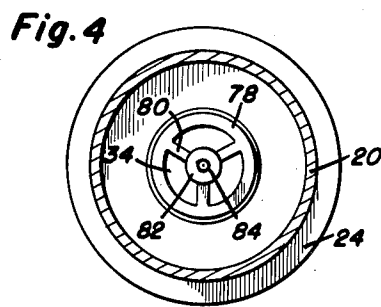
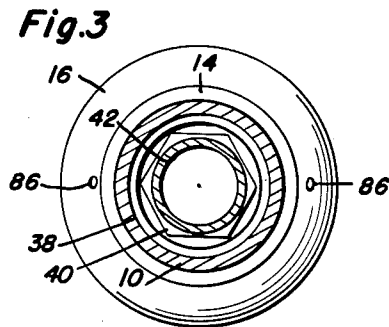
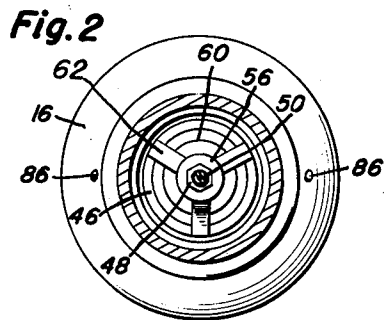
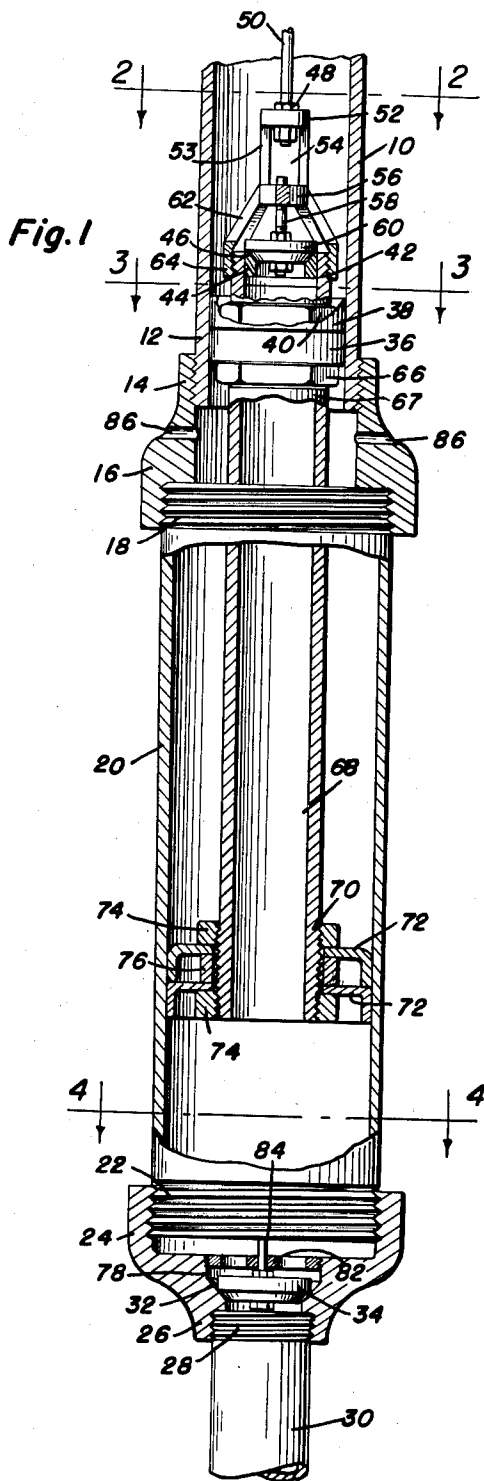


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W. L. TUCKER
DOUBLE-ACTION PUMPS
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DOUBLE-ACTION PUMPS

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2 Claims. (Cl. 103—190)

This invention relates to new and useful improvements in pumps and the primary objection of the present invention is to provide a deep well pump including a discharge conduit and piston means which will effectively discharge a fluid from said conduit upon each up or down stroke of said piston means.

Another important object of the present invention is to provide a double action pump including a pair of oppositely arranged pistons and novel and improved means connecting said pistons for simultaneous reciprocation.

Yet another object of the present invention is to provide a double acting pump of tested ability for use with windmills and the like that will reduce to a minimum the type and number of tools required to service the pump.

A further object of the present invention is to provide a double action deep well pump that is extremely simple and practical in construction, and which may be quickly and readily disassembled or assembled facilitating the convenient inspection of parts.

A still further aim of the present invention is to provide a double action pump that is strong and reliable in use, small and compact in structure, neat and attractive in appearance, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of the present pump construction, the upper delivery conduit removed therefrom, and with parts thereof broken away and shown in sections;

Figure 2 is a transverse horizontal sectional view taken substantially on the plane of section line 2—2 of Figure 1;

Figure 3 is a transverse horizontal sectional view taken substantially on the plane of section line 3—3 of Figure 1; and,

Figure 4 is a transverse horizontal sectional view taken substantially on the plane of section line 4—4 of Figure 1.

Referring now to the drawings in detail, and more particularly to Figures 1-4 inclusive, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a pump housing or chamber that terminates at its upper end in an upper delivery conduit (not shown) which is conveniently located above the ground surface for accessibility thereto by users.

The lower externally threaded end 12 of this chamber 10 receivably engages the internally threaded reduced end 14 of a coupling or collar 16 that is threadingly engaged on the externally threaded upper end 18

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of a lower chamber 20, of a diameter greater than the diameter of chamber 10.

Suitably engaging the externally threaded lower end 22 of the chamber 20, is a further collar or coupling 24 having a reduced internally threaded nipple 26 that receivably engages the threaded upper end 28 of an inlet or intake conduit 30 that is extended into a suitable source of fluid such as water. This collar 24 is provided with a beveled valve seat 32 in which there is normally seated the usual beveled check valve 34 for opening and closing the discharge end of the intake conduit.

Workable in the upper chamber 10, is an upper pair of pistons 36 and 38 the uppermost of which is provided with a hollow sleeve portion in which there is fixed a nut 40 that receivably engages an externally threaded tubular support 42 having an internal ring 44 fixed at one end that is provided with a beveled valve seat 46.

Removably secured by nuts 48 engaged on the lower end portion of a sucker rod 50, is the upper ring 52 of a guide sleeve 53 having opposed outlet openings 54, and a bottom ring 56 that is provided with a suitable centrally located vertical passage (not shown) in which the stem 58 of a beveled check valve 60 is slidably mounted. In order to retain the valve 60 positioned relative to the valve seat 46, there is provided a plurality of radially inclined arms 62 that are fixed at one of their ends to the bottom ring 56. The opposite ends 64 of these arms are turned substantially vertical and are threaded to receivably engage the threaded upper end of the tubular support 42. The rings 52 and 56, the sleeve 53, the arms 62 and support 42 form a combined valve cage and sucker rod coupling.

Rigidly secured to the lower face of the piston 36, is a nut 66 that receivably engages the external threaded upper end 67 of a lower delivery conduit 68 that is axially disposed in the lower pump chamber 20 and which is of a reduced diameter and smaller than the upper pump chamber 10. The lower externally threaded end 70 of this delivery conduit 68 adjustably supports a pair of adjustable and inverted dish-like pistons 72 of conventional construction that are fixed on the ends 70 by lock nuts 74 and a spacer washer 76.

Fixed within the lower collar 24, is a ring element 78 through which there are suitably secured a plurality of radially inclined arms 80 supporting a guide ring 82 in which there is slidably mounted the valve stem 84 of the check valve 34.

It should be noted, that the upper collar 16 is provided with a plurality of release vents or apertures 86 for the lower chamber 20.

The invention is to be constructed of brass since this particular type of material has proven to be highly satisfactory. However, for cheapness of construction, a galvanized pipe lined with brass may be employed.

In practical use of the double action pump described, upon the initial up stroke of the sucker rod 50, the pistons 36 and 72 will be raised to their maximum suction position, so that a fluid will enter chamber 20 from conduit 30 and will be locked therein by the valve 34. Upon a down stroke of the sucker rod 50, fluid will enter the conduit 68 from chamber 20 and hence will be admitted into the chamber 10, where it will be locked therein by check valve 60. Henceforth, upon each up or down stroke of the sucker rod 50, fluid will be discharged from the upper delivery conduit (not shown) as the volume of the lower chamber is greater than the volume of the upper chamber.

Having described the invention, what is claimed as new is:

1. A double action pump comprising upper and lower casing sections having externally threaded adjacent ends, an internally threaded coupling collar joining the adja-

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cent ends of said sections and having a plurality of circumferentially spaced radial extending apertures therein, said lower section being larger in cross section than said upper section, a tubular open ended conduit extending axially within the sections and having a lower end disposed in the lower section and an upper end disposed in the upper section, the lower end of said conduit being externally threaded, upper and lower clamping nuts receivably engaged on the lower end of said conduit, pistons held on the lower end of said conduit and clamped between said nuts, the upper end portion of said conduit also being externally threaded, upper pistons on the upper end portion of said conduit, upper and lower clamping nuts receivably engaged on the upper end portion of said conduit and clampingly engaging the upper pistons therebetween, a guide sleeve disposed above the upper end of said conduit, a tubular support, a plurality of rigid arms fixed to and extending downwardly from the sleeve, said arms having lower threaded ends receivably engaging the upper end of said tubular support, said support being secured to said conduit above said upper pistons, a sucker rod extending downwardly into the upper section, means coupling the lower end of said sucker rod to a ring secured on an upper portion of said support, a beveled valve seat within the upper end of said tubular support, a beveled valve confined at the upper end of said tubular support by said arms and said ring, said valve adapted to engage said seat as the tubular conduit and pistons are moved upwardly within the sections, said valve having a stem

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slidably engaging said ring, a second coupling collar secured to the lower end of said lower section and having a valve seat therein, and a valve within the second coupling and adapted to be seated against the seat of said second coupling as the tubular conduit and pistons attached thereto are moved downwardly in the sections.

2. In a double action pump including a vertically reciprocable conduit having pistons thereon adjacent the ends thereof and a slidably mounted valve disposed adjacent the upper end of said conduit including a stem, a combined valve cage and sucker rod coupling at the upper end of said conduit comprising, a ring slidably engaging the stem of said valve, a plurality of rigid arms fixed to the ring and extending downwardly therefrom, a support connected to the upper end of said conduit, the lower ends of said arms being threaded on the upper end of said support, and a guide sleeve fixed to and extending upwardly from the ring and adapted to be secured to a sucker rod.

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