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THERMO SAFETY CONTROL FOR RAILROAD CARS

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2 Sheets-Sheet 1

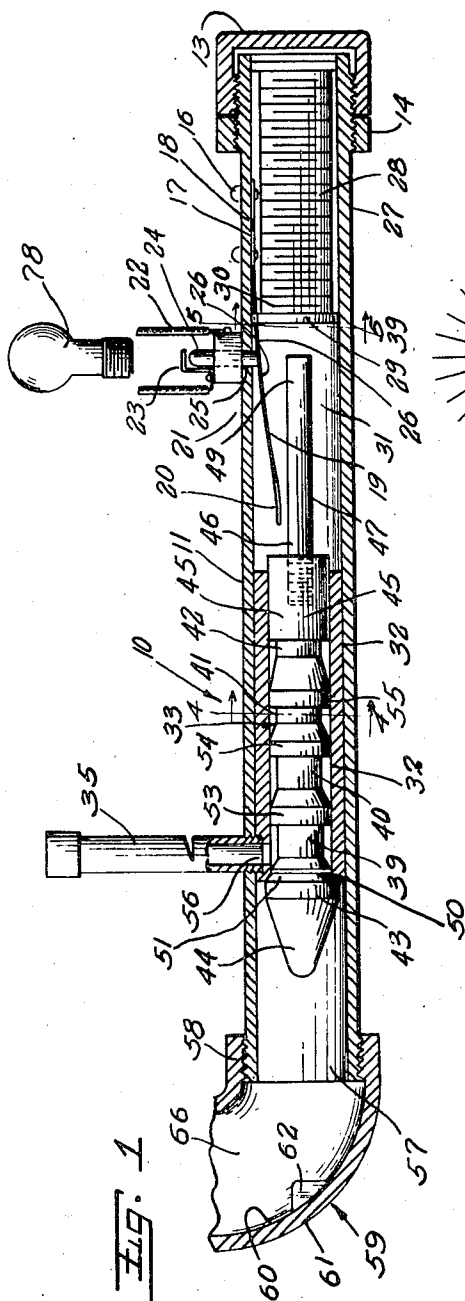


Fig. 1

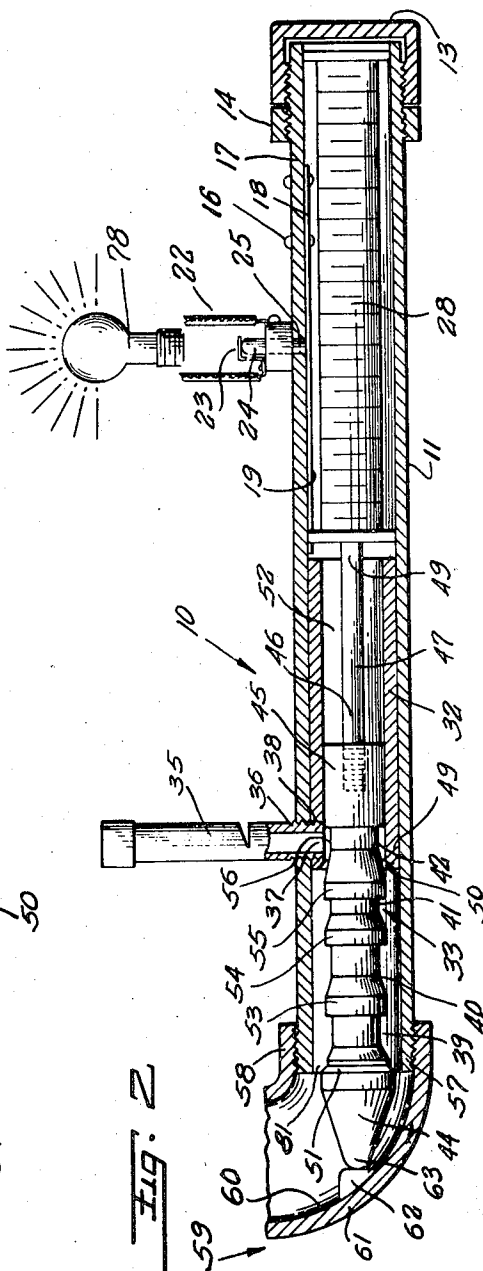


Fig. 2

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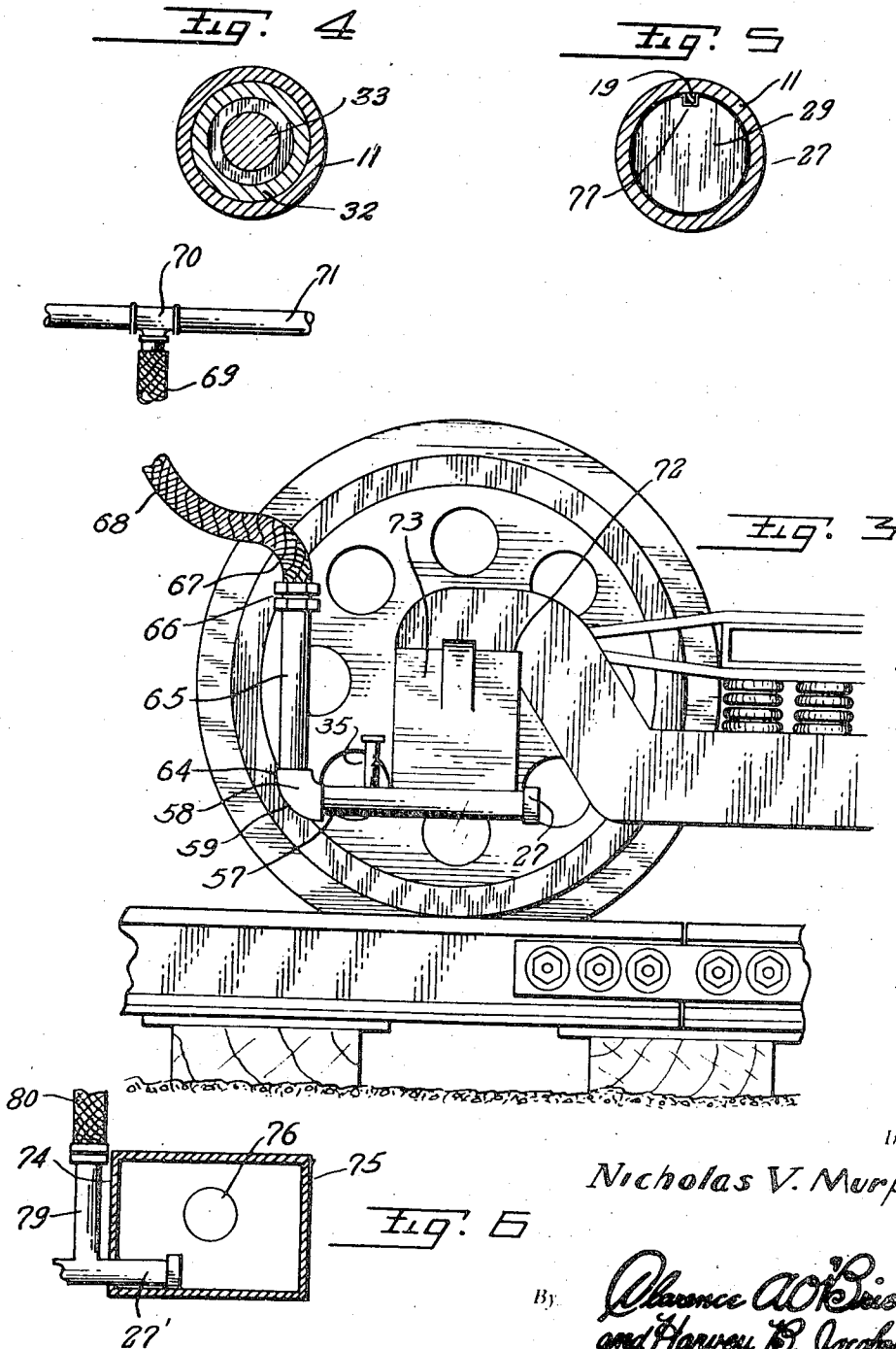
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## UNITED STATES PATENT OFFICE

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## THERMOSAFETY CONTROL FOR RAILROAD CARS

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2 Claims. (Cl. 246--169)

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My invention as described herein, and illustrated in the accompanying drawings, consists of a signal control, an object of which is to provide means through which a train crew will be notified by signal when a journal box becomes overheated.

Another object of my invention is to provide means for actuating audible and visual signals through reaction of a train hot box.

A further object of this invention is to provide automatic means for applying train brakes gradually in case of a hot box condition.

A still further object of the invention is the provision of means whereby a train may be stopped in gradual steps and signals operated upon reaction of a hot box.

A primary object of my invention is the provision of means for safeguarding the lives and limbs of train passengers and property loss which may result from a hot box reaction.

Other features and advantages will become more readily apparent from the following description and the accompanying illustrative drawings in which:

Figure 1 is a longitudinal sectional view of my invention,

Figure 2 is a similar view, the parts being shown in changed position,

Figure 3 is a detailed elevational view illustrating the application of my signaling system,

Figure 4 is a sectional view on line 4--4 of Figure 1,

Figure 5 is a like view on line 5--5 of Figure 1, and

Figure 6 is a detail sectional view of a journal box illustrating another means of hooking up my device with the box.

While one embodiment of my invention is illustrated in the above referred to drawings, it is to be understood that they are merely for the purpose of illustration and that various changes in construction may be resorted to in the course of manufacture in order that the invention may be utilized to the best advantage according to circumstances which may arise, without in any way departing from the spirit and intention of my device, which is to be limited only in accordance with the appended claims. And while I have stated the primary field of utility of my invention it remains obvious that it may be employed in any other capacity wherein it may be found applicable.

In the accompanying drawings, and in the following specification, the same reference characters are used to designate the same parts and

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elements throughout and in which 10, refers to my invention in its entirety and 11, indicates a tube, the end 12, of which is closed by a cap 13, threaded on the tube and secured by a lock-nut 14.

Fixed by rivets 16, to the interior of wall 17, is one end 18, of a longitudinal leaf spring 19, the end 20, of which is free and is normally inclined away from the wall 17. Mounted on the outer surface 21, of wall 17, is an electric switch 22, provided with a contact 23, in the path of an electrode 24, which is gravity actuated and which operates through an aperture 25, in the wall 17, and normally seats upon the portion 26, of spring 19, and thus spaced from the contact 23.

Seated within the end 27, of the tube 11, is a normally contracted bellows spring or diaphragm 28, provided with a disk 29, on its end 30, which disk is slightly smaller in diameter than the interior 31, of the tube 11, and bears upon the spring 19, at all times and one function of which is to push spring 19, upward upon any undue expansion of the said diaphragm 28.

Operating within a relatively short tube 32, fixed within tube 11, is an elongated valve member 33, and within the interior 34, of tube 32 is connected a whistle tube 35, the lower end 36, of which is screw-threaded through aligned bores 37 and 38, in the respective tubes 11 and 32.

The valve member 33, is provided with a series of annular recesses 39, 40, 41 and 42, a head 43, terminating in a cone 44, and a tail-piece or end 45. Into the said end is threaded an end 46, of a valve stem 47, the free end 48, of which lies within the path of the above referred to bellows disk 29.

The end 49, of tube 32, is chamfered to form a valve seat 50, into which the chamfered inner terminal 51, of the member 43, is adapted to, and does, normally seat to close the passageway 52, through tube 32. The diameter of the integral collars 53, 54 and 55, of member 33, is such as to close the inlet 56, of whistle 35, as they may seat thereagainst.

Screw-threaded to end 57, of tube 11, is one terminal 58, of an L-coupling 59, upon the inner surface 60, of its arc 61, is formed a stop 62, which is in alignment with the apex 63, of the conic head 44, which stop limits the outer movement of valve member 33. The end 64, of the L-connection has threaded thereinto a nipple 65, coupled at 66, to end 67, of a flexible hose 68, the other end 69, of which is fixed to a connection 70, of a train airline 71, of a braking system. The tube 11, may be mounted upon the top wall 72,

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of a journal box 73, or it may have its end 27', projecting through the end 74, of a box 75, said end being located within the box under the journal 76. The disk 29, may have a cut-out 77, in which spring 19, may seat.

The operation of my safety signaling system is as follows:

Should the box 73, become overheated, the heat will be transmitted to tube 11, the action of which will be to expand diaphragm 28, causing disk 29, to raise spring 19, which in turn will push up the electrode 24, into engagement with contact 23, closing an electric circuit which will light red danger signal bulbs 78, which may be located in various sections of a train, such as the engine cab and in one or more coaches, especially where a conductor or other members of the train crew are usually located. This is an original signal and does not affect the brake system of the train due to the fact that the diaphragm has not yet advanced far enough to push against the end 49, of rod 47. If upon the initial signal the train is not immediately stopped, the gradually increasing heat in the box 73, or 75, will continue to further expand the diaphragm which will in turn first push rod 47, and with it valve member 33, unseating valve 51, permitting compressed air from the train line 71, to pass into recess 39, and thence pass through the whistle 35, which will continue to sound until closed by collar 53. This loss of air in line 71, will very lightly apply brakes to the wheels of the entire train, tending to slow it down. However, if the train crew is not yet awake to the danger that there is a hot box, the further movement of the diaphragm will continue to push out member 33, whereupon collar 53, passes from the port 56, and the whistles start sounding again. This procedure continues and the gradually diminishing air in line 71, slowly applies the train brakes until the train automatically comes to a standstill, thus eliminating danger of a possible wreck through jumping of the track by the wheel before it has been stopped from rolling through freezing of the journal thereto by its heat created expansion. All the time the above described invention is in action the danger lights 78, remain on.

It is of course obvious that air escape tube 79, may be connected with a flexible tube 80, which may in turn be connected with a system of whistles throughout the train whereby both visual and audible signals may be heard and seen regardless of the noise of a running train.

When the hot box has been reduced to normal heat and air again pumped into line 71, the pressure thereof through line 68, bearing against the head 43, due to the reduced passage 81, between the head and tube end 57, will automatically re-

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turn the valve member 33, to its normal inactive position, whereby the port 56, of pipe 32, will be closed, the diaphragm 28, will automatically contract to normal releasing the spring 19, to drop to normal, thus permitting electrode 24, to drop out of connection with contact 23, opening the electric circuit and extinguishing lights 78.

From the foregoing it becomes obvious that I have provided an unique, comparatively inexpensive, very simple and effective safety device for trains.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Changes in shape, size and rearrangement of details and parts such as come within the purview of the invention claimed may be resorted to, in actual practice, if desired.

Having now described my invention that which I claim as new and desire to procure by Letters Patent is:

1. A safety device for trains having an air brake system which comprises a housing, an expandible heat-responsive element at one end of said housing and in heat exchange relation with an axle journal box, an air brake line in communication with said housing adjacent its other end, an elongate valve body in said housing positioned to be moved longitudinally of the housing when heat developed in the journal box causes the heat responsive element to expand, said valve member having a plurality of annular grooves thereon which are spaced by annular shoulders, a vent in said housing normally closed by said valve member and successively opened and closed by the grooves and annular shoulders of said valve member as it is moved longitudinally of the housing by the expandible element in order to progressively vent air from the braking system.

2. A claim as in claim 1 further characterized by audible signal means in communication with said vent and adapted to be operated by said vented air.

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