

J. DEMPSEY.  
 Device for Preventing Journals from Heating.  
 No. 220,061.      Patented Sept. 30, 1879.

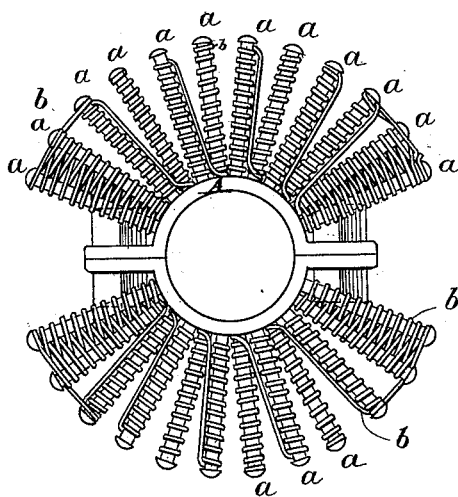


Fig. 1.

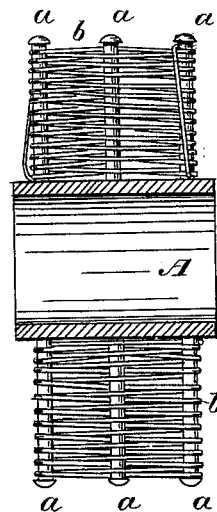


Fig. 2.

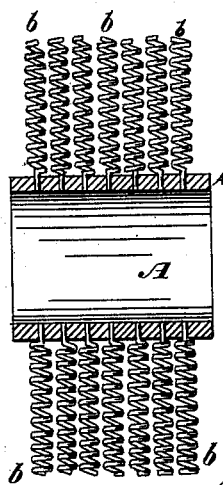


Fig. 3.

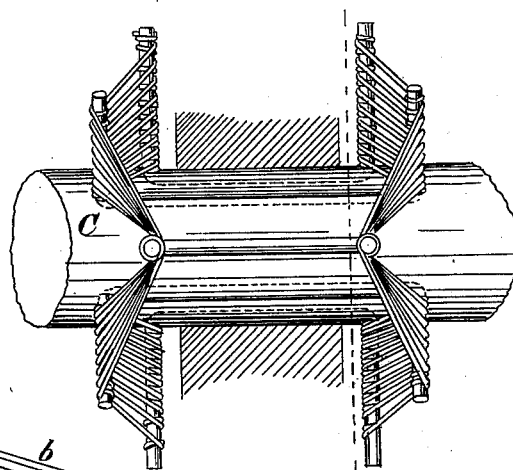


Fig. 6.

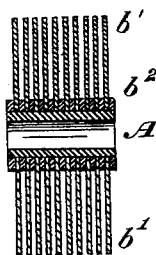


Fig. 4.

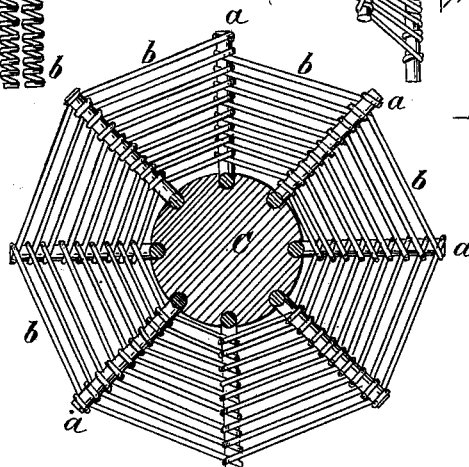


Fig. 7.

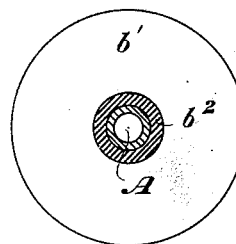


Fig. 5.

Frank C. Parker.  
 C. H. Glade.

James Dempsey.  
 by Maynard & Co.  
 his Atty.

# UNITED STATES PATENT OFFICE.

JAMES DEMPSEY, OF LEWISTON, MAINE.

## IMPROVEMENT IN DEVICES FOR PREVENTING JOURNALS FROM HEATING.

Specification forming part of Letters Patent No. **220,061**, dated September 30, 1879; application filed July 10, 1879.

*To all whom it may concern:*

Be it known that I, JAMES DEMPSEY, of Lewiston, Androscoggin county, State of Maine, have invented a new and useful Mode of Preventing Bearings from Heating, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, making a part hereof, in which—

Figure 1 is an end view, and Fig. 2 a section, illustrating a cooler embodying my invention. Fig. 3 is a section illustrating a modified form of cooler also embodying my invention. Fig. 4 is a section, and Fig. 5 a cross-section, both illustrating a third form of cooler, also embodying my invention. Fig. 6 is a side elevation, showing one mode of applying my invention directly to a shaft, and Fig. 7 is a cross-section in further illustration of Fig. 6.

The ill effects of allowing the bearings of shafting, car-axles, calender-rolls, &c., to become too hot are well known, and various modes of preventing this are also well known; but it is not uncommon, nevertheless, to find one or more shafts or journals in a mill which cannot be kept from heating without a very high degree of care, and hot boxes are by far too common on railroad-trains.

The object of my invention is to prevent this overheating in a way which is at once very simple, cheap, and durable; and my invention consists in providing the bearings with a metallic clothing or covering so arranged that a comparatively small bulk shall present a very large area of contact with the air, in order that the heat generated by friction shall be communicated to the metal clothing and rapidly dissipated by this clothing into the surrounding air, owing to the great superficial area and comparatively small bulk of this clothing.

The principle of my invention is the familiar one that a conductor of heat will dissipate heat in the air in proportion to its quality as a conductor and the area of its surface in contact with the air. Thus the burning gases forming a flame will become cooled below the point of ignition by the passing through the meshes of wire-gauze.

My invention is, in short, a novel application of the discovery of Sir Humphrey Davy

to practical use for preventing the overheating of bearings of all kinds.

I prefer to use copper wire, that being the best conductor of heat which is cheap enough for practical use for this purpose, and I prefer to arrange the wire on pieces projecting from the periphery of a copper collar, as shown in Figs. 1 and 2 of the drawings, in which A represents a copper collar, and *a* radial pins projecting from it, upon which the copper wire *b* is arranged, as shown. As this collar can be readily secured to the shaft and fitted closely to it and near the bearings, consequently the temperature of the shaft in contact with the collar can never very largely exceed the temperature of the collar, and the temperature of the collar can never very largely exceed the temperature of the surrounding air, because it is practically impossible to bring the radial pins and the wire supported by them to a temperature very greatly in excess of the air surrounding them. In fact, if a jet of flame were directed against the copper collar shown in Fig. 1, it would not greatly heat that collar, especially if that collar were revolved in the air.

Another form of collar is shown in Fig. 3, made up of a copper collar or sleeve, A, studded with copper wires *b*, each in the form of a spiral. This answers well, but has the disadvantage of being more easily injured. A fall, for example, which would not affect the collar shown in Fig. 1 would deface the collar shown in Fig. 3.

Sheets or plates of metal may, of course, be used—for instance, as shown in Figs. 4 and 5, in which A is the collar; *b*<sup>1</sup>, disks of sheet metal, and *b*<sup>2</sup> washers for holding the disks in place on the collar. Instead of a collar with the wire or sheet metal attached to it, the wire or sheet metal may be attached directly to the shaft; but as this will usually weaken the shaft the use of a collar or its equivalent is desirable.

Figs. 6 and 7 illustrate the use of a cooler which extends on each side of a bearing, and where a series of stout copper wires, *a*, are let into grooves in the shaft C, the ends of these wires projecting radially and supporting finer copper wires *b*.

As every bearing consists, strictly speaking, of a journal and box, and as one cannot get hot unless both do, it is obvious that my invention may be practiced by applying the metal

clothing above described to either; but I prefer in all cases to apply it to the moving parts of the bearing, as in that case a new supply of air is brought into contact with the radiating-surface of the collar, not only because of the tendency of hot air to rise, but also because of the motion of the collar, as will be clear without more detailed explanation.

In practice, I have found that a copper collar three inches wide, carrying fine copper wire, arranged as in Figs. 1, 2, and 3, so as to present about eight hundred square inches of surface to the air, remedied all trouble with a three-inch shaft running two hundred and seventy-six revolutions per minute under a very heavy strain, which shaft before the application of the collar was excessively troublesome, requiring very frequent oiling, and often the application of water.

The best manner of applying this clothing depends largely upon the circumstances of each case; but the examples above given are of general application.

I contemplate also the use of an article much like the well-known card-clothing, except that the wire teeth are inserted in sheet-copper instead of leather or the like.

What I claim as my invention is—

The mode above described of preventing bearings from overheating by means of metallic clothing arranged and operating to dissipate the heat, as above explained.

JAMES DEMPSEY.

Witnesses:

J. M. ROBBINS,  
ADDISON SMALL.