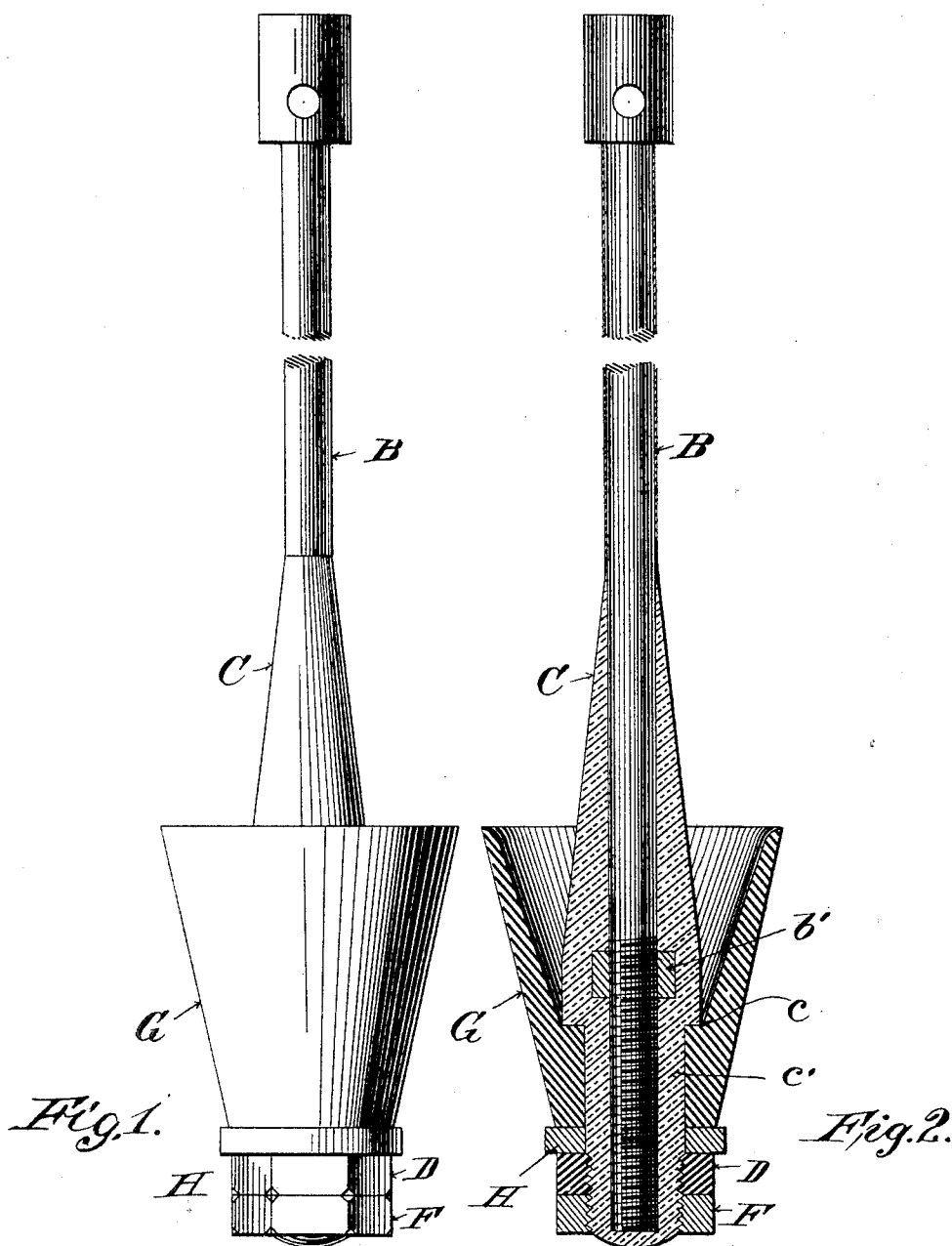


(No Model.)

J. T. MORROW.
PUMP FOR ACIDS OR OTHER LIQUIDS.

No. 586,688.

Patented July 20, 1897.



WITNESSES
C. W. Benjamin
Geo. H. Lombard

INVENTOR
John T. Morrow
BY *Charles H. Smyth*
ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN T. MORROW, OF GREAT FALLS, MONTANA.

PUMP FOR ACIDS OR OTHER LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 586,688, dated July 20, 1897.

Application filed November 20, 1896. Serial No. 612,822. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. MORROW, of Great Falls, Montana, have invented a new and useful Improvement in Pumps for Acids or other Liquids, of which the following is a description, referring to the accompanying drawings, which form a part of this specification.

The invention particularly concerns the plunger or bucket rod and the means by which the plunger or bucket is attached thereto.

An old and more or less approved plunger-rod for acid-pumps is made of wood, provided at its lower end with an annular channel, within which is fitted the rubber bucket, which constitutes both the plunger and the valve. The rubber bucket is forced down over the rod by means of a jack-screw or otherwise and finally springs into the annular recess. In putting on the rubber it is strained and injured so that it soon becomes inefficient, fitting loosely around the neck of the wooden rod and allowing more or less solution to leak back. Furthermore, the lower part of the rod splits off from time to time, and the pieces get into the foot-valve or other lower valve, causing trouble, while the rubber plunger, then improperly sustained, rocks back and forth and quickly wears away, causing leakage.

The nature of my improvement will be readily understood from the accompanying drawings, wherein—

Figure 1 is an elevation of the plunger-rod and rubber bucket, and Fig. 2 a central section of the rod and bucket.

Throughout the drawings like letters of reference indicate like parts.

At B is indicated a plunger-rod, preferably a round iron rod, screw-threaded for several inches at its lower portion and provided with a nut *b'*. The nut may of course be an integral part of the rod, and in place of screw-threading the lower end of the rod may be roughened in any other manner or even left smooth without departing from the invention. About the lower end of the rod is cast or otherwise secured a boss C, preferably of lead and antimony, which may extend a foot or more from the end of the rod and completely incase its lower end. While the nut *b'*, with the screw-threading already described, is the

preferable manner in which I secure substantially integral union of the boss and the rod, such a union may be otherwise obtained, the essential point being the covering of the rod by the boss C. The boss C has the shoulder *c* and the shank *c'*, extending from the shoulder *c* and screw-threaded to receive a nut and jam-nut D F. The rubber bucket G fits around the shank *c'* against the collar *c*, as shown, and after it is placed in position the washer H is placed beneath the bucket and the nut D then screwed on, confining the rubber in the annular recess, as shown, and insuring an acid-tight joint. The jam-nut F, which, like the washer H and nut D, should preferably be of lead and antimony or otherwise acid-proof, is then screwed on, locking the parts in position. Above the boss C the rod B is preferably surrounded with a lead pipe or a continuation of the boss, extending up to the highest portion which the acid or other solution may reach. The covering of this portion may be accomplished by incasing it in a lead pipe and then drawing the pipe until it is rigidly compressed upon the rod. By this simple improvement all the parts are perfectly protected against the solution, and at the same time the rubber bucket may be put on without straining, may be renewed from time to time, and a perfectly-secure acid-tight joint between the rubber and plunger-rod is had.

What I claim, and desire to secure by these Letters Patent, are the following features:

1. As an improvement in pumps for acids and other liquids: the plunger-rod, B, screw-threaded at its lower portion, the nut *b'* thereon, the boss, C, incasing the lower end of the rod and the nut, and provided with an annular shoulder *c*, the plunger G upon the said boss and fitting against the shoulder *c*, and means for forcing and confining the said plunger against the said shoulder *c*, substantially as set forth.

2. As an improvement in pumps for acids and other liquids: the plunger-rod B, provided with an acid-proof boss incasing its lower end which has a shoulder *c* and means for securing an annular plunger upon or near the lower extremity of said boss, below the said shoulder, substantially as and for the purposes set forth.

3. As an improvement in pumps for acids and other liquids: the plunger-rod B, the boss C upon its end, provided with a shank *c'*, the plunger upon the said shank, and one or
5 more nuts, D, screw-threaded onto the said shank, substantially as set forth.

4. As an improvement in plunger-rods for pumps for acids and other liquids, an interior rod of relatively stronger material, an incas-
10 ing protective boss at its lower end, a pro-

TECTIVE material surrounding and extending upward upon the said rod above the said boss, and means for mounting and securing the plunger upon the said boss.

In testimony whereof I have hereunto set my hand.

JOHN T. MORROW.

Witnesses:

GEORGE C. PIWOUKA,
G. HEBERLEIN.