

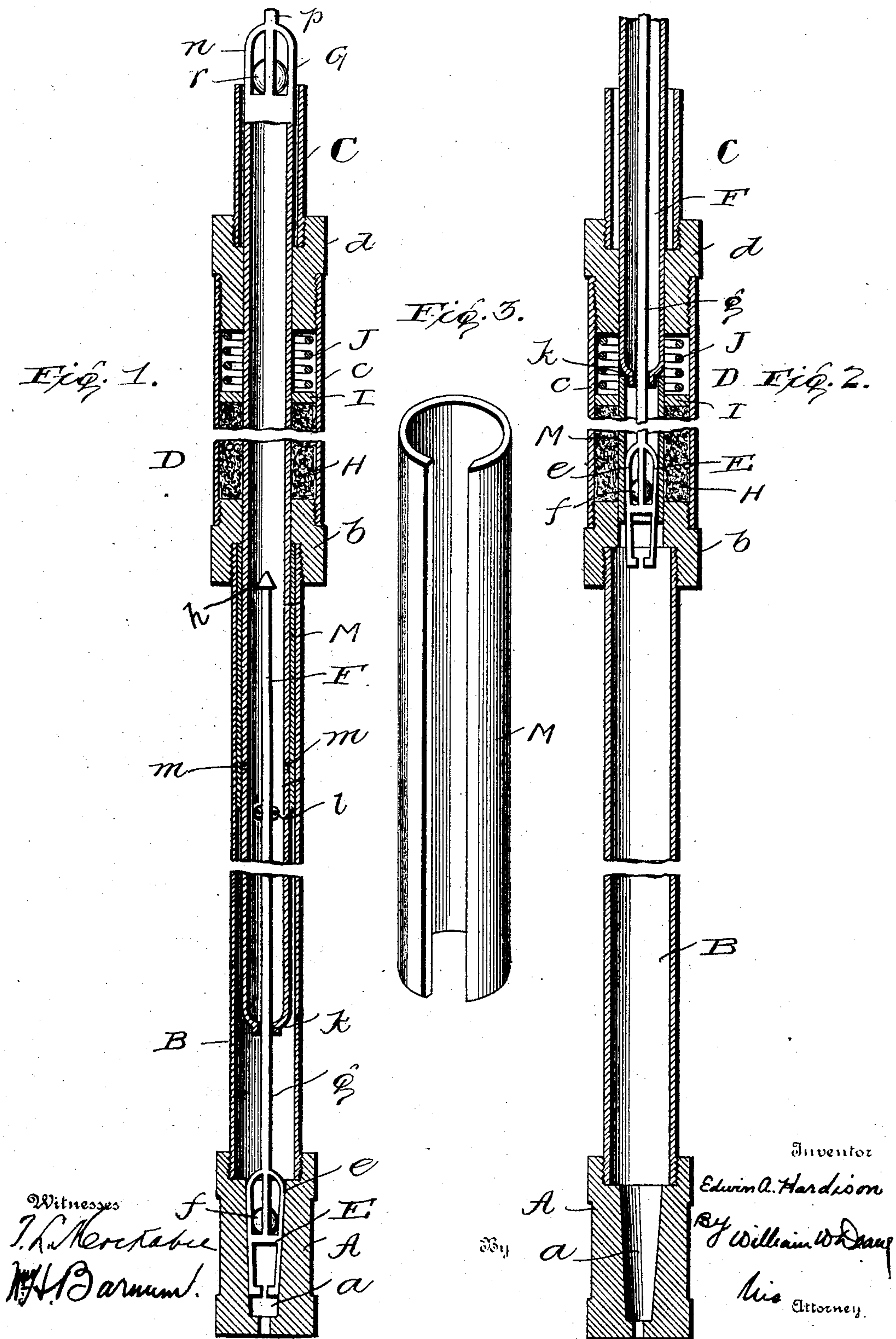
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PATENTED AUG. 8, 1905.

E. A. HARDISON.

PUMP.

APPLICATION FILED FEB. 25, 1905.



UNITED STATES PATENT OFFICE.

EDWIN A. HARDISON, OF BAKERSFIELD, CALIFORNIA.

PUMP.

No. 796,909.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWIN A. HARDISON, a citizen of the United States, residing at Bakersfield, in the county of Kern and State of California, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention pertains to pumps, more particularly pumps of the tubular-piston type; and it has for one of its objects to provide such a pump embodying inexpensive material for packing the tubular piston and means for taking up and compensating for wear of the packing material with a view of prolonging the usefulness of the same.

Another object of the invention is the provision in a pump of the kind stated of a construction that will permit of expeditious and easy repacking when the same is necessary.

Another object is the provision of a tubular-piston pump embodying such a construction that it may be readily cleared of sand or other foreign substance when the same interferes with its proper operation.

The invention will be fully understood from the following description and claims when taken in connection with the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical diametrical section, with some parts in elevation, illustrative of the pump constituting the present and preferred embodiment of my invention. Fig. 2 is a detail diametrical section illustrating the split tube, of resilient material, within the packing material and a portion of the tubular piston above said split tube; and Fig. 3 is an enlarged perspective view of the said split tube removed.

Similar letters designate corresponding parts in all of the views of the drawings, referring to which—

A is the lower end section of my novel pump, which is open at its lower end and has a downwardly-tapered bore or seat *a*, for a purpose hereinafter set forth.

B is a lower tubular casing-section, screwed in or otherwise suitably connected to the upper end of the section A.

C is an upper tubular casing-section, and D is a box arranged endwise intermediate the casing-sections B and C. The said box is preferably made up of a lower head *b*, screwed on or otherwise connected to the upper end of casing-section B, a cylinder *c*, screwed on or otherwise connected to the head *b*, and an up-

per head *d* interposed between and connected to the casing-section C and the cylinder *c* and removable from the latter, for a purpose presently set forth.

E is the lower valve of the pump. The said valve comprises a cage-like body *e*, exteriorly tapered in conformity to the taper bore *a* in section A and designed to normally rest in said taper bore, as shown in Fig. 1, a non-return valve proper, *f*, preferably a ball, arranged in and carried by the body *e*, and a rod *g* permanently connected to and extending upwardly from the upper end of the body *e* and terminating at its upper end in an enlargement *h*.

F is the tubular piston, which is arranged to be reciprocated through the box D and in the casing-sections B and C. The said piston has an opening *k* in its lower end for the passage of the rod *g* and the liquid to be lifted, and it is also provided with an interior abutment *l*, which is preferably arranged, as shown, to loosely receive the rod *g*, and is designed when the piston is drawn upwardly to engage the enlargement *h*, and thereby raise valve E. The piston is further provided with one or a plurality of openings *m* at an intermediate point in its length, which openings are designed to assist in the operation of clearing the pump of sand or other foreign substance, as presently explained.

G is the upper non-return or lifting valve of the pump. This latter valve comprises a cage-like body *n*, connected to the upper end of the piston F and having connected to it a rod *p* for reciprocating the piston, and a valve proper, *r*, preferably a ball, arranged in said body *n*.

H is a packing, preferably fiber, arranged in the box D around the piston F and on the head *b*.

I is an annular plate superposed on the packing, and J is a coiled spring surrounding the piston and interposed between the box-head *d* and the plate I. The said spring tends to expand and by so doing takes up and compensates for wear of the packing H and materially prolongs the usefulness of the same. It will also be noted that at all times the spring holds the packing under pressure and assures the packing pressing tightly against the piston.

M is a split tube of resilient material, preferably spring-steel, which when contracted corresponds in diameter to the piston F. The said tube M is designed during the ordinary

working of the pump to rest in the casing-section B, and it is also designed by tending to expand to press against the section B and retain itself against casual movement in the same.

In the practical use of my novel pump the piston F is reciprocated through the medium of the rod *p*, when, as will be apparent, liquid will be drawn upwardly past the valve *f* on the upward stroke of the piston and will be forced upwardly through the piston and past the valve *r* on the downward stroke of the piston. If during the working of the pump the valve E becomes clogged with sand or other foreign substance, the operator has but to raise the piston F sufficiently to carry the apertures *m* in the piston to a point in the upper casing-section C and above the upper end of the packing-box D. When the apertures *m* reach the point stated, the abutment *l* in the piston will have acted against the enlargement *h* on rod *g* and raised the valve E as a whole from the taper bore *a*, and hence it will be seen that the liquid which will pass downwardly from the casing-section C through the apertures *m*, the piston F, and the casing-section B will wash all of the collected sand or other foreign substance out of the valve E. Subsequent to the clearing of the valve E in the manner just described the piston F is lowered to its working position, (shown in Fig. 1,) when the cage-like body *e* of the valve will seat in the taper bore *a* and by reason of frictional contact will remain in said seat during the ordinary working of the pump. When it is necessary to remove the packing material H and replace the same with new packing material, the piston F and valve E are drawn upwardly through the box D, the said box D is disconnected from the casing-section B, the head *b* is removed from the box, and the tube M is withdrawn from the casing-section B. Then after the old packing material is taken from the box D the tube M, surrounded by new packing material, is placed in the box and the parts are coupled, as shown in Fig. 2. When surrounded by packing material and placed in the box D, as stated, the tube M is compressed to the diameter of the piston F, and hence it will be observed that when the piston is moved downwardly from the position shown in Fig. 2 it will displace the tube M and assume the position of the latter in the packing material. The tube M displaced, as stated, will expand when it reaches the position shown in Fig. 1 and will of itself remain in such position out of the way of the piston and yet ready for use when it is necessary to replace the packing material in the box D with new material.

In addition to the practical advantages

which I have hereinbefore ascribed to my novel pump it will be noted that the same is simple, compact, and inexpensive in construction and embodies no frail parts such as are likely to get out of order after a short period of use.

While I have specifically described the construction and relative arrangement of the parts included in the present and preferred embodiment of my invention with a view of imparting a definite understanding of such embodiment, I do not desire to be understood as confining myself to the said construction and relative arrangement of parts, as such changes or modifications may be made in practice as fairly fall within the scope of my invention as claimed.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A pump comprising a lower casing-section having a downwardly-tapered bore, an upper casing-section, a box intermediate said sections, a tubular piston extending through the box and having an aperture in its side at an intermediate point of its length, a body of packing material arranged in the box and around the piston, an annular plate surrounding the piston and arranged against one end of the body of packing material, a coiled spring surrounding the piston and interposed between the said plate and the adjacent end of the box, a split tube, of resilient material, arranged in the lower casing-section and exerting outward pressure against the inner side thereof, a valve having a body tapered to seat in the downwardly-tapered bore of the lower casing-section and a valve proper contained in said body, and coacting means on the valve and the tubular piston for lifting the body of the former from the tapered bore when the piston is raised sufficiently to carry its intermediate aperture above the box.

2. A pump comprising lower and upper casing-sections, a box intermediate said casing-sections, a piston extending through the box, packing arranged in the box and around the piston, and a split tube, of resilient material, arranged in the lower casing-section and exerting outward pressure against the inner side thereof, whereby it is held of itself against casual movement and is retained in position for ready removal when the packing is to be replaced with new packing.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN A. HARDISON.

Witnesses:

W. S. ALLEN,
M. L. BUTTZ.