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2,164,674

HOT BOX DETECTOR AND SIGNAL APPLIANCE

Filed April 12, 1937

FIG. 1.

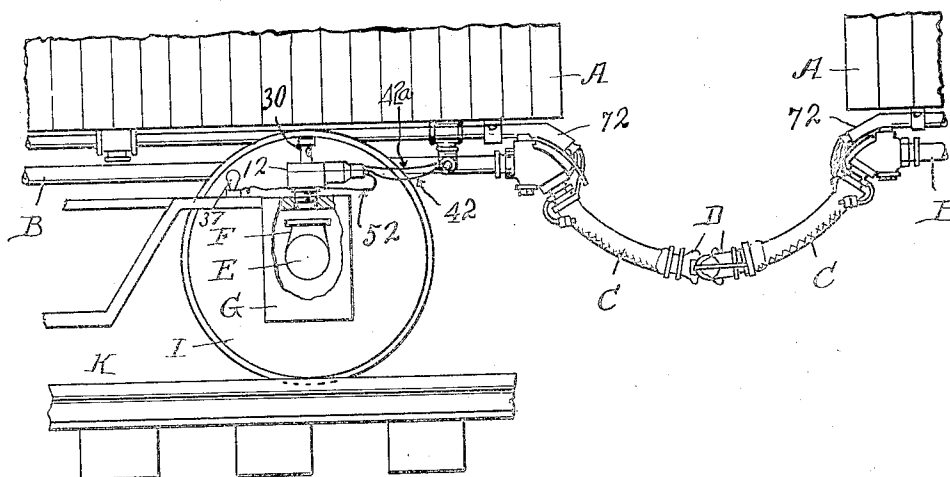


FIG. 2.

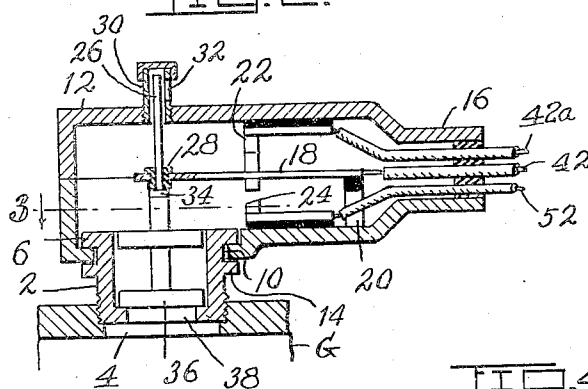


FIG. 3.

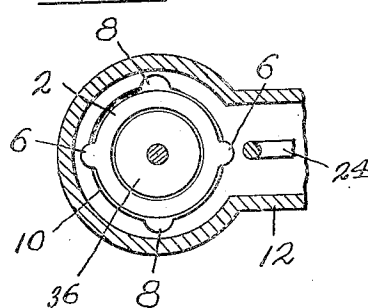
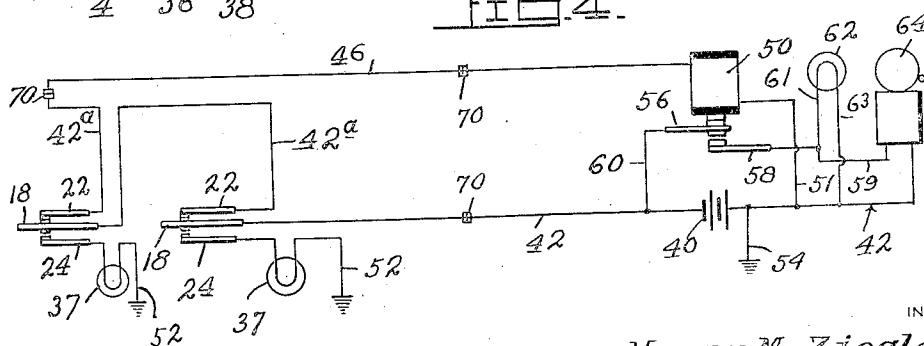


FIG. 4.



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HOT BOX DETECTOR AND SIGNAL
APPLIANCE

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Application April 12, 1937, Serial No. 136,443

5 Claims. (Cl. 246—169)

My invention relates to signal means for journal-bearings and while said means may be employed in connection with various kinds of bearings, it is particularly useful when used with the journal-bearings of a railway train where it is important to be able to promptly locate any bearing before the same becomes overheated to such degree as to cause trouble. The system may also be arranged to afford a means of communication between the engineer and the conductor both by telephone and a signal code.

The present invention is an improvement over the hot box detector and signal appliance shown and described in my U. S. Patent of June 4, 1924, No. 1,496,194. One advantage possessed by the present invention over the appliance shown in said patent resides in permanent contacts which are used in the signal circuits in place of the fuse employed for bridging the terminals of certain contacts. The present fuse, unlike the one in said patent, forms no part of a circuit and hence can be made of any kind of material that will fuse or disintegrate before the temperature of the associated bearing rises high enough to cause trouble.

Another advantage obtained by the present invention over the one disclosed by the above-mentioned patent resides in the use of a simple enclosed visual signal in place of the exposed and somewhat complex semaphore and its working parts for indicating when the associated fuse has burned out. Other advantages will herein appear and in order that the invention may be fully understood, reference will now be had to the accompanying drawing, in which:

Fig. 1 is a fragmentary elevation of two railway cars on which a portion of the system is installed.

Fig. 2 is a vertical longitudinal section of one of the appliances installed on the upper portion of a journal-box.

Fig. 3 is a fragmentary horizontal section on line 3, of Fig. 2.

Fig. 4 is a diagram of part of the electrical system employed in carrying out the invention.

Referring in detail to the different parts, A designates portions of two railway cars which are equipped with the usual air brake lines B, connected between cars by hose elements C detachably connected to each other by the customary coupling members D. E designates one of the journals which is mounted in a bearing F enclosed within a conventional journal-box G.

Referring now more particularly to the parts constituting the present invention, 2 designates

a tubular coupling member one end of which is threaded into an opening 4 extending through the top of each journal-box G at a point just above the bearing F, Fig. 1.

The coupling member 2 is provided at its upper end with a suitable number of marginal lugs 6 adapted to pass through a like number of marginal openings 8 communicating with a main opening 10 formed in the lower portion of a housing 12 for the reception of the upper end of the coupling 2. With the foregoing arrangement it is apparent that when the housing 12 is turned to a position where the openings 8 coincide with the lugs 6, said housing may be lowered over the upper end of the coupling member 2 and turned a suitable distance to secure the housing 12 to said coupling member 2.

An annular shoulder 14 is provided to limit the downward movement of the housing 12 upon the coupling member 2. The free end of the housing 12 is reduced in size to provide a handle 16 for convenience of the operator when applying or removing said housing from the coupling member 2.

18 designates a movable contact arranged within the housing 12 and secured at one end to an insulated support 20. The movable contact 18 is interposed between spaced fixed contacts 22 and 24 secured to but insulated from the upper and lower walls, respectively, of the housing 12.

Normally the free end of the contact 18 is supported by an indicator 26 comprising a vertically disposed rod which is insulated from said contact 18 by a bushing 28. The indicator 26 extends upwardly into a tube 30 projecting upwardly from the top of the housing 12 and provided with a sight-opening 32 through which the upper portion of said indicator 26 may be viewed when in normal position.

The lower end of the indicator 26 is provided with a foot 34 which normally rests upon the upper end of a fuse 36 extending down into the coupling member 2 and resting upon the bottom wall thereof. Said bottom wall has an opening 38 communicating with the interior of the journal box G, so that heat generated by the associated journal E and bearing F may impinge against and disintegrate the fuse 36 before the temperature rises high enough to endanger the bearing. Since the fuse 36 is not connected to an electric circuit, or used for bridging two contacts as in my patent hereinbefore mentioned, it may be made of any kind of material that will melt or disintegrate before the temperature of

the associated bearing F becomes high enough to endanger said bearing.

In order that instant notice may be given of the burning out of a fuse 36, I provide an electrical system embodying both visual and audible signals which may be located in any suitable part of the train, but preferably in the engineer's cab. Said electrical system also includes a number of visual signals, preferably in the form of incandescent lamps 37, one of which is associated with each bearing F, so that when any particular fuse 36 burns out the associated bearing F can be quickly located by means of its respective lamp 37, which is caused to glow as will hereinafter appear.

Referring in detail to the electrical system, Fig. 4, 40 designates a suitable source of electricity such as a battery from which current flows through a line 42, the initial movable contact 18 of a series, and the initial stationary contact 22 which is connected in series with the successive contacts 18 through lines 42a. The current returns to the battery 40 through the last line 42a of the series, a wire 46, a relay 50 comprising an armature 56 and an electromagnet, and a wire 51.

When one of the fuses 36 burns out the associated contact 18 drops out of engagement with the contact 22 and into engagement with the contact 24. This cuts out the current from the succeeding lines 42a and the line 46 and causes it to return to the battery 40 through the signal lamp 37, associated with the burned out fuse, and through the ground connections 52 and 54 which may include the wheels I and the rails K. The signal lamp 37 is energized by the current passing there-through and thus attracts attention to the journal-box containing the burned out fuse. The associated indicator 26 drops out of sight and thus also indicates the journal-box with the burned out fuse.

When the current is cut out from the lines 42a and 46, as stated, the electromagnet 50 becomes deenergized and permits its armature 56 to drop into engagement with a contact 58, thereby closing a local signal circuit through a wire 60 connected to wire 42 at one side of the battery, the armature 56, contact 58, wires 61 and 59 to visual and audible signals 62 and 64, respectively, and thence back to the other side of the battery 40 through wires 63 and 42. Preferably, the signals 62 and 64 are located in the cab of the engineer so that he will be instantly notified when a fuse has burned out. Current is restored through wires 42a and 46 by replacing the burned out fuse with another. The restored current energizes the electromagnet 50 which lifts its armature 56 out of engagement with the contact 58 and thus opens the local circuit containing the signals 62 and 64.

For protection against damage the circuit wires 42, 42a and 46 are enclosed in tubes 72, and the hose C, and said wires are provided at their ends with couplings 70, which preferably are adapted to couple and uncouple when the hose couplings D are connected and disconnected, respectively.

From the foregoing description it is apparent that I have provided an appliance which is well adapted for the purpose intended, and while I have shown a preferred form of my invention I reserve all rights to such changes and modifications as properly fall within the spirit and scope of the invention as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:

1. In combination with a journal box, a bearing 75 in said journal box, and a journal for said bear-

ing, two fixed contacts spaced one above the other in said housing, a circuit wire connected to each contact, a signal in series with the circuit wire connected to the lowermost contact, a relay in series with the other circuit wire, a signal circuit controlled by said relay, a movable contact in the housing adapted to engage either of the fixed contacts, a source of electrical energy, a circuit wire leading from said source to the movable contact, a vertically movable visual indicator extending through an opening in the housing and adapted to control the movable contact, and a fuse arranged in the housing at a point between the journal bearing and said visual indicator to normally support the latter in raised position and thereby hold the movable contact in engagement with the uppermost fixed contact, said fuse being adapted to melt when the bearing reaches a predetermined temperature and allow the indicator to engage the movable contact with the lower fixed contact.

2. In combination with a series of journal boxes, a bearing in each journal box, and a journal for each bearing; a series of housings associated with the respective journal boxes, a fixed contact in each housing, a movable contact in each housing adapted to engage the associated fixed contact, a source of electrical energy, a circuit wire leading from said source to the movable contact in the first housing of the series, a circuit wire leading from the fixed contact in the last housing of the series, wires connecting the remainder of the fixed contacts in series with the remainder of the movable contacts, a relay in series with the circuit wire leading from the last fixed contact, a signal circuit controlled by said relay, a visual signal projecting upward through an aperture in each housing and adapted to control the associated movable contact, a fuse located in each housing at a point between each bearing and associated visual signal to normally support the same in raised position and thereby hold the movable contact in engagement with the fixed contact, said fuse being adapted to melt when the associated bearing reaches a predetermined temperature and allow the movable contact to disengage the fixed contact.

3. In combination with a series of journal boxes, a bearing in each journal box, and a journal for each bearing; a series of housings associated with the respective journal boxes, two fixed contacts spaced one above another in each housing, a movable contact in each housing adapted to engage either of the fixed contacts therein, a source of electrical energy, a circuit wire leading from said source to the movable contact in the first housing of the series, a circuit wire leading from the upper fixed contact in the last housing of the series, wires connecting the remainder of the upper fixed contacts in series with the remainder of the movable contacts, a relay in series with the circuit wire leading from the last upper fixed contact, a signal circuit controlled by said relay, a signal circuit connected to each lower fixed contact, a visual signal projecting upward through an aperture in each housing and adapted to control the associated movable contact, and a fuse located in each housing at a point between each bearing and associated visual signal to normally support the same in raised position and thereby hold the movable contact in engagement with the upper fixed contact, said fuse being adapted to melt when the associated bearing reaches a predetermined temperature and allow the movable con-

tact to engage the associated lower fixed contact.

4. In combination with a journal box having an opening in its top portion, a bearing in said journal box, a journal upon which said bearing is mounted, a housing connected to the journal box having an opening in its bottom portion communicating with the opening in the top of the journal box, a fuse in the housing covering the bottom opening and adapted to melt before the temperature of the bearing attains a high enough value to damage the bearing, a rod in the housing normally resting upon said fuse and adapted to move downward when the fuse melts, a fixed contact in the housing, a movable contact in the housing connected to the rod to move downward therewith and engage said fixed contact, said movable contact also acting to limit the downward movement of the rod, and a signal circuit controlled by said contacts.

5. In combination with a journal box having an

opening in its top portion, a bearing in said journal box, a journal upon which said bearing is mounted, a housing connected to the journal box having aligned openings in its top and bottom portions, the bottom opening communicating with the opening in the top of the journal box, a fuse in the housing covering the bottom opening and adapted to melt before the temperature of the bearing attains a high enough value to damage the bearing, a signal rod in the housing resting upon said fuse and extending upward through the opening in top of the housing and adapted to move downward out of sight when the fuse melts, a fixed contact in the housing, a movable contact in the housing connected to the rod to move downward therewith and engage said fixed contact, said movable contact also acting to limit the downward movement of the rod, and a signal circuit controlled by said contacts.

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