No. 825,832. PATENTED JULY 10, 1906.

C. L. HEISLER.

PUMP PLUNGER PACKING BOX.

APPLICATION FILED APR. 5, 1905.

2 SHEETS—SHEET 1.

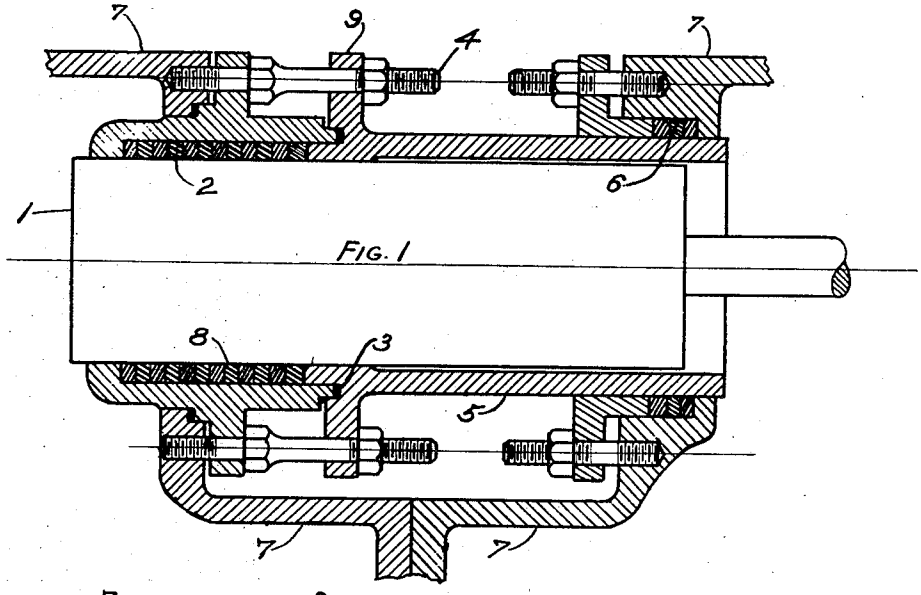


FIG. 1

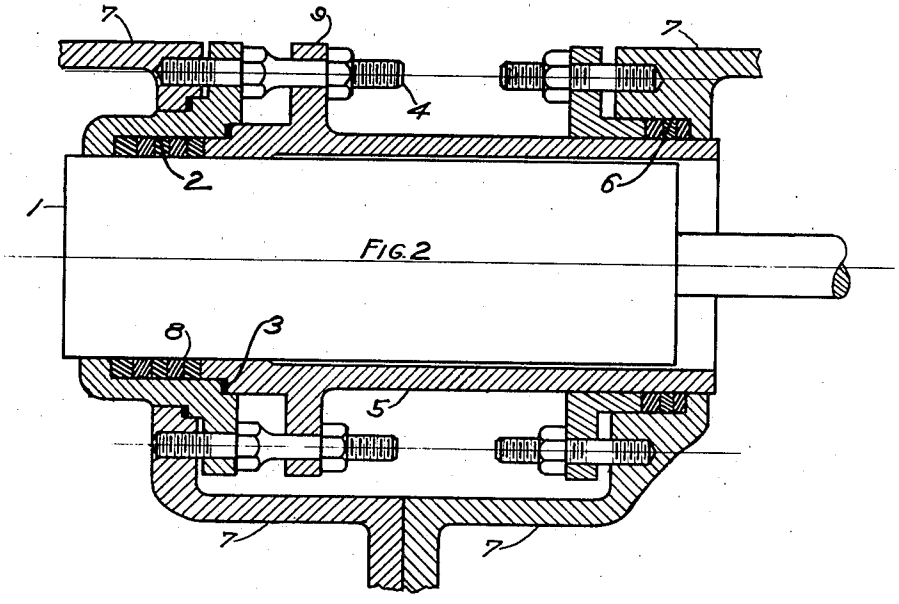


FIG. 2

WITNESSES:

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Emma Stoker

INVENTOR.

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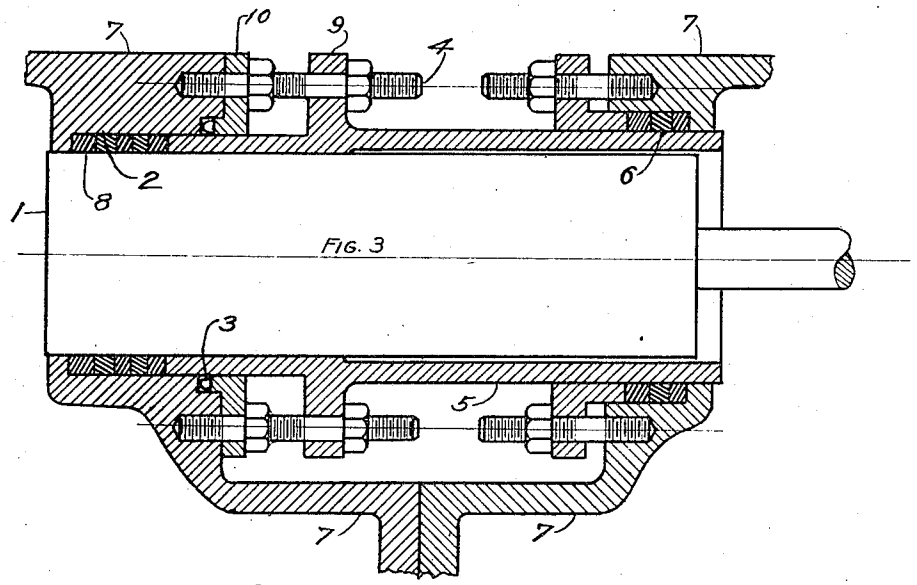


FIG. 3

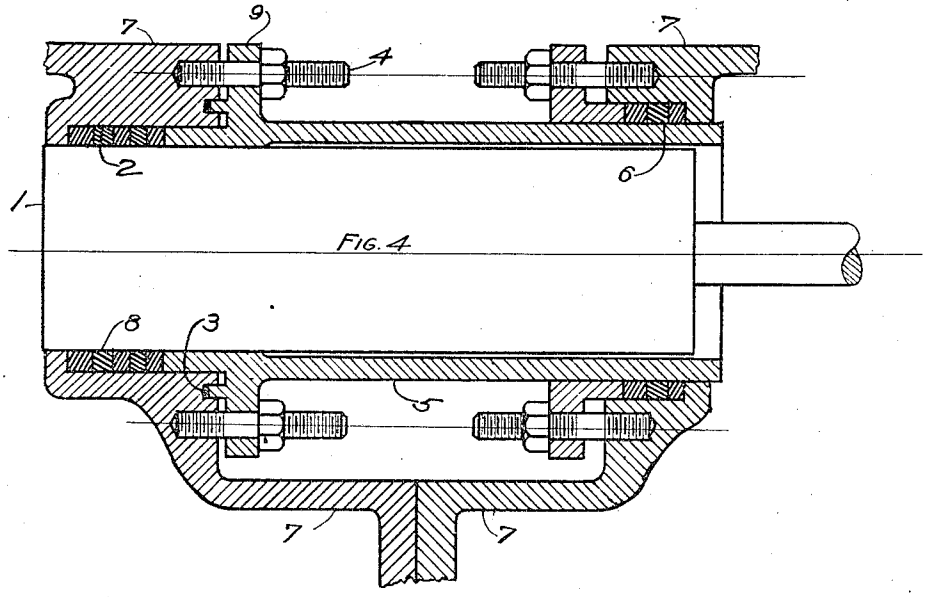


FIG. 4

WITNESSES:

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CHARLES L. HEISLER, OF PITTSBURG, PENNSYLVANIA.

PUMP-PLUNGER PACKING-BOX.

No. 825,832. Specification of Letters Patent. Patented July 10, 1906.

Application filed April 5, 1905. Serial No. 254,044.

To all whom it may concern:

Be it known that I, CHARLES L. HEISLER, a citizen of the United States of America, and a resident of the city of Pittsburg, State of Pennsylvania, have made certain new and useful improvements in that class of pumps in which oppositely-arranged packing-boxes are used in connection with a single plunger or shaft, of which the following is a specification.

My invention relates principally to the construction of the plunger packing or stuffing box, the object thereof being to provide an efficient means for preventing leakage of air or water through the stuffing-box of outside-packed water-plungers by arranging a seal mainly between the main plunger stuffing-box and the adjusting-bolts of said main stuffing-box.

Figure 1 of the accompanying drawings illustrates the most usual form of the improvement. Figs. 2, 3, and 4 show modifications thereof.

Numeral 1 is the plunger.

7 is the casing of the pump proper or plunger-chamber; 2, the main stuffing-box; 4, the adjusting-bolts; 5, the telescopic plunger sleeve and stuffer; 6, the auxiliary packing for the plunger-sleeve 5, arranged in a box in the casing.

8 is the usual nest of suitable packing-rings in the box 2 in the casing and in contact with the reciprocating plunger.

In the common form of outside-packed plungers, where there are two sets of packings for the usual oppositely-arranged pulsation chambers or cylinders, the attendant is continually adjusting the double set of packings extremely tight to make it show a minimum of external leakage, not that this slight amount of water-leakage causes an appreciable waste, but because there is a leakage of air to the plunger-chamber, thereby causing destructive water-hammer and the water-leakage is unsightly, which he thinks reflects upon his care of the pump. On the other hand, the excessive frictional resistance due to tight packings is not so apparent or readily detected even by an expert, who, however, from many repeated tests knows of the great loss of power by friction in the double nest of packing used in the usual construction of outside-packed plungers, and therefore would insist on having a single nest of inside packing if the latter were readily accessible and externally adjustable for leakage. The object of this invention is to solve this difficulty, and this I effect by sealing the joint between the sleeve and the casing adjacent to the inside packing, thus combining the good features of the inside packing with the accessibility of the outside packing—that is, to provide an air-tight and externally-adjustable stuffing-box fitted with a single nest of packing set against the reciprocating plunger, but with a packing at each end between the sleeve and casing.

The main stuffing-box 2 is preferably made independent of the plunger-chamber 7, so it can be renewed or changed in size. This stuffing-box is held in place by suitable bolts, as 4.

The plunger sleeve or stuffer 5 is made cylindrical and adjustable endwise, one end entering the main stuffing-box 2 and the other end through an auxiliary stuffing-box 6, which makes a water-tight telescopic joint between the plunger-sleeve and plunger-chamber 7. Near where the plunger-sleeve 5 enters the main stuffing-box 2 is arranged a suitable seal, formed at 3. This seal is for the purpose of preventing leakage around the main-stuffing-box end of the plunger-sleeve or through the main stuffing-box to the exterior of the pump, also to prevent air from entering the plunger-chambers by passing along the same route. Without the use of the seal 3 it would be necessary to continually force the plunger-sleeve 5 very tight and hard against the packing-rings 8, thereby causing excessive friction on the plungers. Evidently the seal 3 permits the packing 8 to be properly adjusted for most economical results. When there is an undesirable amount of leakage past the packing-rings 8, it can be detected by the hissing noise made by water when passing through a small crevice. In Figs. 1 and 2 this seal is arranged directly upon the cylindrical shell of the plunger-sleeve 5. In Fig. 4 it is arranged on the flange 9 of the plunger-sleeve. In Fig. 3 it is arranged adjacent to the plunger-sleeve and is held in place by a suitable flanged stuffer 10. In Figs. 1, 2, and 4 most common form of packing is used for the seal. In Fig. 3 a cupped leather packing forms the seal. In all the figures the seal 3 is shown to be arranged mainly between the main packing-box 2 and the adjusting-bolts 4, thereby giving ready access to the said bolts and keeping them free from the liquid pumped, which often causes excessive corrosion, par-

ticularly when pumping salt brine, acids, and liquids having strong corrosive properties.

As shown, the arrangement permits the use of a single main stuffing-box 2, as in inside-packed pumps, thereby reducing the friction one-dalf as compared with the usual form of outside-packed plungers. The adjusting-bolts are arranged, as usual, within the hyatus or gap formed between the opposite plunger-chambers of outside-packed pumps, and therefore are readily accessible. All the parts are easily removed from the pump and replaced when worn. By drawing the sleeve 5, with the bolts 4, tight against the stuffing-box 2, with the seal 3 intervening, there will be no external leakage in case the packing 8 is worn or destroyed. So no harm would result except the loss due to the leak from one plunger-chamber to the other. In the usual construction of outside-packed plungers it would be necessary to immediately shut down the pump, as the air entering the pump would instantly cause destructive water-hammer or prevent its operation. The seal 3 can be formed, as shown in the several drawings, by cutting a groove or making a small stuffing box or recess and filling it with some yielding packing, which may be metallic or fibrous.

Evidently the plunger 1 may be in the form of a piston or plunger rod and which may have a rotative instead of reciprocating motion.

In the following claims are embodied my improvements:

1. In a pump of the character described having a casing, two packing-boxes therein, a plunger, a surrounding sleeve and two opposite packings, one around the plunger and the other around the sleeve, and a supplemental packing adjacent that around the plunger but between the sleeve and casing, substantially as set forth.

2. The combination with a plunger and casing, of a surrounding sleeve, a packing opposite one end of the sleeve and surrounding the plunger, and a packing at each end of the sleeve between the latter and the casing, substantially as set forth.

3. The combination of a plunger, a casing having separated packing-boxes and packings therein, a sleeve bearing at one end against the packing in the box surrounding the plunger and surrounded by the packing in the other box, and a box in the casing adjacent to the box surrounding the plunger and containing a packing in contact with the sleeve, substantially as set forth.

4. The combination of a plunger, a casing having separated packing-boxes and packings therein, a sleeve bearing at one end against the packing in the box surrounding the plunger and surrounded by the packing in the other box, a box in the casing adjacent to the box surrounding the plunger and containing a packing in contact with the sleeve, and means for compressing the packings in the different boxes, substantially as set forth.

5. The combination of a plunger, a casing having separated packing-boxes and packings therein, a sleeve bearing at one end against the packing in the box surrounding the plunger and surrounded by the packing in the other box, a box in the casing adjacent to the box surrounding the plunger and containing a packing in contact with the sleeve, and independent means for compressing the packings in the different boxes, substantially as set forth.

6. The combination of the casing, the plunger, sleeve extending at the ends into different parts of the casing, a packing-box in the casing around one end of the sleeve and another opposite the other end of the sleeve and adjacent to the latter box, and a supplemental box and packing in the casing around the sleeve, substantially as set forth.

7. The combination of the casing, the plunger, sleeve extending at the ends into different parts of the casing, a packing-box in the casing around one end of the sleeve and another opposite the other end of the sleeve and adjacent to the latter box, a supplemental box and packing in the casing around the sleeve, and means for adjusting the sleeve longitudinally and for securing it in place after adjustment, substantially as set forth.

8. In a plunger-packing, the combination of a main nest of packing placed against the plunger, a telescopic plunger-sleeve one end thereof forming the stuffer for aforesaid nest of packing, the other end arranged with an auxiliary packing, means for holding said sleeve in place, and a seal arranged externally of the said main nest of packing and plunger, said seal being formed in the telescopic plunger-sleeve, for the purpose described.

9. In a plunger-packing, the combination of a main nest of packing placed against the plunger, a telescopic plunger-sleeve one end thereof forming the stuffer for aforesaid nest of packing, the other end arranged with an auxiliary packing, means for holding said sleeve in place, and a seal arranged externally of the said main nest of packing and plunger, said main nest of packing arranged in a stuffing-box made detachable from the pump-chamber, for the purpose described.

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Witnesses:
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H. L. DOERING.