

(No Model.)

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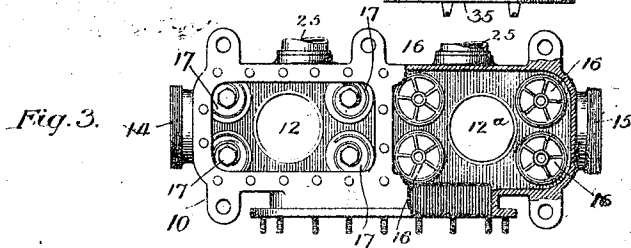
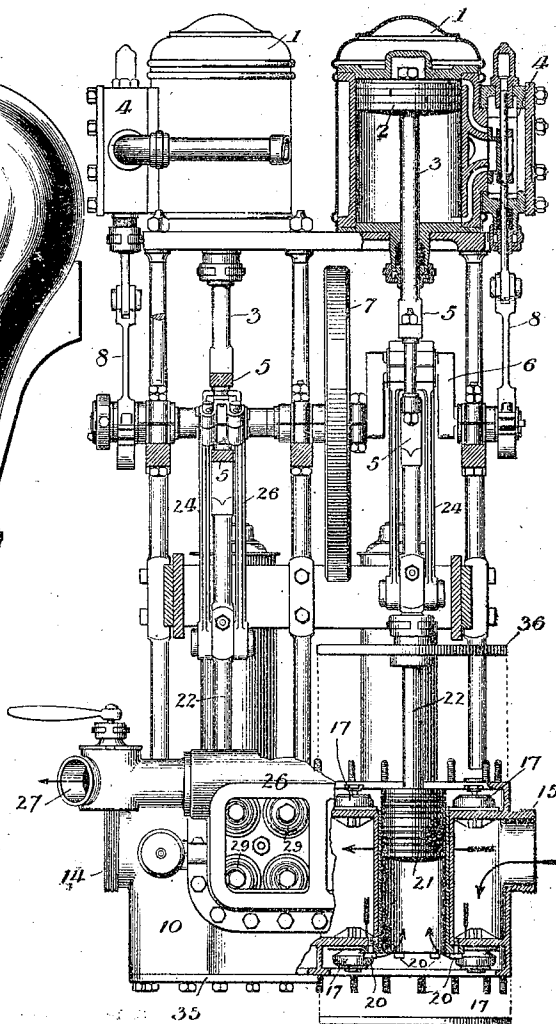
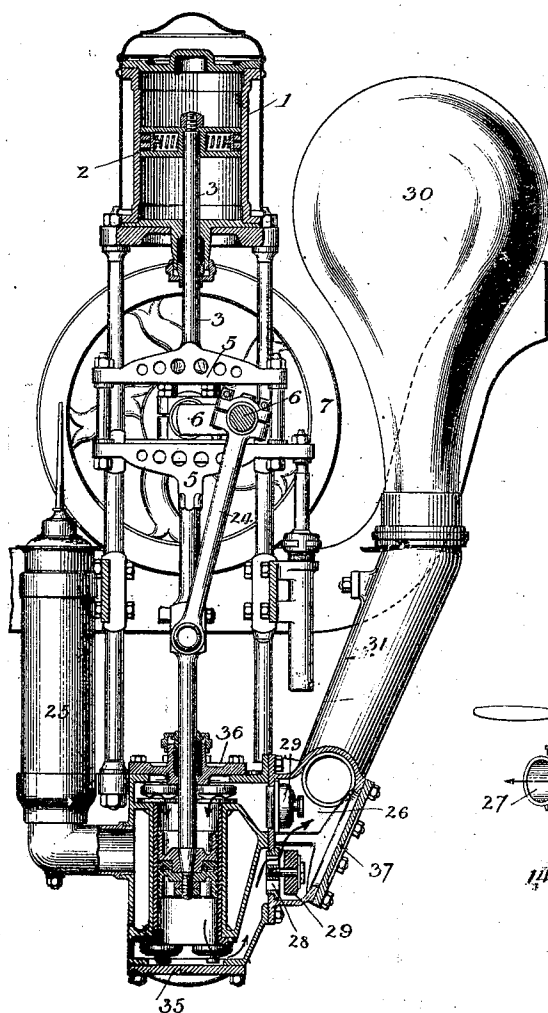
C. H. FOX.
STEAM FIRE ENGINE PUMP.

No. 569,966.

Patented Oct. 20, 1896.

Fig. 1.

Fig. 2.



Witnesses:
Walter C. Allen,
S. Allen.

Inventor:
Charles H. Fox,
By Knight Bros.
Attys

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2 Sheets—Sheet 2.

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Fig. 4.

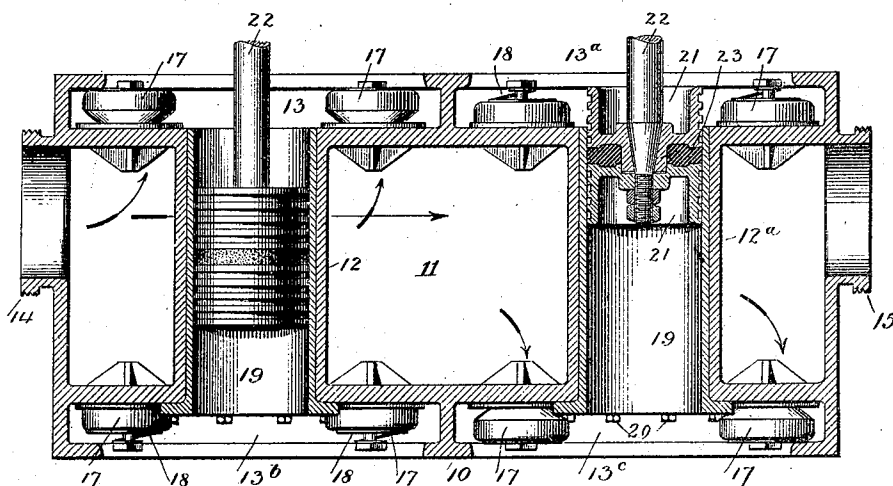


Fig. 6.

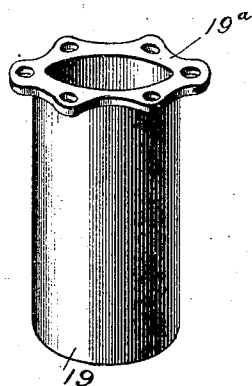
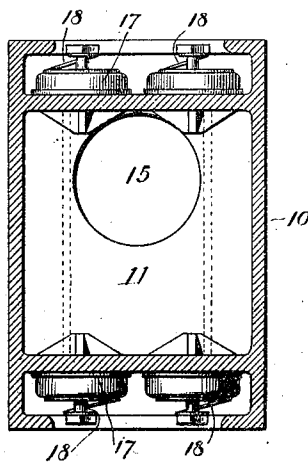


Fig. 5.



Witnesses:

Walter E. Allen.

S. Allen

Inventor:

Charles H. Fox,

By Knight Bros.

Attys.

UNITED STATES PATENT OFFICE.

CHARLES H. FOX, OF CINCINNATI, OHIO, ASSIGNOR TO THE AMERICAN
FIRE ENGINE COMPANY, OF SENECA FALLS, NEW YORK.

STEAM-FIRE-ENGINE PUMP.

SPECIFICATION forming part of Letters Patent No. 569,966, dated October 20, 1896.

Application filed June 22, 1894. Serial No. 515,404. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. FOX, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful
5 Improvements in Steam-Fire-Engine Pumps; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, is a full, clear, and exact description of my improvements, such as
10 will enable those skilled in the art to make and use the same.

My invention relates to improvements in fire-engine pumps of the double-acting type,
15 the object aimed at being to combine both the practical and theoretical requirements essential to a simple, reliable, and efficient fire-engine pump, and particularly with regard to combined efficiency and facility for examination and repair.

The pumps are united in a gun-metal casting which forms a single body, embracing the suction-chamber or reservoir, the suction-
25 mouths, and reciprocal suction and force chambers of both pumps, and permits the pumps to be placed much closer as to centers than could otherwise be done. Uniting the two pumps in a single structure also obviates the usual weakness in construction attending
30 a connection between separate pumps for the reason that the combined form furnishes a rigid basis for the entire structure, simplifies the driving mechanism, and enables it to endure extraordinary strains without vibration.
35 Removable caps and other parts are provided for rendering the working parts of the pump's interior mechanism readily accessible for cleaning or renewing, and the prime importance of perfect waterways has been provided
40 for by greatly increasing the valve area, diminishing the lift of the valve, and arranging the valves in clusters around the open ends of the pump-barrels. The suction may be connected to either end of the pump, the common suction chamber or reservoir serving to
45 uniformly distribute the water to the suction-valves, which are preferably of the conical Wilcox type. The discharge-valves are placed in a separate chamber which communicates with the reciprocal suction and force
50 chambers at the opposite ends of the pump-

barrels and are so adapted to prevent conflicting currents. The air-cushion branch in connection with the discharge-chamber is extra long, which materially aids in the steadiness of the pump's action.

My invention will be first fully described with reference to the accompanying drawings, and afterward more particularly pointed out in the annexed claim.

Figure 1 is a sectional elevation of my improved double-acting fire-engine pump. Fig. 2 is a front elevation of the same, parts being broken away and parts being shown in section. Fig. 3 is a detail plan view of a gun-
65 metal casting embracing the common suction chamber or reservoir, the pump-barrels, and the reciprocal suction and force chambers, part being broken away and some of the valves being removed from their seats. Fig. 4 is an enlarged longitudinal sectional view of the same. Fig. 5 is a transverse sectional view of the same. Fig. 6 is an enlarged perspective view of the detachable pump-barrel
75 lining.

1 1 are ordinary steam-cylinders, in which operate pistons 2, mounted upon the piston-rods 3. 4 is the slide-valve for controlling the admission of steam to the cylinder, and 5 are reciprocating yokes connecting the piston-rods 3 and 22, and spaced to provide the necessary room for the rotation of the fly-wheel cranks and boxed ends of the connecting-rods 24, which latter extend on each side
80 of the lower yoke-piece 5 and piston-rod 22, as shown in Fig. 2. 6 are the fly-wheel cranks, journaled in the engine-frame and to the box-ings of the connecting-rods 24. 7 is the fly-wheel. 8 are the eccentric-valve movements for actuating the steam-valves 4. These parts
90 are of ordinary construction.

10 is the gun-metal casting, resembling a box-girder forming a single body which embraces the common suction chamber or reservoir 11, extending from end to end and
95 serving as a common reservoir to the double-acting pump, the open-ended pump-barrels 12 and 12^a, which are located centrally in the main suction chamber or reservoir adjacent to the opposite ends, and the reciprocal suction and force chambers 13, 13^a, 13^b, and 13^c, which extend at right angles across the open
100

ends of the pump-barrels. Chambers 13 and 13^b are in communication with the opposite ends of the pump-barrel 12, while the chambers 13^a and 13^c are in communication with the opposite ends of the pump-barrel 12^a.

14 and 15 are the suction-mouths at the opposite ends of the casting, communicating with the main reservoir, and which are adapted to be connected with any suitable water supply and, as the casting extends transversely across the engine, afford convenient means of connecting the pump up to the water supply from the nearest side.

16 are the metal grates or valve-seats, located in the passages which communicate between the reservoir 11 and the reciprocal suction and force chambers 13, 13^a, 13^b, and 13^c.

17 are the conical Wilcox suction-valves provided with the spiral springs 18 for holding them to their seats.

19 are the removable pump-barrel linings, which are formed with the perforated flanged heads 19^a, adapted to receive and be secured in place by the screw-bolts 20.

Each of the pump-pistons 21 is constructed of an upper cup-shaped section fitted to the piston-rod 22 and formed with a projecting boss, over which fits a packing-disk 23, consisting, preferably, of canvas, graphite, and oil pressed and cut into the form of a disk, and a lower cup-shaped section fitted to the end of the piston-rod 22 and confining the packing. The piston-rods 22 are attached to the lower yoke-sections 5 and to the cranks 6 through the connecting-rods 24.

25 are vacuum-chambers communicating with the suction chamber or reservoir 11.

26 is the discharge-chamber having the outlet-nozzle 27 and communicating with the reciprocal suction and force chambers 13, 13^a, 13^b, and 13^c through the valved passages 28. The valves 29, controlling the passages 28, are preferably of the form covered by patent of Ahrens, dated January 22, 1884, No. 292,296.

30 is the air-chamber, communicating through the pipe 31 with the force-chamber 26, said chamber being made extra long for rendering the pump's action more steady.

The passages 28 are located adjacent to the upper walls of the reciprocal suction and force chambers, and the outlet-nozzle 27 is at a higher elevation than said passages in order that the air-bubbles will not be trapped, but will be allowed to pass upward and onward to the nozzle and be discharged from the pump.

Pump-heads 35 and 36, the casting embracing the discharge-chamber 26 and air-vessel

branch 31, and the cap-plate 37 are removably secured in place for facilitating the exposure of the pump's interior mechanism for cleaning or repairing.

The operation will be clear from the drawings. In the drawings the left-hand piston is represented in the middle of its downward stroke, while the right-hand piston is represented at the point of completing its upward stroke. The water is taken into the suction chamber or reservoir 11 from any suitable supply and drawn through the suction-valves 17 into the independent reciprocal suction and force chambers 13, 13^a, 13^b, and 13^c. The valves 17 operate independently to allow the entry of or confine the water in the independent chambers 13, 13^a, 13^b, and 13^c. In the position in which the pump is represented water is being drawn into the chambers 13 and 13^c while the water is being forced out of the chambers 13^a and 13^b into the common discharge-chamber 26. From the chamber 26 the water is forced from the outlet-nozzle 27 in the usual manner.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

In a steam fire-engine, the combination of a rectangular horizontally-arranged casting formed with an inner suction-chamber upper and lower horizontal partitions and two chambers outside of said partitions each divided by a transverse wall into two compartments which operate reciprocally as suction and force chambers, two pump-barrels mounted between the horizontal partitions, extending through but not communicating with the main suction-chamber and opening each into two opposite reciprocally-acting compartments, water-supply inlets communicating with the respective ends of the main suction-chamber, valved openings arranged around the respective ends of the pump-barrels and forming a communication between the main chamber and the reciprocally-acting compartments, upper and lower cap-plates closing said compartments, a suitable discharge-chamber, an independent valved passage leading from each of the reciprocally-acting compartments to the discharge-chamber, and an engine of substantially the character described controlling pump-pistons working in the respective barrels, as explained.

CHARLES H. FOX.

Witnesses:

A. G. MATHER,

J. O. WOODWARD.