

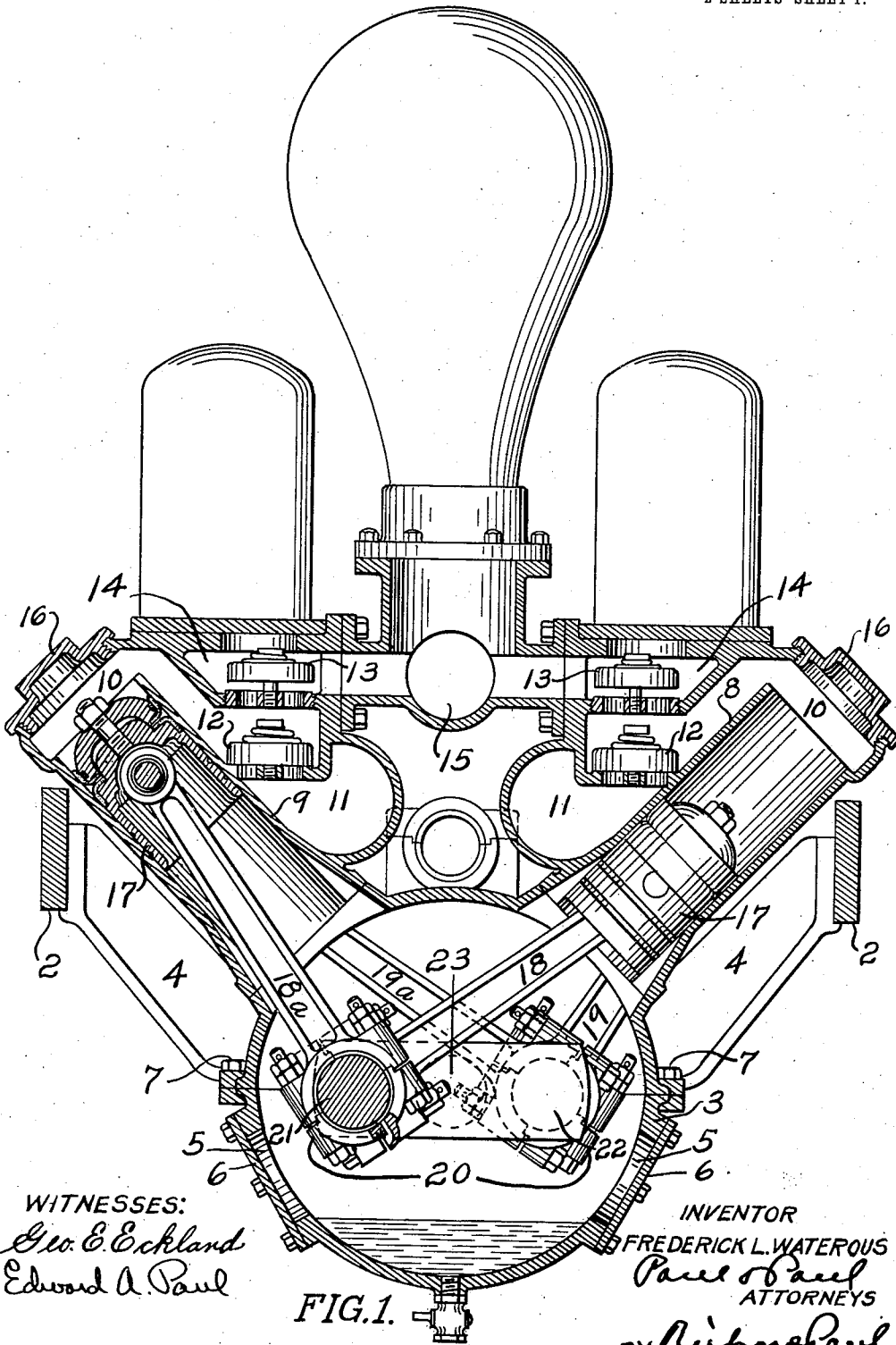
F. L. WATEROUS.  
PUMP.

APPLICATION FILED DEC. 21, 1910.

1,024,919.

Patented Apr. 30, 1912.

2 SHEETS-SHEET 1.



WITNESSES:  
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FIG. 1.

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2 SHEETS-SHEET 2.

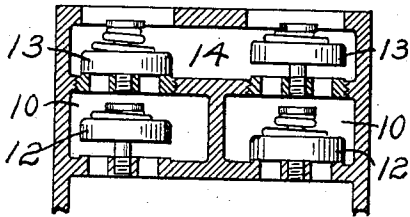


FIG. 3.

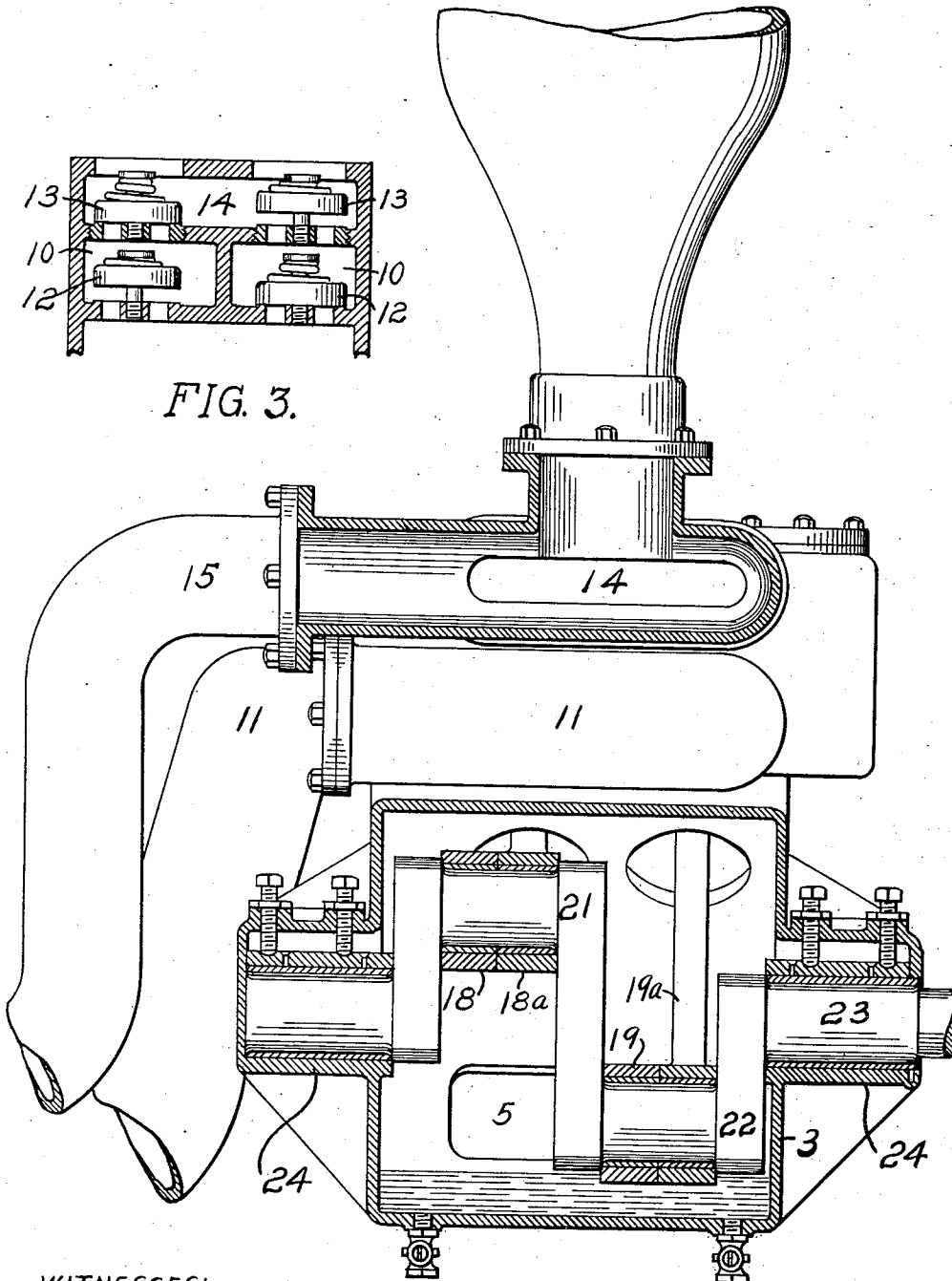


FIG. 2.

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# UNITED STATES PATENT OFFICE.

FREDERICK L. WATEROUS, OF ST. PAUL, MINNESOTA.

## PUMP.

1,024,919.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed December 21, 1910. Serial No. 598,645.

*To all whom it may concern:*

Be it known that I, FREDERICK L. WATEROUS, St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention relates particularly to pumps for a fire engine and the object of the invention is to eliminate vibration as far as possible due in engines as usually constructed to the unbalanced arrangement of the pumping cylinders and pistons.

A further object is to provide a pump having a large capacity and one that will be comparatively simple in construction and having all its parts easily accessible.

My invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a transverse sectional view through a portion of the frame of a fire engine, illustrating the application of my invention thereto, Fig. 2 is a sectional view taken on a line substantially at right angles to the section line of Fig. 1, Fig. 3 is a detail sectional view showing the arrangement of the inlet and outlet valves.

In the drawing, 2 represents a suitable frame and 3 a crank case having brackets or braces 4 extending to said frame, the case being centrally disposed in the frame and extending lengthwise thereof. The case has the usual hand hole openings 5 on each side, covered by plates 6 in the usual way. The case is also preferably made in two parts, the lower section being secured to the upper by bolts 7 and being thereby readily removable to allow full access to the interior of the case. On each side of the crank case I arrange cylinders 8 and 9, as indicated in Fig. 1. These cylinders are disposed in pairs, two on each side of the middle line of the case, and angularly disposed with respect to said case, so that the cylinders radiate from the ends on diverging lines. At the outer end these cylinders have passages 10 communicating with inlet chambers 11 through valves 12. Valves 13, operating oppositely to the valves 12, alternately shut off or open the passages to the outlet chambers 14 which communicate with the centrally arranged pipe 15. These chambers 14 are disposed upon opposite sides of

the center of the pump and communicate with the pipe 15, as shown in Fig. 1. The outer ends of the cylinders have removable heads 16 through which access may be had to the interior of the cylinders and to their pistons. The pistons 17 are of any ordinary or preferred construction, having connecting rods 18, 18<sup>a</sup>, 19 and 19<sup>a</sup> attached to the pistons in a suitable manner and having boxes 20 at their inner ends mounted on double cranks 21 and 22 of a shaft 23 which has bearings 24 in the crank case. The pistons of the connecting rods are so disposed in their cylinders that one piston will be drawn inwardly while the other piston on the same side of the pump is forced outwardly, as indicated plainly in Fig. 1, the same arrangement being provided on both sides of the crank case, and it follows, therefore, that the pistons on one side will balance those on the other side and the vibration or jar usually incidental to the operation of a reciprocating pump will be almost entirely eliminated.

I have shown a shaft with two double cranks and two pairs of pistons and cylinders, but evidently this number may be increased according to the desired capacity of the pump; the principle involved, however, in a greater number of cylinders and pistons will be the same as that utilized herein.

I claim as my invention:—

1. A pump comprising a crank case, cylinders mounted in pairs side by side and radiating from said crank case on diverging lines on opposite sides of the longitudinal center of said crank case, pistons for said cylinders, a shaft having double crank rods connecting said pistons with said cranks, said rods being so disposed with respect to said cranks that when a piston of one cylinder is drawn inwardly the piston of the other cylinder on the same side of the crank case will be forced outwardly, said cylinders having openings in their outer ends the full diameter of the cylinders, housings disposed on each side of the longitudinal center line of said crank case and having inlet chambers located near the inner ends of said cylinders and extending along beside the inner walls thereof and communicating with the open ends of said cylinders, inlet valves disposed opposite the middle portion of said cylinders and separating the lower portions of said inlet chambers from the open

ends of said cylinders, said housings also having outlet chambers disposed above said inlet chambers and also on opposite sides of the longitudinal center line of said crank case and provided with ports communicating with said inlet chambers, and valves for said ports, said valves being disposed above said inlet valves, and a centrally arranged outlet pipe communicating with said outlet chambers.

2. A pump comprising a crank case, a frame provided on each side of said crank case, brackets mounted on said crank case and having bearings at their outer ends on said frame, said crank case being centrally disposed in said frame, cylinders mounted in pairs side by side and radiating from said crank case on diverging lines and on opposite sides of the longitudinal center line thereof, said cylinders having open outer ends above and near said frame, housings disposed between said cylinders and also on

opposite sides of the longitudinal center line of said crank case, said housings having inlet chambers provided with ports communicating with the open ends of said cylinders and valves for said ports, said housings also having outlet chambers and ports in the walls thereof communicating with the open ends of said cylinders, and valves for said outlet ports, a centrally disposed outlet pipe communicating with both of said outlet chambers and separated from said inlet ports and chambers, said cylinders, and said inlet and outlet chambers being readily removable from said crank case to allow convenient access thereto.

In witness whereof, I have hereunto set my hand this 14th day of December 1910.

FREDERICK L. WATEROUS.

Witnesses:

W. HOLMS,  
H. NICOL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."