(No Model.)

F. BAUER.

PUMP.

No. 410,396. Patented Sept. 3, 1889.

Fig. 1.

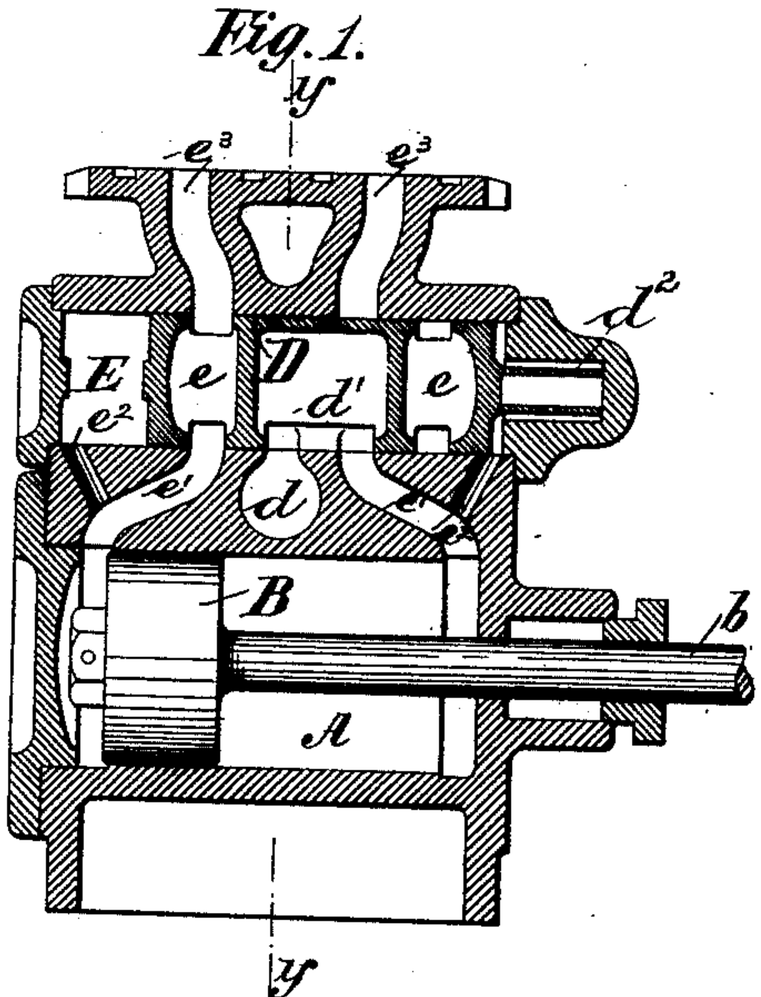


Fig. 3.

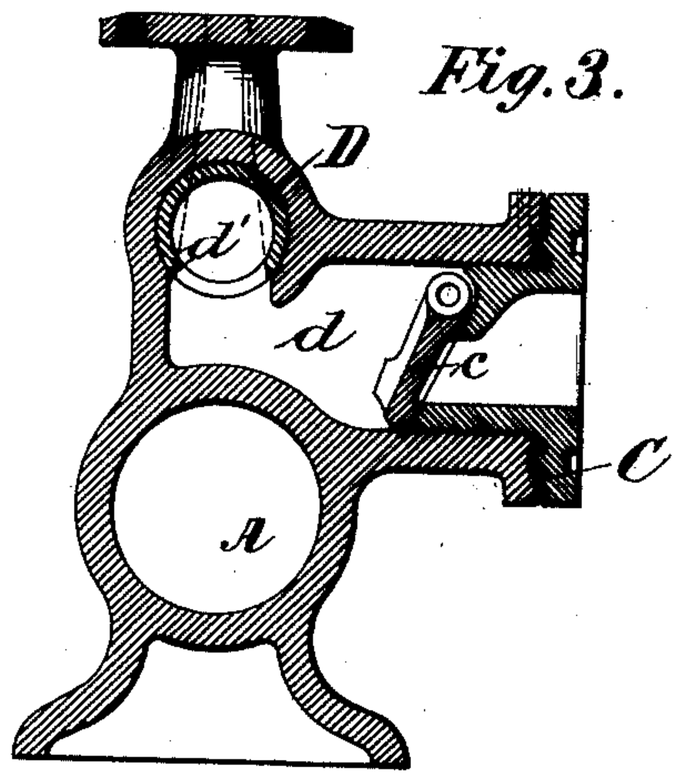
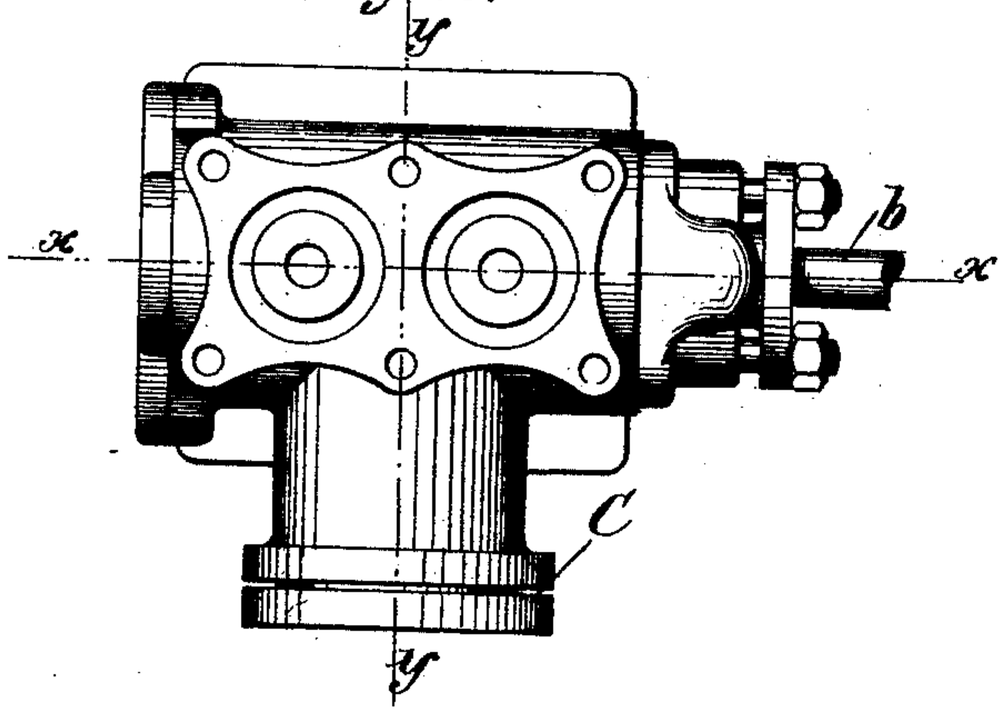


Fig. 2.



WITNESSES

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SPECIFICATION forming part of Letters Patent No. 410,396, dated September 3, 1889.

Application filed July 19, 1888. Serial No. 280,384. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND BAUER, a resident of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Pumps, of which the following is such a full, clear, concise, and exact description as will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates more particularly to that class of pumps employed in connection with gas compressing and refrigerating apparatus for introducing the oil or lubricating liquid into the compressor; and it consists in the construction of the piston-chamber, valve-chamber, valve, and openings for receiving and discharging the oil into and from the pump, as hereinafter more fully described and claimed.

In the drawings, Figure 1 is a longitudinal vertical section of the pump and connections, the same being taken on the line *x x* of Fig. 2, which is a plan view thereof; and Fig. 3 is a vertical cross-section of the same, taken on the line *y y* of Fig. 2.

In the drawings, A represents the piston cylinder or chamber; B, the piston, which may be actuated by suitable connections with the piston-rod *b*. The pump receives its supply of oil through the inlet-pipe C, which may return the oil from the system after being discharged from the compressor and separated from the compressed gas in the usual way. The inlet-pipe C is provided with a check-valve *c*, for regulating the flow of oil to the port *d*, such valve being made to open and close by the pressure, which, when greater in the pipe C than in the port *d*, causes the check-valve to open and the oil flows into the port, and when the pressure in the port becomes greater than that obtained in the pipe the check-valve closes and cuts off the supply of oil until the pressure in the port is again reduced below that in the pipe. From the port *d* the oil flows into a cylindrical cup-valve D, which is provided with a cavity or receptacle *d'*, for receiving the oil from the port *d* and supplying it to the piston-cylinder. The cup-valve D is also provided with outlet-openings *e e*, for permitting the discharge of the oil after its passage through the cylinder, such discharge being effected by the pressure of the piston. This cup-valve is inclosed within a chamber E, and moves back and forth according to the movements of the piston and consequent pressure thereby exerted upon the oil, which is admitted to and discharged from the cylinder, and is also preferably provided with flattened or elliptical guiding-stem d^2, adapted to move in suitable socket in head of the chamber for preventing turning, and thus throwing the outlet and inlet openings therein out of position to admit of the flow of oil from the cavity *d'* of the valve D to the cylinder. Openings or passage-ways *e' e'* make communication between the chamber E and the cylinder leading into the latter near each end thereof, and as the pump is intended to be double-acting the movements of the valve alternately bring the cavity *d'* and the oil therein over or in connection with the passages *e' e'*, and when such cavity is in communication with one of such passages the outlet-opening *e* at the opposite end of the valve will be in communication with the other passage leading from the cylinder. To insure the proper movements of the valve, the passages *e' e'* are each connected with the opposite ends of the chamber E by branch passages e^2 e^2, so that when the piston, being in the position shown in Fig. 1, begins to move in the opposite direction the oil which has flowed from the valve D to the chamber of the piston-cylinder is forced up through the passage *e'*, which at the beginning of the stroke is in communication with the valve, and, finding no outlet through the main passage-way *e'*, passes therefrom through the branch passage e^2 and enters the chamber E between the end of the same and the valve, and the pressure exerted upon the oil moves the valve toward the opposite end of such chamber until the oil finds its outlet through the main passage-way *e'* and outlet-opening *e* in the valve, while by such movement the other outlet-opening *e* in the valve is passed beyond its corresponding passage-way *e'*, and the cavity *d'* is brought into communication therewith. The outlets *e e* in the valve D also communicate with outlets e^3 e^3 in the diaphragm or cover of the chamber E, and from such outlets proper con-

nections are made with the oil-inlets of the compressor, so that oil is supplied to the same with each stroke of the pump-piston, and it will be apparent that the construction and arrangements of the parts of the pump shown by the drawings herein are such as to introduce the oil in measured quantities of practically the same quantity at each injection thereof.

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 piston-chamber with a piston adapted to move therein, a valve-chamber provided with two outlet or discharge openings and corresponding passages leading from said piston-chamber, and a cup-valve, also provided with two discharge-openings and adapted to move in said valve-chamber and connect one or the other of the discharge-openings therein with corresponding passages leading from said piston chamber, said cup-valve being further provided with a cavity having an opening adapted to connect successively with a port through which the oil or other liquid is supplied and the passage leading to piston-chamber and not connected with an outlet-opening, said valve and piston-chamber being further connected by channels at each end, whereby the cup-valve is given a reciprocating motion by means of the pressure of the oil forced through said channels under successive strokes of said piston, and the passages leading to and from said valve-chamber are opened and sealed and equal quantities of oil discharged, substantially as described.

2. In a pump, the combination of the piston-chamber A, with piston adapted to move therein, valve-chamber with port *d*, having discharge-openings e^3 e^8, channels e^2 e^2, and passages e' e', and cup-valve D, provided with passages *e e*, cavity d', having an opening therein, and guiding-stem d^2, adapted to move in socket in head of valve-chamber, arranged and operating substantially as described.

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