

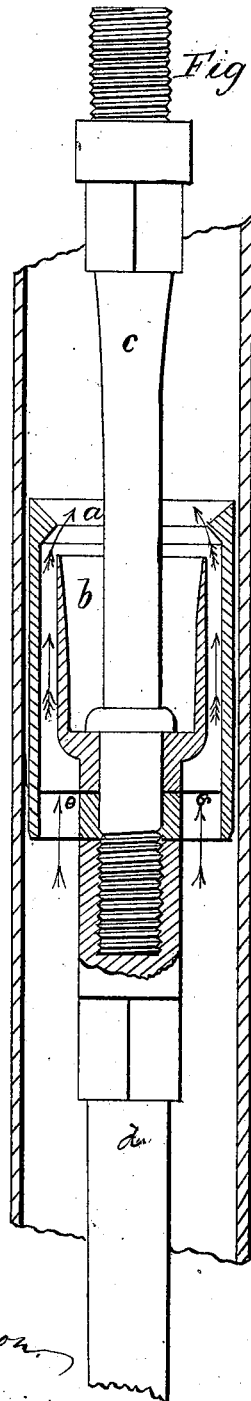
*F. Armstrong,*

*Pump Piston.*

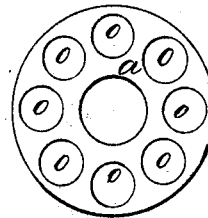
*N<sup>o</sup> 54,484.*

*Patented May 8, 1866.*

*Fig: 1.*



*Fig: 2.*



*Witnesses;*  
*Thomas Anderson,*  
*A. Garrison.*

*Inventor;*  
*Francis Armstrong.*

# UNITED STATES PATENT OFFICE.

FRANCIS ARMSTRONG, OF PITTSBURG, PENNSYLVANIA.

## APPARATUS FOR PROTECTING PUMPS IN DEEP WELLS.

Specification forming part of Letters Patent No. 54,484, dated May 8, 1866.

*To all whom it may concern:*

Be it known that I, FRANCIS ARMSTRONG, of Pittsburg, State of Pennsylvania, have made a new and useful machine for catching loose or broken rivets that come from sucker-rods when parting in oil-wells; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

Figure 1 is a sectional elevation. Fig. 2 is view of the bottom of cup *a*.

For deep oil-wells the sucker-rods are made of wood, in order that their buoyancy will meet a part of their weight. Being continuous in the liquids, the wood softens and the rivets used to make their iron connections work loose, break, and comes out. These atoms fall down and get into the pump; having sharp edges, cuts and injures it, as well as suspends its uses until they are taken out, and which requires the tubing to be drawn to do so.

This apparatus is placed between the working-barrel of the pump and the lowest point of the sucker-rod where rivets are used. The rivets when falling goes into it, and are thus prevented from reaching the pump. To remove them from the well, drawing the sucker-rod brings them out.

The diameter of the rivet-catcher to suit a given size of tubing will depend very much on the uniformity of the inside diameter of the tube. It should be as large as will go in without binding, in order to leave as small a space as possible between the tube and itself to exclude solid substances from getting between them or passing it.

In order to have the arrangement complete I will suggest the employment of two, and in very deep wells three, separate rivet-catchers, situated in the well at stated distances apart, so each one will catch such rivets falling from above it. The upper section of the sucker-rod is most liable to part, and such arrangement would facilitate in taking the rivets out, in having less of the rod to draw to do so. For the lower one, have a piece of tubing for it to work in, the same length as the working barrel, and placed between it and the common tubing. This can have a diameter larger than the working-barrel and less than the tubing.

The rivet-catcher, in passing down, can do

so readily through the common tubing, but when in its position will fit its own tube sufficiently close to prevent anything passing that could injure the pumping apparatus.

In the construction as seen by Fig. 1 two cups are in combination, (marked *a* and *b*,) both of which I make of brass. The liquids in passing enter through holes *o*, made in the bottom of *a*, and pass around *b*, as indicated by the arrows. Consequently the cup *b* covers the openings through *a* ample to prevent rivets from getting through openings *o* without any contraction in the passage for the fluids upward, and if the cup *b* was reduced in depth from that shown by the drawings, or even have a level plane surface, this feature would exist the same; and for the use of small tubing in wells; in order to enlarge the space for containing the broken rivets, it will be necessary to do so, as the room is too limited to have the cup the receptacle for the rivets, as seen by that shown in Fig. 1, which I will now more definitely describe.

The mouth of cup *a* is contracted to a size that will simply allow *b* to pass into it, this contraction having angular faces, the upper face guiding substances in falling into cup *b*, the under one bending the currents of the fluids over the mouth of it, which not only keeps the atoms in it there, but acts on others which may have to pass the mouth of *a*, that may have fallen in a position as not to get into *b*, and arrange them so they will do so.

The bar *c*, on which the cups *a* and *b* are mounted, screws into the socket on the end of the sucker-rod, that is made in the usual form and riveted on it.

The bar *d* is made of such length as will keep the bar *c* above the working-barrel and in the lower end of the tubing joining it. It has a socket at each end, one screwing on the lower end of bar *c*, after passing through the cups, the other screwing on the male part of the pump-piston in the ordinary way.

After this my description, what I claim as new, and desire to secure by Letters Patent, is—

The cups *a* and *b*, when arranged and operated as, or substantially as, and for the purpose set forth.

FRANCIS ARMSTRONG.

Witnesses:

A. GARRISON,  
F. ANDERSON.