

No. 690,879.

Patented Jan. 7, 1902.

F. W. ROGLER.

ARRANGEMENT OF VALVES FOR PUMPS, &c.

(Application filed Apr. 12, 1901.)

(No Model.)

2 Sheets—Sheet 1.

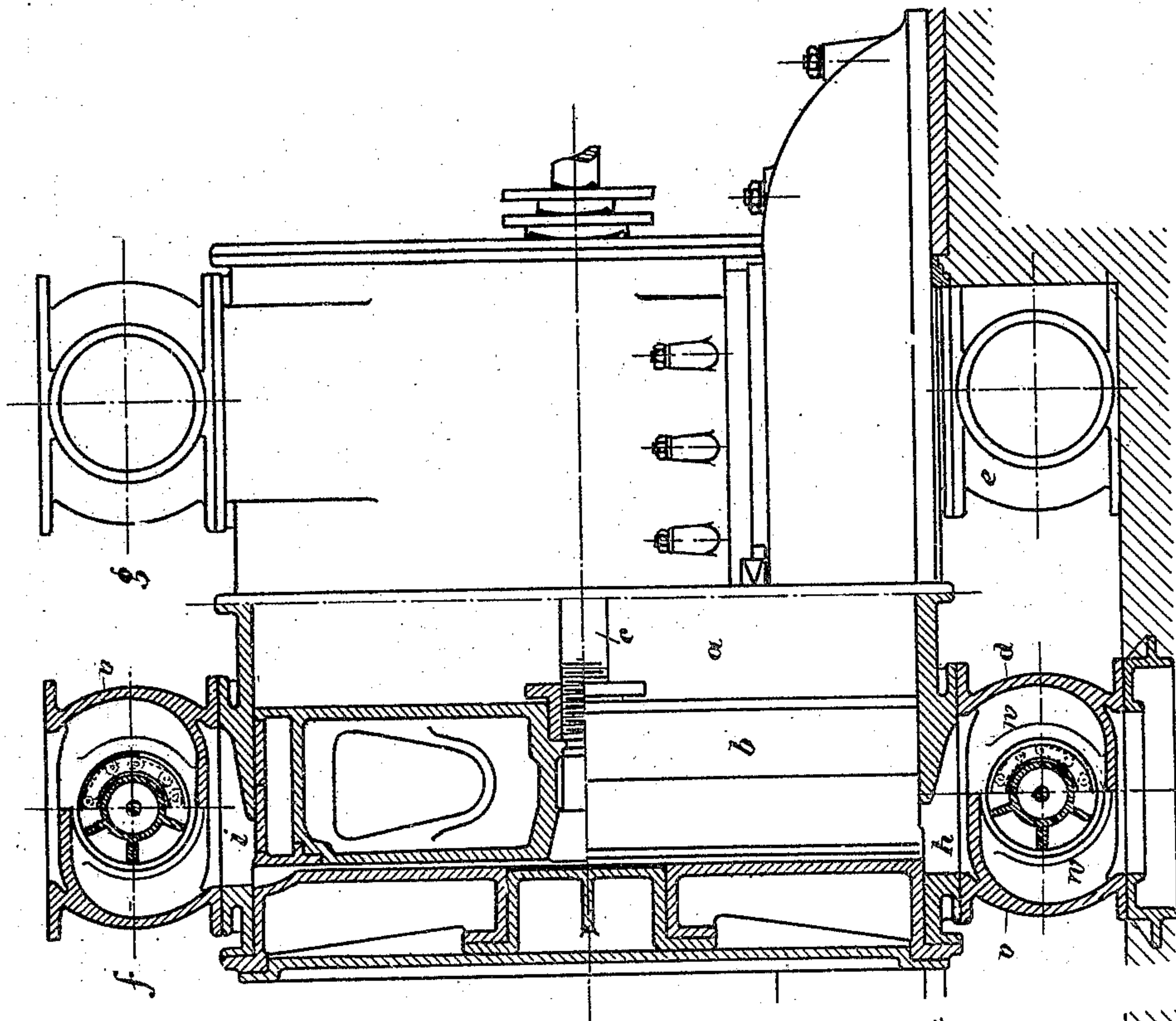


Fig. 2.

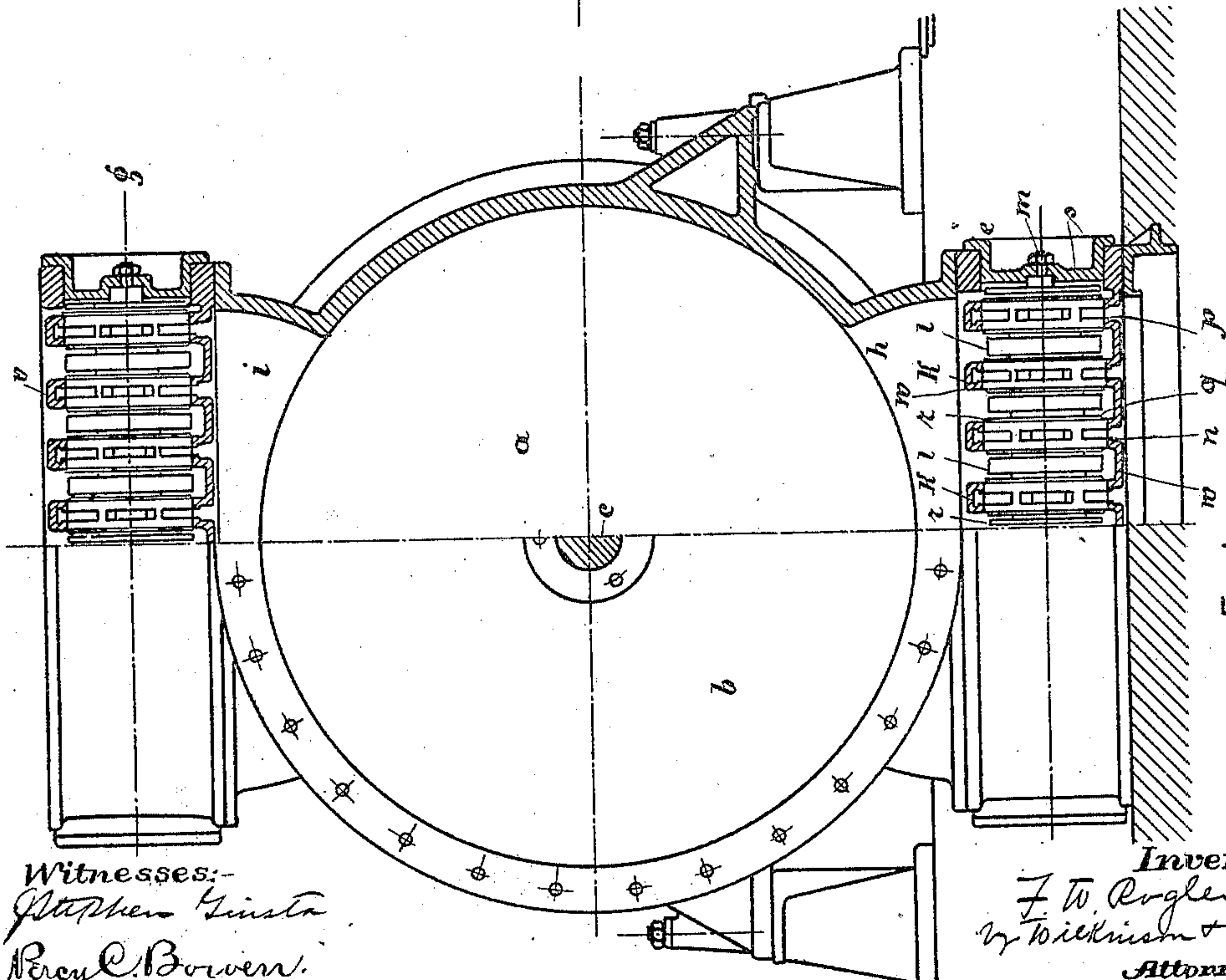


Fig. 1.

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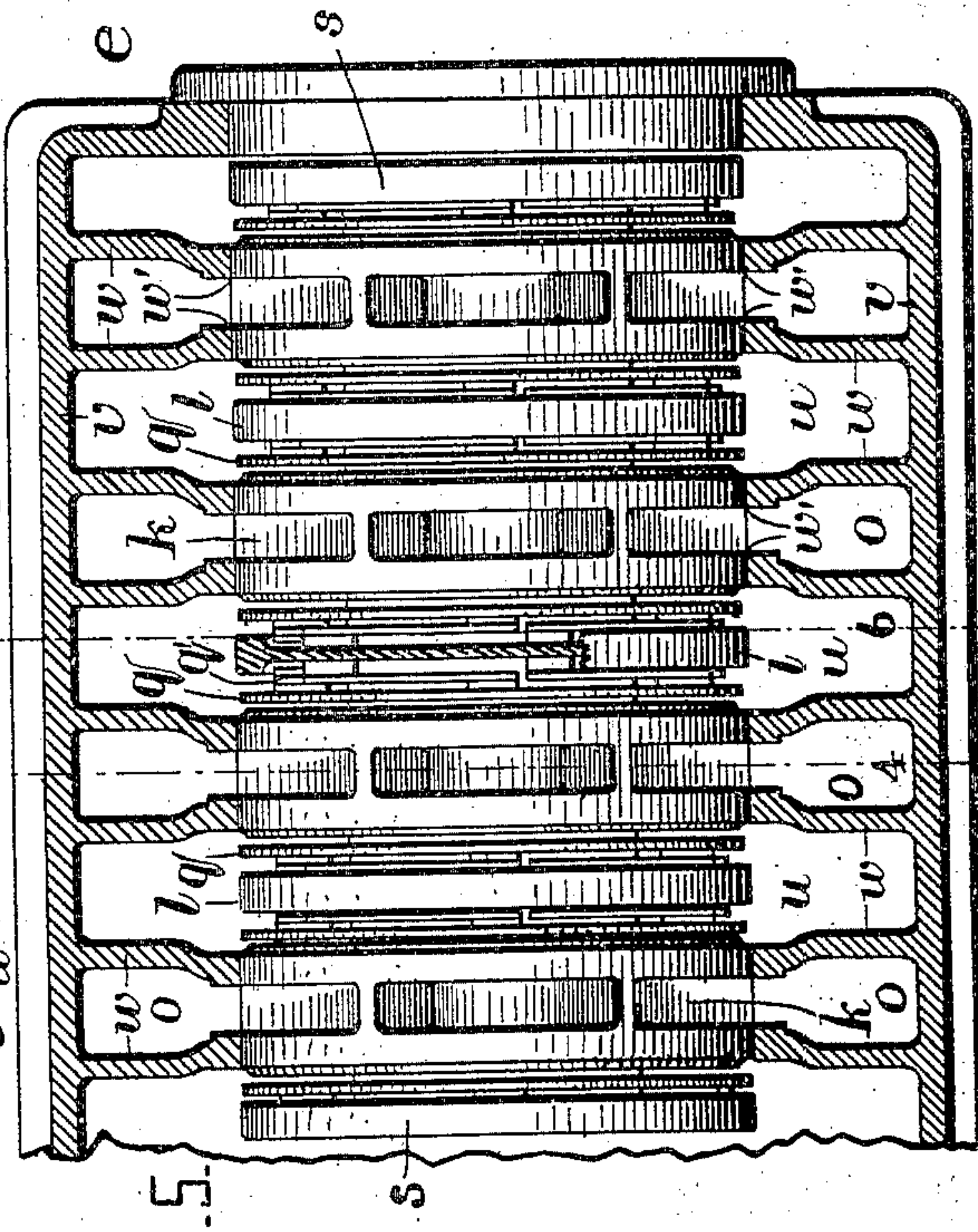
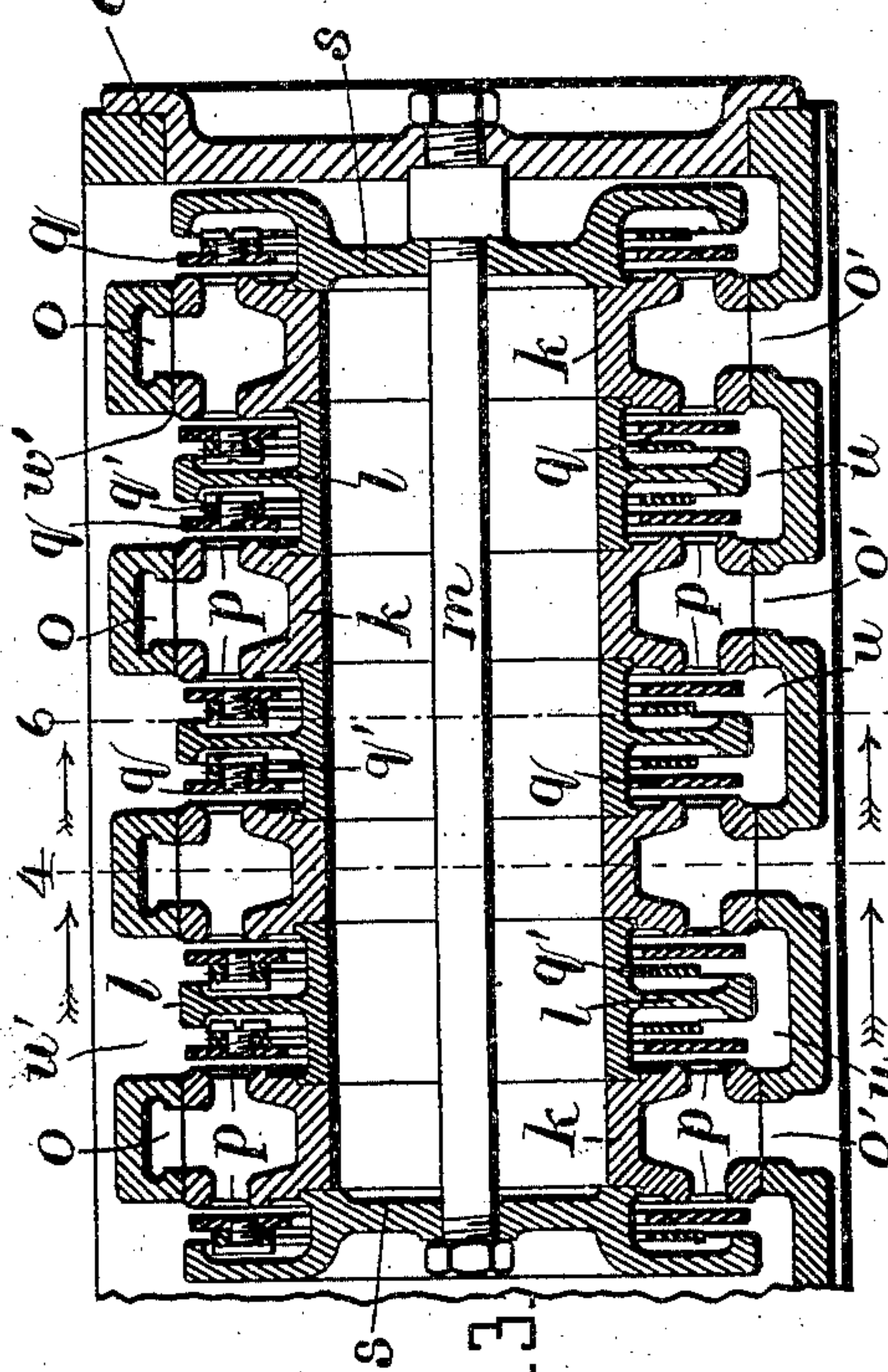
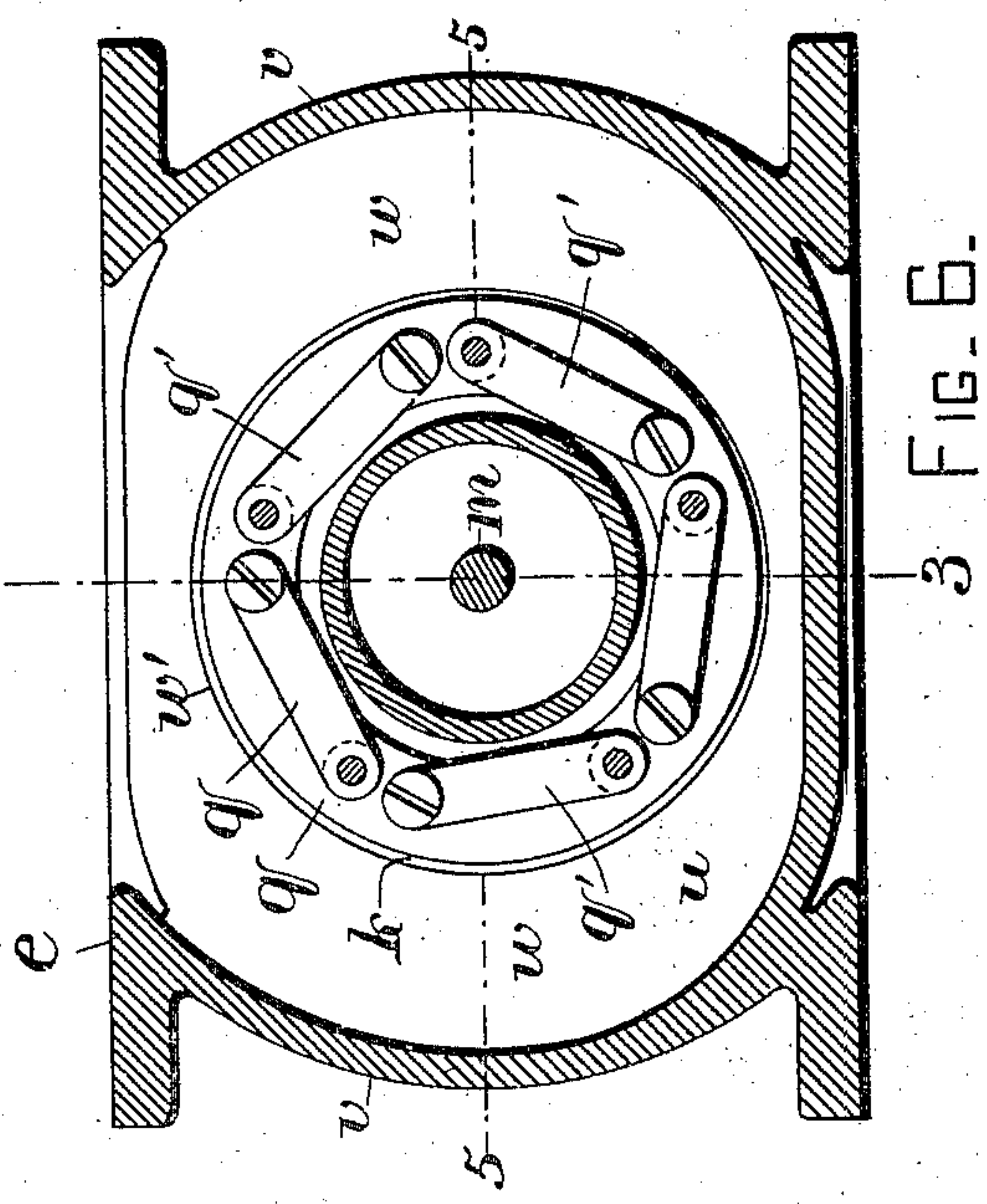
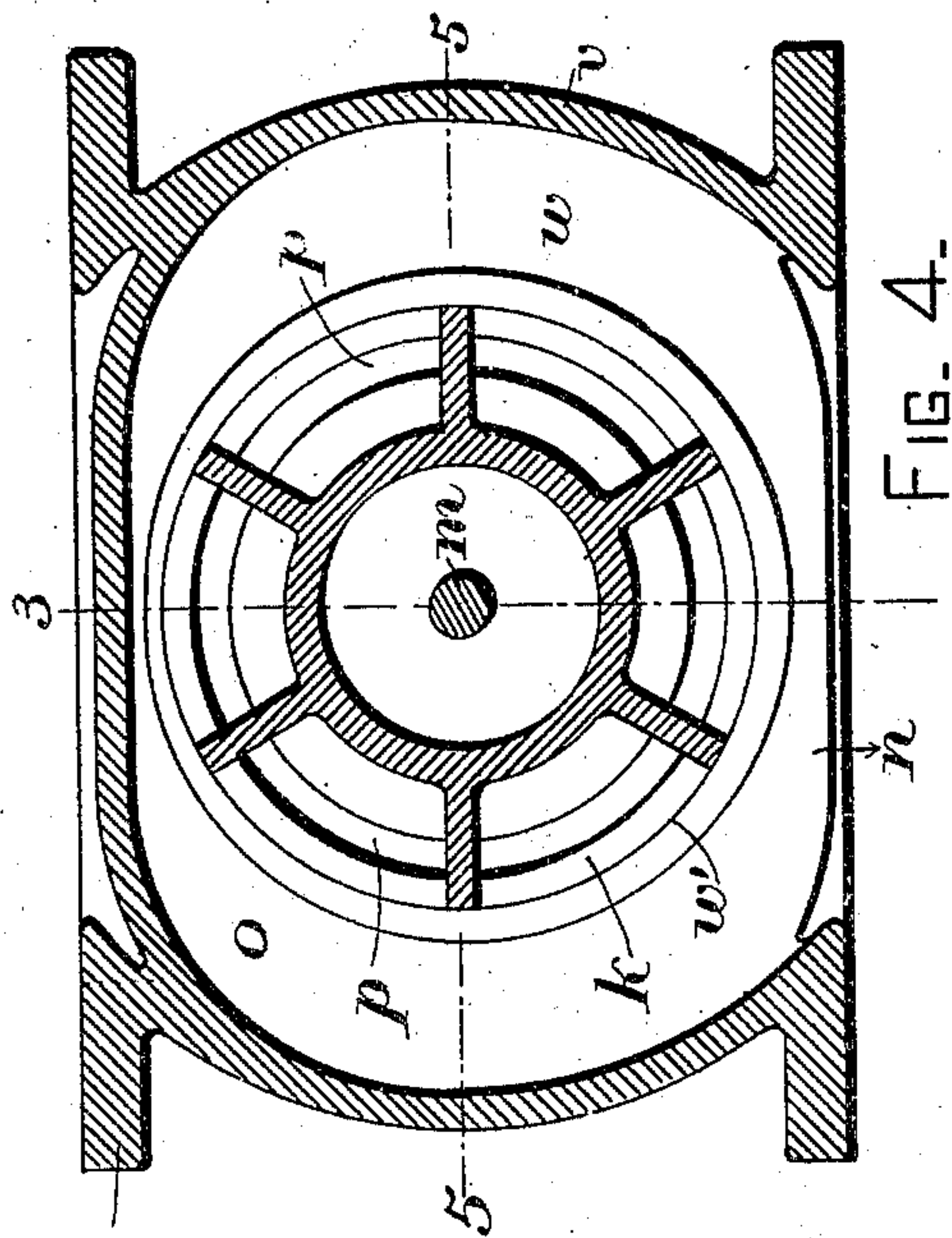
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2 Sheets—Sheet 2.



Witnesses

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FIG. 5.

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UNITED STATES PATENT OFFICE.

FREDERICK W. ROGLER, OF BUDAPEST, AUSTRIA-HUNGARY.

ARRANGEMENT OF VALVES FOR PUMPS, &c.

SPECIFICATION forming part of Letters Patent No. 690,879, dated January 7, 1902.

Application filed April 12, 1901. Serial No. 55,537. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. ROGLER, engineer, a citizen of the United States of America, residing at V Lipót Körút No. 1, in the city of Budapest, Empire of Austria-Hungary, have invented certain new and useful Improvements in the Arrangement of Valves for Pumps, Compressors, Blowing-Machines, and the Like; 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.

This invention relates to an improved arrangement of automatic valves for pumps, compressors, blowing-machines, and the like. If such machines have to be driven at a high speed, it is difficult to obtain the necessary fluid-passage area at the admission and exhaust valves without unduly increasing the dimensions of the valve-chest.

The object of this invention is to so arrange the automatic admission and exhaust valves of pumps, compressors, blowing-machines, and the like that on the one hand the space occupied by such valves and valve-casings is reduced to a minimum and that on the other hand the valves are readily accessible.

A further object of this invention is to so arrange the valves and the valve-casings that they can be used for the admission or for the exhaust of the fluid without requiring any change whatever; and still another object of this invention is to so construct the valves and valve-casings that they can be readily manufactured in large quantities and at a low price.

This invention is not limited to the use of any particular form or construction of automatic valves; but annular valves supported by elastic tangential links, such as described in the United States Patent No. 604,326, are particularly suitable for carrying into practice the present invention.

In the accompanying drawings, Figure 1 is an elevation and partly a vertical section of a blowing-machine provided with the present valve arrangement. Fig. 2 is a side elevation and partly a longitudinal section thereof. Fig. 3 is a longitudinal section of the valve-casing and valves, taken on the line 3 3 of

Figs. 4 and 6. Fig. 4 is a transverse section of the same, taken on the line 4 4 of Figs. 3 and 5, looking in the direction of the arrows. Fig. 5 is a horizontal section through the casing, taken on the lines 5 5 of Figs. 4 and 6, showing the valve proper in plan with one of the disks broken away; and Fig. 6 is a transverse section taken on the line 6 6 of Figs. 3 and 5 looking in the direction of the arrows.

a is the cylinder, *b* is the piston, and *c* is the piston-rod, of a double-acting blowing-machine. The air is admitted to the cylinder through the suction-valve chests *d* and *e*, and the air under pressure is forced out through the exhaust-valve chests *f* and *g*, the suction-valve chests being connected with the cylinder by channels *h*, while channels *i* connect the cylinder with the exhaust-valve chests.

The construction of the suction and exhaust valves and valve-casings are or may be identical. Each of these valves comprises a series of valve-seats *k* and a series of valve stops or disks *l*, alternating with the seats, both seats and stops being carried by a common central spindle *m*. Between each seat and the adjacent valve-stop an automatic valve *q* is located, such valve being preferably supported by spring-links *q'*, connected at one end to the valve *q* and at their other ends to the stop *l* and constructed as described in the United States Patent No. 604,326, above referred to.

Preferably the valve-seats are hollow and double-faced—that is to say, each of the faces of the valve-seat bodies *k* constitutes a seat for a valve *q*. Similarly the valve-stops *l* are preferably double-faced, so that each of the stops carries two valves *q*, one on each of its faces, as shown. The valve-seats and valve-stops *k* and *l* are held tightly against each other by heads *s*, held on the spindle *m* in any suitable manner—for instance, by nuts—such heads serving also as stops for the outermost valves *q*, as shown.

In the construction shown the hollow valve-seats *k* are provided with ports or slots *p* on their circumference, through which the interior of such valve-seats communicates freely with the compartment-space into which they are placed.

The valve-casing for the valve above de-

scribed consists, substantially, of a hollow cylinder *v*, of suitable cross-section, divided by transverse partitions *w* into alternating compartments *o* and *u*, provided with lateral openings or slots *o'* and *u'* for permitting fluid to enter into or escape from such compartments, respectively. The said partitions *w* are provided with central openings *w'*, into which the valve-seats *k* exactly fit, and the distance between adjacent partitions *w*, forming the walls of a compartment *o*, is such that when a valve-seat is placed into such compartment, as shown, it completely closes the central opening in both partitions. On the other hand, the distance between two adjacent partitions *w*, forming the walls of a compartment *u*, is such as to provide sufficient place for a valve-stop *l* and valve or valves *q*. The number of compartments *o* of the valve-casing is of course equal to the number of valve-seats in the valve above described, so that if the valve is inserted into the valve-casing and locked in position in any suitable manner all the compartments *o* receive valve-seats, while the compartments *u* receive the valve-stops *l* and valves *q*, as shown in Figs. 3 and 5.

When the valve is mounted in the valve-casing, as described, the whole may be secured to the compressor, pump, or blowing-machine in any preferred manner at the proper place and will be ready for use.

It is only necessary to so arrange the valve that of the two spaces to be connected by the valve the one in which the fluid-pressure in the operation of the blowing-machine, pump, or compressor is higher communicates with the compartments *o*, while the other of these two spaces, in which the fluid-pressure is lower, communicates with the compartments *u*. Thus, as shown in the drawings, the compartments *u* of the suction-valve *e* communicate through channels *h* with the interior of the cylinder, while the compartments *o* communicate with the atmosphere, as at *n*, while in the delivery-valve *g* the compartments *o* communicate with the interior of the cylinder by channel *i*, whereas the compartments *u* communicate with the conduit or collector for the air under pressure. It will be seen that during the suction-stroke the valves *q* of *e* will open to admit air into the cylinder, while during the pressure-stroke the valves *q* of *g* will open to permit the air under pressure to escape into the conduit or collector. Therefore the valve as an entirety—viz., the casing *v*, with the seats *k*, stops *l*, and valves *q* secured therein, as described—may be manufactured and brought on the market independently of the body of the pump, compressor, blowing-machine, or the like and may then be secured to the latter as may be desired.

The casing *v*, together with the valves, valve-seats, and valve-stops, as above described, constitutes what may be called a "mul-

tiple automatic valve," which may be readily brought into position and removed therefrom as an entirety and which may be readily taken to pieces by simply removing the head or heads *s* and the spindle *m*. The constituent parts of the multiple valve—the valves proper, the valve-seats, and the valve-stops—being interchangeable, respectively, any damage may be repaired by simply substituting for the damaged part a fresh one. Moreover, the number of constituent parts of different forms or construction being small, such multiple valves may be manufactured in large quantities and at a low cost.

Obviously the fluid-passage area at the valves *q* is comparatively very large, even if the stroke of the individual valves *q* is small.

It is obvious that the valve-seats *k* and stops *l*, instead of being double-faced, as shown, may be single-faced—that is to say, may have a valve-port or a valve, respectively, on one of their faces only.

It will be seen that the construction of the valves proper, *q*, the valve-seats *k*, and the stops *l*, as well as that of the casings *v*, may be varied within wide limits without departing from the essence of this invention and that the number of valves proper in each multiple valve and also the number and position of such multiple valves on the cylinder or cylinders of the compressor, pump, or blowing-machine may be chosen at will.

I claim—

1. In a device of the character described, the combination with a series of disks having recesses in their peripheries, and ports opening through their sides into said recesses, of collars fitting between said disks and having stop-disks thereon, valves arranged between said ports, and said stop-disks, and flexibly connected with the latter, substantially as described.

2. In a device of the character described, the combination with a series of disks having recesses in their peripheries, and ports opening through their sides into said recesses, of collars fitting between said disks and having stop-disks thereon, valves arranged between said ports, and said stop-disks and flexibly connected with the latter, and means for binding said disks and collars together, substantially as described.

3. In a device of the character described, the combination with a spindle, disks mounted on said spindle and having recesses in their peripheries, and ports through their sides opening into said recesses; of collars fitting between said disks and having stop-disks thereon, valves arranged between said stop-disks and said ports and flexibly connected with said stop-disks, and heads on said spindle for binding said disks and collars together, substantially as described.

4. In a device of the character described, the combination with a casing, and partitions

in said casing having central openings there-
through; of a series of disks fitting in said
openings, said disks having recesses in their
peripheries, ports opening through their sides
5 into said recesses, collars between said disks,
stop-disks on said collars, valves arranged
between said ports and said stop-disks, and
flexibly connected to the latter, and means

for binding said disks and collars together,
substantially as described. 10

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

F. W. ROGLER.

Witnesses:

PAUL JOSEPH TOMANOCRY, Jr.,
LOUIS GERSTER.