

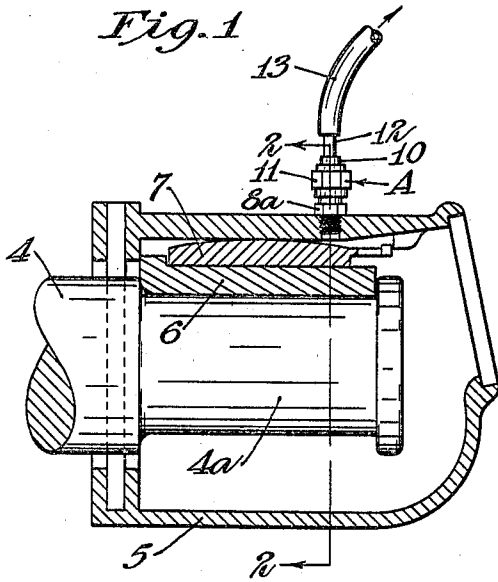
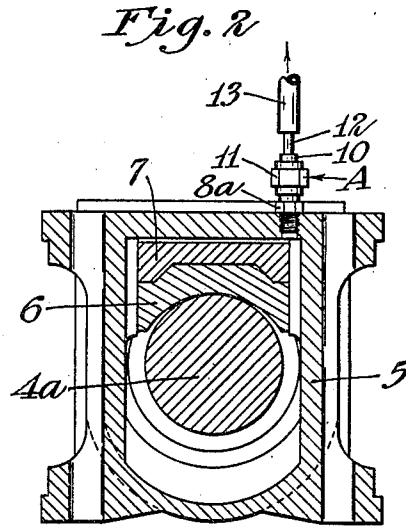
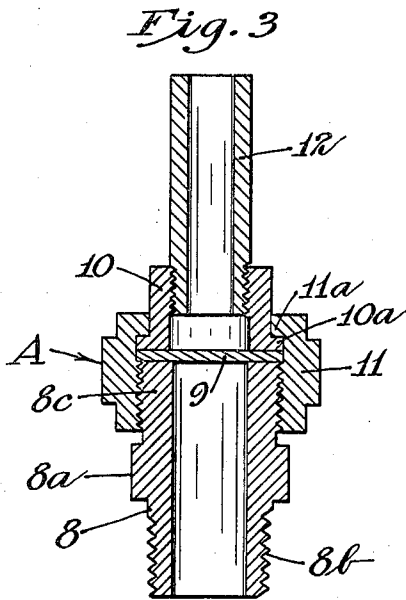
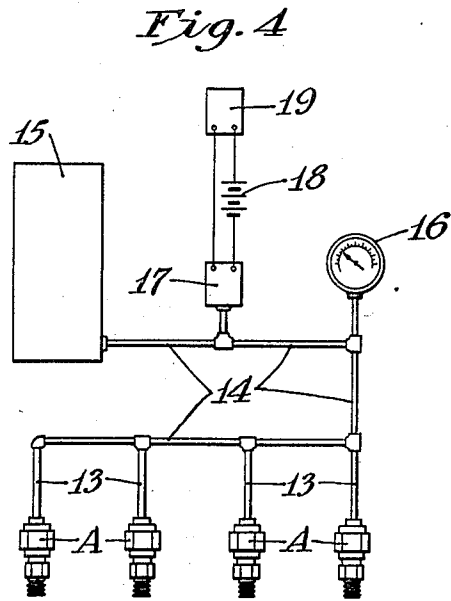
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BEARING OVERTEMPERATURE INDICATOR

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BEARING OVERTEMPERATURE INDICATOR

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1 Claim. (Cl. 308—8)

My invention relates to bearings and particularly to devices for indicating an excess temperature condition of a bearing.

The journals, bearings and journal boxes associated with the wheel axles of railway cars frequently overheat due to lack of lubrication. Usually, an overheated journal, bearing and journal box, commonly referred to in short as a "hot box", is unnoticed until the heating has advanced to a stage where the stuffing material customarily used in the journal box has been set on fire and has been burning long enough to attract the attention of a member of the train crew. By such time considerable damage may have been done. Also, a defective bearing may cause a fire or accident.

An object of my invention is to provide an indicating system whereby the occurrence of a "hot box" is immediately made known by an appropriate indication at a point which may be remote from the overheated journal box.

Another object is to provide a device capable of producing an indication marking the location of the particular journal box which is overheated. Still another object is to provide such an indicating device adapted for association with a compressed air line of a railway train or car for cooperative action therewith in producing indications.

A still further object is to provide such an indicating device of simple, reliable, rugged and inexpensive construction.

These and other objects and advantages of the invention will be more fully set forth in the following description made in connection with the accompanying drawing, in which like reference characters refer to similar parts throughout the several views, and in which:—

Figs. 1 and 2 are longitudinal and transverse vertical sectional views of a railway journal box with which an embodiment of my invention is incorporated;

Fig. 3 is a longitudinal sectional view of one form of the temperature actuated device incorporated with the journal box of Figs. 1 and 2; and

Fig. 4 is a diagram of an indicating system including a plurality of my temperature actuated devices.

Referring to the drawing, my indicating system is shown as associated with a railway car axle 4, journal 4a, journal box 5, bearing 6 and wedge 7, all of which are of conventional construction and which are associated with other parts of a railway car in the customary manner. The lower part of the interior of the journal box 5 is ordi-

narily filled with absorbent packing material which is normally saturated with lubricant.

The heat actuated device A of my system, which is mounted on the journal box 5 of Figs. 1 and 2 and which is shown in detail in Fig. 3 is preferably constructed as follows. A generally tubular or axially apertured body 8 has an externally polygonal medial portion 8a, an externally screw-threaded lower portion 8b defining at its lower end an outlet for the device A and an externally screw-threaded upper portion 8c. A disk 9, formed of material which is fusible at a temperature between the normal operating temperature of the bearing 6 and a temperature which would damage the bearing 6, is placed upon the upper end of the body 8 so that it forms a closure therefor and rests in its marginal portions thereupon. The fusing temperature of the disk 9 may, of course, be selected to suitably correspond to the melting temperature of the bearing 6 and the degree of excess bearing temperature at which an indication is desired.

A tubular element 10 having a radially outwardly projecting annular flange 10a integrally formed at its lower end is placed with its flanged lower end abutting the marginal portion of the upper side of the fusible closure disk 9.

An internally screw-threaded clamping nut 11, having a radially inwardly projecting annular flange 11a formed at its upper end, is screwed upon the screw-threaded upper portion 8c of the body 8 so that the flange 11a bears downwardly upon the flange 10a of the tubular element 10 to clamp the marginal portion of the fusible disk 9 between the tubular element 10 and the upper portion 8c of the body 8 in sealed relation thereto.

A tubular connection member 12 is screw-threadedly mounted in the upper end of the tubular element 10 as shown and defines at its upper end an inlet to the device A. The interiors of the connection member 12, the tubular element 10 and the body 8 cooperatively form a passage between the inlet and outlet of the device A.

My heat actuated device A, as should be obvious from the above description, consists, in essence, of a member having a passage there-through normally closed by a fusible element. The form of my heat actuated device shown in Fig. 3 is comprised of several parts separable from each other in order to permit convenient disassembly of the device for the purpose of replacement of a ruptured disk 9 with a new disk.

In applying my heat actuated device A to a journal box such as the journal box 5, the upper

wall of the journal box is apertured and internally screw-threaded to receive the screw-threaded lower portion 8b of the body 8 of the device A. The device A, when mounted on the journal box 5 as shown in Figs. 1 and 2 and described above, is in intimate association with the journal box 5, the wedge 7, the bearing 6 and the journal 4a with respect to thermal conductivity between the parts mentioned. Thus heat generated in the journal 4a and bearing 6 is readily carried through the wedge 7 and the top wall of the journal box 5 to the device A. When the temperature reaches the melting point of the disk 9, the disk 9 fuses to open the passageway through the device A.

In a railway train it is intended, in accordance with my invention, to provide every journal box with a heat actuated device A associated therewith as illustrated and described in connection with the journal box 5 of Figs. 1 and 2.

The connection members 12 of the respective devices A are connected through respective flexible conduits 13 to a source 15 of air or other fluid under pressure. Normally the disk 9 blocks passage of compressed air through the device A but, when excessive bearing temperature causes melting of the disk 9, air is permitted to flow through the device A into the interior of the journal box 5. Smoke produced within the journal box 5 by overheating or burning of packing therein is driven out of the journal box 5 through various cracks and openings therein by the compressed air and provides a visual indication or signal announcing the existence and location of an overheated journal box.

My heat actuated devices A may be combined with other elements to form a system capable of giving an indication of the existence of an overheated bearing at a point remote from the overheated bearing as, for example, in the engineer's cab of a train. Fig. 4 illustrates one form of such a system wherein 14 is an air line extending throughout the length of a train and to which all of the heat actuated devices A are connected by means of flexible conduits 13. An air tank 15, containing air under pressure, is connected to the line 14 to normally maintain pressure therein.

On the occurrence of sufficient overheating of a bearing to melt the disk 9 of one of the devices A the resultant escape of air will cause a reduction of pressure in the line 14. This reduction in pressure may be utilized to indicate the existence of an overheated bearing at a point remote from the affected bearing as, for example, in the engineer's cab.

A pressure gauge 16 located in the engineer's cab and connected to the line 14 may be used to indicate the reduction in pressure and hence indicate that a bearing is overheated.

A pressure responsive relay 17 of conventional form, having electrical contacts which close upon the occurrence of subnormal air pressure, may be placed in communication with the line 14 with its contacts arranged to complete an electrical circuit from a source of electrical energy such as the battery 18 to an electrical indicating device 19 which may be a lamp, electric bell or any other suitable type of visual or audible electrical signalling device.

In the above described system the pressure responsive relay 17 may be of a type including a

valve instead of electrical contacts and hence may be utilized in a well known manner to control flow of air or steam from a suitable source thereof to a pressure actuated signal device such as a whistle.

Where pressure in the tank 15 is maintained by a conventional automatically controlled air pump, a drop in pressure in the line 14 due to action of one of the devices A would cause speeding up of such an air pump and thus call attention to the existence of an overheated bearing.

If desired, the temperature actuated devices A may be connected to the train line of an air brake system instead of to an independent signal line. In this case the pressure responsive indicating devices mentioned above may be used in the same manner as in the case of an independent signal line.

When one of the temperature actuated devices A operates to release compressed air into the interior of a journal box it is obvious that the released air will have a cooling effect upon the overheated parts which caused actuation of the device A.

While an embodiment of my invention suited for application to railway wheel bearings and use with compressed air has been illustrated and described, it should be obvious that embodiments of my invention may be readily constructed for application to many other types of bearings or to other mechanical elements subject to overheating and for use with fluids under pressure other than air.

It is apparent that I have invented a rugged, reliable, simple, efficient and inexpensive system for indicating the existence and location of overheated bearings.

It will, of course, be understood that various changes may be made in the form, details, proportions and arrangement of the parts, without departing from the scope of my invention, which, generally stated, consists in a device capable of carrying out the objects above set forth and in the novel parts and combinations of parts disclosed and defined in the appended claim.

What is claimed is:—

A device for indicating an overheated condition of a railway axle bearing and journal box comprising a pair of axially aligned tubular elements, a disc of fusible material disposed between said elements in a plane normal to the common axis of said elements and having a marginal portion adapted to be abutted on opposite sides by the mutually facing ends of the walls of said respective elements, and releasable means for drawing said elements toward each other to clamp said marginal portion therebetween and holding said elements in clamping position, one of said elements being adapted for connection thereof to a source of compressed air and the other of said elements being adapted to be removably secured in a suitable aperture in a wall of a journal box so as to place said disc in thermal communication with said box whereby excess heat in said journal box will fuse said disc to permit flow of air through said aligned elements into said journal box to eject smoke therefrom to constitute an indication.

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