

No. 780,061.

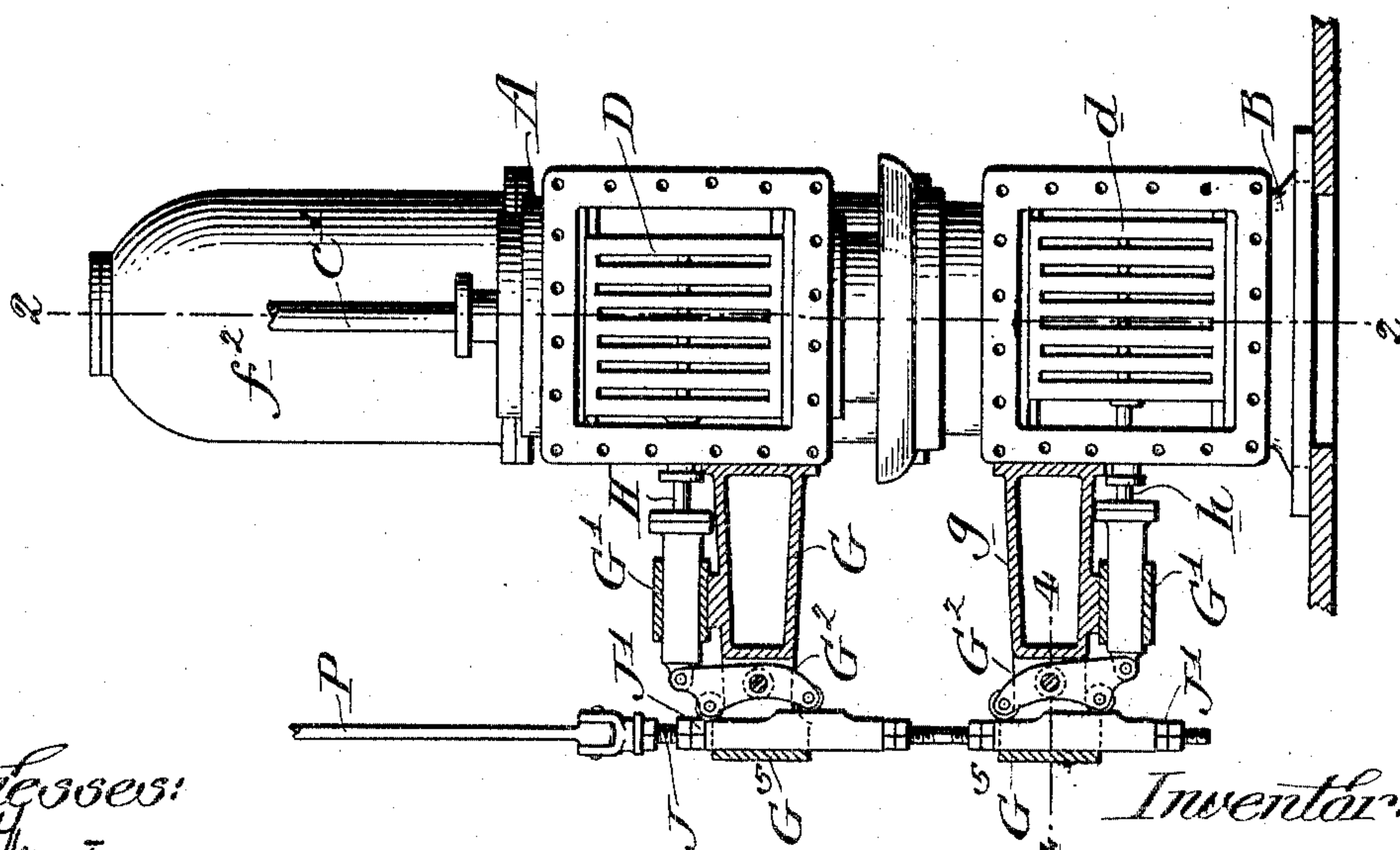
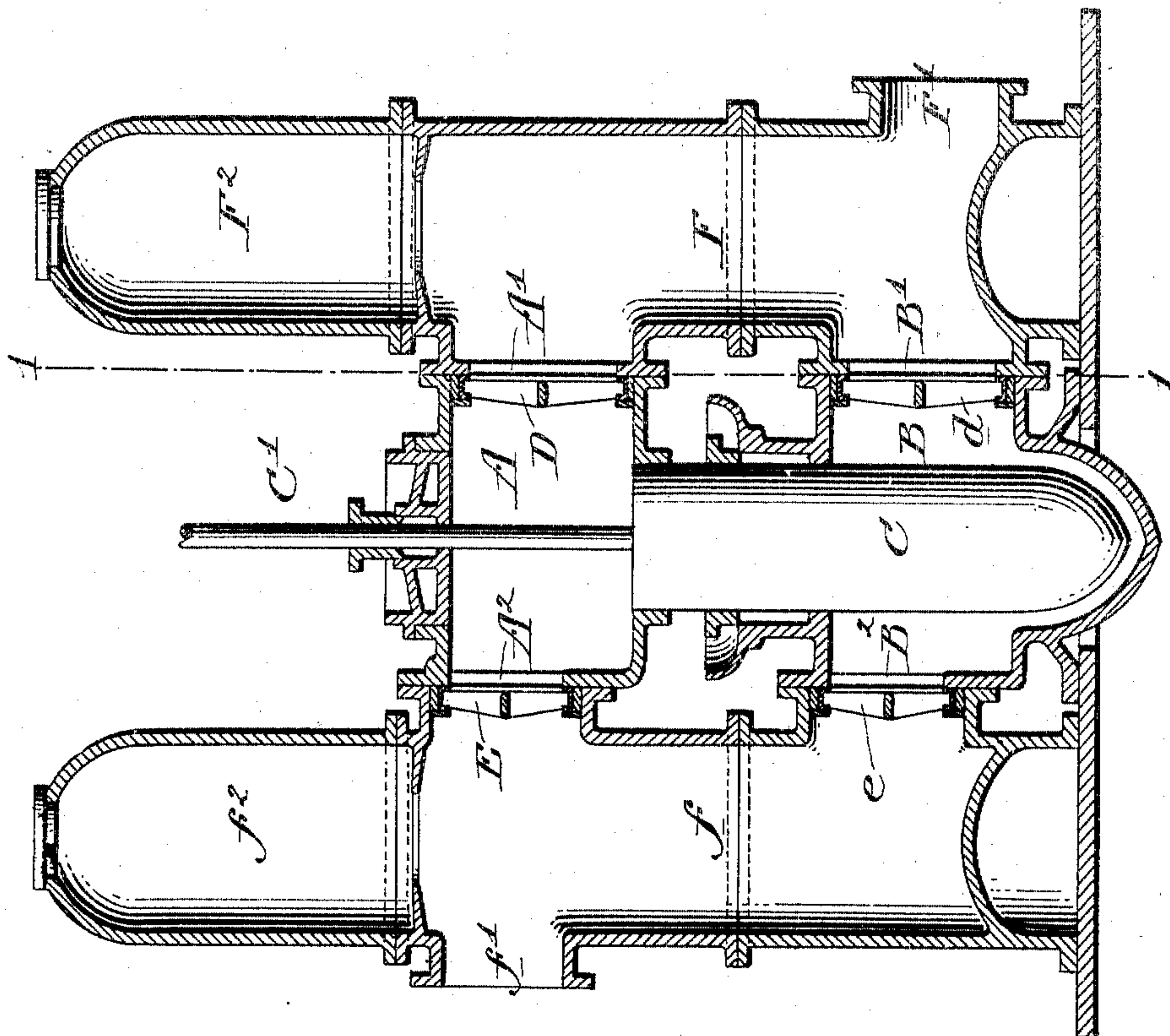
PATENTED JAN. 17, 1905.

G. B. PETSCHÉ.

PUMP.

APPLICATION FILED APR. 25, 1903.

2 SHEETS—SHEET 1.



Witnesses:
Hewart
A. Williams

Inventar:

Gustav B. Petsche
by his atty.

Francis J. Chamberlain

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2 SHEETS—SHEET 2.

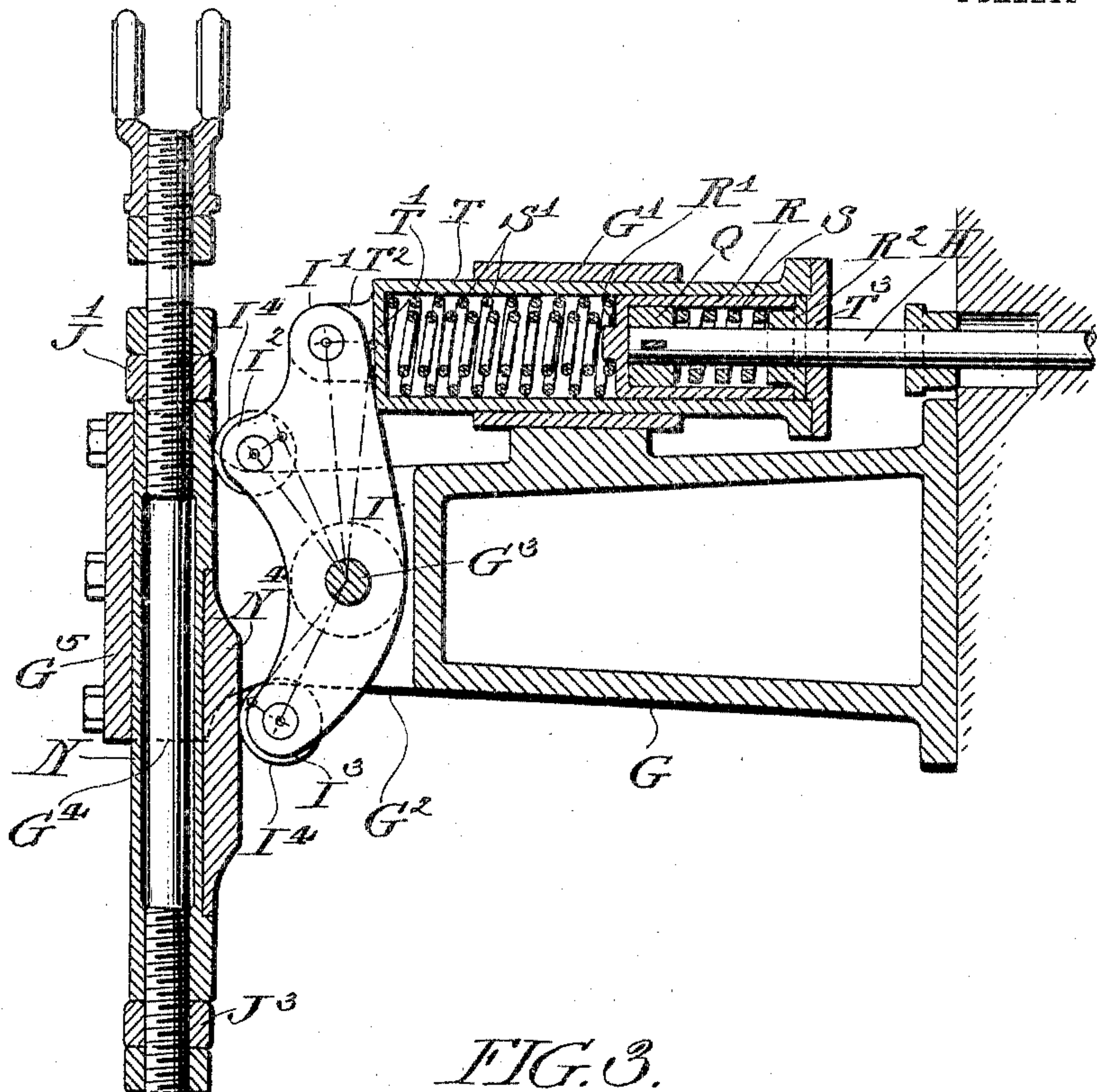


FIG. 3.

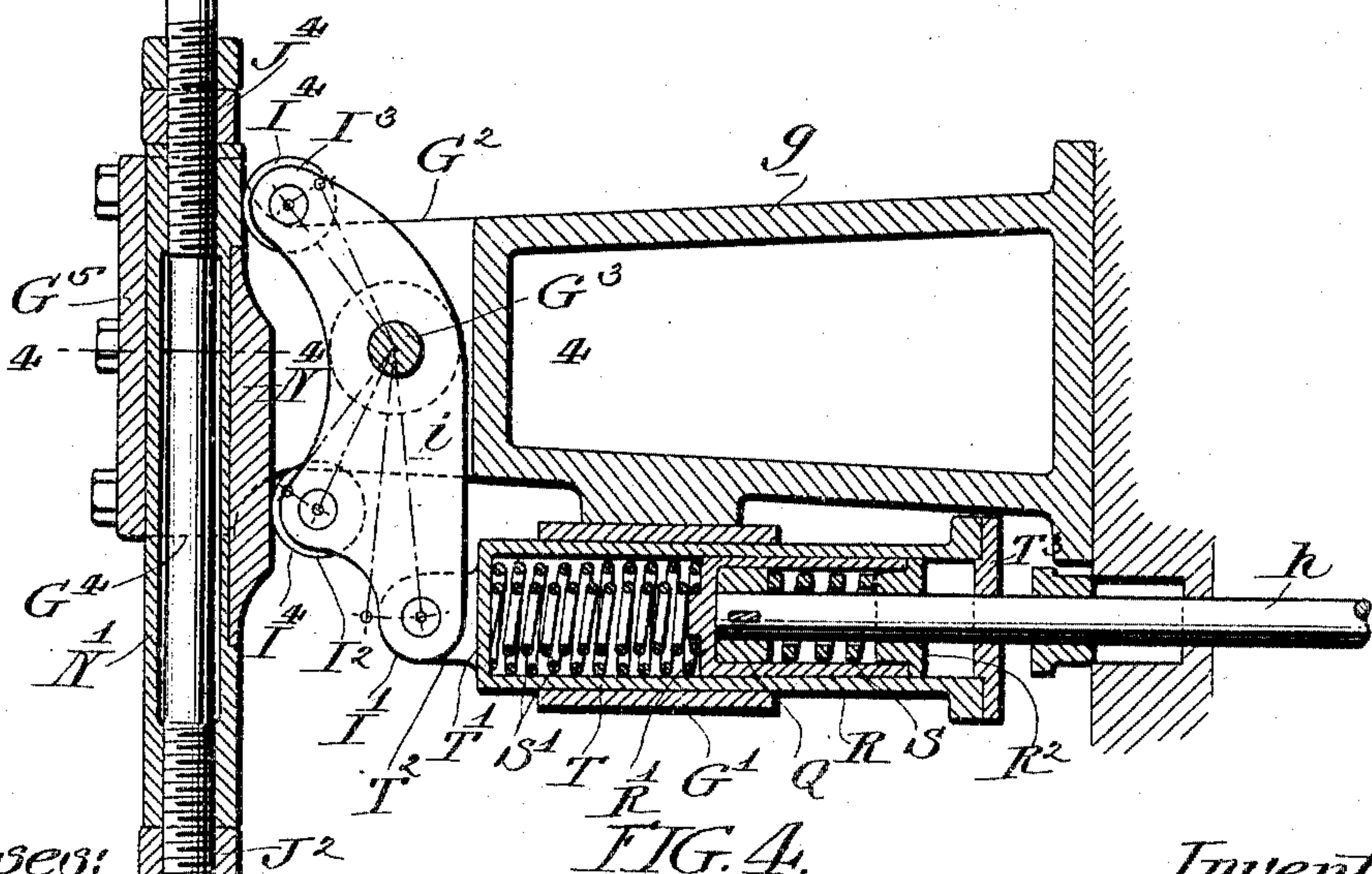


FIG. 4.

Witnesses:

H. Howard
A. Williams

Inventor:

Mustav B. Petsche

by his atty.

Francis D. Chambers

UNITED STATES PATENT OFFICE.

GUSTAV BERNHARD PETSCHÉ, OF PHILADELPHIA, PENNSYLVANIA,
ASSIGNOR TO THE SOUTHWARK FOUNDRY & MACHINE COMPANY,
OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENN-
SYLVANIA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 780,061, dated January 17, 1905.

Application filed April 25, 1903. Serial No. 154,201.

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 pumps, and is broadly applicable to pumps used in connection with both liquids and gases, though especially adapted for use in connection with incompressible fluids.

Primarily the object of my invention is to provide improved means for actuating the valves controlling the entrance and exit of fluid to and from the pump-chamber, whereby said valves are connected through resilient means, which permit them to remain stationary when the forces opposing their movement exceed a determined amount. This method and, in a broad sense, the means for actuating the valves in connection with liquid-pumps are substantially of the character described in my patents granted on the 25th of November, 1902, and numbered 714,603 and 714,604.

The leading feature of my present invention consists in combining with a valve-actuating spindle or rod a head secured to the spindle by springs, which normally hold the head and spindle in fixed relative position, but which permit the head to move in either direction independently of the spindle when resistance to the movement of the valve exceeds determined amounts, and in further combining with said head means operating to give to it a reciprocating movement.

The nature of my invention and its various details will be best understood as described in connection with the drawings in which it is illustrated, and in which—

Figure 1 is an elevation through a pump provided with my improvement, taken as on the section-line 1 1 of Fig. 2; and Fig. 2 is an

elevation taken as on the section-line 2 2 of Fig. 1. Fig. 3 is an enlarged section of the valve-actuating cams, showing their connections with the reciprocating heads and valve-spindles; and Fig. 4 is a transverse section on the line 4 4 of Fig. 1.

A and B indicate pump-chambers having admission-ports A' and B' and delivery-ports A² and B². C is the plunger, working through the said pump-chambers and actuated by a moving part of the engine. (Not shown.)

F is a chamber forming part of the admission-conduit, with which it is connected through port F', F² indicating an air-chamber at the top.

f is an air-chamber forming part of the delivery-conduit, with which it communicates through the delivery-conduit f', f² indicating an air-chamber.

G and g are brackets extending out from the side of the pump and similar in construction, except that their characteristic parts are, as shown, reversed in direction. These brackets support guideways (indicated at G') and have outwardly-extending ends G² G², between which is supported the pivot-pin G³ and upon the ends of which are formed or supported the guideways, (indicated at G⁴,) G⁵ indicating a bearing-plate secured to the ends of the flanges G².

H and h indicate the valve-rods, which in the section shown are those belonging to the admission-valves D and d.

I and i are three-armed levers pivoted on the pins G³ and having long arms (indicated at I') and short arms, (indicated at I² and I³,) said short arms being of equal length and supporting cam-rollers, (indicated at I⁴.)

J indicates a reciprocating rod, one such rod being provided for each pair of valves and motion being imparted to said rods preferably by a connection of the moving part of the pumping-engine, (not shown,) the motion of course being imparted through a connecting-rod such as indicated at P in Fig. 1.

J' and J² indicate adjusting-nuts screwing on the ends of the rods J, and J³ and J⁴ are

adjusting-nuts screwing on the central portions of the rod J. Between the adjusting-nuts is secured the cam-block, (indicated at N or N',) N¹ indicating in each case the cam-surface of the block. These cam-blocks are made of such conformation as to fit in the bearings of the bracket-arms G² and be supported at their rear against the plates G⁵, and, as is shown, the cam-faces of the blocks rest in contact with the cam-rollers I¹ on the levers I and i, so that as the rod J moves up or down the said levers I and i are moved in opposite directions and at such relative times as is determined by the conformations of the cam-faces.

The long arms I' of the levers I and i are connected with the lugs T², extending out from the heads T' of cylindrical casings, (indicated at T,) which casings have their inner ends closed by heads T³, through which extend the valve-rods H and h. Situated and longitudinally movable in the casings T are the casings indicated at R, having their outer ends closed and preferably formed integral with the seats, as indicated at R', while their inner ends are closed by heads, as indicated at R², through which heads extend the valve-rods H and h, to the ends of which rods are secured heads, (indicated at Q.) A spring S is placed in the casing R between the head Q, secured to the valve-stem, and the head R² of the casing, and a spring or springs, as indicated at S', are placed in the casing T between the outer head of said casing and the outer head of the casing R. It will be seen that in this construction the casing R forms, in effect, a head, which is secured to the valve-spindle in normally fixed position by the action of the spring S, but which is capable of moving outward without moving the valve-spindle whenever the resistance to the movement of the spindle exceeds that determined by the energy of the spring S, and it will also be seen that the said casing R, in connection with the casing T, forms, in effect, a compound head, which is normally held in fixed relation to the valve-spindle by the action of the springs S and S', but which is capable of inward movement where the resist-

ance to the movement of the valve-spindle exceeds the energy of the springs S'. Consequently the reciprocating cams will normally impart positive and regular movement to the valve-spindles and valves, but in case of resistance in excess of determined amounts will permit the valve-spindle to remain stationary by the resilience of the spring connections provided for in the sliding-head construction described.

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

1. In a pump, a slide-valve in combination with a valve-actuating spindle firmly secured to it, a head secured to said spindle by springs which normally hold the head and spindle in fixed position, but permit the head to move in either direction independently of the spindle when the resistance to the movement of the valve exceeds determined amounts, and positively-actuated means acting to give the head a reciprocating movement.

2. In a pump, a valve in combination with a valve-actuating spindle, a head positively secured to said spindle, a casing R, fitting over the spindle end and head, a spring S, acting against the head to hold it against the end of the casing, a casing T, fitting over casing R, a spring or springs S', acting to hold casing R, against the end of casing T, and positively-acting means acting to give casing T, a reciprocating movement.

3. In a pump, a valve in combination with a valve-actuating spindle, a head positively secured to said spindle, a casing R, fitting over the spindle end and head, a spring S, acting against the head to hold it against the end of the casing, a casing T, fitting over casing R, a spring or springs S', acting to hold casing R against the end of casing T, a fixed guide for casing T, and positively-acting means acting to give casing T a reciprocating movement.

GUSTAV BERNHARD PETSCHÉ.

Witnesses:

CHAS. F. MYERS,
D. STEWART.