

No. 618,725.

G. B. PETSCHÉ.  
PUMP.

Patented Jan. 31, 1899.

(Application filed July 31, 1897.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

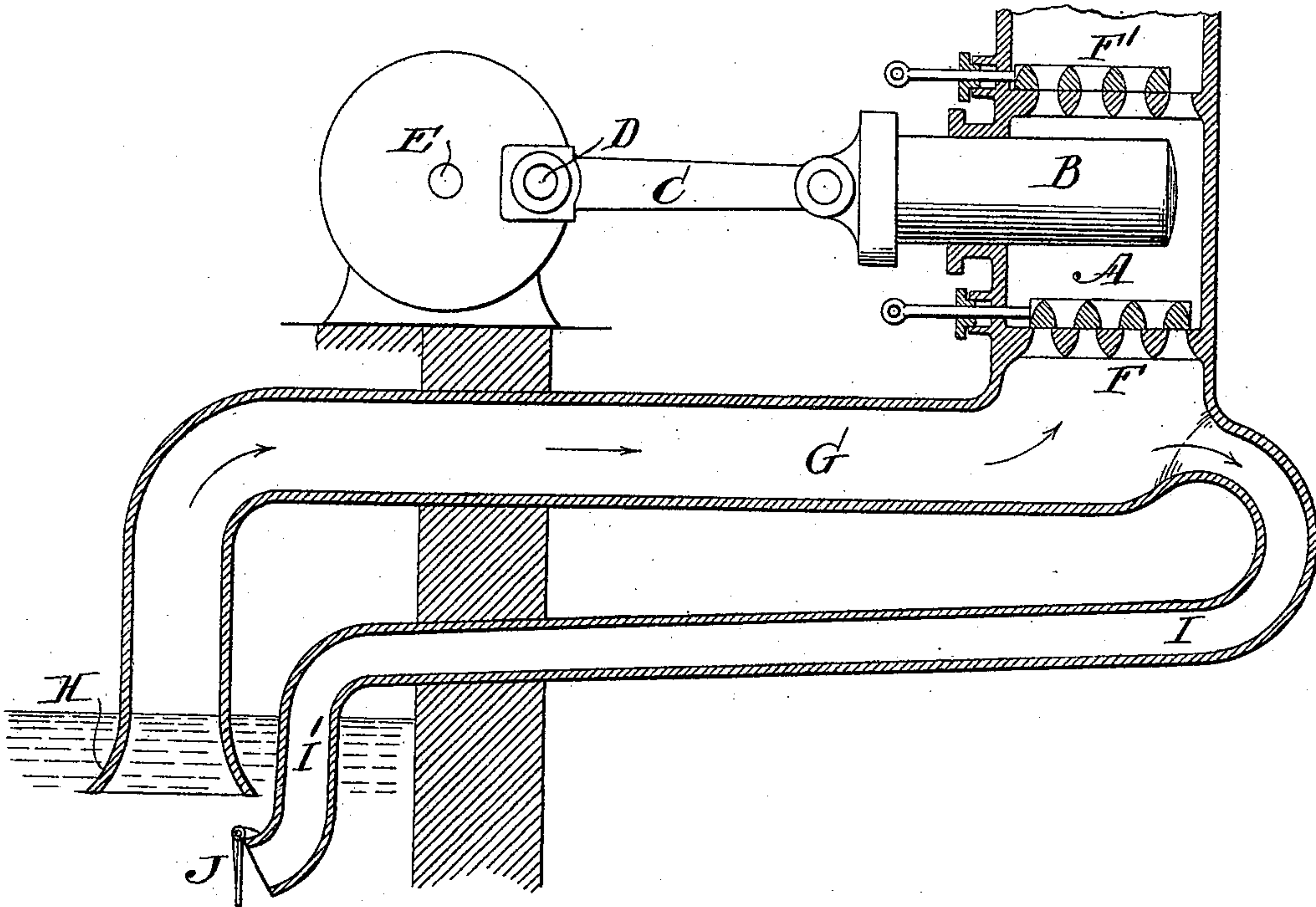
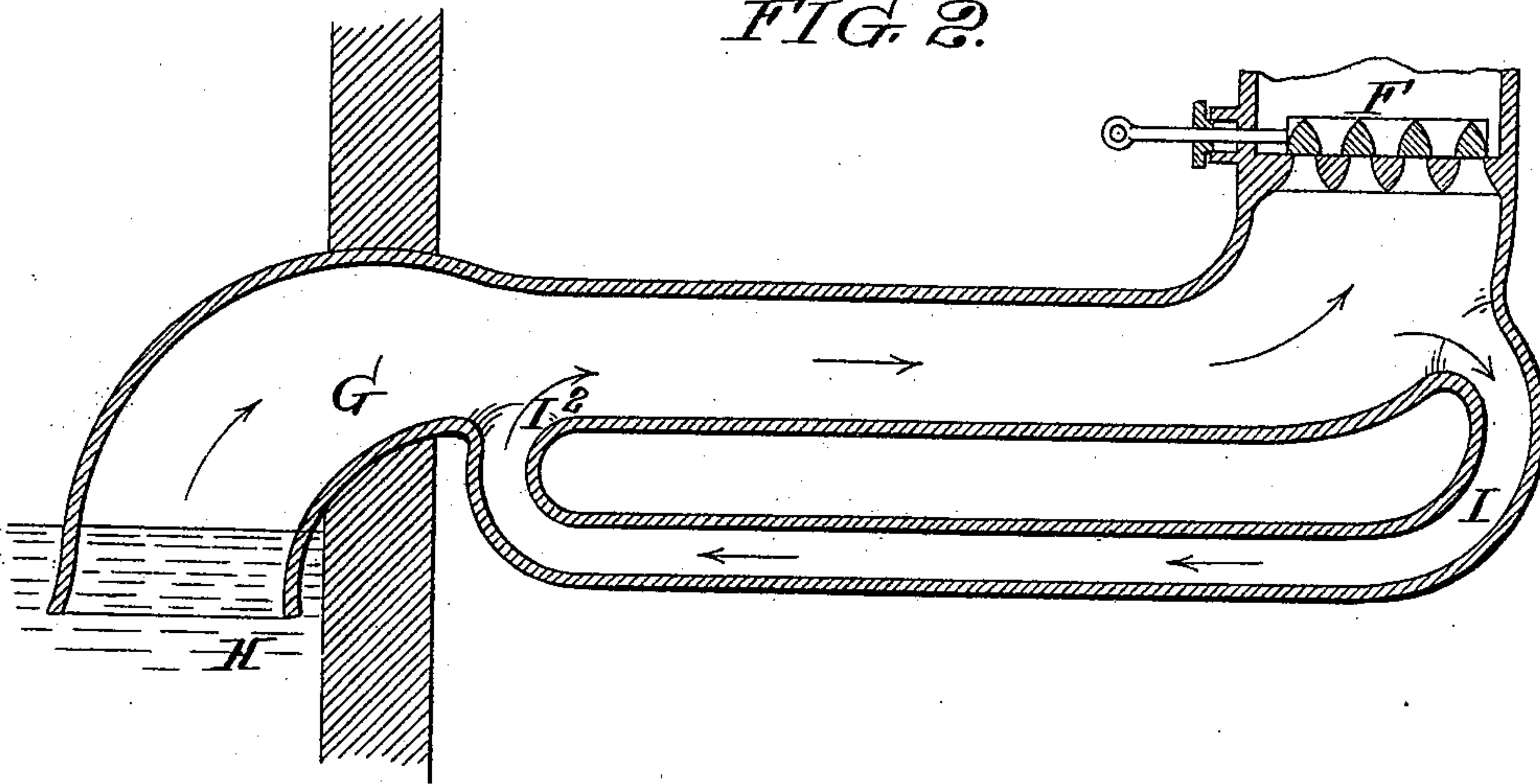


FIG. 2.



Witnesses.

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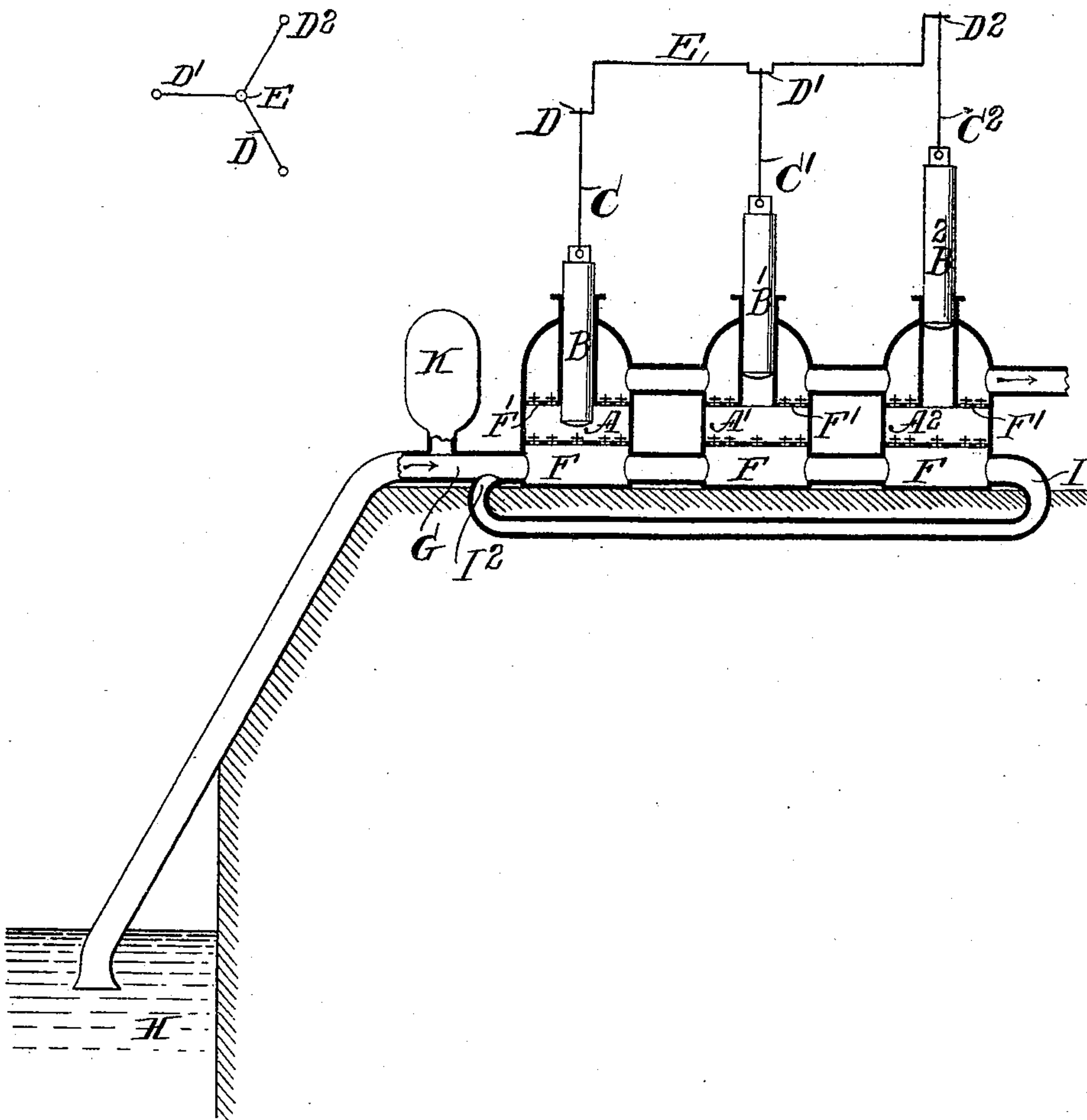
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2 Sheets—Sheet 2.

FIG. 4.

FIG. 3.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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ASSIGNOR TO THE SOUTHWARK FOUNDRY AND MACHINE COM-  
PANY, OF SAME PLACE.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 618,725, dated January 31, 1899.

Application filed July 31, 1897. Serial No. 646,638. (No model.)

*To all whom it may concern:*

Be it known that I, GUSTAV BERNHARD PETSCHÉ, a subject of the Emperor of Germany, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Pumps, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the construction and operation of pumps for acting upon water or other liquids, and has for its object to provide a means whereby the column of water passing to the pump through the suction-pipe may be kept in motion after the closing of the suction-valve of the pump, so as to avoid the shock due to the sudden check of this column of water. Heretofore this has been accomplished with greater or less success by providing air-chambers, into which, upon the closing of the suction-valve, the water column in the suction-pipe rises against the increase of pressure of the air contained therein; but of course in this construction there is a reciprocating action of the water in the air-chamber, the column, which rises therein while the valve is closed, falling again when the valve opens and the pump is again taking water from the suction-pipe; and my object is to provide against a shock due to the sudden stoppage of the water by continuing it in motion and in the same direction, and this I accomplish by providing a by-pass connecting with the suction-pipe as close as may be convenient to the suction-valve of the pump and leading therefrom either back to the forebay or, preferably, back again into the suction-pipe at a point some distance away from the suction-valve. In the latter case, of course, the water column contained in the suction-pipe between the forebay and the point where the by-pass returns into it will be checked, as before; but the height of this column and the volume and impetus of the water contained therein may, it will readily be seen, be so inconsiderable as not to be a serious factor.

Reference being now had to the drawings, in which my invention is illustrated, Figure

1 is a side elevation of a single-acting pump provided with a modification of my invention in which the by-pass returns to the forebay. Fig. 2 is a similar view illustrating a construction in which the by-pass returns into the suction-pipe at a distance from the pump-valve. Fig. 3 is a sectional diagrammatic elevation of my invention applied to a pump having three pistons in separate chambers and actuated by cranks angularly placed at one hundred and twenty degrees from each other, and Fig. 4 is a side elevation of the driving-shaft and the cranks connected thereto.

A in each case indicates the pump-chamber; B, a plunger, B<sup>2</sup> and B<sup>3</sup> being also plungers in Fig. 3. C, C', and C<sup>2</sup> are connecting-rods coupling the plungers with the cranks D, D', and D<sup>2</sup>, secured on the actuating-shaft E.

F indicates the admission or suction valve of each chamber, and F' the delivery-valve.

G is the suction-pipe leading from the forebay H, and I the by-pass pipe, which, as shown in Fig. 1, terminates at I' in the forebay and, as shown in Figs. 2 and 3, at I<sup>2</sup> at a point in the suction-pipe near the forebay.

J, Fig. 1, indicates a non-return valve, which prevents the water from passing upward through the by-pass pipe I. Similar valves may, if desired, be used in the by-passes shown in Figs. 2 and 3, but the by-pass being, as shown, considerably smaller than the suction-pipe and turned into it at proper angles the flow through the by-pass will be found to be constant in the reverse direction to the other in the suction-pipe even without the use of a non-return valve.

In operation the pump draws its supply from the forebay through the suction-pipe G in the usual way, and on the closing of the admission or suction valve the column of water moving upward through the suction-pipe will be deflected into the by-pass pipe I, continuing its motion in the same direction through the suction-pipe, and thus avoiding the shock and noise incident to the sudden checking of the water column. In the construction indicated in Figs. 2 and 3 the result is to give the water column situated beyond the outlet I<sup>2</sup> of the by-pass a whirling or cir-



cular movement, thus avoiding entirely the stoppage of this water or the reversal of its direction, as has heretofore been the ordinary practice.

5 Of course where a number of pump-chambers are used together, as indicated in Fig. 3, the work thrown upon the by-pass is simply to take care of the comparatively small excess of supply-water due to the normal flow  
10 of water through the supply-pipe being at times greater than the one or two outwardly-moving plungers called for, and I may state that I believe my invention to be most usefully applicable to double-acting or multiple-  
15 acting pumps.

While, as I have stated, my invention is intended to a certain extent to take the place of the ordinary air-chambers used for checking the water in the suction-pipe, it will be  
20 obvious that it can be used and used with advantage in addition to such air-chambers. Particularly it will be advantageous, especially where a long supply-pipe is used, to place an air-chamber slightly in the rear of  
25 the point I<sup>2</sup> at which the by-pass returns into the suction-pipe—a construction such as is indicated at K in Fig. 3.

Having now described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a pump a suction-pipe leading to the suction-valve thereof and a by-pass leading from the suction-pipe at a point near its valve to a point in or closer to the forebay and whereby the water checked  
35 by the valve in closing can continue in motion in the same direction.

2. In combination with a pump a suction-pipe leading to the suction-valve thereof and a by-pass leading from the suction-pipe at a  
40 point near its valve back to said pipe at a point near the forebay and whereby the water checked by the valve in closing can continue in motion in the same direction.

3. In combination with a pump a suction-pipe leading to the suction-valve thereof, a  
45 by-pass leading from the suction-pipe at a point near its valve to a point in or closer to the forebay and whereby the water checked by the valve in closing can continue in motion  
50 in the same direction and a non-return valve situated in said by-pass.

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Witnesses:

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