

No. 655,037.

F. M. WHEELER.
PUMP.

Patented July 31, 1900.

(Application filed Oct. 21, 1897.)

(No Model.)

Fig. 1.

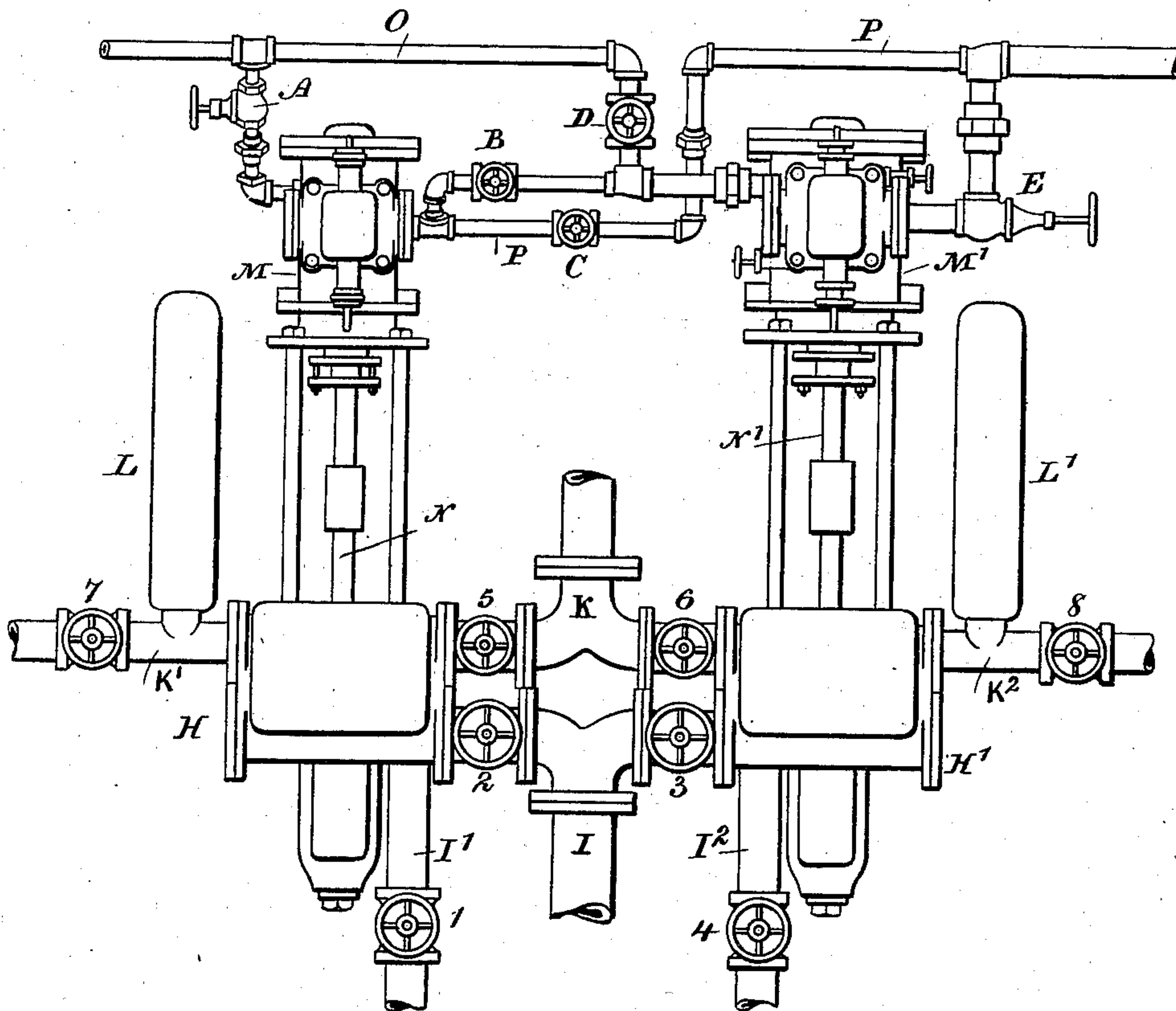
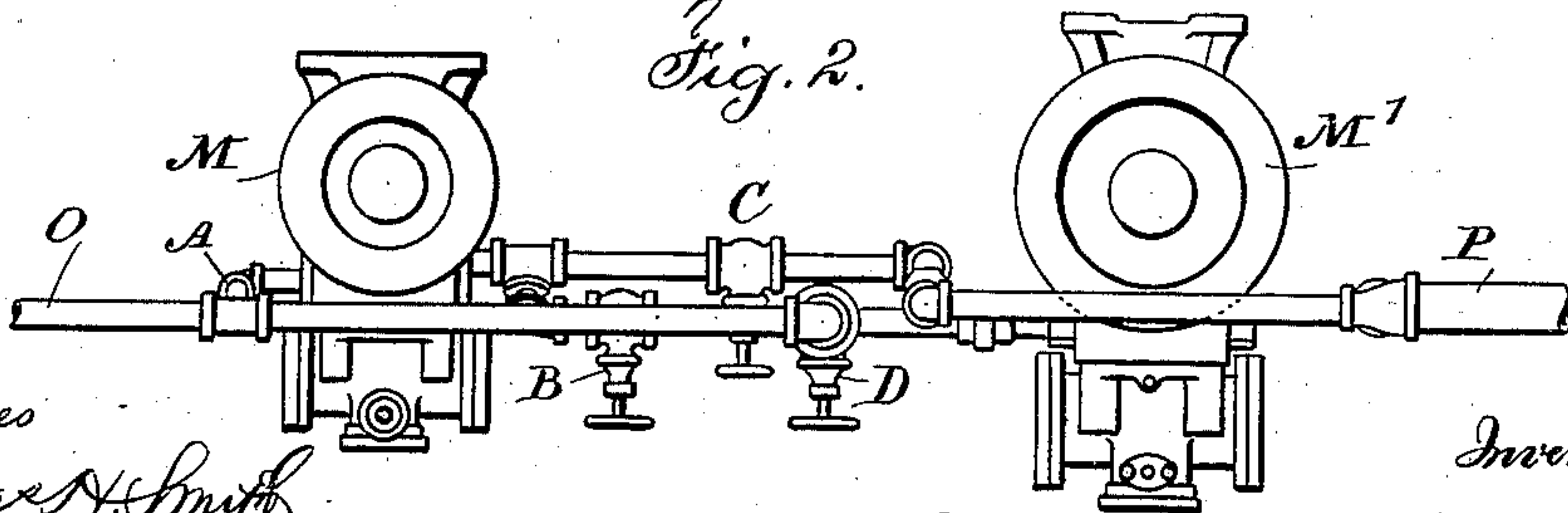


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

FREDERICK MERIAM WHEELER, OF MONTCLAIR, NEW JERSEY, ASSIGNOR
TO THE GEO. F. BLAKE MANUFACTURING COMPANY, OF NEW YORK, N. Y.

PUMP.

SPECIFICATION forming part of Letters Patent No. 655,037, dated July 31, 1900.

Application filed October 21, 1897. Serial No. 655,932. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK MERIAM WHEELER, a citizen of the United States, residing at Montclair, in the county of Essex and State of New Jersey, have invented an Improvement in Pumps, of which the following is a specification.

Pumps have heretofore been made in which an engine has been directly connected with the piston-rod of the pump and the engine has been either simple or compound to work expansively, and duplex pumping-engines have also been made in which one engine moves the valves of the other engine, so as to cause them to work in harmony. Where the engine is compound, so that the steam from the high-pressure cylinder works expansively in the larger and lower pressure-cylinder, the direct-acting pump is generally run to the best advantage and with the best economy; but it sometimes happens that one pump may be required for one purpose and another pump for another purpose and that they are most advantageously run entirely separate for a greater or less length of time, and sometimes a greater duty is required from one pump than from another, and an emergency may arise where the water from one pump has to be ejected with much more force at one time than at another. These conditions arise largely upon vessels and in emergencies—such, for instance, as the springing of a leak or the discovery of a fire or the breaking down of one of the pumps—and the object of my invention is to provide for these conditions. In the present instance I make use of two pumps and two steam-cylinders. One steam-cylinder is larger than the other and they are connected to the respective pumps, and I combine with these connecting-pipes and valves, as hereinafter described, whereby the steam under high pressure can be admitted into the smaller steam-cylinder, worked expansively in the larger cylinder, and thence passed to the exhaust, or the steam can be admitted directly into both of the cylinders, so as to work the pumps with their maximum capacity and pass separately to the exhaust, or the steam can be cut off from either one pump or the other, so that the pump that is in use can be run entirely independent of the

pump that is not in use, so that the latter may be undergoing repairs, if necessary, or the pump with the smaller steam-cylinder can be run to deliver a less quantity of water or at a less pressure than the pump having the larger steam-cylinder and from which water can be discharged under a higher pressure and for a greater distance in consequence of the steam-cylinder being larger, the pressure of steam itself not necessarily being increased. By these arrangements one pump can be employed for keeping a condenser clear of water or for pumping water into the boiler, while the other pump is used for freeing the vessel from leakage or for directing water upon a fire, or both pumps can be used with the steam-cylinders working expansively and economically for the ordinary purpose of feeding the boiler or for freeing the condenser or for circulating water through the condenser or for freeing the vessel from leakage or for any other purpose, thus adapting the pump without change in its structure to the various conditions that may exist or the duties to be performed.

The diagrammatic elevation, Figure 1, illustrates the general arrangements of the parts of the pump, and the diagrammatic plan view, Fig. 2, shows the relative positions of the pipes.

The pumps H and H' are to be of any desired character, and I employ the suction or inlet pipe I, that is common to the two pumps, and the suctions or inlets I' I² are provided, the suction I' being for the pump H and the suction I² for the pump H', and valves 1 2 3 4 are provided, so that the suction can be from either of the pipes or either suction can be closed.

The discharge-pipe K is common to the two pumps, and by the valves or cocks 5 and 6 either one or both discharges may be closed, and the discharge K' may be used when the valve 7 is open, or the discharge K² may be used when the valve 8 is open, and air vessels L L' are usually provided.

The connecting-rods N N' extend from the plungers or pistons of the respective pumps to the pistons of the steam-cylinders M M', the steam-cylinder M being for high pressure and smaller than the cylinder M', which is

especially adapted to receiving the expanding steam, and live steam is admitted by the pipe O, and the exhaust-pipe is represented at P.

The cocks or valves A and D are provided
5 in the steam-pipes, and the cocks or valves B, C, and E are provided in the exhausts, so that the steam may be admitted directly to the cylinder M through the cock A and exhaust through the cock B or the cock C. In the lat-
10 ter instance the exhaust will go to the exhaust-pipe P; but when C is closed the exhaust from M will go by the pipe and cock B to the cylinder M' and thence by the exhaust-cock E to the exhaust P. In this instance
15 the steam-valve D is closed; but when the valve B is closed and the valve C is open the steam may go direct through the valve D to the chest of the cylinder M', so that in this latter instance the live steam is acting in the
20 engine M and in the engine M'. I have found that when the valve B is open and the valves C and D closed and the valve E open the steam at a high pressure acts in the cylinder M and thence exhausts by the valve B and acts
25 in the larger engine M' expansively, escaping by the valve E to the exhaust P, and the two engines will move synchronously or in harmony, because as soon as the valve of the engine M is changed, so as to shut off the ex-
30 haust from one end and admit steam, the pause in the one engine will insure a corresponding action in the other engine, so that the engines will run in harmony and the expansive action in one will not only be due to the expansion of the steam, but to the driving
35 out of the steam by the movement of the piston in an opposite direction, and for this reason it is unnecessary to have an intermediate steam-chamber and consequent loss by con-
40 densation or heat of the steam.

By the aforesaid improvement the two cylinders can work as a compound engine, or either engine can be run without reference to the other, the engine with the larger cylinder
45 exerting much more power when run with live steam than the engine with the smaller cylinder, and one engine or pump can be undergoing repair when the other one is in operation, and the water from either pump can be
50 directed in whatever manner is desired.

By the arrangements hereinbefore described it is possible to employ one pump for keeping the condenser clear of water or for

pumping water into the boiler, while the other and companion pump may be employed for 55 freeing the vessel from leakage or for directing water for putting out fire. Furthermore, both pumps can be simultaneously used with the steam-cylinders working expansively and also economically for ordinary purposes of 60 feeding the boiler or freeing the condenser of the water of condensation or for circulating water through the condenser or for freeing the vessel from leakage; also, for any other purpose that pumps are usually adapted to. 65 All these uses are possible without changing the structure of the pump, thus employing a pump of compact dimensions for the various and numerous duties devolving upon such an apparatus. 70

I claim as my invention—

1. The combination with the steam-cylinders, of pumps operatively connected to the steam-cylinders, inlet water-pipes and exit water-pipes to each pump and valves in the 75 said inlet and exit pipes whereby the pumps may be operated simultaneously yet independently of one another, or either one be operated alone, an inlet-pipe and branches connecting both pump-cylinders, an exit-pipe and 80 branches also connecting both pump-cylinders and valves in said branch pipes whereby both pumps may be coupled together and work in unison, substantially as specified.

2. The combination with the steam-cylinders, of pumps operatively connected to the steam-cylinders, inlet water-pipes and exit water-pipes to each pump and valves in the 85 said inlet and exit pipes, and air vessels connected to the exit-pipes whereby the pumps may be operated simultaneously yet independently of one another, or either one be operated alone, an inlet-pipe and branches connecting both pump-cylinders, an exit-pipe 90 and branches also connecting both pump-cylinders, and valves in said branch pipes whereby both pumps may be coupled together and work in unison, substantially as specified. 95

Signed by me this 15th day of October, 1897.

FREDK. MERIAM WHEELER.

Witnesses:

C. L. LIPP,
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