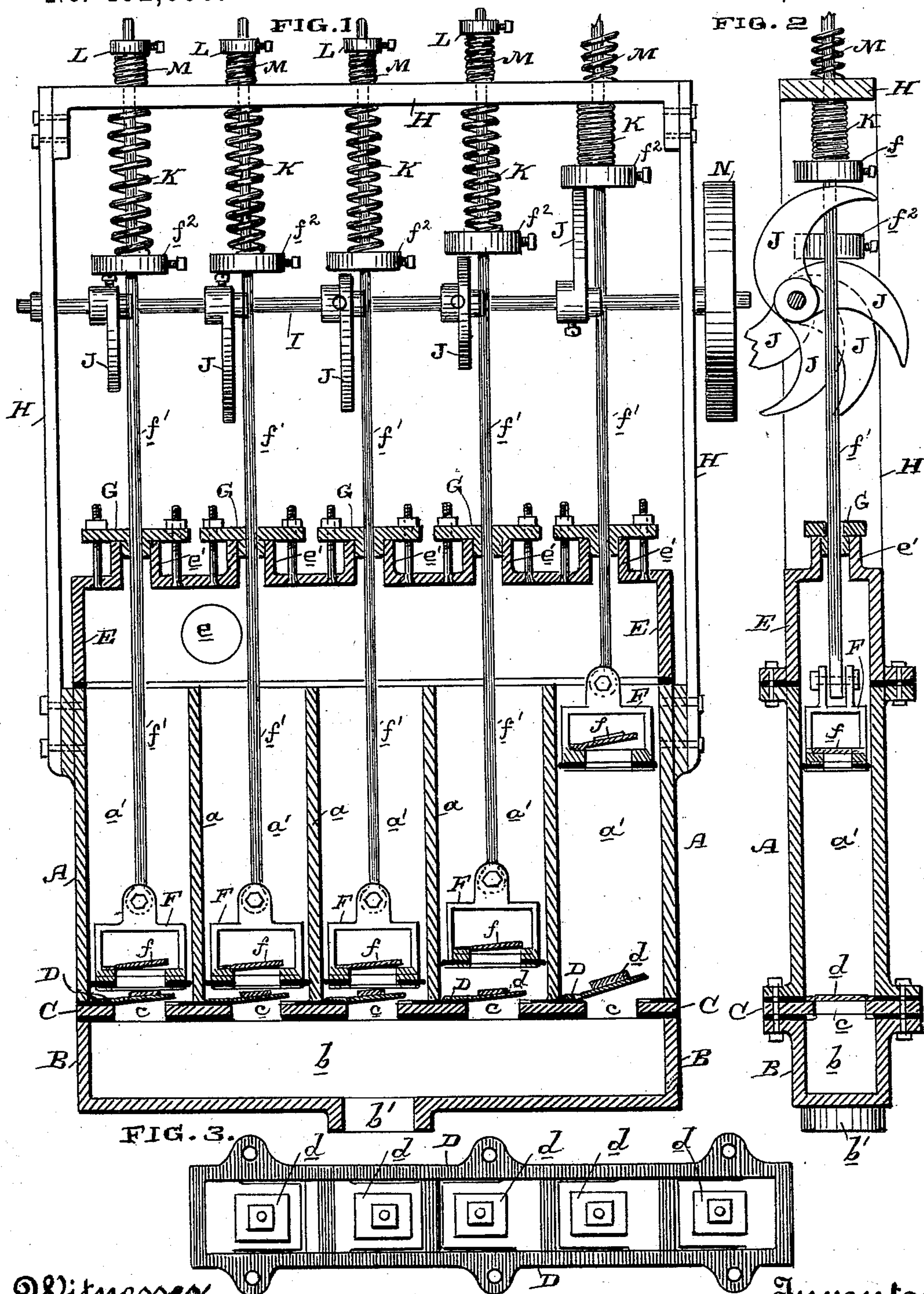


(No Model.)

H. J. DYKES.
PUMP.

No. 462,666.

Patented Nov. 3, 1891.



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PUMP.

SPECIFICATION forming part of Letters Patent No. 462,666, dated November 3, 1891.

Application filed February 6, 1891. Serial No. 380,528. (No model.)

To all whom it may concern:

Be it known that I, HUGH J. DYKES, a citizen of the United States, residing at Peralta, Alameda county, State of California, have invented an Improvement in Pumps; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of pumps in which are embodied a number or series of separated cylinders, said cylinders having a common inlet and a common discharge, and each having a piston, said pistons being operated successively to produce a continuous stream.

My invention consists in the novel construction and organization of parts hereinafter fully described, and specifically pointed out in the claims.

The object of my invention is to provide a simple pump of this class in which the total capacity is so divided as to materially reduce the power necessary to operate the members separately and yet effect as a sum of the operation of all a result equal to the sum of their capacities.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical longitudinal section of my pump. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a plan of the valve-strip D.

The main portion or body of the pump consists of a single casting A, made hollow and provided with partitions *a*, which divide the interior space of the casting into a number of independent cylinders *a'*.

Bolted to the lower end of the casting A is the casting B, the interior space of which forms the common receiving-chamber *b*, which communicates with all the cylinders, said casting having a common inlet-aperture *b'* in its lower portion.

Between the castings A and B is the valve-seat plate C, having a series of ports *c*, which communicate with the common receiving-chamber *b* and with the independent cylinders of the casting A. Upon this plate rests the valve-strip D, having made in it the series of upwardly-swinging clack-valves *d*, which control the several ports of the valve-

seat plate. Suitable washers intervene to provide a tight joint.

Bolted to the top of the main casting A, with a suitable washer intervening, is a casting E, the interior space of which forms the common discharge-chamber communicating with all the cylinders of the casting A and having a single discharge-aperture *e*. This top casting is also formed with the several stuffing-boxes *e'*.

In each cylinder is a plunger F, having an upwardly-swinging valve *f*. Each piston has a piston-rod *f'*, which extends upwardly through the common discharge-chamber and through the stuffing-boxes thereof. These rods are guided by means of cross-bars G, bolted to the top casting, and are further guided by the top bar of a frame H, the arms of which are bolted to the ends of the main casting A. In this frame is mounted the power-shaft I, adapted to be rotated by any suitable means, as by a weight. Upon this shaft are secured the cams J, one for each piston-rod. Each piston-rod has secured to it a tappet *f''*, under which the cams operate, and said cams are arranged at different points throughout the circumference of the power-shaft, so that they will operate the several piston-rods successively.

Between the tappets and the top bar of the frame H are springs K. Above the top bar of the frame, upon the piston-rods, are mounted collars L, between which and said top bar are springs M.

A suitable balance-wheel N is placed on the power-shaft.

The operation of the pump is as follows: The cam-shaft being set in operation, the cams successively lift the several piston-rods by bearing up under the tappets thereof and successively relieve said tappets by passing from under them. The springs K as soon as the cams relieve the tappets, throw the piston-rods down again. The upper springs M prevent the pistons from striking the lower valves and serve as cushions to limit and arrest the downward stroke of the piston. As the pistons rise their valves close, and the water is sucked into the receiving-chamber and into the cylinders. As the pistons de-

scend their valves open, while the lower valves close, and the water which is within the cylinders passes through the pistons. On the next upstroke this water, closing the valves of the piston, is raised by said pistons while more water is drawn in from below. The water raised by the several pistons is lifted into the common discharge-chamber and, communicating with all the cylinders, bears directly upon the piston in each, thus insuring the closing of its valve. A steady and continuous stream is discharged from the aperture of the discharge-chamber. It will be seen that by dividing the valves up into a number of smaller ones the power required to operate each member of the series is very much reduced, while the sum of the result is equivalent to the combined capacities of the several pumps.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pump, the combination of a series of independent cylinders having a common receiving-chamber and a common discharge-chamber with suitable controlling-valves, valved pistons operating within the several cylinders and having valve-rods, the means for operating the pistons, consisting of the power-shaft having the series of differently-located cams, the tappets on the piston-rods, against which the cams successively operate to raise the rods, the springs for forcing the rods down again when relieved of the cams, and the top springs on the piston-rods serv-

ing as cushions for limiting the downward stroke of the pistons, substantially as herein described.

2. In a pump, the combination of the main casting A, having the partitions dividing its interior space into separate cylinders, the bottom casting B, bolted to the main casting and forming a receiving-chamber common to all the cylinders of the main casting, the valve-seat plate and valve-strip secured between the bottom casting and the main casting and controlling their communication, the top casting bolted to the upper end of the main casting and forming the common discharge-chamber communicating with each of the cylinders of the main casting, the reciprocating pistons with valves operating within the independent cylinders of the main casting, the piston-rods of said pistons, the power-shaft, the cams located at different points about the circumference of said shaft, the tappets on the piston-rods, against which the cams successively operate to lift the rods, the springs above the tappets for forcing the rods down again, and the top springs on the piston-rods for limiting the downward stroke of the pistons and preventing them from coming in contact with the lower valves, substantially as herein described.

In witness whereof I have hereunto set my hand.

HUGH J. DYKES.

Witnesses:

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