E. A. EMERY.

METHOD OF LUBRICATING PNEUMATIC MACHINERY.

APPLICATION FILED SEPT. 30, 1907.

1,019,772. Patented Mar. 12, 1912.

Fig. 1.

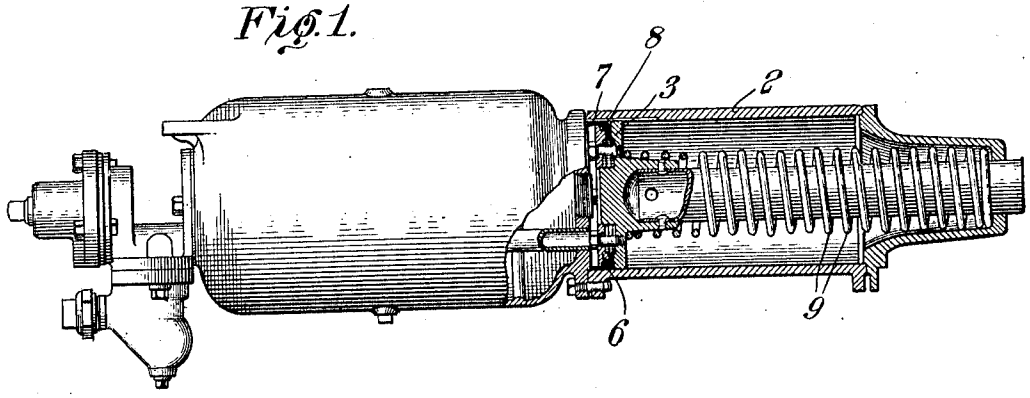
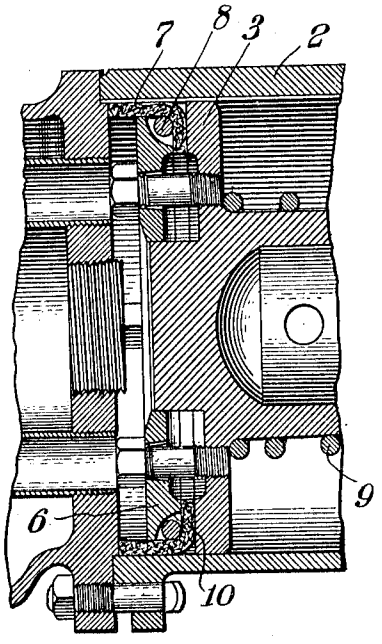


Fig. 2.



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UNITED STATES PATENT OFFICE.

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METHOD OF LUBRICATING PNEUMATIC MACHINERY.

1,019,772. Specification of Letters Patent. Patented Mar. 12, 1912.

Application filed September 30, 1907. Serial No. 395,287.

To all whom it may concern:

Be it known that I, EDWIN A. EMERY, a citizen of the United States, residing at Cripple Creek, in the county of Teller and State of Colorado, have invented certain new and useful Improvements in Methods of Lubricating Pneumatic Machinery, of which the following is a specification.

My invention relates to an improved method of lubricating the interior working surfaces of pneumatic machinery. When oil is used for this purpose, it is not only liable to be wasted, but is also liable to form a troublesome gum which interferes with the operation of the machinery, and it is one of the objects of my present invention to provide a method whereby a lubricant that is free from these objections may be efficiently applied to the metallic or other surfaces and the packings of leather or other material within the machinery, to the end that said surfaces and packings may be preserved and their utility increased.

In the practice of my invention, I employ a lubricant having an ingredient which is soluble in water and which, therefore, may be dissolved by the moisture contained in atmospheric air or an ingredient which has an affinity for the moisture in the air. Preferably, another ingredient in the lubricant suitable for use in the practice of my invention is graphite or its equivalent as a lubricating and leather filling agent. While there are many different substances which will answer the requirements stated, I find that the following recipe gives a very satisfactory lubricant for use in the practice of my improved method: 6 parts of powdered white castile soap, 4 parts of graphite, and 7 parts of glycerin are heated together, mixed, molded and allowed to cool. The lubricant thus prepared has an affinity for the moisture in the atmosphere and will slowly dissolve when exposed thereto. It will be apparent that the degree of hardness of the lubricant may be varied, if desired, by the introduction of more or less water or by increasing the quantity of glycerin employed.

My invention consists in taking a lubricant of the general character described, or its equivalent, and introducing the same into the pneumatic machinery either in the path of moving parts of the machinery or directly upon the moving parts of the machinery into a position where the motive air that operates the machinery shall have ready access thereto, to the end that the moisture contained in the motive air may act upon the soluble ingredient in the lubricant, thus slowly dissolving it to the end that the movement of the parts of the machinery may the more readily and efficiently distribute the same over a more extended surface. This distribution having been effected, the lubricant is in the very best possible shape for the moisture in the air to still further act thereon and dissolve the soluble ingredient therein, thus setting free the other parts of the lubricant which are then picked up by the air in its movement within the machinery and evenly distributed over all of the parts thereof with which it comes in contact. Not only is the uniform distribution of the lubricant thus obtained, but a further result highly desirable in some classes of pneumatic machinery is obtained, viz., the maintenance of the distribution of the lubricant. This is of particular importance in such classes of pneumatic machinery, for example, as the brake cylinders of air brake mechanism, since it is of the highest importance that all parts of the cylinder and of the packing leather on the piston working therein should be thoroughly subjected to the action of the lubricant if the surfaces of the cylinder and the leather are to be preserved and their utility maintained at the highest standard. Not only does the air act to distribute the thoroughly dissolved portions of the lubricant throughout the cylinder and upon the packing leather, but it also acts to force the graphite and the glycerin into the pores of the leather, thereby efficiently closing the pores against the passage of air therethrough and at the same time preserving the leather from becoming hard and also against wear, since the lubricant and particularly the graphite therein is thus enabled to form an efficient film or coating upon the surfaces of the leather.

There are various ways in which the lubricant may be applied to the interior of the pneumatic machinery. For example, the lubricant when in a sufficiently fluid state

may be squirted on the interior of the cylinder walls or other surfaces or it may be introduced in a mass in any place where the motive air will come in contact with it and where it will flow to the working surfaces in order that it may be distributed thereby.

For the purpose of illustrating one form of pneumatic machinery in which my method of applying lubricant may be employed, reference is had to the accompanying drawings, in which,

Figure 1 represents an air brake cylinder; and Fig. 2 shows the piston thereof on an enlarged scale.

The brake cylinder 2 is adapted to receive air pressure from the left and has a piston 3 which is held against said pressure by the spring 9. The piston 3 carries a follower plate 6 adapted to be clamped thereto and to hold the packing leather 7 in the position shown.

8 represents a packing expander which serves to hold the leather out against the cylinder walls.

In the practice of my method, the lubricant may be placed in the packing ring groove 10, and, if desired, may be also placed around the interior of the packing leather 7 and on the plate 6 and may also be squirted upon the interior surface of the air brake cylinder. The solvent action of the moisture of compressed air in contact with the face of the piston 3, tends to dissolve the soluble ingredient of the lubricant so that upon the movement of the parts, the lubricant is distributed in an even manner over the surface of the cylinder, thus exposing an extended surface to the further action of the moisture in the air, and this moisture acts to still further and more effectively dissolve the soluble ingredient of the lubricant. When the lubricant is thus thoroughly dissolved, it is acted upon by the swirling currents of air and carried to every part of the machinery with which said air comes in contact, thus efficiently maintaining the distribution of the lubricant against the tendency which gravity has to cause all lubricants to settle away from the upper portions of the machinery, such for example, as the upper part of the cylinder 2 or the upper portion of the packing leather 7. This tendency of lubricants, as heretofore applied, to settle away from the upper portion of the air brake cylinder has resulted in dry streaks or surfaces on the upper portion of the cylinder while an excess of lubricant was found in the lower portion, with the resultant dryness and cracking of the packing leathers and leakage of the air therethrough, whereas by my method of distribution of the lubricant, the lubricant is maintained in an equal state of distribution on the upper as well as the lower surfaces of the cylinder and other parts and all leakage or abrasion or wear of the surfaces is thereby effectively avoided. In addition to this distribution of the lubricant to all of the parts and maintaining such distribution, my method further provides for the forcing of the graphite and glycerin and other parts of the lubricant into the pores of the packing leather or other packing material, thereby effectively closing such pores and ultimately forming a protecting film on the exterior surface of the packing which greatly prolongs the life of the packing as well as enables the same to effectively retain the air pressure to the rear of the cylinder, that is, to the left of the cylinder. In addition to this, the action of the lubricant has a cleansing effect upon the mechanism by reason of the presence of the soap.

While for the purpose of illustrating the invention I have specifically described an air brake mechanism and have given a specific formula to illustrate the class of lubricants to which my invention is applicable, it is to be understood that my invention is not limited to the specific lubricant thus described nor to the practice of my method in the particular apparatus chosen for illustration, the inventive idea being as broad as the appended claims.

Having thus described my invention, what is claimed is:

1. The method of lubricating pneumatic machinery which consists in applying a lubricant having a soluble ingredient in a position to be distributed by the moving parts of the machinery and dissolving the soluble ingredient of the lubricant by the moisture in the motive air, distributing the lubricant by the action of the moving parts, thus exposing an extended surface of the lubricant to the moisture in the air, then subjecting the distributed lubricant to the action of the moisture in the motive air, and maintaining the distribution of the lubricant by the movements of the motive air.

2. The method herein described of lubricating packing leathers and bearing surfaces in pneumatic machinery which consists in applying a lubricant having a soluble ingredient in a position to be distributed by working parts of the machinery and subjecting it to the solvent action of the moisture in the motive air, whereby the lubricant is distributed by the action of the moving parts, then further subjecting the distributed lubricant to the moisture in the air, and then feeding the lubricant to the packing leathers and bearing surfaces by the action of the motive air.

3. The method herein described of lubricating and preserving packing leathers in pneumatic machinery which consists in applying a lubricant containing graphite and a soluble ingredient in a position to be dis-

tributed by the moving parts of the machinery, and subjecting it to the solvent action of the moisture in the motive air, whereby the lubricant is distributed by the action of the moving parts, further subjecting the distributed lubricant to the moisture in the motive air, and then forcing the graphite into the packing by the pressure of the motive air.

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