

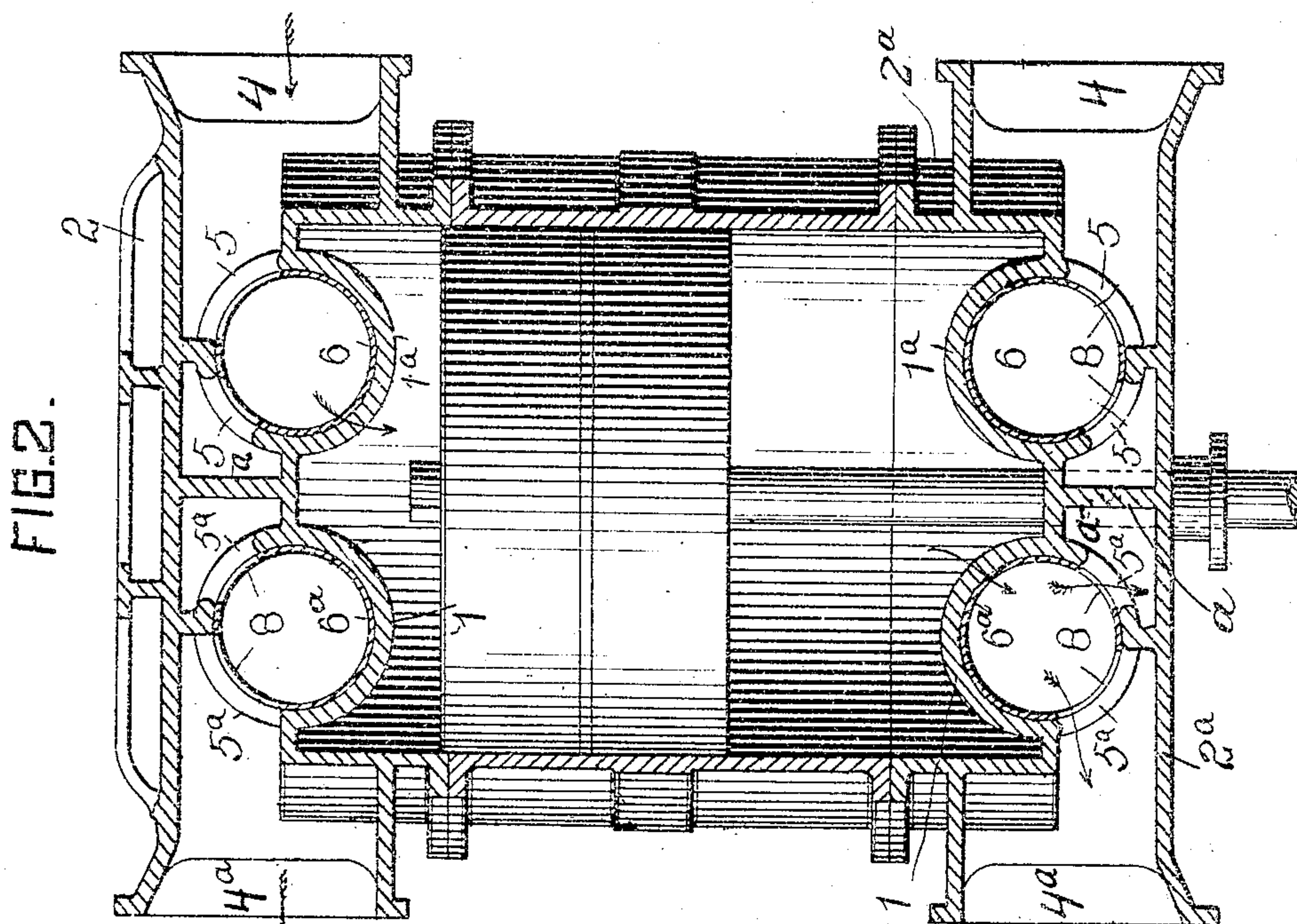
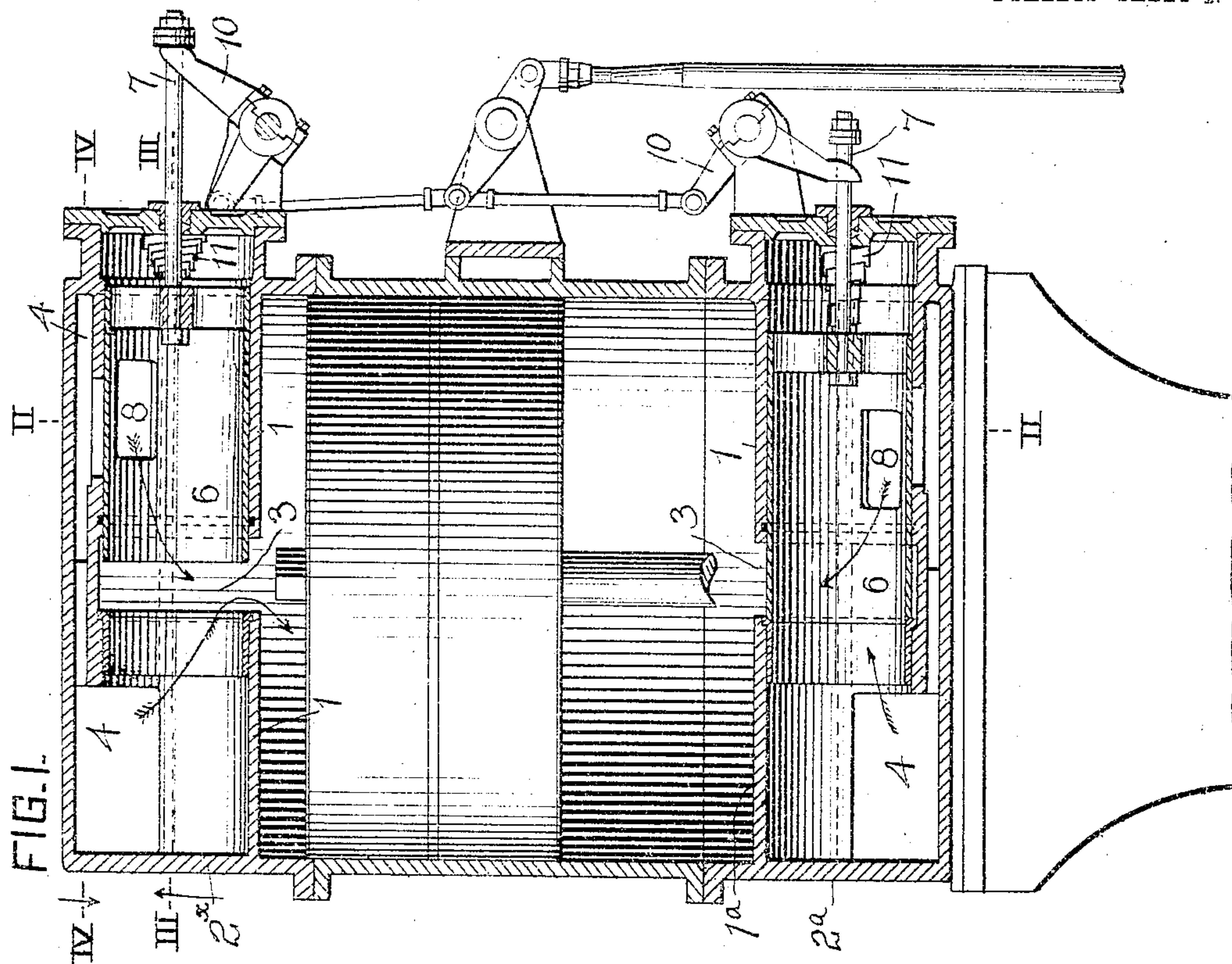
No. 778,493.

PATENTED DEC. 27, 1904.

A. T. KELLER.
VALVE FOR BLOWING ENGINES.

APPLICATION FILED SEPT. 3, 1902.

2 SHEETS—SHEET 1.



WITNESSES:
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Fred Kirschner.

INVENTOR
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2 SHEETS—SHEET 2.

FIG. 4.

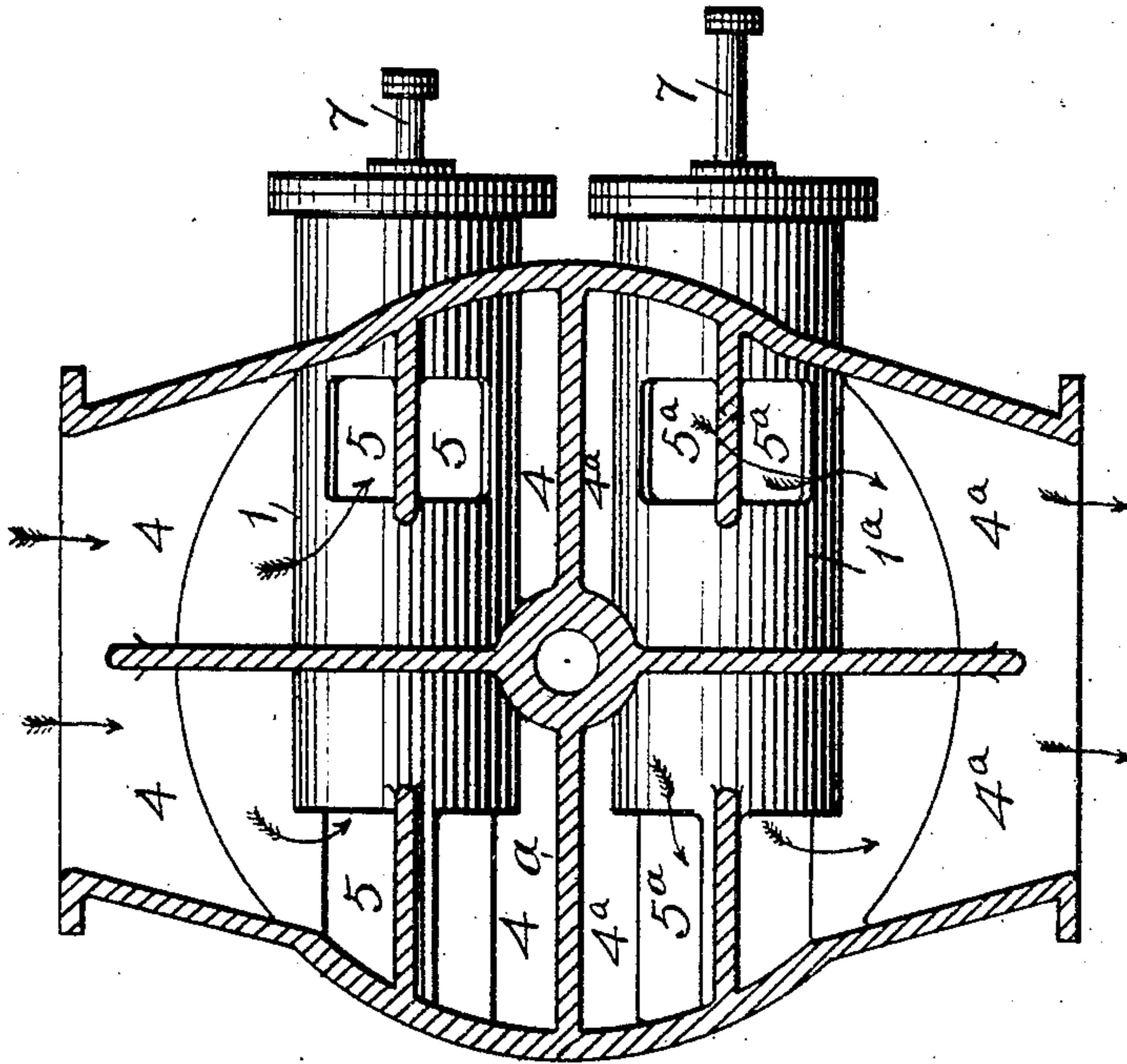
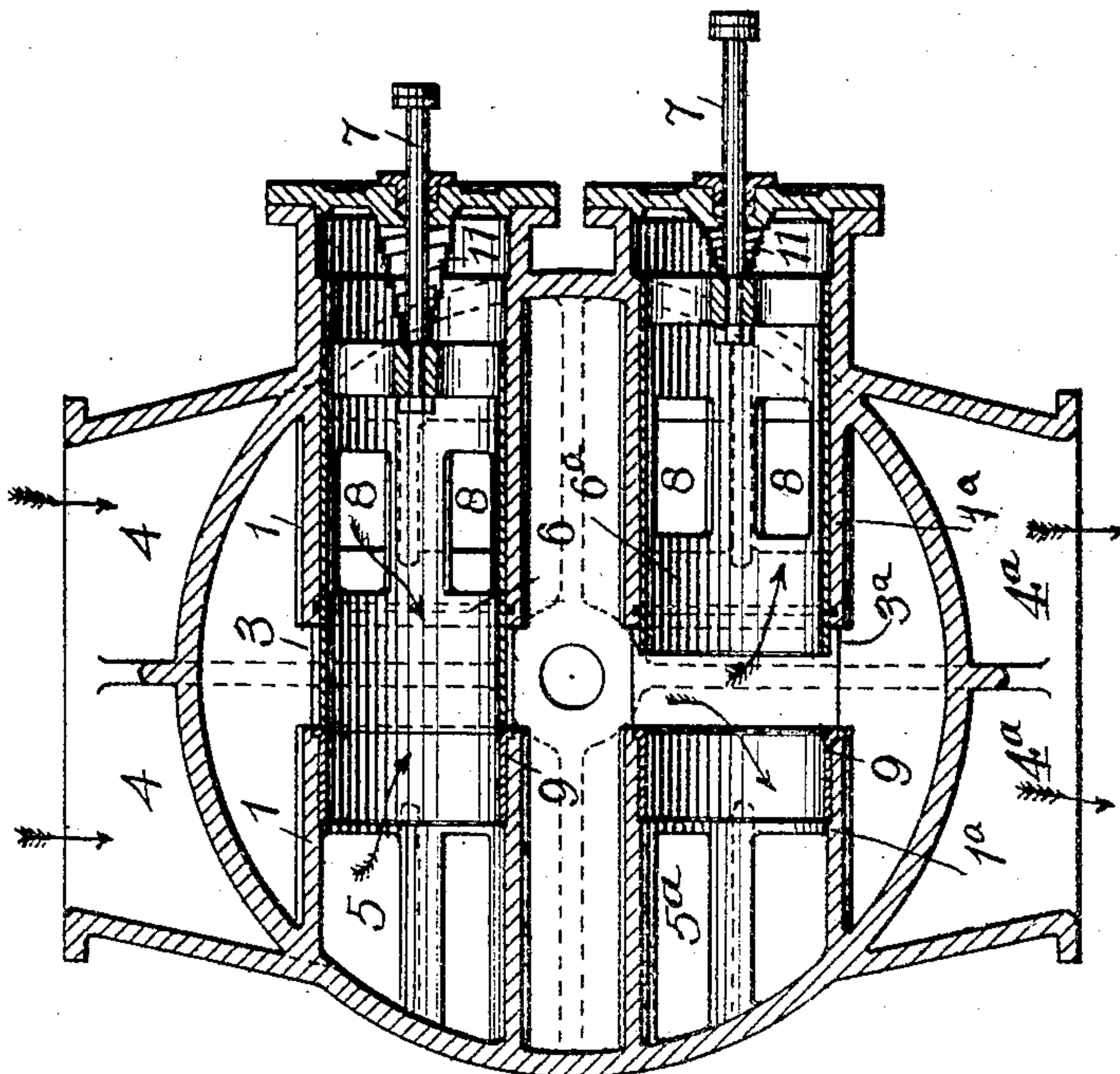


FIG. 3.



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UNITED STATES PATENT OFFICE.

ALBERT T. KELLER, OF WILKINSBURG, PENNSYLVANIA.

VALVE FOR BLOWING-ENGINES.

SPECIFICATION forming part of Letters Patent No. 778,493, dated December 27, 1904.

Application filed September 3, 1902. Serial No. 121,948.

To all whom it may concern:

Be it known that I, ALBERT T. KELLER, a citizen of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Valves for Blowing-Engines, of which improvement the following is a specification.

The invention described herein relates to certain improvements in valves for blowing-engines, and has for its object a construction wherein a perfect balance of the inlet and outlet valves can be attained with a large capacity for the in and out flow of the air.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of the cylinder of a blowing-engine having my improvements applied thereto. Fig. 2 is a sectional view on a plane indicated by the line II II, Fig. 1. Figs. 3 and 4 are sectional plans on planes indicated by the lines III III and IV IV, Fig. 1, looking in the direction of the arrows *x* and *y*, respectively.

In the practice of my invention the valve-chambers 1 and 1^a are formed in and transversely of the heads 2 and 2^a and have their axes coincident with the chords of a circle, on opposite sides of the diameter thereof. These chambers connect with the interior of the cylinder by ports 3 and 3^a, formed by cutting away the peripheral walls at points intermediate of the ends of the chambers, thereby dividing the valve-chambers into two sections. Inlet-passages 4 and outlet-passages 4^a are formed in the heads, said passages being connected, respectively, to the sections of the valve-chambers by ports 5 and 5^a, located adjacent to the ends of said chambers. The inlet-passages 4, with their ports 5 leading to the valve-chambers, are separated from the passages 4^a and ports 5^a by partitions *a*. The valves 6 and 6^a are made in the form of open-ended cylinders provided with intersecting or cross arms, to which the operating-rods 7 are connected. These valves are provided with ports 8, adapted when the valves are in open

position to fully register with the ports 5 and 5^a in the sections of the valve-chambers. The ports 3 3^a are closed by the valves when shifted inwardly, said valves extending entirely across said ports from one section of the valve-chamber to the other and bearing at their inner ends against shoulders or abutments 9.

It is characteristic of my improved valve mechanism that the valve proper is subjected to the same pressure at all points whether such pressure acts on the inner or other surface. The valves controlling the flow to the compression-chamber will during the movement of the piston in one direction be subjected to internal pressure by the fluid from the compression-chamber, such pressure entering through the ports 5^a to the interior of the valve. When the piston moves in the opposite direction, the same valves will be subjected to the same internal pressure and the parts extending across the port 3 to a gradually-increasing external pressure which acts equally on all sides of the valve. Hence the valve is in a balanced condition when the pressure acts externally or internally, or both.

The valves may be operated in any suitable manner known in the art—as, for example, by means of bell-crank levers 10, suitably mounted so that one end will bear against shoulders or collars on the rods 7 to shift the valves to open position against the tension of springs 11. The other arms of the levers 10 are connected by suitable interposed mechanism to an eccentric or eccentrics on the shaft of the engine. It will be observed that the valve-shifting mechanism is so constructed and arranged that the outlet-valves at one end will close as soon as the piston has begun its movement away from such end; but the outlet-valve at the other end will not open until the piston has moved sufficiently far to effect the desired compression.

It will be observed that the ports 5, 5^a, and 8 in the valve-case and valve are not entirely out of register with each other and are employed to provide a passage or communication between the interior of the valve and the passages 4 4^a in addition to that provided by the ports 5 5^a at the end of the shells and the

open end of the valve. Hence either one or both of these means of communication can be employed.

When the piston is moving down, as in Figs. 5 1 and 2, the valve 6 at the upper end of the cylinder will be open, and air will flow in through passages 4 and ports 5 into the cylindrical valve and thence by the port 3 into the compressing-cylinder. As soon as the 10 compressing-piston has moved down sufficiently far to effect the required compression, the valve 6^a at the lower end of the cylinder is opened, so that the compressed air will flow through port 3 into the cylindrical 15 valve, through ports 8 and 5^a into passages 4^a, leading to the compression-chamber. The direction of flow of the air into and from the cylinder is clearly indicated by arrows.

I claim herein as my invention—
20 1. A blowing-engine having formed in and

transversely of its heads cylindrical valve-chambers, each in two sections and having openings in their exterior portions in combination with open-ended hollow cylindrical valves, movable across the space or openings 25 between said sections.

2. A blowing-engine having in combination sectional valve-chambers one section having a normally open port, an open-ended cylindrical valve mounted in the other section, the valve 30 and its chamber-section having normally registering ports, and means for shifting the valve across the space or opening between the chamber-sections, substantially as set forth.

In testimony whereof I have hereunto set 35 my hand.

ALBERT T. KELLER.

Witnesses:

DARWIN S. WOLCOTT,
GEO. B. BLEMING.