L. P. & W. F. Dodge.

Double Acting Pump.

No. 9,777. Patented June 7, 1853.

Fig. 1.

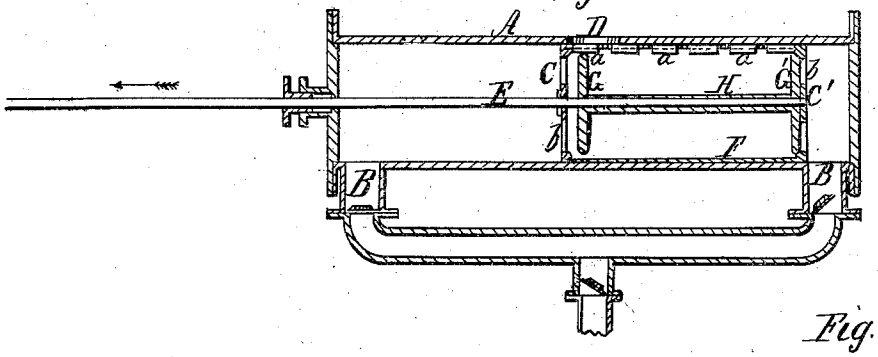


Fig. 2.

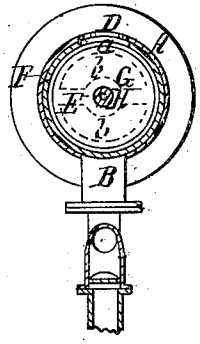
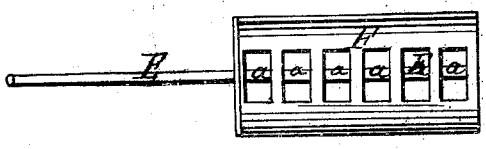


Fig. 3.



UNITED STATES PATENT OFFICE.

LEVI P. DODGE AND WM. F. DODGE OF NEWBURG, NEW YORK.

PUMP.

Specification forming part of Letters Patent No. 9,777, dated June 7, 1853; Reissued September 25, 1855, No. 329.

To all whom it may concern:

Be it known that we, L. P. DODGE and WM. F. DODGE, of Newburg, in the county of Orange and State of New York, have invented a new and useful Improvement in Pumps and Fire-Engines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section of a pump having our improvements. Fig. 2 is a transverse section of the same. Fig. 3 is a view of the piston detached from the pump.

Similar letters of reference indicate corresponding parts in each of the several figures.

The description of pump or engine to which our invention relates may be distinguished as a double acting lift or force pump.

The improvement consists in connecting the valves of the piston heads (which are themselves kept at a certain distance apart) by a tube encircling the rod or by rods, whereby their simultaneous operation is insured, one closing at the precise moment the other opens, while the piston heads are connected by a thin cylinder open on one side to communicate with the discharge pipe or are otherwise held in position on the piston rod, said heads having valve openings through them for the admission of the water into the space between them.

To enable those skilled in the art to make and use our invention we will proceed to describe its construction and operation.

A, is the barrel, which is placed horizontally.

B, B, are the suction pipes entering the barrel at opposite ends and both intended to connect together, so as to form one pipe. The valves in the suction pipe or at its entrances to the cylinder are supposed to be the same as in other pumps.

D, is the discharge aperture in the middle of the cylinder. This may be furnished with an air vessel.

C, C, are the piston heads, which in the pump shown are to be the ends of a hollow cylinder F, which is turned so as to fit easily within the pump barrel and requires no packing and which is secured to the piston rod E, so as to be incapable of turning or sliding thereon. On the upper side of the piston cylinder F, opposite the discharge aperture D, there is a passage or series of passages *a*, to allow the water to pass out freely from the interior of the piston.

The valves G, G′, are of the kind known as the "conical puppet valve" fitting in conical seats in the inside of the piston heads and being connected together by the hollow tube or rods H, which slide easily over the rod E, the said tube or rods being of proper length to hold the valves at such a distance apart that when one is in its seat the other is just open wide enough to allow the free passage of the water which is forced through the passages *b*, in the pistons. In the drawing (Fig. 1) the pistons are supposed to be just commencing the stroke in the direction of the arrow shown near the rod, the valve G′, of the piston C′, being closed and the water entering the barrel behind it, the valve G, of the piston C, being open. The water in front of G′, is being forced out through D, and that in front of the piston C, rushing through to supply its place. When the pistons reach the end of the stroke and the movement is reversed the valve G, instantly closes and G′, opens, when the whole operation is reversed. It will be understood that as both valves are connected both must operate at once, and therefore any delay on the part of either will be overcome by the other, and thus a more continuous operation is secured.

Instead of making the two piston-heads form parts of a hollow cylinder they can be either attached securely to the rod at proper distances apart independently of each other or secured together by a tube fitting to the rod E within the tube or rods H, or by any other convenient means.

By this construction and arrangement of parts it is perceived that all the water passes in through the piston heads and out between them through one opening D, without the necessity of eduction valves, partitions, or chambers, between the piston heads, and also without the leakage incident to Jeffery's pump, and the complication and liability to derangement thereof.

When the pump has the cylinder connected with the piston head in operation the resistance of the water upon the interior or of the cylindrical piston tends to expand the

cylinder and keep its exterior surface in constant contact with the interior of the barrel, keeping the joint between them tight, while at the same time the barrel gives perfect support to the cylinder and preserves it from being injured by the force requisite to expel the water. Thus the cylinder will expand, as it wears, by the pressure of the water so as constantly to fit the barrel and render packing unnecessary as long as the cylinder lasts and is protected from all danger of bursting by the support given by the barrel, and when the cylinder is worn out another can be substituted at trifling expense upon the same piston heads. No wear comes upon the piston heads because the expansion of the cylinder causes it to take the friction. A cylinder thinner than paper would perfectly answer the purpose and the operation of the pump will be perfect until the cylinder is worn entirely through and would work tolerably even then. It is advisable to attach the piston heads firmly to the rod E, and is perhaps preferable to have one opening from end to end of the cylinder, at the side, for the discharge of the water.

What we claim as our invention and desire to secure by Letters Patent is—

1. The combination of the cylindrical piston constructed as herein described, with its valves and the induction and eduction passages so that the water all entering said piston-cylinder under pressure alternately at its ends, and being discharged under pressure through the opening or openings at its side tends to expand the same substantially in the manner and for the purpose set forth.

2. We also claim the combination of the piston heads, without the cylinder, with their valves and the induction and eduction passages when these valves are united (to insure simultaneous action) as described, the water entering through the piston-heads into the space between the same, and being discharged therefrom through a lateral eduction orifice, the whole being arranged substantially as described.

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WM. F. DODGE.

Witnesses:
S. H. WALES,
W. P. FITZGERALD.

[FIRST PRINTED 1913.]