April 22, 1930. L. D. GANNON 1,755,642

WARNING FUSE

Filed May 1, 1929

Fig. 1

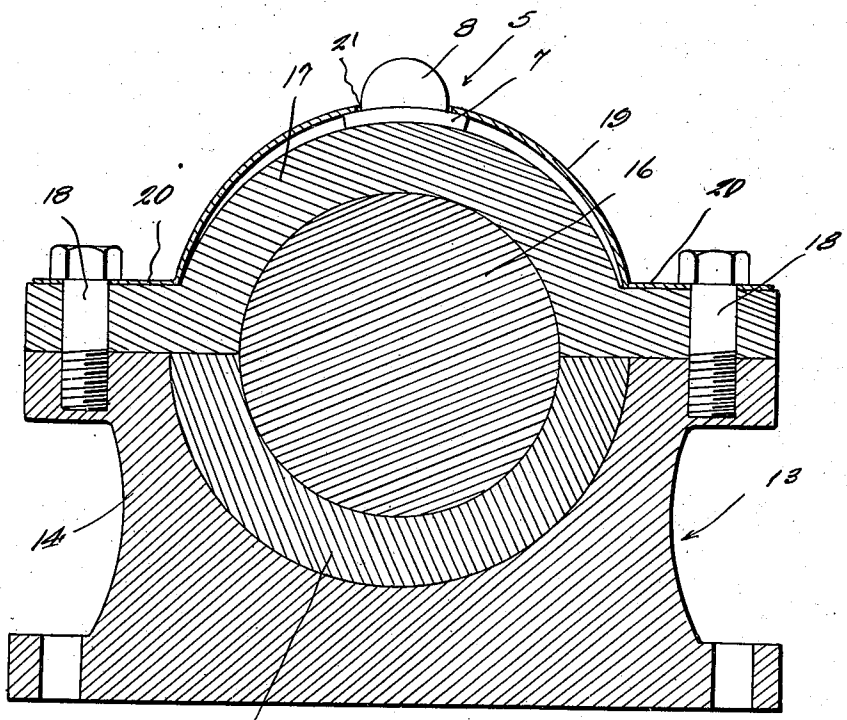


Fig. 2.

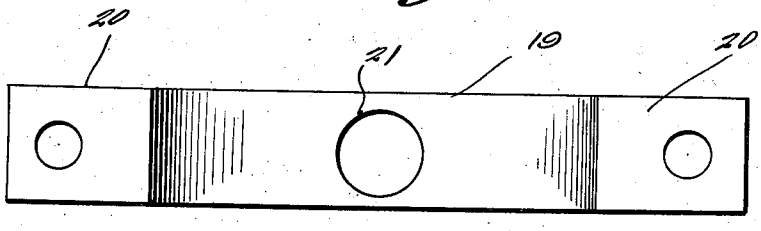


Fig. 3.

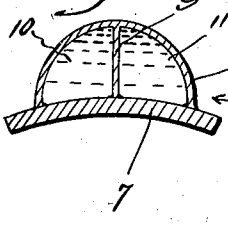
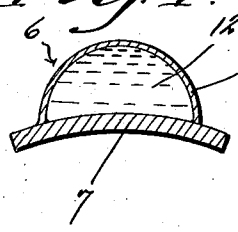


Fig. 4.



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UNITED STATES PATENT OFFICE

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WARNING FUSE

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This invention relates to that classification of structures and appliances generally known in the prior art as warning signals, and it has more specific reference to an accessory of this class which is expressly, but not necessarily intended for use and association with machine elements, particularly bearings.

It is a matter of common knowledge that excessive heat is produced by the incessant rotation of a shaft in its bearing, thus developing friction and in turn heating the shaft, bearings and adjacent parts of the structure. This undue frictional heat causes the bearings to burn out, thus bringing about ruinous results and subsequent serious troubles if the bearing is not repaired.

At the present time, so far as I have been able to ascertain there are numerous types of signals and warning devices which automatically come into play when abnormal conditions exist, and provide an audible signal of some kind to warn the attendants that undesirable conditions may develop.

Some of these prior art devices, and in fact most of them depend on a remote electrical signal under the action of a thermostatic switch or a fusible switch. Others depend for their action and utility on a fusible capsule or container for an audible charge which is exploded. Relying on the sense of hearing, however, has proved to be somewhat undependable as the audible signal is usually momentary and frequently not distinguishably heard by the attendant, particularly where machine and plant noises are rampant. Then too, some attendants are incapacitated to a certain extent by poor hearing, thus rendering the range of success of an audible signal limited.

In carrying the present invention into effect I have worked on different principle and theory in an attempt to provide simple and economical fuse so made and operable as to permit the attendant to become instinctively aware of impending danger through senses of sight and smell.

Briefly stated, I have evolved and produced a simplified fuse preferably in the form of an attachment, which may be fastened on a bearing cap or the like, and which is characterized principally by a fusible capsule or receptacle which contains one or more chemicals, one of which, when active, gives off an offensive odor, and the other of which develops a thick smoke cloud, either of which will warn of subsequent bearing trouble if not immediately attended to.

In the drawings:

Figure 1 is a transverse sectional view through a common form of bearing showing the improved fuse operatively associated therewith.

Figure 2 is a plan view of a retaining strap for maintaining the fuse in place.

Figure 3 is a central longitudinal section through one embodiment of fuse, and

Figure 4 is a similar sectional view through slightly different embodiments.

In both instances the fuse is in the form of a capsular receptacle or miniature vessel. The fuse seen in Figure 3 is designated generally by the reference character 5 and the one in Figure 4 is distinguished by the reference character 6. They are principally the same. In other words both embodiments comprise a circular base 7 preferably of a nonfusible metal shaped to conform to the surface which it is adapted to contact. This base carries a dome like receptacle 8 which as is obvious is of fusible material adapted to disrupt under abnormal heat conditions. The fuse 5 includes an internal partition 9 dividing it into separate chambers 10 and 11, respectively.

The fuse 6 embodies a single unobstructed chamber 12. Each of chambers 10, 11 and 12 are adapted to contain the heat activated chemicals.

It has been found practicable in making the fusible receptacle to utilize a compound consisting of an appropriate proportional mixture of tin, lead, bismuth and cadmium. When properly mixed, these ingredients will provide containers which are meltable from 130 degrees F. to 302 degrees F. However the range will vary according to the character of bearing on which the fuse is employed. The above metals are more constant and practicable than waxes and are less liable to accidental operation from outside sources.

The fuse 5 is intended to simultaneously produce the visible smoke cloud signal and the odor signal. The chemicals for the odor chamber 10 may be either oil, anise seed, amyl acetate, or carbon disulphide. Any of these will give a strong and instinctively noticeable odor. The remaining chamber 11 for producing the smoke screen may be either silicon tetrachloride, or titanium tetrachloride. The fuse 6 is intended for giving off odor only and any one of the first three agents may be employed as a chemical in the chamber 12.

In Figure 1 I show the fuse in actual position for operation. In this figure the reference character 13 designates an ordinary bearing comprising a face 14 having a bushing 15 in which the shaft 16 is seated for rotation. The reference character 17 designates the cap, and 18 designates the bolt for fastening the parts of the bearing together. A suitable metal strap 19 is employed for holding the fuse in place. This strap includes a substantially semi-circular intermediate portion having its end portions 20 fastened to the bolts. The central portion is provided with a circular opening 21 through which the dome portion or chemical receptacle projects.

In operation when the heat generated by the frictional action of the bearing becomes abnormal, the fusible receptacle will melt, thus liberating the chemical or chemicals contained therein to give off simultaneously a smoke screen signal and an odor signal, or only an odor signal, or a smoke screen signal, which ever is found to be most practicable. In either instance the signal will be noticeable at random and by unskilled hands. The warning will take place sufficiently early to permit repairs to be made.

It is thought that by considering the description in connection with the drawings, a clear understanding of the construction, and principle of operation and features will be had. Therefore, a more lengthy description is regarded unnecessary.

Minor changes in shape, size, materials, and ingredients in the chemical may be resorted to in actual practice if desired.

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

In a structure of the class described, in combination, a shaft bearing, and a warning fuse placed upon and impinging against a portion of said bearing, said fuse embodying self contained means for providing a warning signal observed through the medium of the senses of smell and sight.

In testimony whereof I affix my signature.

LARRY D. GANNON.