of the bell crank lever 32 has an opening 36a through it from top to bottom of sufficient size to permit said arm to pass over the valve stem 26 or said valve stem to pass through the lower arm.

A valve and indicator operating means 42 is in the form of an angular lever pivoted at 43 to the bracket 44 fastened to the rear wall 13 of the casing, said bracket having a rest or stop 45 to limit the downward movement of the substantially horizontal arm of said operating means 42 or the setting movement of said operating means. The substantially vertical arm of the operating means 42 has a nose or keeper 46 which is beveled and coacts with the free end of the arm 36 of the bell crank lever 32, which free end is also beveled at 47. The bevels permit the release of the bell crank lever from the operating means upon application of sufficient force to disengage the coacting parts but there are sufficient contact surfaces to prevent release of said bell crank lever under the tension of the spring 37 and any jarring action incident to the vehicle passing over railroad tracks at switches and the like.

The operating means 42 is urged towards its set position, Fig. 1, by a spring 48 and the outer free end of the substantially horizontal arm of said operating means is in line with the valve stem 26 and underlies the lower arm of the bell crank lever 32 on both sides of the opening 36a. From the foregoing it will be apparent that if the parts are adjusted as shown in Fig. 1 the operating means 42 will, when operated to move the substantially horizontal arm thereof upward, first disengage the keeper 46 from the lower arm of the bell crank lever 32 and release the free end of said lower arm so that the spring 37 can pull said lower arm upward and move the indicator or semaphore 39 outward. Shortly thereafter the operating means 42 will contact the valve stem 26 and unseat the valve and release the air pressure from the signal line through the valve housing 21 and the casing 11 of the unit. Thus we have a condition where an indication of a signal is given prior to the actual signal.

By lowering the crown plate 16 sufficiently to place the terminal end of the valve stem in the same plane as the underneath face of the lower arm of the bell crank lever the indication and the signal will be accomplished substantially simultaneously. Upon lowering the crown plate further or until the lower end of the valve stem projects below the lower arm of said bell crank lever the valve will be opened and the signal given prior to throwing of the indicator or semaphore.

On the terminal end of the lower arm of the operating means 42 is a cross head 49 having a pair of bumper members 50 longitudinally slidably mounted therein for movement in the same direction as said lower arm of said operating means but relative thereto and to the cross head under certain conditions. The bumper members 50 may be in the form of bolts and their nuts with springs 51 between the bolt heads and the cross head in order to urge said bumper members forwardly. The springs 51 are stronger

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than the spring 48 whereby said spring 48 must be fully compressed before the springs 51 can be compressed.

A thermostatic element 52, preferably of the expansible bellows type, is held in a frame 53 mounted in the base of the casing 10. Said frame 53 includes a collar 54 in a permanently fixed position relative to the other parts of the apparatus. The thermostatic element has a head 55 which reciprocates with the expansion and contraction of said element and rests in the collar when the thermostatic element is contracted to approximately the zero position as shown in Fig. 1. The head 55 of the thermostatic element is disc shaped and the bottom wall of said head is spaced from the operating means 42 and its bumpers but the latter are in the outward path of travel of said head so that said operating means can be actuated when the thermostatic element is expanded due to excessive heat transmitted thereto through the casing base from an overheated journal box.

The apparatus is secured to any part of a journal box in any desired position, preferably with the indicator 41 facing outwardly, by means of fastening devices which are projected through holes 56 in the base and screw threaded into a wall of the journal box.

In practice, when a journal box is moderately cool the parts will be positioned substantially as shown in Fig. 1 and as the journal box warms up the thermostatic element will expand and when sufficient expansion has taken place the valve will be unseated and the indicator 41 thrown. The sequence of the movements of the valve and indicator will depend upon the adjustment of the crown plate. Upon the unseating of the valve air will flow through the valve housing and cause an actuation of the signal means on a railway vehicle as is well known. After the cause of the hot box is remedied the thermostatic element will contract and the valve will be resealed thus shutting off the signal but the indicator must be reset manually.

After the signal has been actuated, should the thermostatic element continue to expand the bumpers 50 will be pushed back against the action of the springs 51 thus relieving pressure on the operating means 42 and counterpressure on the thermostatic element to prevent damage to the parts of the apparatus.

From the foregoing it will be apparent that the valve is actuated for unseating the same directly by the pressure of the expanding thermostatic element through the operating means 42 which has a cam effect on the valve stem.

Of course I do not wish to be limited to the exact details of construction herein shown and described as these may be varied within the scope of the appended claim without departing from the spirit of my invention.

Having described my invention what I claim as new and useful is:

In a signal actuator for a journal box of a railway vehicle comprising a casing, a valve housing in a wall of said casing to provide a communication between the exterior and interior of said casing, a valve seat in said housing, a valve cooperating with said seat and having a stem projecting into the casing, means to normally close said valve, a thermostatic element mounted in said casing opposite the valve stem, and a pivoted operating means interposed between the thermostatic element and the valve stem, said operating means including a keeper, the com-

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ination with said operating means of a pivoted bell crank lever having its lower arm apertured to straddle the valve stem and the terminal end of said lower arm coacting with the keeper, a finger projecting from the upper arm of said bell crank lever and extending through a hole in the casing, indicating means on the outer end of said finger and normally lying close to said casing, and means to swing the lower arm upward when released by the keeper on the operating means to project the indicating means away from the casing.

THEODORE MARKS, JR.

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