C. B. HODGES & T. McCAFFREY.

FUSIBLE PLUG FOR AIR COMPRESSORS.

APPLICATION FILED OCT. 25, 1911.

1,036,621.

Patented Aug. 27, 1912.

FIG. 1

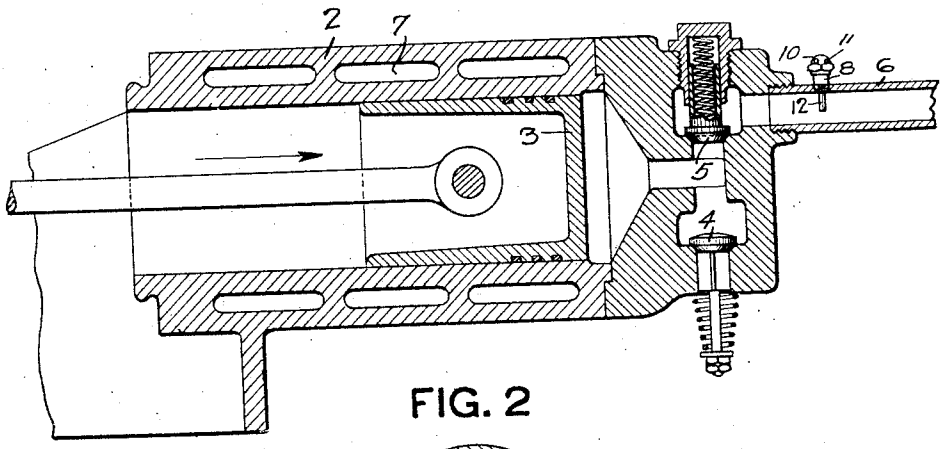
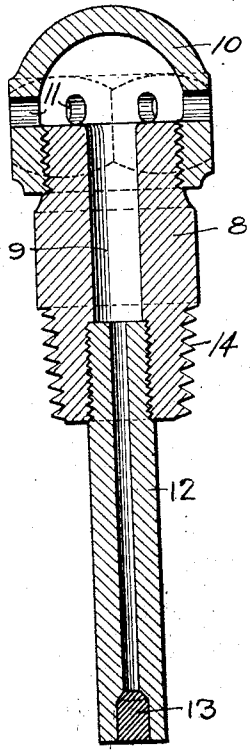


FIG. 2



WITNESSES.

J. R. Keller.

Robert C. Totten

INVENTORS

Charles B. Hodges

and Thomas McCaffrey

By Kerr & Totten

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES B. HODGES, OF PITTSBURGH, AND THOMAS McCAFFREY, OF BRIER HILL, PENNSYLVANIA.

FUSIBLE PLUG FOR AIR-COMPRESSORS.

1,036,621. Specification of Letters Patent. **Patented Aug. 27, 1912.**

Application filed October 25, 1911. Serial No. 656,641.

To all whom it may concern:

Be it known that we, CHARLES B. HODGES, a citizen of the United States, and resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, and THOMAS McCAFFREY, a citizen of the United States, and resident of Brier Hill, in the State of Pennsylvania, have invented a new and useful Improvement in Fusible Plugs for Air-Compressors; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to fusible plugs for air-compressors.

The object of our invention is to provide a fusible plug located adjacent to the discharge valve of the compressor and adapted to indicate by the melting out of the fusible metal abnormally high temperatures of the air. As is of course well known, the air is always heated by compression and if the temperature rises to an excessive degree, it will cause evaporation of the necessary lubricating oils in the cylinder resulting in an explosive compound of the evaporated oil and air which may a little later be ignited by an increased temperature due to compression, resulting in serious explosions which in the operation of air compressors has resulted in the loss of life and injury in addition to the loss occasioned by the destruction of property.

Our invention therefore consists in a plug located at the discharge of the compressor and adjacent to the discharge valve, said plug having a button of metal fusible at a higher temperature than the normal temperature of the air when discharged under proper conditions, whereby an outlet is afforded through said plug to the atmosphere to reduce the temperature and so give the proper warning to the operator that the compressor is working inefficiently.

In the accompanying drawings Figure 1 is a sectional view of a single acting compression cylinder with our invention applied thereto; and Fig. 2 is an enlarged vertical section of our improved safety plug.

Referring to the drawings we have illustrated our invention in connection with a single acting compressing cylinder 2 although it will be apparent that the invention is equally applicable in connection with a double acting compressing cylinder or with two or three-stage air-compressors and we have selected the single acting cylinder for simplicity of illustration. The piston 3 operates within the cylinder 2 and said piston compresses air only when traveling in the direction of the arrow, the other side of the piston being open to the atmosphere. Located within the cylinder head is the inlet valve 4 which is an ordinary type of spring-actuated puppet-valve and through which the air is drawn as the piston withdraws. The discharge valve 5 is also a spring-actuated puppet-valve of the usual construction which is open when the piston is advanced and the compressed air is forced through said valve to the discharge pipe 6. The cylinder is provided with the water-chambers 7 for the circulation of water to assist in preventing excessive temperatures.

The plug 8 formed of brass or other suitable metal is provided with the passage 9 which communicates with the cap 10 threaded onto said plug. The cap 10 is provided with the vents or apertures 11. The tubular extension 12 is screwed into the plug 8 and at the lower end of said extension is inserted the fusible metal 13. The metal selected for forming this fusible button is of such composition that it will melt at a temperature higher than the normal temperature of the air when discharged under the conditions of the normal operation of the compressor. This temperature may be 50° or 100° higher than such normal temperature of the air. An alloy of tin and lead has been found suitable for the purpose under many conditions. We do not, however, wish to confine ourselves to any particular alloy or metal as there may be many suitable for our purpose.

The plug 8 is located adjacent to the discharge valve and in the case of the compressor illustrated, an opening is formed in the discharge pipe 6 and the threaded portion 14 of the plug is screwed into said opening. The extension 12 extends into the pipe a sufficient distance to remove the fusible metal from the cooling influence of the external air, and accordingly the inner end of said extension is indicated as at the center or substantially center of the discharge pipe 6.

In the using of our invention and working under normal conditions the fusible plug remains intact. In the operation of air-compressors the increased temperature of

the air may be caused by leaky valves such as the discharge valve 5 for it is clear that if the valve 5 leaks the cylinder will not be filled with cool, fresh air from the outside through the valve 4, but will be filled by the hot compressed air rushing back under the valve 5, if said valve is in a leaky condition. This excessive temperature of the air in the cylinder will cause evaporation of the lubricating oils in said cylinder and the result will be an explosive compound which is liable to be ignited by still higher temperature due to compression. By our invention, however, when the air becomes excessively heated the fusible button 13 will melt and so permit of the escape of the overheated air through the outlets 11 opening to the atmosphere. In this way the noise occasioned by the escaping air warns the operator that the compressor is working in an inefficient or dangerous manner, in time to correct the cause of the abnormal operation in time to prevent explosions or material loss due to the continued operation of the compressor in an inefficient manner.

What we claim is:

1. The combination with an air-compressor, of a plug located adjacent to the outlet of said compressor, said plug having a passage connecting the atmosphere with the passage conveying compressed air, and a fusible metal closing said passage.

2. The combination with an air compressor, of a plug located adjacent to the outlet of said compressor, having an extension in the path of the discharged air, said plug having a passage connecting the atmosphere with the passage conveying compressed air, and a fusible metal in said extension.

3. The combination with an air compressor, of a vertical plug beyond the outlet of said compressor, said plug having a passage connecting the atmosphere with the passage conveying compressed air, and a fusible metal in said plug.

4. The combination with an air compressor, of a vented discharge passage closed by a fusible metal.

In testimony whereof, we the said CHARLES B. HODGES and THOMAS MCCAFFREY have hereunto set our hands.

CHARLES B. HODGES.
THOMAS McCAFFREY.

Witnesses:
ROBERT C. TOTTEN,
JOHN F. WILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C.".