

(No Model.)

2 Sheets—Sheet 1.

P. L. WEIMER.

VALVE FOR BLOWING ENGINES.

No. 313,140.

Patented Mar. 3, 1885.

Fig. 1.

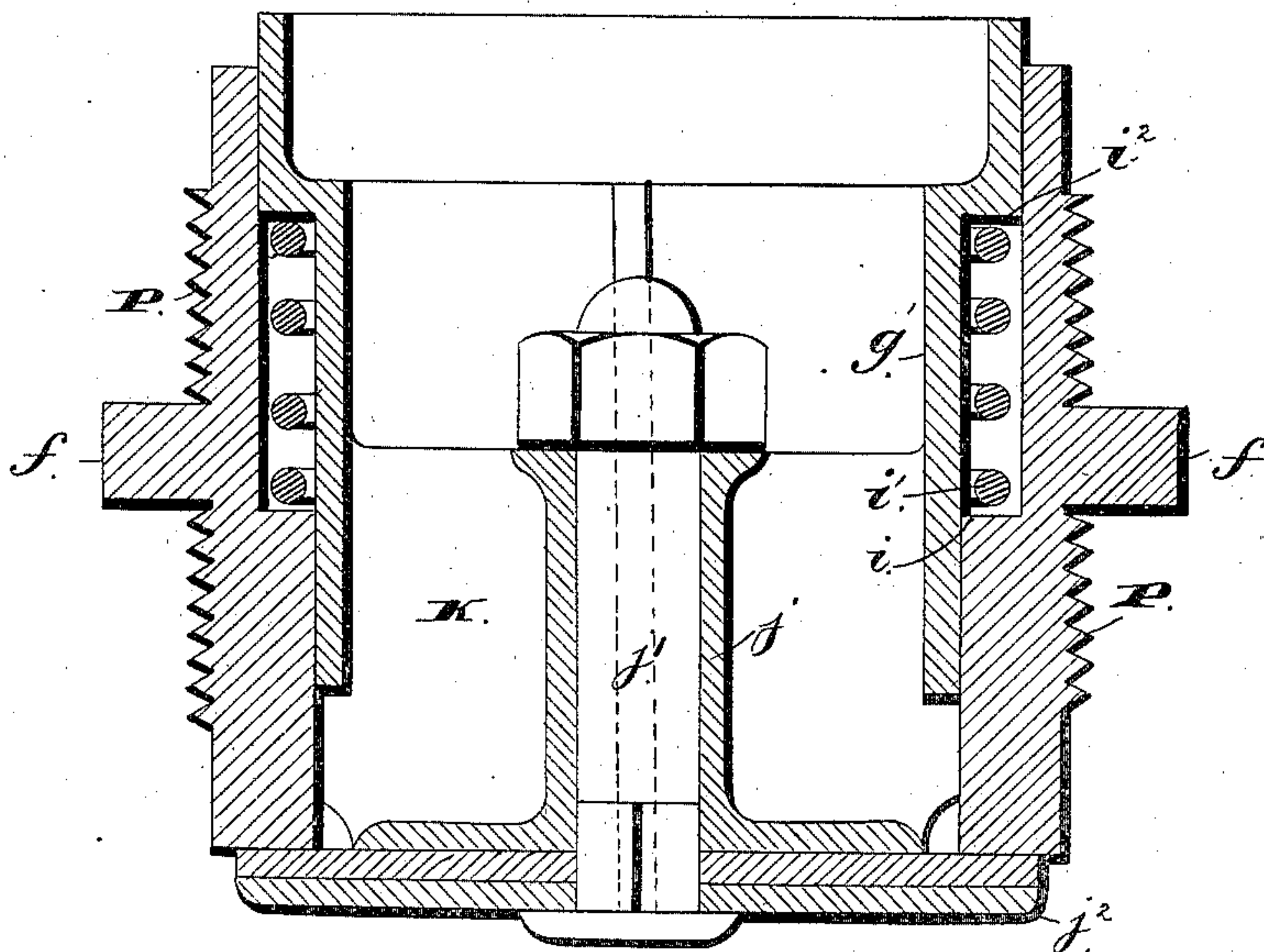
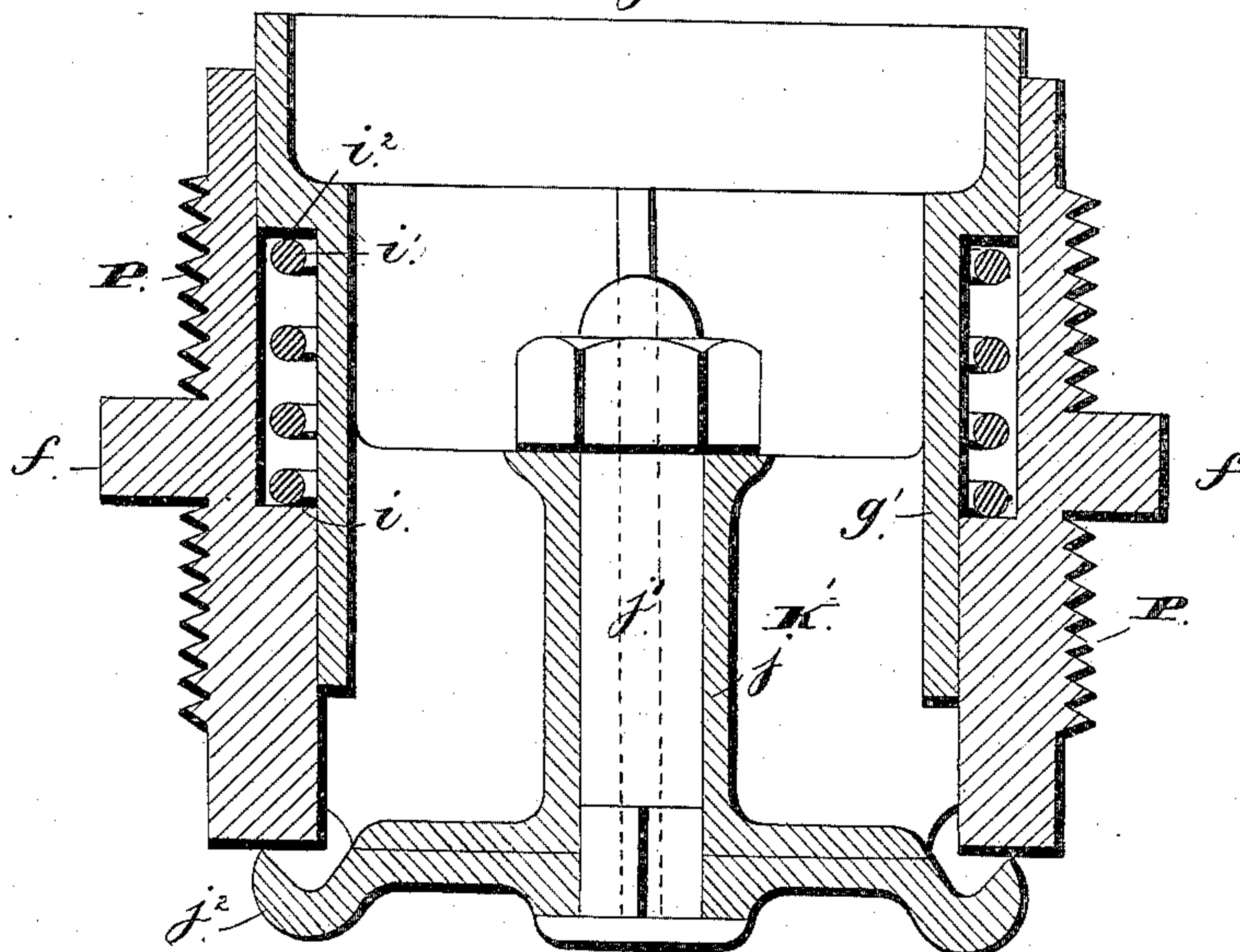


Fig. 2.



WITNESSES

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Fig. 5.

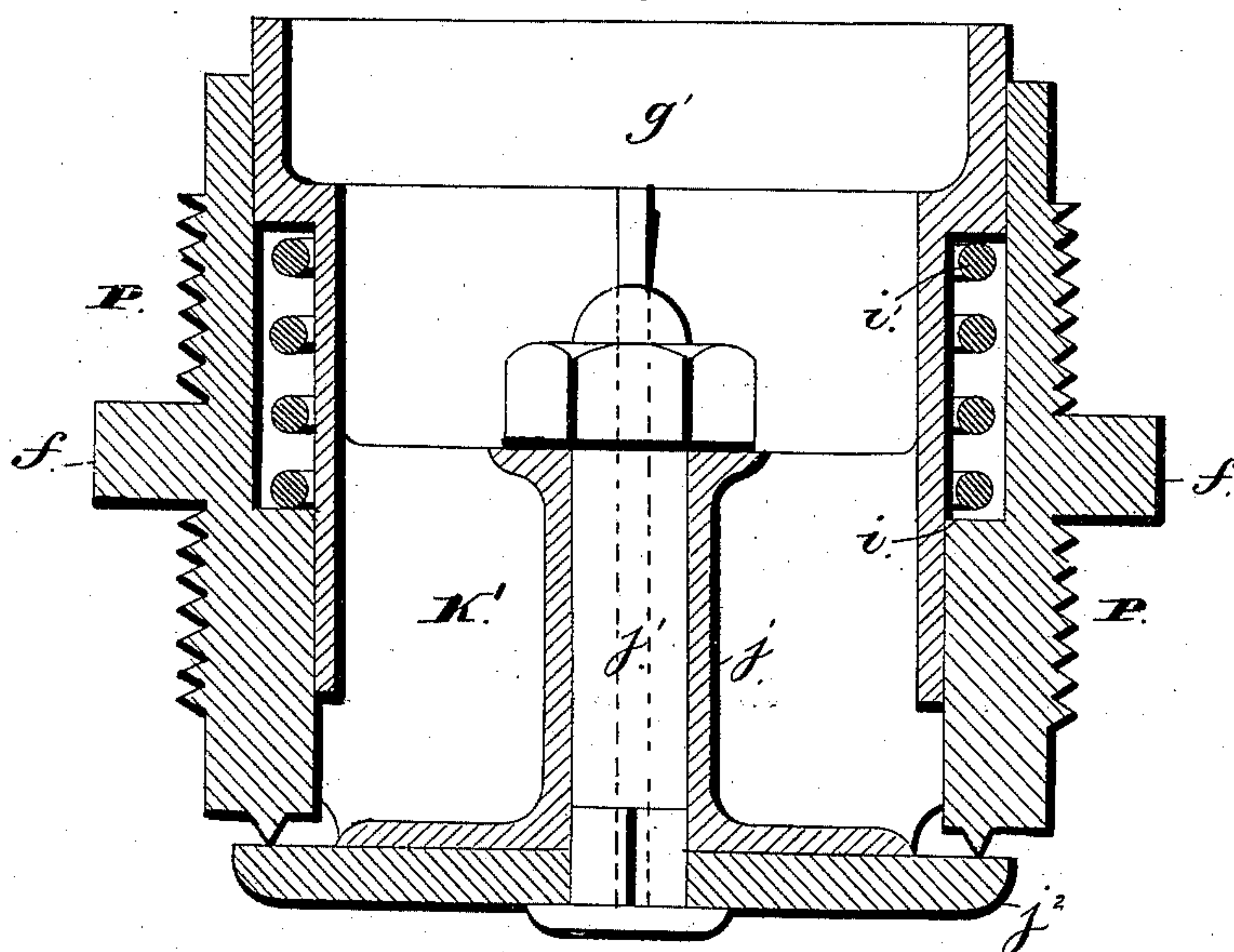
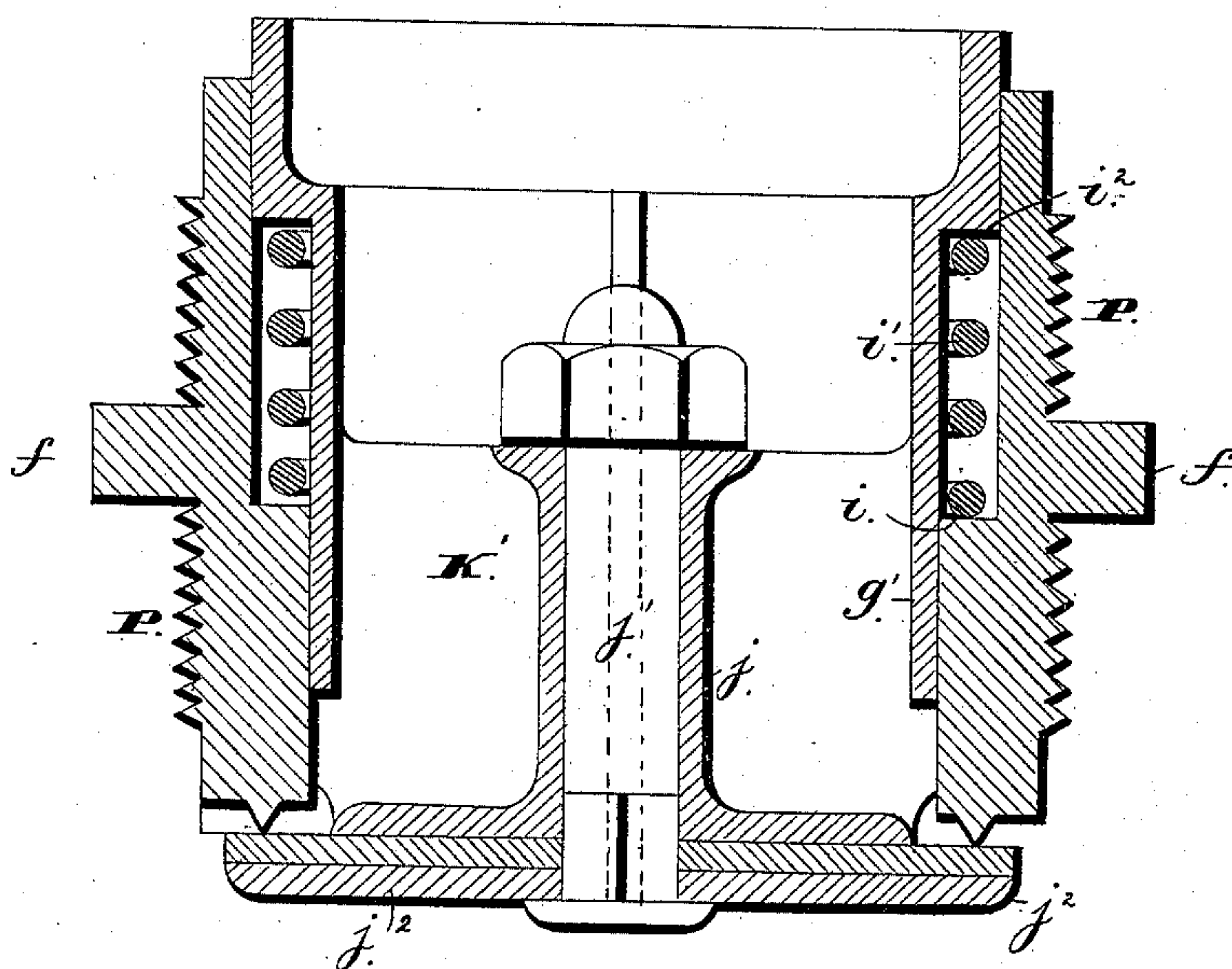


Fig. 4.



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

PETER L. WEIMER, OF LEBANON, PENNSYLVANIA.

VALVE FOR BLOWING-ENGINES.

SPECIFICATION forming part of Letters Patent No. 313,140, dated March 3, 1885.

Application filed April 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, PETER L. WEIMER, of Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Valves for Blowing-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in valves adapted more particularly for blowing-engines of the construction described in my application filed November 16, 1883, Serial No. 111,989; and it consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claim.

In the accompanying drawings, Figure 1 is a view in section of one of my improved receiving-valves. Fig. 2 is a view of one of the discharging-valves, and Figs. 3 and 4 are modified forms of the discharging-valves.

The receiving-valves K and discharging-valves K' are each composed of an outer casing, P, centrally screw-threaded or provided with a central rib, *f*, and screw-threads on one or both sides of the rib. When screw-threads are employed on both sides of the ribs, the valve can be used either as an inlet or outlet valve; but I prefer to employ a valve with a knife-edge engagement as the discharge-valve; hence it is only necessary to screw-thread each valve-case on one side of the rib. The casing P is bored out to receive the valve-stem *g'*, which in turn is trued so as to snugly fit within the casing P. This casing P is provided with an annular shoulder, *i*, on which the spiral spring *i'* rests. This spring encircles the hollow cylindrical valve-stem *g'*, and is retained within the space formed by the shoulder *i* of the casing and the shoulder *i'* of the valve-stem. This stem, as before stated, is hollow, and fits snugly within the casing, and is provided centrally with the hollow hub *j*, through which the bolt *j'* passes. This bolt *j'* is provided with a head and is adapted to clamp the valve-plate *j''* to the outer enlarged end of the hub *j*, and also hold the valve within the casing.

In the valve K in Fig. 4, which represents a modified form of outlet-valve, a leather washer

is shown interposed between the valve-plate *j''* and the hub. This washer is adapted to bear against the adjacent end of the casing and form an air-tight joint. In the valves K the plate *j''* has an extended bearing-surface on the casing, while the valves K' are so constructed that the pressure on both sides of the plate *j''* will be about equal.

The object of constructing the outlet-valves with knife-edge seats is to decrease the excess pressure on the back of the valve to a minimum. In heavy-pressure blowing the excess area of the back of the valve to the area under the valve is so great as to cause a serious loss of power, and to obviate this I form the valve with a knife-edge, as shown in Fig. 4, which rests on the valve seat, or I construct the casing with a knife-edge, as shown in Figs. 3 and 4.

In Fig. 3 the end of the casing is formed into a knife-edge, which latter bears directly against the brass or other suitable plate, *j''*, while in Fig. 4 a leather washer is interposed between the enlarged end of the hub and the plate *j''*. Either of these forms reduces the excess of pressure on the back of the valve by increasing the area of the under side thereof. I prefer to make the valve with a knife-edge to rest on a flat seat, as shown in Fig. 2. This seat can be faced with leather or gum, or it may be a plain metallic surface, as shown. By this arrangement of valves and valve-casing I provide ample room for a large spiral spring the function of which is to rapidly close the valve. In valves of this kind the closing-spring is usually small in diameter, and is wound around a small central stem, which also forms the valve-guide; but this is objectionable in that both spring and guide being of small size wear very rapidly and soon require renewal, which I obviate by using a large spiral spring and a large valve-stem. This construction of valve, and my manner of arranging them in the heads and walls, also enables me to employ a comparatively large number of valves with very little lost or dead-air space between the piston and cylinder heads.

When the machine is in operation, the inlet-valves on one side of the piston and the outlet-valves on the opposite open simultaneously. Suppose, for the sake of illustration,

that the piston is moving toward the outer end of the cylinder, then the inlet-valves on the outer head would be closed and the outlet-valves K' open for the escape of the air from the cylinder. The inlet-valves on the lower or inner end of the cylinder would also be open and the discharge-valves closed. As soon as the piston reaches the end of its stroke and begins to return, the valves that were closed open, and vice versa, and so on continuously.

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

15 The combination, with an external screw-threaded valve-casing provided with a continuous shoulder on its inner side, a hollow valve-stem constructed to rest snugly within

said casing and having a continuous shoulder on its outer side, and provided centrally with a hub, the valve-casing and stem and their shoulders forming an inclosed chamber, and a spiral spring located within said inclosed chamber, of a valve-plate removably secured to the hub of the stem and bearing against one end of the casing and holding or locking said stem within the casing, substantially as set forth. 20 25

In testimony whereof I have signed this specification in the presence of two subscribing witnesses. 30

PETER L. WEIMER.

Witnesses:

W. MORRIS WEIDMAN,
L. E. WEIMER.