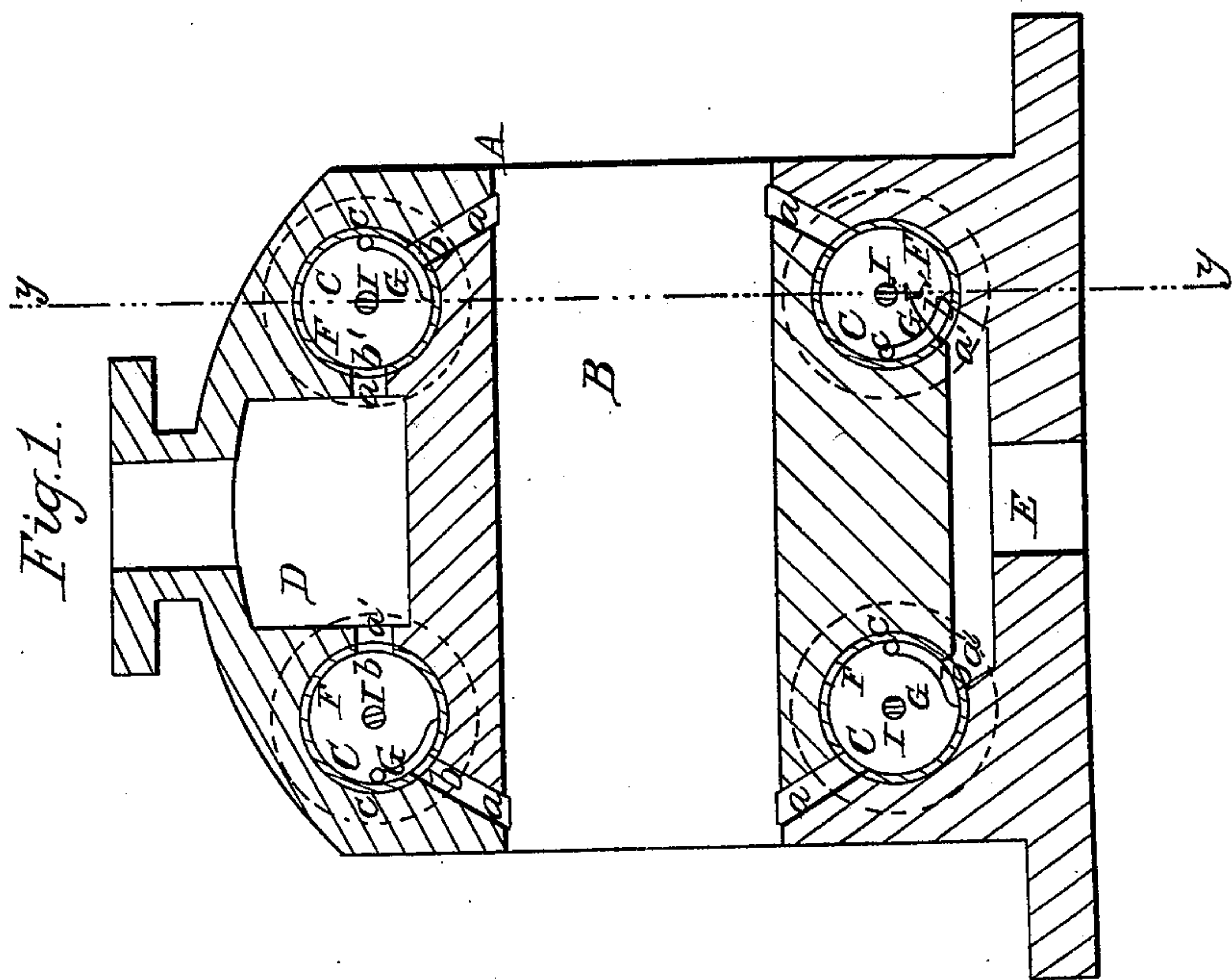
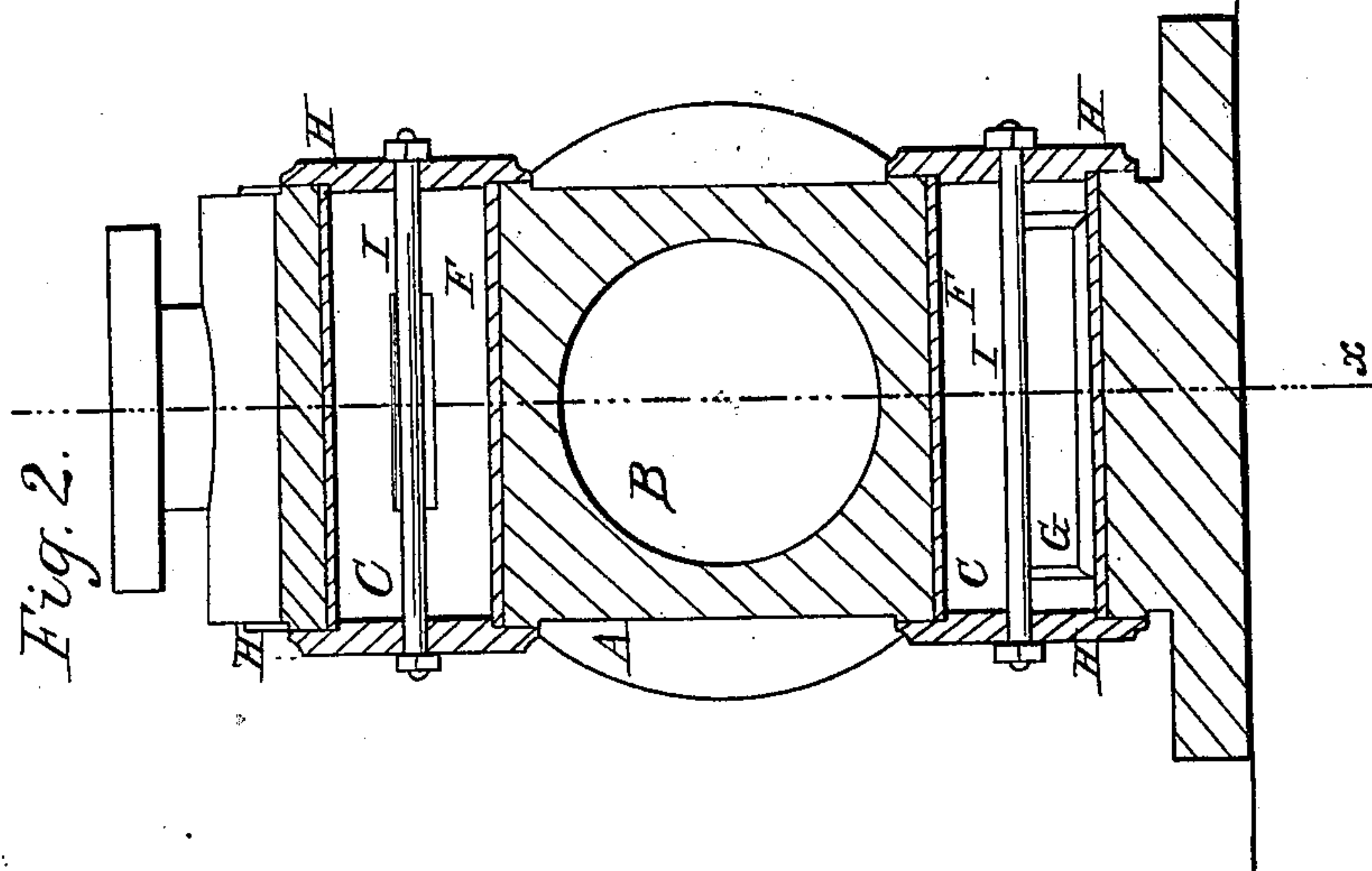


C. & G. M. Woodward,
Pump Valve,
No 19,398, Patented Feb. 16, 1858.



UNITED STATES PATENT OFFICE.

CALVIN WOODWARD AND GEORGE M. WOODWARD, OF NEW YORK, N. Y.

HYDRAULIC VALVE.

Specification of Letters Patent No. 19,398, dated February 16, 1858.

To all whom it may concern:

Be it known that we, CALVIN WOODWARD and GEORGE M. WOODWARD, of the city, county, and State of New York, have invented a new and useful Improvement in the Construction of Valves for Pumps; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a longitudinal vertical section of our improvement, (x) (x) Fig. 2 showing the plane of section. Fig. 2 is a transverse vertical section of the same, (y) (y) Fig. 1 showing the plane of section.

Similar letters of reference indicate corresponding parts in the two figures.

To enable those skilled in the art to fully understand and construct our invention, we will proceed to describe it.

A represents the body of the pump which is formed of cast metal having a circular opening, B, made longitudinally through it, said opening forming the cylinder in which the piston works in the usual manner. Above and below the opening, B, two circular openings C, C, are made, said openings extending entirely through the body A, and communicating with the opening, B, at each end of it by passages (a) shown clearly in Fig. 1. The openings C also communicate, by means of passages (a'), with chambers D, E, the upper chamber, D, communicating with the force pipe, and the lower chamber, E, communicating with the suction pipe. In each opening C a brass or composition tube F is fitted. These tubes have slots (b) made in them corresponding to the passages (a) leading from the opening, B, and the passages (a') leading into the chambers D, E.

G, are the valves which are formed of the section or segment of a tube so that they may be fitted snugly within the tubes F and cover the orifices of the passages (a). The valves G have tenons or axes (c), one at each end, and these tenons, or axes fit in holes made in caps H, which cover the ends of the tubes F, and are connected by screw bolts I which extend entirely through the openings C, and through the centers of the caps, H, as shown clearly in Fig. 2. The valves G it will be seen operate precisely similar to the usual flap valve, and the operation of the pump is precisely the same as the ordinary double acting pumps.

The advantage of the above improvement is, that the tubes F serve as bushes for the passages (a) and when the valve seats become worn, the tubes F may be readily removed and replaced by new ones. The valves may also be constructed with the greatest facility, and fitted perfectly on their seats without difficulty, for as they are segments of a tube they may be turned in a lathe, and the work, consequently, may be done very accurately. The tubes F may be drawn, or cast and finished in a lathe. The ordinary valves require considerable labor in order to fit them perfectly, and expert or skilful workmen are required to insure the work being properly done. The valve arrangements of the common steam pumps are generally of a comparatively complicated nature, difficult of access, and repair when broken or stopped up. One of the most important uses of the steam pump is as a fire engine or ship's pump. For this purpose the construction should be simple, not liable to stoppage and convenient in respect to access to the valves and interior parts. The caps of the common pumps are usually fastened against the ends of their cylinders by a series of screw bolts for each head. But in our improvement it will be observed that the bolts I, each end having a nut, serve to hold the caps tightly over the ends of the valve chambers, no other fastening being required. By removing one nut both caps may be at once removed when the valves and chambers are at once exposed, and any chip or foreign substance, that may have entered can be quickly removed. The bolts I, also serve as stops for the valves. The latter strike against the bolts, which thus prevent the valves from opening further than is necessary.

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

The arrangement and combination as herein shown and described of the valves G, caps H, and bolts I, the caps serving the extra purpose of bearings for the valves, and the bolts the double purpose of packing the caps and stopping the valves.

CALVIN WOODWARD.
GEO. M. WOODWARD.

Witnesses:

W. TUSCH,
JAMES F. BUCKLEY.