UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN THERMOSCOPES.

Specification forming part of Letters Patent No. **142,190**, dated August 26, 1873; application filed September 14, 1872.

To all whom it may concern:

Be it known that we, GEORGE F. BARKER, of the city and county of New Haven and State of Connecticut, and ALFRED M. MAYER, of Hoboken, in the county of Hudson and State of New Jersey, have invented a new Improvement in Thermoscopes; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to a device for detecting heat in frictional bearings, such as journals, &c.; also, for indicating heat in various manufacturing operations, &c., the object being the application of a device to such purposes, so that the person in charge will be able to detect excessive or required heat by sight.

We term our device a thermoscope.

The invention consists in applying to points where the detection of heat is desirable, either directly or by intervening material, a substance which, when heated to a certain degree, will change its color, and, upon a reduction of temperature, will return to its original color.

There are various substances known to chemists which change color by heat, but for this purpose the best known to us are the following:

First, a bright red or copper compound. For the production of this copper compound a solution of copper sulphate (mixed with sulphurous acid) is added to a clear solution of hydrargyro-iodide of potassium, and the red precipitate washed and dried.

Second, a bright yellow silver compound. For this yellow compound a solution of silver nitrate is added to the clear solution above mentioned, and the yellow precipitate is washed and dried.

This compound will be in the form of a powder, and is applied to the desired point or article by means of any suitable varnish.

The material may be applied directly or indirectly to the end of a journal, or upon any point of a shaft or journal or box or other frictional bearing, so that when heated to a certain extent the color will change, the red compound, for example, becoming nearly black; but when the temperature is reduced, the original color will return. The degree at which this change takes place is about 160° Fahrenheit in the case of the red compound. As in many journals or bearings this temperature would be too low, an intervening material or non-conductor is to be applied, removing this composition from the bearing to such an extent that whenever excessive heat is attained in the bearing it will be properly indicated.

The application of this invention may be best illustrated for railroad-axles. The material may be applied to the end of the axle or to the journal-box, where it is constantly in sight, so that a person passing may instantly detect an excessive heat.

This illustration will readily suggest to mechanics and others its application to other parts or points of machinery.

Another use of this thermoscope is in the heating of bars of metal. The heat from the furnace will be communicated to a certain extent along the bars, and at the point outside the furnace on the bar this compound is applied by means of a varnish or otherwise, where the temperature will change the color and indicate the desired heat within the furnace; hence the person in attendance, so soon as the change becomes perceptible, is aware that the heat has become perfected.

From these illustrations mechanics and others who know the necessity for such a thermoscope will readily perceive its application.

For many purposes this compound may be applied to card-board, leather, or thin metals, and by this means be attached to the point desired.

From our description of the compounds, as above, chemists will readily perceive that other compositions may be employed to produce the same result.

We claim as our invention—

A thermoscope consisting of the application, to points where excessive or required heat is desired to be detected or indicated, of a substance or compound which will by heat change its color, and immediately on the reduction of the temperature return to its original color, either with or without intervening material, substantially as set forth.

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Witnesses:
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