

PLANT PROBLEMS . . . put your know-how to work

help the other guy cure his headaches

TYLER HICKS, Associate Editor

How Can We Detect Hot Machine Bearings?

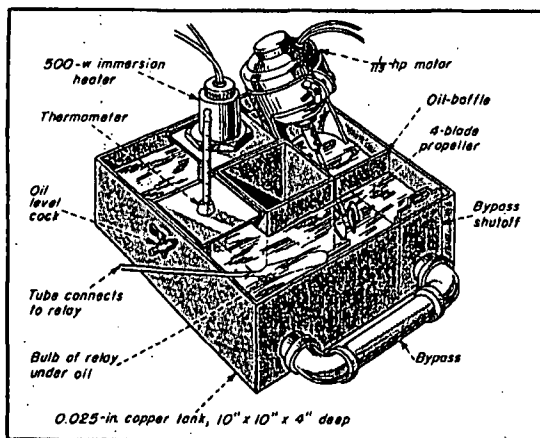
I run an industrial power plant and am in charge of all equipment for both power generation and process work.

Recently we've run into some serious trouble with bearings on heavy rolls overheating and burning out. This always occurs before we discover what is happening.

I'm convinced this wouldn't happen if we knew the bearing temperature, or had an alarm that indicated temperature was rising. If we know how a bearing behaves, we get to it soon enough to prevent burning out.

Have Power readers ever built simple devices that work well for this job? How are they best built? What materials and parts are needed?—W.C. May Power

Here Are the Answers



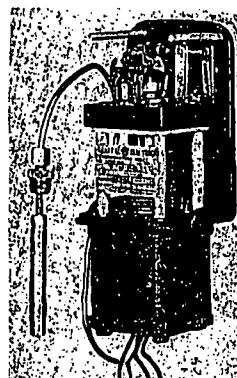
SEEING WC'S QUESTION brought back many memories. I've wrestled with this problem any number of times and have come to the conclusion that standard temperature relays, photo, as manufactured by a number of firms, are best. This might not seem like the brightest answer of the month, but, brother, I know these units work, and work well.

These relays can be arranged to stop the machine when bearings overheat. They act at a temperature of 100 C. volatile liquid in metal bulb expanding

to actuate relay. Expansion takes place instantaneously when liquid reaches critical temperature.

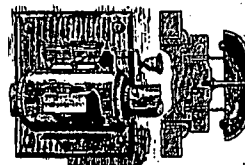
Bulb is installed in a horizontal hole drilled in bearing's lower half, as close to bearing surface as possible. Tubing is run to relay.

Joe Nordquist, writing in *Operating Engineer* in August 1949, gave some fine hints for a thermal relay tester. I'm borrowing Joe's illustration because his tester is really tops. As you see in the sketch, it consists of an oil-filled copper



tank fitted with a thermometer, heater, and circulator. To test thermal relay, immerse bulb in the hot oil, and note at what temperature the relay functions. Bypass will help you adjust the oil temperature.

JIM SPARKS Spokane, Wash.

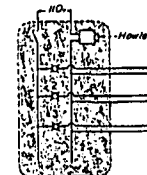
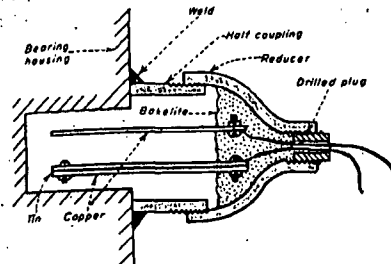


HERE'S AN OLDIE. I picked this up in the Dec 20, 1884 issue of *Scientific American*. It shows that as far back as 69 years ago engineers were concerned over bearing temperatures.

This device has a fusible head attached to the end of a wire connected with a lever, fulcrumed on a post fastened to the box. Outer end of lever is bent downward to form an arm to which a bell is connected. End of arm carries a foot piece, which is struck by a stud on the shaft when bearing becomes hot enough to melt fusible head. Bell weight carries lever arm down to shaft, and bell rings at every shaft revolution.

Illustration, right, shows similar device for crankpin bearing of an engine. It rides in fusible plugs fitted snugly into end bores in the wristpin.

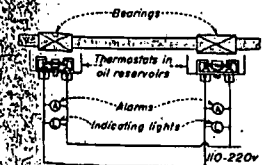
CHARLES WELLEY Penacook, N. H.



BIMETALLIC STRIP, inserted in a shallow hole, in diameter hole drilled in stationary part of each bearing, makes a simple temperature alarm. Sketches show setup. Strips close contacts in a 110-v circuit. They can be purchased to close at one temperature, or with an adjust-

ment that permits you to select closing temperature. Run No. 12 RII wire from bearings to a central alarm panel. Hook up an industrial howler to warn personnel, and a small lamp to indicate which bearing is overheating.

JOHN COWAN Salway, N. Y.



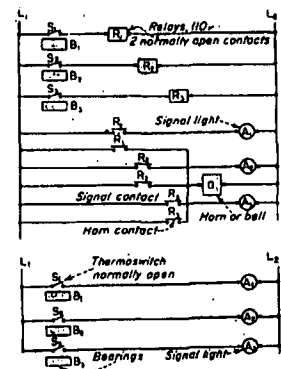
USE SNAP-ACTION bimetallic thermostat mounted in bearing lube-oil reservoir, as top sketch shows. High oil temperature causes thermostat to snap closed, energizing an alarm and warning light. Adjusting screw permits changing temperature at which thermostat closes. Mount alarm and warning light near bearing or on a central panel, whichever is most convenient.

Though sketch shows only two bearings, any number may be served with this type of hookup. Installation cost is low.

Bottom sketch shows a typical hookup available from several manufacturers. Temperature probes may be located in reservoirs containing hot oil leaving bearings. Two wires lead from hot junction to monitor. This may have 25 or

more double-wire leads that enter it. Temperature indicator may be used for a single monitor. Or a portable one may be used when plant has more than one monitor. It indicates bearing temperature directly.

H B WAYNE Brooklyn, N. Y.



HOOK UP thermoswitches as shown in sketches. Clip to bearing housing or install in tapped holes in bearing shell. Bearing-temperature rise causes switch to close, lighting a warning bulb or sounding an alarm.

Lower sketch shows how relays can be used to sound an alarm, in addition to lighting a warning bulb. Each relay has two normally open contacts; one for the signal-light circuit, the other for the common alarm.

M E HEATH Cincinnati, Ohio.

SEVERAL WAYS to determine bearing temperature are: (1) by feel during periodic rounds, if bearings are accessible (2) with a thermometer taped or clamped to bearing housing (3) with thermometer inserted in hole drilled in bearing (4) with an electronic device. Though homemade devices have been used, a unit built specifically for this purpose is better.

Before buying special equipment, check overheated bearings to see they are suitable for the job and are not loaded beyond manufacturer's specifications.

L E POLIKOFF Brooklyn, N. Y. (Continued on page 132)