

(No Model.)

C. PETERSON.  
VALVE FOR VACUUM PUMPS.

No. 369,879.

Patented Sept. 13, 1887.

Fig. 1.

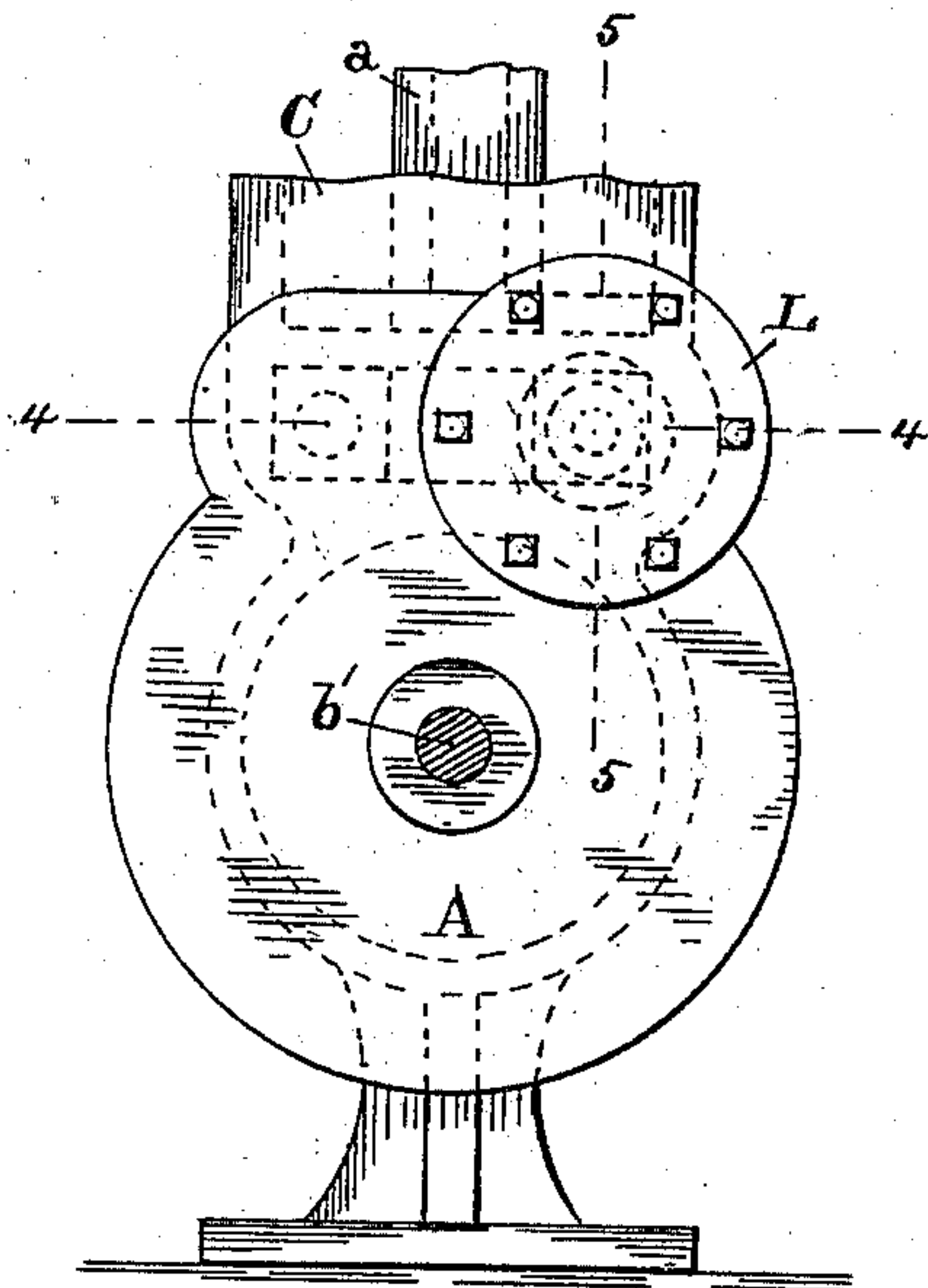


Fig. 2.

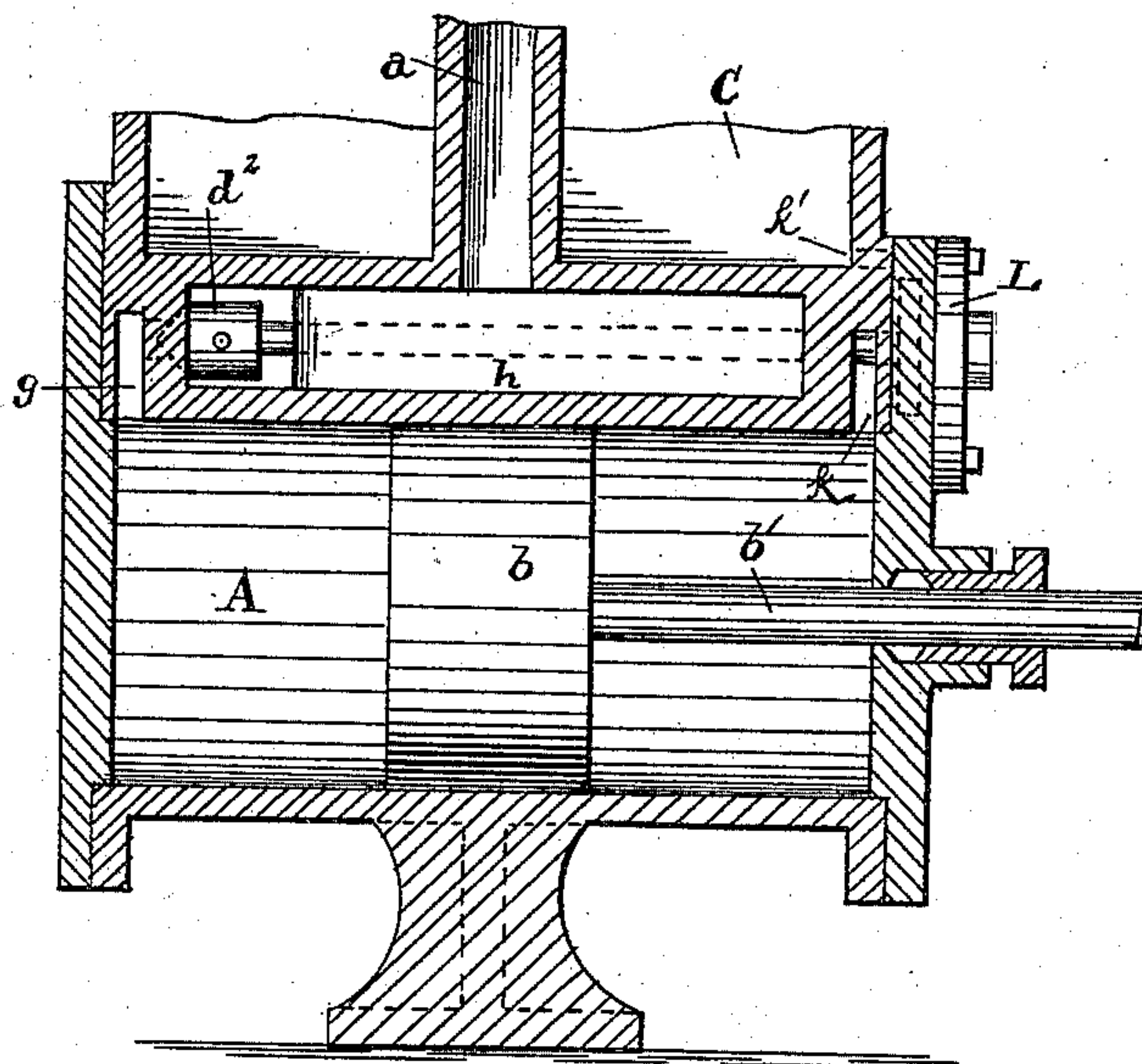


Fig. 3.

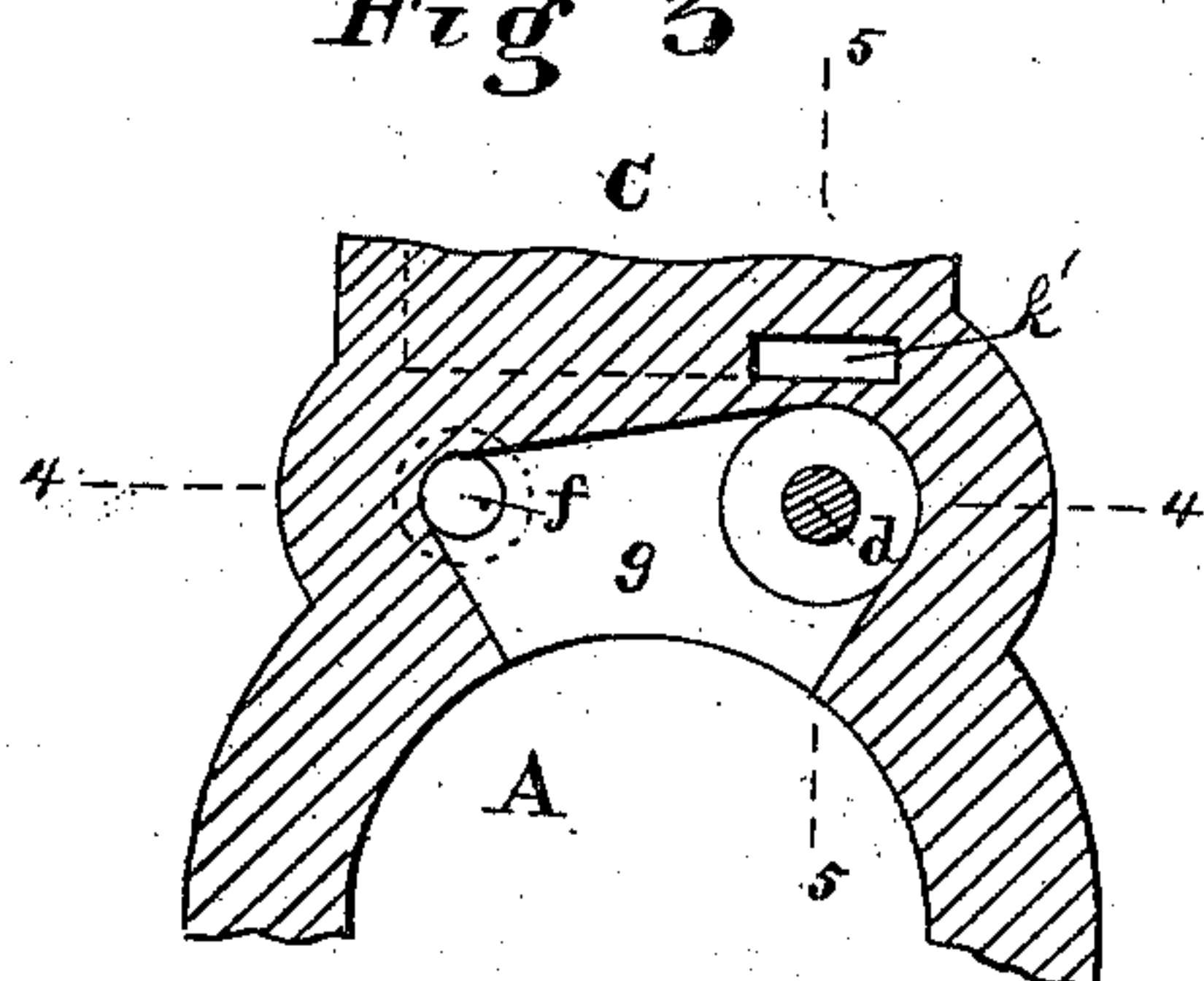


Fig. 4.

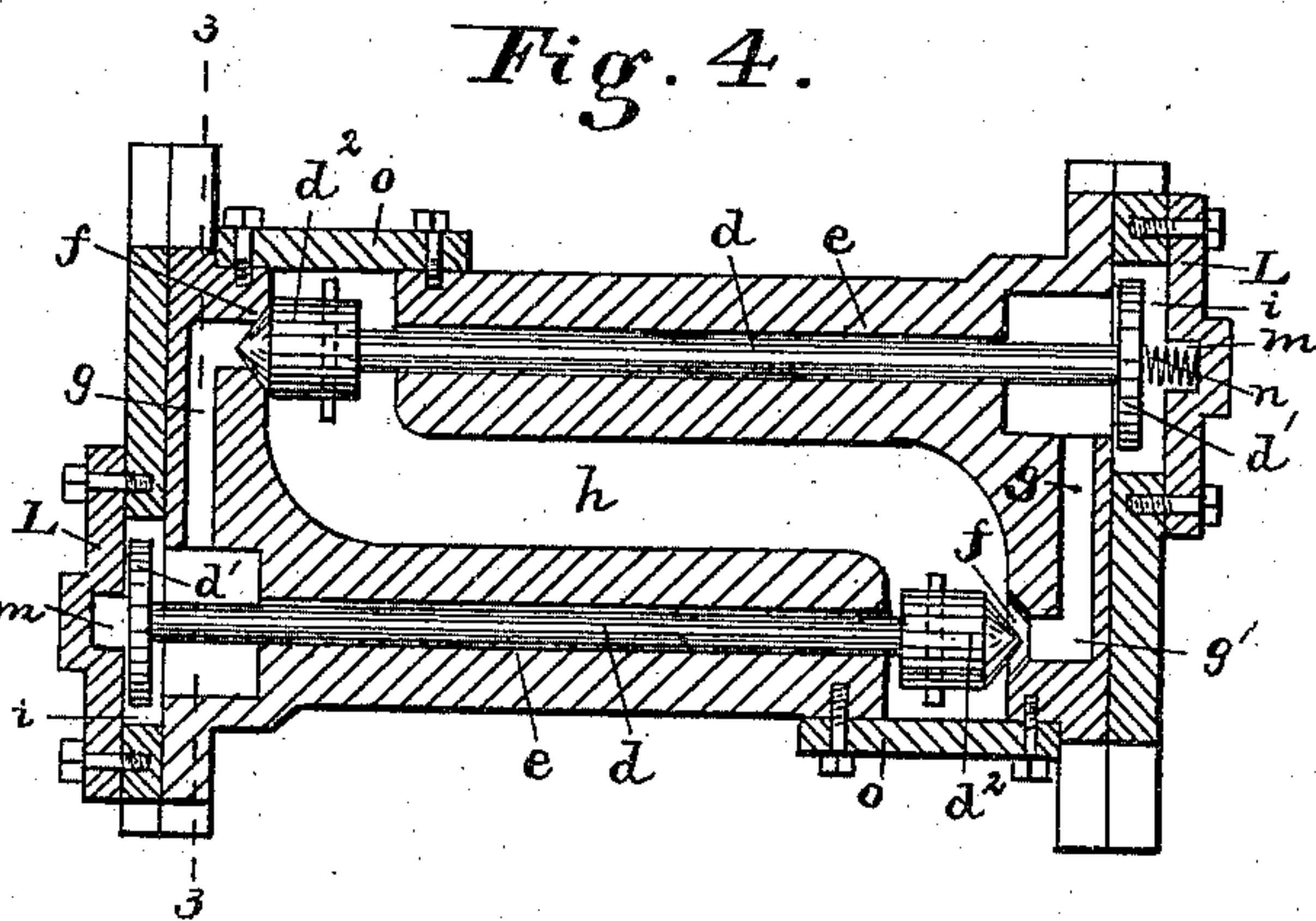
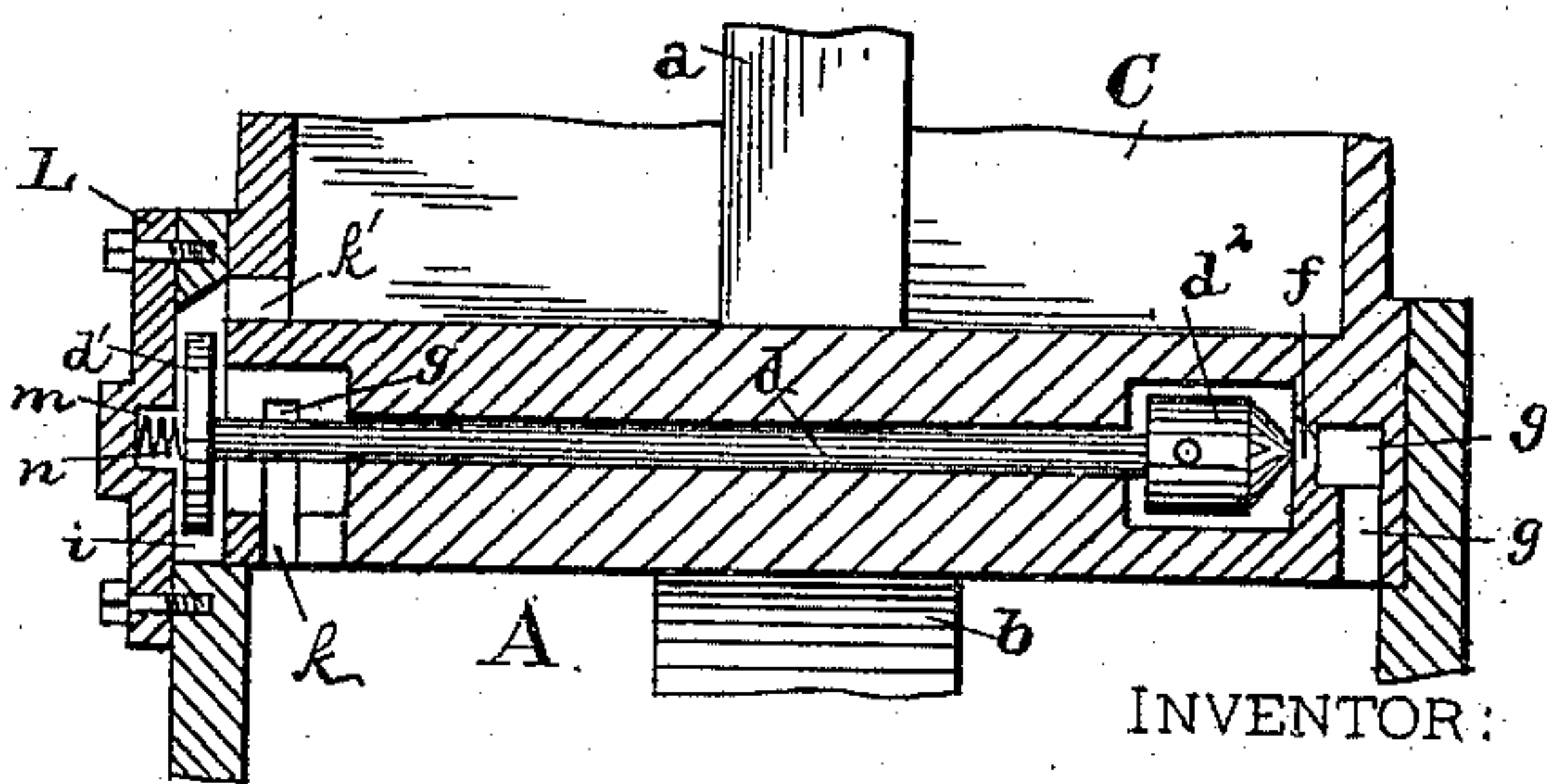


Fig. 5.



WITNESSES:

Robert L. Clemmitt.  
John E. Morris.

INVENTOR:

Christian Peterson

BY

Chas B. Mann

ATTORNEY.



# UNITED STATES PATENT OFFICE.

CHRISTIAN PETERSON, OF BALTIMORE, MARYLAND.

## VALVE FOR VACUUM-PUMPS.

SPECIFICATION forming part of Letters Patent No. 369,879, dated September 13, 1887.

Application filed May 31, 1887. Serial No. 239,797. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN PETERSON, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Valves for Vacuum-Pumps, of which the following is a specification.

This invention relates to a valve-action for vacuum-pumps.

10 The invention is illustrated in the drawings, in which—

Figure 1 is an end elevation of the pump. Fig. 2 is a central vertical longitudinal section of the pump. Fig. 3 is a vertical cross-section through the valves at one end on the line 3 3. Fig. 4 is a horizontal section on line 4 4. Fig. 5 is a vertical longitudinal section through the part where one valve-stem is located on the line 5 5.

20 The letter A designates the cylinder, *b* the piston-head, and *b'* the piston-rod. A water-chamber, C, surmounts the cylinder above the valves, and a suction-pipe, *a*, projects upward at center of water-chamber, and its lower end joins the valve-connecting duct *h*. The suction-pipe *a* may lead to and connect with the condenser of a steam-engine for the ex-  
25 haustion of air and vapor, or may connect with any other thing or device where it is desired to produce a vacuum. On top of the cylinder are two horizontal valve-stems, *d*, which are free to slide in bearings *e*, bored out of the metal. Each valve-stem *d* has at one end a flanged head, *d'*, and at the other end a cone-point, *d''*. The heads and points of these two valve-stems have reversed position with respect to each other. (See Fig. 4.)  
35 The two bored-out bearings *e* have a seat, *f*, for the cone-point of the stem, and at one side of each is the suction-inlet *g*, which is controlled by said valve-stem. The two seats *f* are connected by a duct, *h*, (seen in Fig. 4,) which passes laterally or at right angles from each seat, and thence extends straight be-  
40 tween the two bored-out bearings *e*—that is, parallel with them. At each seat *f* is a suction-duct, *g'*, leading into the cylinder A. At the opposite end is a recess, *i*, to receive the head *d'* of the valve-stem, which is the discharge-valve. An exhaust-port, *k*, leads from the cylinder to this recess *i*, and another port,

*k'*, from the recess to the water-chamber C. Thus the cone-point is the suction end and the head the discharge end of each valve.

The two valves *d''* act alternately, one when 55 the piston-head *b* moves forward and the other when the piston moves back. When one valve *d''* is open, the other valve *d''* is closed. When the discharge-valve *d'* at one end of cylinder is open, the suction-valve *d''* 60 at the other end is also sure to be open, because both are connected together by the stem *d*.

The operation of the pump is as follows: The movement of the piston-head *b* one way 65 causes a suction, the course of which is from the pipe *a* to duct *h* through the valve *d''* and suction-duct *g'* into the cylinder A. Then the reverse movement of the piston-head closes the said suction-valve *d''* and opens the dis- 70 charge-valve *d'* which is at the same end of the cylinder, and thereupon the air or vapor which has just been drawn into the cylinder will be discharged into the water-chamber C by the following course: from the cylinder A 75 through the exhaust-port *k* to the recess *i*, and thence through the port *k'* to the said water-chamber. A cap, L, closes the valve-head recess *i*, and has a recess, *m*, on its inner side. A small spiral spring, *n*, fits in this recess *m* and 80 bears lightly against the valve *d'*, and serves to keep the two valves *d'* and *d''*, which are connected by a stem, *d*, closed. Each valve *d''* is accessible by a side port and cap, *o*. (Shown in Fig. 4.) By removing this cap *o* 85 the valve *d''* may be detached from the valve-stem *d* and taken out. A discharge-valve *d'* and suction-valve *d''* to act at each end of the cylinder A, and my combination thereof with of the stems *d*, each of which connects 90 the discharge-valve at one end with a suction-valve at the other end, produces a certainty of action in the valves that effects a superior result.

Having described my invention, I claim and 95 desire to secure by Letters Patent of the United States—

In a valve-action for vacuum-pumps, the combination of the cylinder A, piston *b*, water-chamber C, surmounting the cylinder, a 100 suction-duct, *g'*, a suction-valve, *d''*, and an exhaust-port, *k*, and a discharge-valve, *d'*, for

action at each end of the cylinder, and a duct,  
*h*, connecting the seats of the two suction-  
valves, the suction-pipe *a*, joining the said  
valve-connecting duct, and two valve-stems,  
5 *d*, each of which connects the discharge-valve  
at one end with the suction-valve at the other  
end.

In testimony whereof I affix my signature in  
the presence of two witnesses.

CHRISTIAN PETERSON.

Witnesses:

JOHN E. MORRIS,  
JNO. T. MADDOX.