

(No Model.)

3 Sheets—Sheet 1.

C. C. WORTHINGTON.
PUMP VALVE POT.

No. 561,746.

Patented June 9, 1896.

Fig. 2.

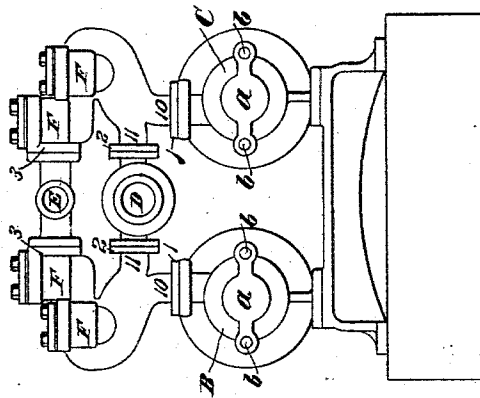
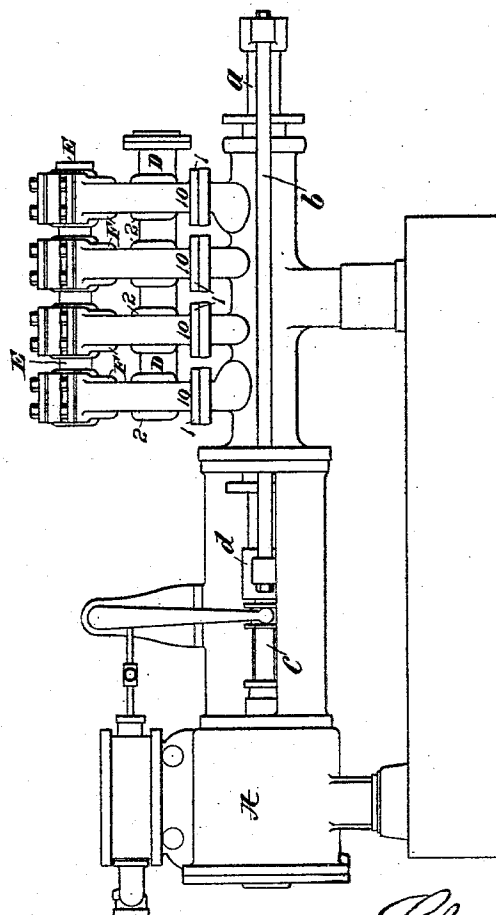


Fig. 1.



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Inventor:
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(No Model.)

3 Sheets—Sheet 2.

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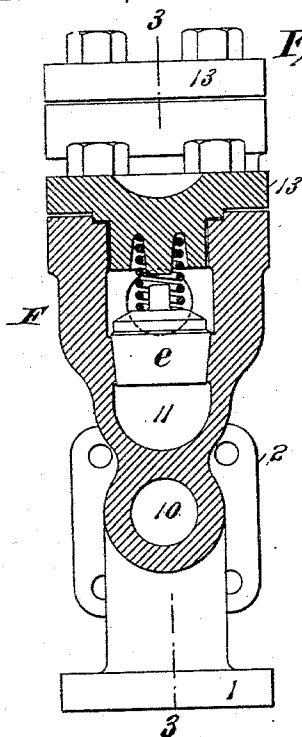


Fig. 4.

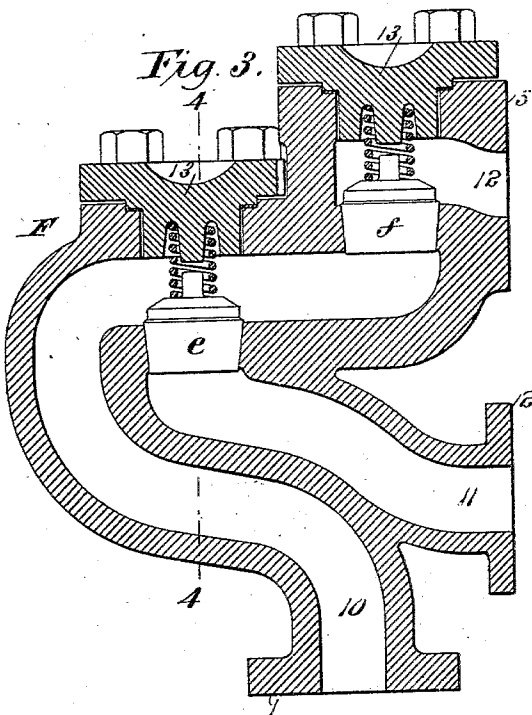


Fig. 3.

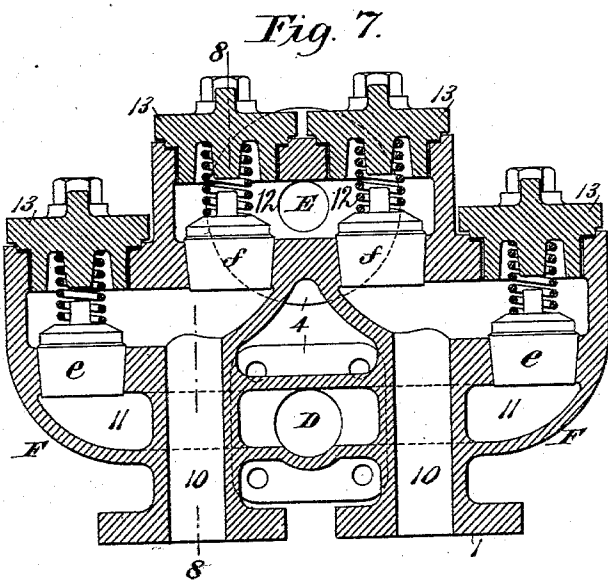


Fig. 7.

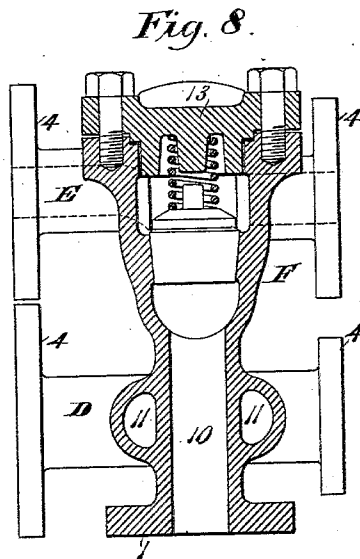


Fig. 8.

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(No Model.)

3 Sheets—Sheet 3.

C. C. WORTHINGTON.
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Patented June 9, 1896.

Fig. 6.

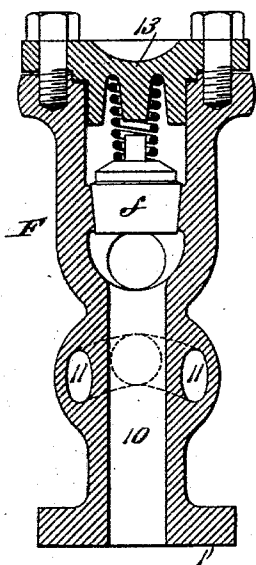


Fig. 5.

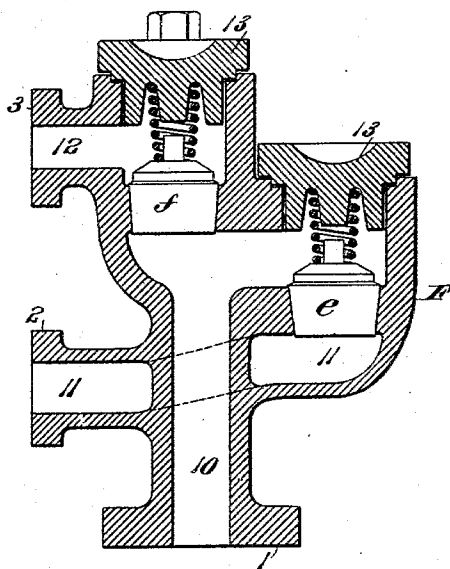
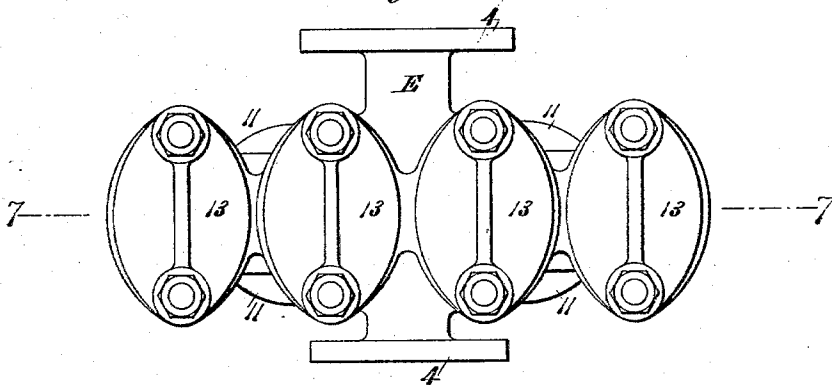


Fig. 9.



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UNITED STATES PATENT OFFICE.

CHARLES C. WORTHINGTON, OF IRVINGTON, NEW YORK.

PUMP VALVE-POT.

SPECIFICATION forming part of Letters Patent No. 561,746, dated June 9, 1896.

Application filed October 13, 1893. Serial No. 488,057. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. WORTHINGTON, a citizen of the United States, residing at Irvington, county of Westchester, and State of New York, have invented certain new and useful Improvements in Pump Valve-Pots, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

By this invention an improved valve-pot is provided which is simpler and cheaper of manufacture than valve-pots heretofore in use, by which the strength of the valve-pot is increased, and at the same time various advantages secured in the construction of the valve-pot and pump upon which it is used.

In the improved valve-pot embodying the present invention, in the preferred form the minimum width of the pot is in the direction of the axis of the pump-cylinder, thus decreasing the requisite length of the cylinder, and provision is made for casting the pot in a single two-part flask, using ordinary cores and without loose pieces of any kind in the pattern, so that hand-molding is greatly simplified and machine-molding made possible and numerous other advantages secured. For instance, in such preferred form of pot the suction and delivery flanges are so placed as to bring the main suction and delivery pipes on one side and between the two cylinders in a duplex pump, so that the main suction and delivery pipes may be simply straight pipes with branches to each pot. The face of the suction and delivery flanges may be placed in the same plane, so that they can both be machined at one setting. Any one of the valve-pots can be removed without interfering with any of the others or the suction and delivery pipes. No more metal is required than is necessary to withstand the fluid-pressure, none being required for purely constructive purposes, and the construction may be such that the same pot is made applicable to either side of a duplex pump without losing the desirable uniformity of appearance of the two sides.

While the improved valve-pot is of general application to pumps, single or duplex, and independently of the means by which they are actuated the valve-pot in certain forms

has features of special value in connection with duplex pumps; and my invention consists in part of duplex-pump constructions, and therefore it will be illustrated as applied to a duplex pumping-engine of the construction now well known as the "Worthington" duplex pumping-engine.

For a full understanding of the invention a detail description will now be given, reference being had to the accompanying drawings, showing various constructions of valve-pots embodying the invention in the preferred forms, and the features forming the invention specifically pointed out in the claims.

Referring to said drawings, Figure 1 is a side elevation of a duplex pump provided with valve-pots of the preferred form. Fig. 2 is an end elevation of the water end of the same. Fig. 3 is a central vertical cross-section of one of the valve-pots, taken transversely to the pump-cylinder, on the line 3 of Fig. 4. Fig. 4 is a central section, taken longitudinally of the pump-cylinder, on the line 4 of Fig. 3. Figs. 5 and 6 are views corresponding, respectively, to Figs. 3 and 4, showing a modified construction. Fig. 7 is a central cross-section, taken transversely to the pump-cylinder, on the line 7 of Fig. 9, showing a double pump-pot for a duplex pump having its cylinders set closely together. Fig. 8 is a cross-section of the same, taken longitudinally of the pump-cylinder, on the line 8 of Fig. 7. Fig. 9 is a plan view of this double pump-pot.

Referring to said drawings, A are the steam-cylinders, and B C the pump-cylinders on opposite sides, the plunger being shown as operated from the outer end of the water-cylinders through plunger-rod *a*, actuated by side rods *b*, connected to the piston-rod *c* by cross-head *d*, as common in such constructions.

D is the suction and E the force main, these mains being arranged at different levels between and above the two water-cylinders B C. Connection between the force and suction mains and pump-cylinders on opposite sides is made by the valve-pots F, which will now be described in detail.

As shown in Figs. 1 to 4, each valve-pot F connects with the water-cylinders by a branch 10, provided with flange 1, with the suction-main by branch 11, provided with flange 2,

and with the force-main by branch 12; provided with flange 3, these branches 10 11 12 and flanges 1 2 3 or their equivalents being placed in the same vertical plane, so that this valve-pot may be cast in a two-part flask without loose parts of any kind, and the cylinder, suction, and force branches being arranged in line transversely to the pump-cylinder, so that the width of the valve-pot longitudinally of the cylinder is reduced to that of a single pipe and flange of the size required for strength. In the valve-pot are the suction-valve *e* and the force-valve *f*, which may be of any suitable construction, the common spring-seated valves being shown, these valves being introduced through openings made in the top of the valve-pot, which are closed by plugs 13, against which the valve-springs are seated, these plugs being held in place by bolts, as shown, or in any other suitable manner, all as usual in such constructions.

In Figs. 5 and 6 I have shown a similar construction, except that the suction branch 11 crosses the cylinder branch 10, the suction-port being divided into two parts and passing around on opposite sides of the cylinder-port, so as to divide the weight of metal and make a more symmetrical valve-pot, although it will be understood that this suction-port may pass the cylinder-port wholly on one side, if desired. In this construction it will be seen that while the suction branch does not lie in the same vertical plane with the cylinder and delivery branches at every point throughout its entire length the important feature of the outer ends of all the branches lying in the same plane central to the branches is retained, and in this construction, in which the suction branch lies in the same plane with the other branches throughout substantially its entire length, the carrying of the suction branch out of said plane for a short distance, so as to pass on one side or both sides of the cylinder branch between its ends, does not prevent securing most of the advantages of the constructions previously described.

It will be seen that with this valve-pot the length of the pump-cylinder is reduced to the minimum, as the branches are arranged transversely to the cylinder. The suction and delivery flanges face in the same direction and are placed so as to bring the main suction and delivery pipes in the same vertical plane on one side, so that in a duplex pump they may be placed between the two pump-barrels and consist of simple straight pipes with branches to each pot, that any one of the pots can be removed without interfering with any of the others or with the suction and delivery pipes, that the amount of metal required in the valve-pot is largely reduced, that the pot may be cast in a common two-part flask using ordinary cores, and that the manufacture of right and left pots is unne-

cessary, as the same pot is equally applicable to either side of the pump.

In Figs. 7, 8, and 9 there is shown a valve-pot for duplex pumps having the cylinders set closely together, which enables a single pot to be used for both sides. In this construction the valve-pot is preferably cast, as shown, with a short section of pipe on each side provided with flange 4. These short sections of pipe form parts of the suction and delivery mains D E, so that by securing together these flanges 4 of the different pots suction or force mains will be constructed in accordance with the number of pots used. It is apparent that this valve-pot, as well as those previously described, can be cast in a two-part flask, the parting being on the line 7 of Fig. 9. The flanges 4, if used, can be drawn in different ways, but preferably by cores, as usual in such constructions.

The construction of the pump and valve-pot and the arrangement of the branches will be understood from Figs. 7 and 8, the suction-ports on the opposite side being divided and passing the cylinder-ports, one-half on each side, as previously described in connection with Figs. 5 and 6. In this construction of single casting forming pots for both cylinders it will be seen that the outer ends of the three branches of each pot lie in the same plane central to the branches, as in the constructions previously described, even though the short pipes D E be cast integral with the branches, as shown, and as is preferable, since the outer ends of the suction and delivery branches are at the points of junction with the suction and force mains, whether such junctions be made by attaching the branches to the force and suction mains, as in the construction shown in Fig. 2, or by casting them integral with parts of the suction and force mains, as in the construction shown in Figs. 7 to 9.

It is apparent that other modifications may be made without departing from the invention, and I am not to be limited to the specific constructions shown.

What is claimed is—

1. A valve-pot having the outer ends of its cylinder, suction and delivery branches in the same plane central to the branches and having the outer ends of its suction and delivery branches on the same side of the pot and facing in the same direction, substantially as described.

2. A valve-pot for duplex pumps, cast in one piece and having cylinder, suction and delivery branches for both cylinders with their outer ends in the same plane central to the branches and with the suction and delivery branches for the different cylinders arranged end to end, substantially as described.

3. A valve-pot cast in one piece and having two cylinder branches, and suction and delivery branches for each cylinder branch, said

cylinder, suction and delivery branches having their outer ends in the same plane central to the branches, and the suction and delivery branches for the different cylinder branches being arranged end to end, substantially as described.

4. The combination with the pump-cylinder of a pump, of a valve-pot having suction and delivery branches on the same side of the pot, and a cylinder branch at the bottom of the pot, said cylinder, suction and delivery branches having their outer ends in the same plane central to the branches, and parallel suction and force mains connected to the suction and delivery branches, substantially as described.

5. The combination with the pump-cylinder of a pump, of a valve-pot having the outer ends of its cylinder, suction and delivery branches in the same plane central to the branches and transverse to the pump-cylinder, substantially as described.

6. The combination with the pump-cylinders of a duplex pump, of force and suction mains extending longitudinally of and in a plane between said cylinders, and valve-pots having the outer ends of their cylinder, suction and delivery branches in the same plane central to the branches and transverse to the pump-cylinders, substantially as described.

7. The combination of the pump-cylinders of a duplex pump, of force and suction mains extending longitudinally of and in a plane between said cylinders, and a valve-pot cast in one piece having cylinder, suction and delivery branches for both cylinders with their outer ends in the same plane central to the branches and transverse to the pump-cylinders, substantially as described.

8. A valve-pot having its cylinder, suction and delivery branches lying substantially throughout in the same plane central to the branches and having the outer ends of its suction and delivery branches on the same side of the pot and facing the same direction, substantially as described.

9. A valve-pot for duplex pumps, cast in one piece and having cylinder, suction and delivery branches for both cylinders lying substantially throughout in the same plane central to the branches, and with the suction and delivery branches for the different cylinders arranged end to end, substantially as described.

10. The combination with the pump-cylinder of a pump, of a valve-pot having suction and delivery branches on the same side of the pot, and a cylinder branch at the bottom of the pot, said cylinder, suction and delivery branches lying substantially throughout in the same plane central to the branches, and parallel suction and force mains connected to the suction and delivery branches, substantially as described.

11. The combination with the pump-cylinder of a pump, of a valve-pot having its cylinder, suction and delivery branches lying

substantially throughout in the same plane central to the branches and transverse to the pump-cylinder, substantially as described.

12. The combination of the pump-cylinders of a duplex pump, of force and suction mains extending longitudinally of and in a plane between said cylinders, and a valve-pot cast in one piece having cylinder, suction and delivery branches for both cylinders lying substantially throughout in the same plane central to the branches and transverse to the pump-cylinders, substantially as described.

13. The combination with the pump-cylinders of a duplex pump, of valve-pots cast in one piece having cylinder, suction and delivery branches for both cylinders with their outer ends in the same plane central to the branches and transverse to the pump-cylinders, and with pipes extending longitudinally of and in a plane between the cylinders and forming parts of the suction and force mains, substantially as described.

14. A valve-pot for duplex pumps cast in one piece with cylinder, suction and delivery branches for both cylinders with their outer ends in the same plane central to the branches and with suction and force main pipes extending transversely to said branches, substantially as described.

15. The combination with the pump-cylinders of a duplex pump, of force and suction mains extending longitudinally of and in a plane between said cylinders, and a valve-pot cast in one piece having cylinder, suction and delivery branches for both cylinders, substantially as described.

16. The combination with the pump-cylinders of a duplex pump, of valve-pots cast in one piece having cylinder, suction and delivery branches for both cylinders and with pipes extending longitudinally of and in a plane between the cylinders and forming parts of the suction and force mains, substantially as described.

17. The combination with the pump-cylinders of a duplex pump, of suction and force mains extending longitudinally of and in a plane between said cylinders, and valve-pots mounted on the tops of the cylinders and having suction and delivery branches on the same side of the pots and extending transversely to the pump-cylinders and cylinder branches at the bottom of the pots, substantially as described.

18. The combination with the pump-cylinders of a duplex pump, of suction and force mains extending longitudinally of and in a plane between said cylinders, and valve-pots mounted on the tops of the cylinders and having suction and delivery branches on the same side of the pots and extending transversely to the pump-cylinders and cylinder branches at the bottom of the pots, said cylinder and delivery branches lying in the same plane central to the branches throughout their entire length, substantially as described.

19. The combination with a pump-cylinder

of suction and force mains at one side of and
above the cylinder and a valve-pot on the top
of the cylinder having suction and delivery
branches on the same side of the pot and ex-
5 tending transversely to the pump-cylinder,
and a cylinder branch at the bottom of the
pot, substantially as described.

In testimony whereof I have hereunto set
my hand in the presence of two subscribing
witnesses.

CHARLES C. WORTHINGTON.

Witnesses:

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H. W. TILLINGHAST.