L. WILLIS.

DUPLEX PUMP.

APPLICATION FILED MAY 4, 1908.

901,138. Patented Oct. 13, 1908.

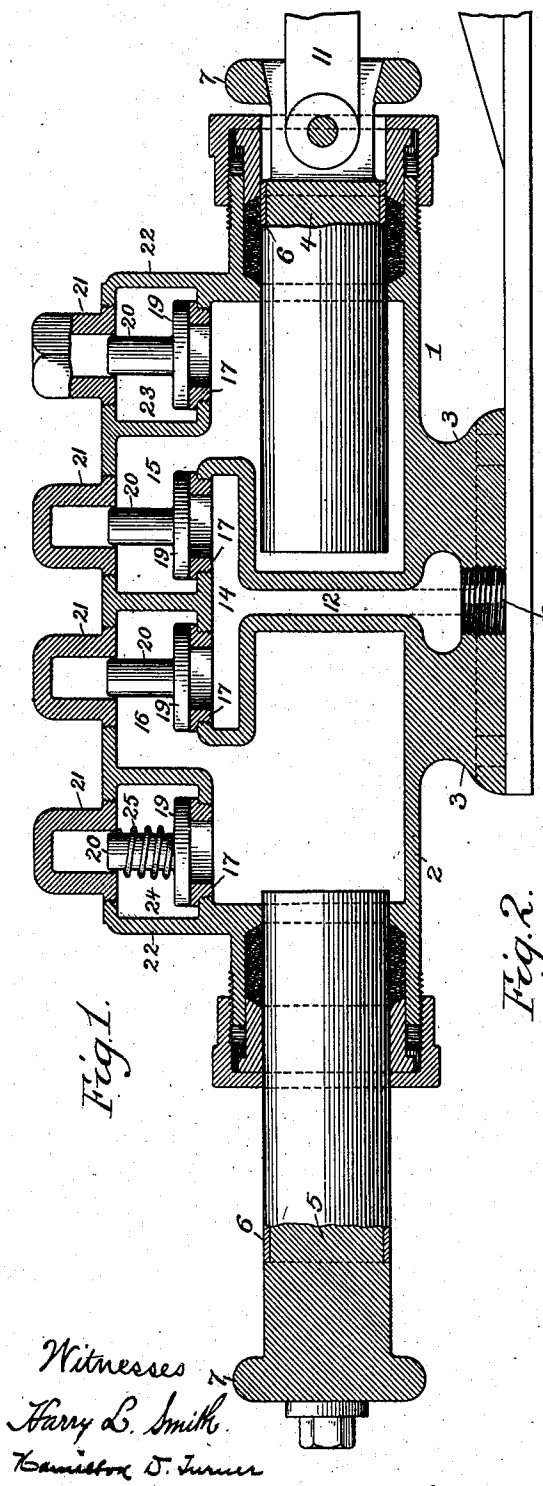


Fig. 1.

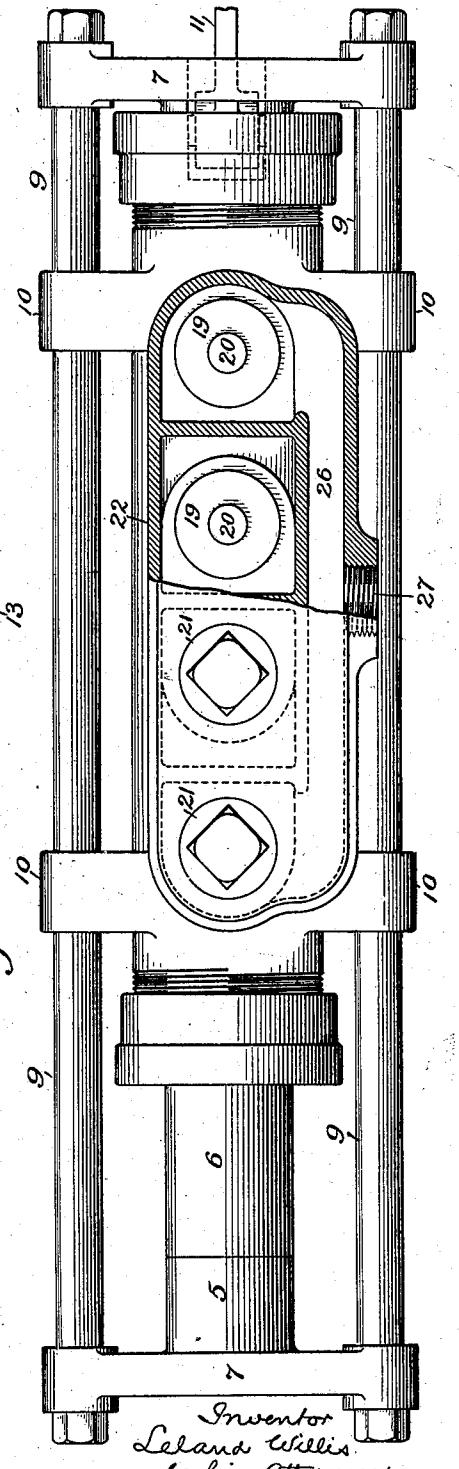


Fig. 2.

Witnesses
Harry L. Smith.
Hamilton D. Turner

Inventor
Leland Willis
by his attorneys
Smith & Brazier

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LELAND WILLIS, OF GRENLOCH, NEW JERSEY, ASSIGNOR TO BATEMAN MANUFACTURING COMPANY, OF GRENLOCH, NEW JERSEY, A CORPORATION OF NEW JERSEY.

DUPLEX PUMP.

No. 901,138. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed May 4, 1908. Serial No. 430,756.

To all whom it may concern:

Be it known that I, LELAND WILLIS, a citizen of the United States, residing in Grenloch, New Jersey, have invented certain Improvements in Duplex Pumps; of which the following is a specification.

The object of my invention is to so construct a duplex pump as to simplify the construction of the same, to provide for the compact disposal of the various parts of the pump, and to permit ready access to any of the valves with which the pump is equipped. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which

Figure 1 is a vertical longitudinal section of a duplex pump constructed in accordance with my invention, and Fig. 2 is a view of the same, partly in plan or top view and partly in horizontal section.

The pump has two barrels, 1 and 2, disposed end to end and cast with or otherwise secured to a common base 3, each barrel having at its outer end a stuffing box through which passes its respective plunger 4 or 5, each of these plungers having, by preference, an external sleeve 6 of non-corrosive metal.

The outer end of each plunger is provided with a cross head 7, and these cross heads are connected by side rods 9 which pass through suitable guides 10 forming part of the pump barrel structure, in order that power applied to one plunger may cause joint and simultaneous movement of both, one plunger being projected into its pump barrel as the other plunger is being withdrawn therefrom, whereby the forcing stroke of one plunger corresponds with the suction stroke of the other.

The plunger 4 and its cross head 7 are recessed centrally for the reception of the connecting rod 11, to which power may be applied by means of a lever, a crank disk on a rotary power shaft, or in any other available manner, means for applying power to the pump forming no part of my invention.

The inner heads of the pump barrels are separated from each other in order to provide a central passage 12 which communicates at its lower end with the inlet opening 13 of the pump, said passage being expanded longitudinally at the upper end, in order to form a chamber 14, which communicates with the induction chamber 15 of the pump barrel 1 and also with the induction chamber 16 of the pump barrel 2, each of these chambers having a valve seat 17 to which is adapted a valve 19, whose stem 20 is guided in a hollow cap 21 screwed into an opening in the outer wall of a valve chest 22 which projects from the top of the pump barrel structure, the valves being thus guided in their vertical movement and each valve being readily accessible, or removable for inspection or repairs, when its corresponding cap 21 has been removed from the valve chest.

Longitudinally beyond the induction chamber 15 is the eduction chamber 23 in the pump barrel 1 and longitudinally beyond the induction chamber 16 is the eduction chamber 24 in the pump barrel 2, each of these chambers having valve seat 17, valve 19 with stem 20, and hollow cap 22 similar to those of the induction chambers.

The valves 19 may be caused to descend by gravity assisted by the pressure of the fluid which is being pumped or, if desired, each of the valves may be provided with a spring for assisting its descent, as shown, for instance, at 25, in Fig. 1.

At one side of the valve chest 22 is the discharge passage 26 which is in communication with the eduction chambers 23 and 24, and also with the central outlet 27 to which the discharge pipe of the pump may be connected.

By locating the valve chest at the top of the pump with all of the valves in a row therein, ready access to any of the valves is permitted and the time during which the operation of the pump must be arrested for the purpose of inspection, repair or replacement of a valve is reduced to a minimum.

Each of the plungers 4 and 5 is of less diameter than its respective pump barrel and consequently is free from contact with the walls of said pump barrel except at the stuffing box end of the same, friction being thereby reduced and the pump being especially adapted for use in connection with the compounds or emulsions used by agriculturalists for spraying purposes.

The provision of the central inlet chamber 12 with expanded upper portion 14 permits of the location of the induction chambers 15 and 16 side by side and in line with the eduction chambers 23 and 24, and thus simplifies

the construction of the pump and renders the same compact and convenient.

I claim:—

1. A duplex pump having pump barrels disposed end to end with an inlet passage between them and common to both, said inlet passage being expanded at one end, externally connected and valveless plungers operating in said pump barrels, a valve chest located at one side of the pump barrels and containing induction and eduction chambers, said valve chest also having valved passages which provide communication between the pump barrels and the eduction chambers and between the induction chambers and the expanded end of the inlet passage.

2. A duplex pump having pump barrels with externally connected pistons operating therein, said pump barrels being disposed end to end with inlet passage between them, said inlet passage communicating directly with the induction chambers of the pump barrels and said induction chambers being disposed end to end in a chest on the pump barrel structure, which chest has eduction passages arranged in line with and at the ends of the induction chambers.

3. A duplex pump having pump barrels and externally connected pistons operating therein, and a valve chest at the top of said pump barrel structure having induction and eduction chambers arranged in line with one another and each containing a vertically movable valve guided in a hollow removable cap secured to the valve chest in line with its respective chamber.

4. A duplex pump having induction and eduction valves, pump barrels with externally connected and valveless plungers operating therein, said pump barrels being disposed end to end with a passage between them and common to both, a valve chest at the top of said pump barrel structure, said valve chest having, at its opposite ends, eduction passages for its respective pump barrels and between said eduction passages a pair of induction passages, each communicating through a valved induction passage with an expanded portion of the inlet passage, both the induction and eduction passages containing vertically movable valves guided in hollow removable caps on the valve chest.

5. A duplex pump having pump barrels with externally connected and valveless plungers operating therein, and free from contact with the walls thereof except at the outer end of each barrel, said pump barrels being disposed end to end with an inlet passage between them, said inlet passage having an expanded chamber at one end communicating with adjoining induction chambers of the pump, each induction chamber having longitudinally beyond it an eduction chamber and all of said chambers being formed in a valve chest on the pump barrel structure.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

LELAND WILLIS.

Witnesses:
CHAS. W. FOSTER,
WALTER MCWHORTER.