A. E. ZUMWALT.

METHOD OF MAKING AND REPAIRING PISTON RODS.

APPLICATION FILED JAN. 24, 1920.

1,374,624. Patented Apr. 12, 1921.

Fig. 1.

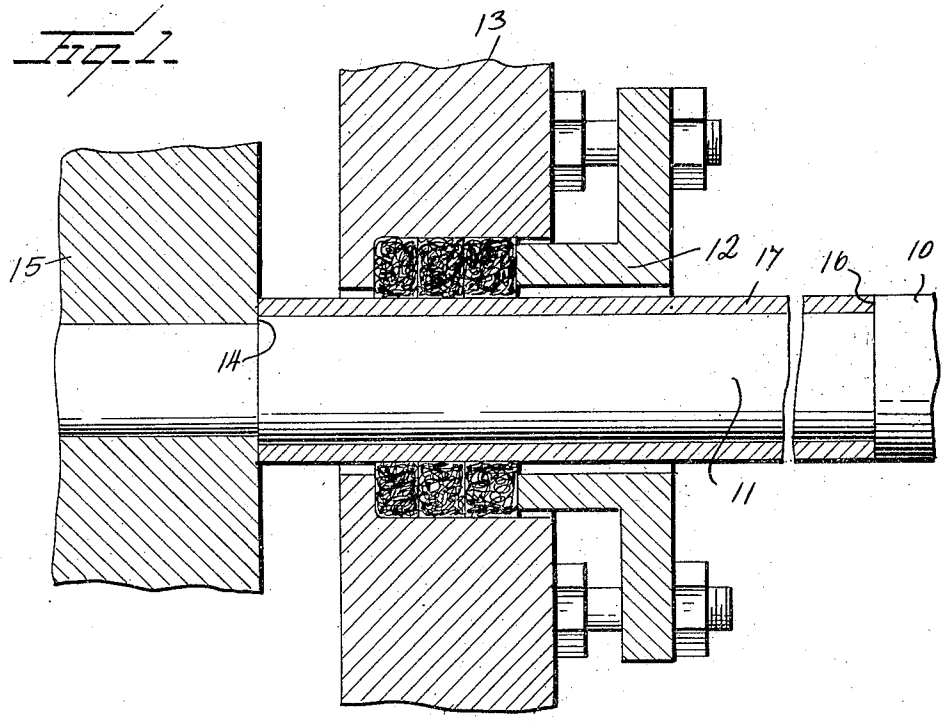


Fig. 2.

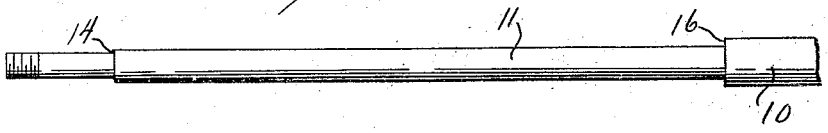
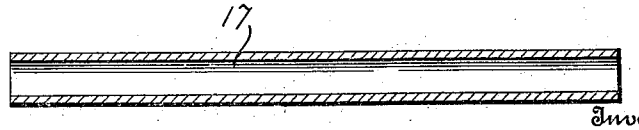


Fig. 3.



Inventor

A. E. Zumwalt

By Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE.

ALVA E. ZUMWALT, OF CANEY, KANSAS.

METHOD OF MAKING AND REPAIRING PISTON-RODS.

1,374,624. Specification of Letters Patent. Patented Apr. 12, 1921.

Application filed January 24, 1920. Serial No. 353,903.

To all whom it may concern:

Be it known that I, ALVA E. ZUMWALT, a citizen of the United States, residing at Caney, in the county of Montgomery and State of Kansas, have invented certain new and useful Improvements in Methods of Making and Repairing Piston-Rods, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to the piston rods of steam engines, pumps, or other like mechanisms, and particularly to the method of repairing these piston rods when they become worn.

The common practice today when the piston rod of a pump, steam engine, or like part becomes worn at the point where it passes through the bearing or stuffing box of the cylinder is to remove the rod and replace it by a new rod. Because of the high cost of material, this is a relatively costly operation, and the general object of my invention is to provide means whereby the piston rod may be repaired and put in as good shape as it was originally without the necessity of throwing away the piston rod, this repairing of the piston rod costing a relatively small amount.

A further object is to so repair the piston rod that the piston will be as firmly held in place upon the rod as it would have been if no repairs had been made.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a sectional view of a portion of an engine cylinder showing the stuffing box and showing in section the piston and the repair sleeve of the piston rod;

Fig. 2 is an elevation of the piston rod after it is turned down to receive the sleeve;

Fig. 3 is a sectional view of the sleeve.

My method of repairing the piston rods of pumps, engines and like parts I have in practice found to be extremely cheap and effective. It consists in taking the worn piston rod 10 and turning it down to a less diameter, as at 11, along that portion of the rod which passes through the stuffing box 12 in the cylinder head 13. This reduced portion 11 extends from the shoulder 14 against which the piston 15 bears to a point beyond the extremity of the stroke of the piston rod, thus forming a shoulder 16 on the piston rod. Of course, the piston has been removed in order to permit the piston rod to be turned down, and after the piston rod is turned down, a bushing 17 of brass, steel, or other suitable metal is slipped over the reduced portion of the piston rod, this bushing preferably having a tight fit on the reduced portion of the piston rod. The bushing has a length exactly equal to the distance between the shoulders 14 and 16 and is forced firmly into place so that the end of the bushing or sleeve 17 will be coincident with and form a continuation of the shoulder 14. The piston 15 is then put in place, and has its full bearing upon the extremity of the bushing 17 and against shoulder 14. Of course, the construction of the piston and the manner in which it is held in place form no part of my invention.

The piston rod so repaired is in every respect equal to a new piston rod, and it is obvious that when the sleeve 17 becomes so much worn that steam or water will escape around the packing in the stuffing box, then the rod may be removed and a new sleeve or bushing 17 put in place, and that this replacement of worn sleeves by new may be continued indefinitely without necessitating the throwing away of the piston rod. As an example of the saving which is effected by the method above outlined, I may state that certain half brass piston rods cost about $43. Thus, if the old piston rod is thrown away, it will cost this amount to replace the piston rods. To repair the rod by the means which I have described costs about $3.15. This method of repairing piston rods can be applied to any piston, steam, water, or oil, or applied to any rod which works in bearings, and it is obvious also that the sleeve or bushing may be made of any desired metal. For water and steam pistons, brass is preferable, but for oil pistons steel bushings may be used. This method of repairing or constructing the piston rod may be applied to polish rods on oil jacks.

I claim:

1. A method of repairing worn reciprocating rods passing through bearings consisting in reducing the worn portion of the rod to a diameter less than its normal diameter and placing thereover a bushing of the same length as the reduced portion of the

rod and having an exterior diameter the same as the normal exterior diameter of the rod before it is reduced.

2. A method of repairing piston rods carrying pistons and reciprocating through bearings consisting in reducing the diameter of that portion of the rod which passes through the bearing from the inner face of the piston and placing upon this reduced portion a bushing having a length equal to the reduced portion whereby the bushing will bear against the shoulder formed at the junction of the reduced portion with the unreduced portion of the piston and at its other bear against the piston itself, said bushing having an exterior diameter the same as the normal diameter of the piston rod before it was reduced.

In testimony whereof I hereunto affix my signature.

ALVA E. ZUMWALT.