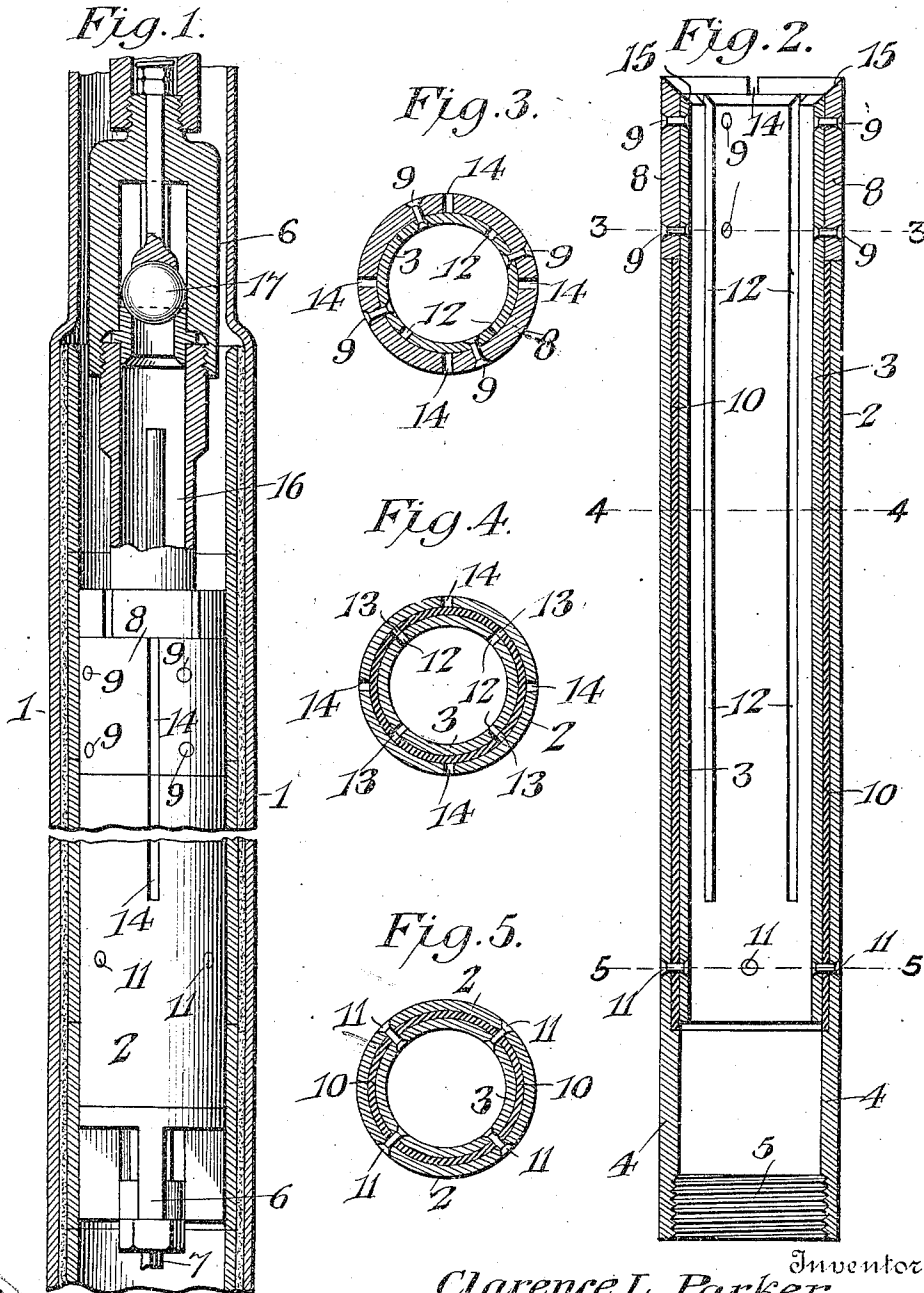


C. L. PARKER.
EXPANSIVE PUMP PLUNGER.
APPLICATION FILED OCT. 25, 1911.

1,027,889.

Patented May 28, 1912.



Witnesses

Jas. H. McLaughlin
F. J. Chapman

Inventor
Clarence L. Parker,

By

E. J. Figgess
Attorney

UNITED STATES PATENT OFFICE.

CLARENCE L. PARKER, OF LOS ANGELES, CALIFORNIA.

EXPANSIVE PUMP-PLUNGER.

1,027,889.

Specification of Letters Patent.

Patented May 28, 1912.

Application filed October 25, 1911. Serial No. 656,606.

To all whom it may concern:

Be it known that I, CLARENCE L. PARKER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Expansive Pump-Plunger, of which the following is a specification.

This invention has reference to improvements in pump plungers, and its object is to provide an expansive plunger designed more especially for use in deep wells, such as oil wells.

The invention comprises a plunger in which the plunger body is composed of two tubular parts, one of which is interior to the other, and these members are split longitudinally throughout the major portion of their length from what constitutes the upper end of the plunger when in place in the well.

The slits of one sleeve or tubular member are in staggered relation to those of the other, while the inner sleeve is of sufficiently less external diameter than the internal diameter of the outer sleeve to accommodate between them a tube of rubber, or other such material, which is also slit longitudinally in conformity to the slits of the inner tube, so that expansion of the inner tube is not resisted by the rubber sleeve, but the latter will prevent the entrance of sand into the space between the inner and outer sleeves. The weight of the column of liquid above the plunger serves to force the split walls of the plunger outward into engagement with the pump barrel, so that leakage past the plunger is effectively prevented.

The improved plunger is particularly useful in connection with wells wherein sand prevails, and the upper end of the plunger is beveled so as to scrape sand from the inner wall of the pump barrel to thereby minimize the cutting action which would result should sand enter between the plunger and the pump barrel.

The invention will be best understood from a consideration of the following detail description, taken in connection with the accompanying drawing forming a part of this specification, with the understanding, however, that while the showing of the drawing illustrates a practical form of invention, the latter is susceptible of various changes and modifications without departure from the salient features of the invention.

In the drawing:—Figure 1 is a longitudinal section of a portion of a pump barrel

with a pump plunger, constructed in accordance with the present invention, in said barrel and shown in elevation. Fig. 2 is a longitudinal diametric section of the pump plunger. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a section on the line 5—5 of Fig. 2.

Referring to the drawing, there is shown a pump barrel 1, which may be of any desired construction, although I prefer the construction disclosed in my application, No. 587,055, filed Oct. 14, 1910.

The plunger comprises an outer tubular member 2 and an inner tubular member 3 in telescoping relation one to the other. The outer tubular member 2 is interiorly thickened at what constitutes the lower end as indicated at 4, and there is screw threaded as shown at 5 for the reception of a guiding cage 6 for a valve unseating rod 7, such as shown in my application, No. 587,056, filed Oct. 14, 1910, and which therefore requires no further description herein. The upper end of the tube 3 is also thickened radially and for structural reasons the thickening of the tube 3 may be in the form of a collar 8, connected to the upper end of the tube 3 by rivets 9, or otherwise.

The thickened portion 4 of the tube 2 is of sufficiently greater thickness than the walls of the tube 2 to form a seat for a sleeve 10 of rubber, or other suitable material, while the external diameter of the tube 3 is such that it may be introduced into the tube 2 within the rubber tube 10, and the collar 8 is of sufficient thickness to bring its outer surface substantially flush with the outer surface of the tube 2.

Near that end of the tube 3 constituting its lower end it is traversed by rivets 11, or other suitable fastening means, also extending through the rubber tube 10 and the tube 2, so that the lower end of the tube 3 is firmly secured to the tube 2.

The tube 3 is formed with longitudinal slits 12 extending from the upper end thereof to near the lower end thereof and terminating short of such lower end. The rubber tube 10 is also formed with slits 13, conforming to the slits 12, while the outer tube 2 is formed with longitudinal slits 14, extending downward to about the same distance as the slits 12 in the tube 3, but the slits 14 are staggered with relation to the slits 12 and 13, so as to come opposite the

solid portions of the walls of the tubes 3 and 10.

The upper end of the tube 3 and the corresponding portion of the collar 8 are beveled upwardly, as indicated at 15 to form a comparatively sharp edge at the upper end of the outer surface of the collar 8. The plunger is carried by a hollow rod 16, which may be screwed into the interior of the cage 6, and this rod carries a valve 17, but the construction of the plunger rod 16 and valve 17 do not enter into the present invention, being fully covered in the aforesaid application, No. 587,956, wherein there is also disclosed but not claimed a plunger in many respects similar to the plunger forming the subject-matter of the present application.

The plunger herein disclosed is an elongated structure, and is designed for use in deep wells, especially where sand may be present, and the elongated slits provide for the expansion of the plunger so as to make a tight yet free fit with the inner walls of the pump barrel. The disposition of the slits 12 and 13 permits the simultaneous expansion of the inner sleeve 3 with the intermediate sleeve 10 against the inner wall of the outer sleeve or tube 2, and the slits 14 permit the expansion of the outer sleeve or tube 2 without communication with the interior of the plunger, and the sleeves 2 and 3 thereby constituting an elastic body, which will freely expand without any liability of sand, or other deleterious matter finding its way between the two sleeves 2 and 3, and which will also prevent the entrance of sand or grit or other material liable to cause wear between the outer walls of the plunger and the inner wall of the pump barrel. Any sand, which may cling to the inner wall of the pump barrel, is removed by the beveled edge 15 of the collar 8 on the upward stroke of the plunger.

By slitting or splitting the intermediate or filling sleeve 10 both tubes or sleeves 2 and 3 may expand freely without interference from the sleeve 10, and the three sleeves are always maintained in such close relation that there is no chance of sand or grit entering between the sleeve 3 and the sleeve 10, or between the sleeve 10 and the sleeve 2. Moreover, there is no necessity of the plunger walls having an elastic outward tendency since in deep wells the internal pressure is heavy, sometimes amounting to as much as nine hundred pounds to the square inch, the plunger being of considerable length and must fit the walls of the pump barrel perfectly in every respect, for otherwise the great pressure would cause the fluid to leak back both between the plunger and the barrel and into the slots or slits.

Having thus fully described my inven-

tion, what I claim as new and desire to secure by Letters Patent, is:—

1. In a pump, a pump barrel, and a plunger composed of two interfitting tubular members laterally expansible, the plunger being provided with a packing intermediate of the two tubular parts, and the inner member and packing being provided with matching passages to provide for the action of the weight of liquid above the plunger directly on the outer member.

2. In a pump, a pump barrel and a plunger composed of an inner split member and an outer split member with an intermediate split packing all secured together near one end, the inner member and packing being constructed for the direct action of liquid above the plunger upon the outer member to expand the latter.

3. In a pump, a pump barrel, and a plunger composed of two interfitting tubular members having longitudinal slits for permitting the plunger to expand into engagement with the barrel, the plunger being provided with a packing for covering the slits in the outer one of the tubular members.

4. In a pump, a pump barrel, and a plunger composed of two interfitting tubular members having longitudinal slits for permitting the plunger to expand into engagement with the barrel, the slits of one member being staggered with respect to those of the other, said plunger having an elastic sleeve interposed between the members to expand therewith and cover the slits of the outer member.

5. In a pump, a pump barrel, and a plunger composed of two interfitting tubular members having longitudinal slits for permitting the plunger to expand into engagement with the barrel, the slits of one member being staggered with respect to those of the other, said plunger having an elastic sleeve interposed between the members to expand therewith and to cover the slits of the outer member, the sleeve being also provided with longitudinal slits matching those of the inner sleeve.

6. In a pump, a pump barrel, and a plunger composed of two interfitting tubular members having slits for permitting the plunger to expand into engagement with the barrel, the slits of one member being staggered with respect to those of the other, and said plunger having a flexible sleeve interposed between the members to expand therewith and provided with passages matching the slits in the inner member, said passages being arranged out of line with the slits in the outer member.

7. In a pump, a plunger comprising an outer and an inner member and an intermediate packing sleeve all connected together at one end, the inner and outer members and the intermediate packing sleeve

being expansible and the inner member and packing sleeve having matching passages opening to the inner surface of the outer member.

5 8. In a pump, a plunger consisting of an inner and an outer tubular sleeve and an intermediate packing sleeve all secured together at one end, the inner sleeve extending out of the end of the outer sleeve remote
10 from the secured ends and there being of substantially the same diameter as the outer member and beveled toward the outer edge, the said sleeves being expansible and the inner sleeve and packing sleeve being provided with matching openings for permit-
15 ting the liquid above the plunger when in use to act directly on the outer sleeve.

9. In a pump, a pump barrel, and a plunger therein consisting of two telescoping
20 tubular members, the inner member extending out of the upper end of the outer member and there of substantially the same diameter as the outer member and also beveled toward the upper edge, both members
25 being split longitudinally at their upper ends and rigidly secured together at their lower ends and the plunger being provided with an elastic packing sleeve disposed between the two members.

30 10. In a pump, a pump barrel, and a plunger mounted therein and consisting of an outer tubular member provided with longitudinal slits extending downwardly from the upper end toward and terminating short
35 of the lower end, an inner member slit longitudinally and arranged with its slits in staggered relation with those of the outer mem-

ber, the lower end of the inner member being rigidly secured to the outer member, and a tubular packing sleeve of elastic material disposed between the members and
40 also provided with longitudinal slits matching the slits of the inner member, said packing sleeve covering the slits of the outer member at the inner wall thereof.

45 11. In a pump, a pump barrel, and an expansible plunger therein comprising an outer member provided with a plurality of longitudinal slits extending from its upper end, an inner member fitted within the
50 outer member and enlarged at its upper end to form a shoulder against which the upper end of the outer members fits, said inner member being of less external diameter than the internal diameter of the outer member
55 to form a packing space closed at its upper end by the enlarged portion of the inner member, said inner member being slit longitudinally and secured to the outer member with its slits in staggered relation to those
60 of the outer member, and an elastic sleeve in the packing space and also provided with longitudinal slits matching those of the inner member, said elastic sleeve covering the slits of the outer member at the inner
65 wall thereof.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CLARENCE L. PARKER.

Witnesses:

JOSEPH STREETON,
M. J. WEBB.