

No. 881,498.

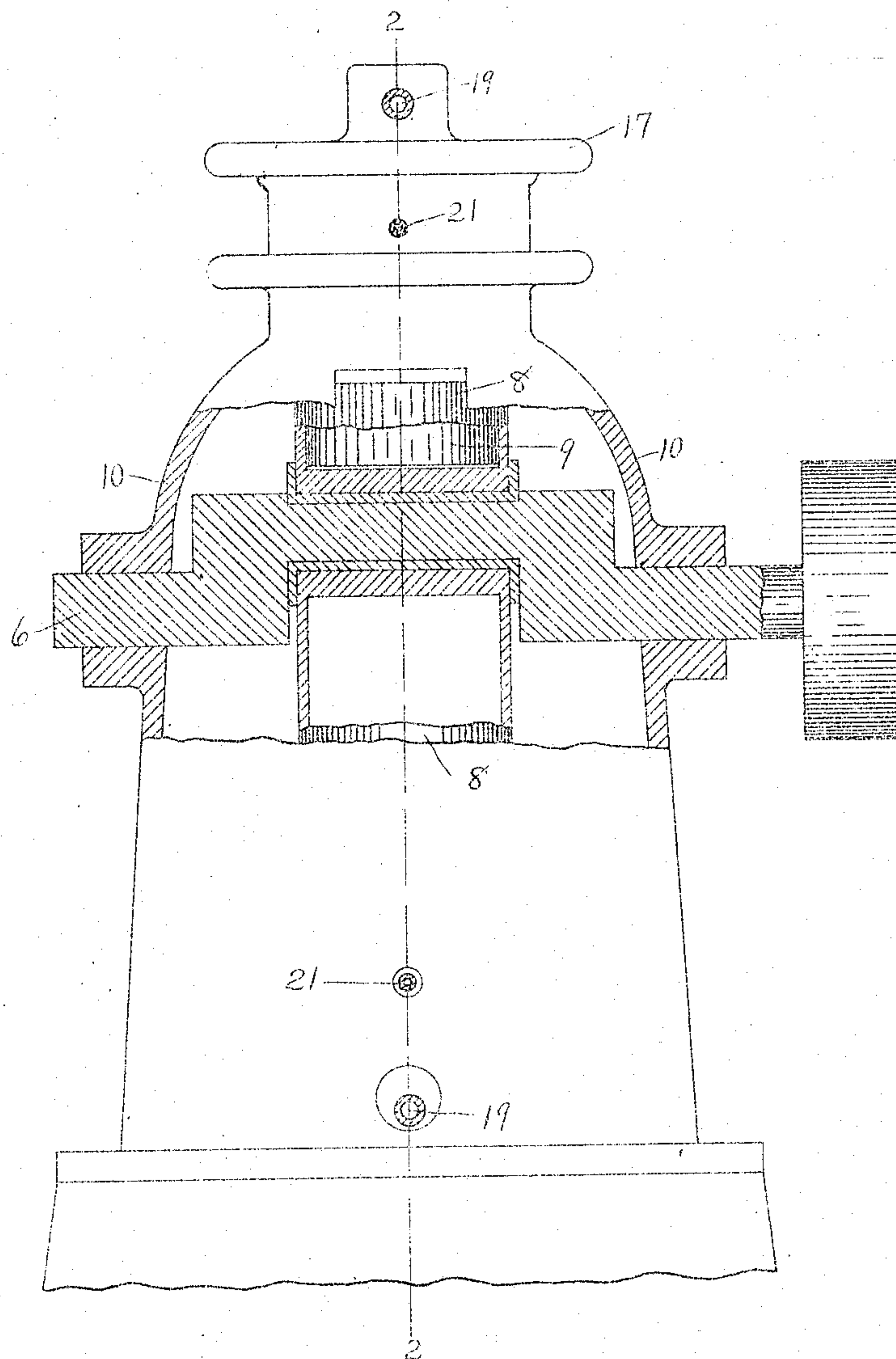
J. STURGESS.  
AIR COMPRESSOR.

APPLICATION FILED JULY 11, 1907.

PATENTED MAR. 10, 1908.

2 SHEETS—SHEET 1.

FIG 1



WITNESSES

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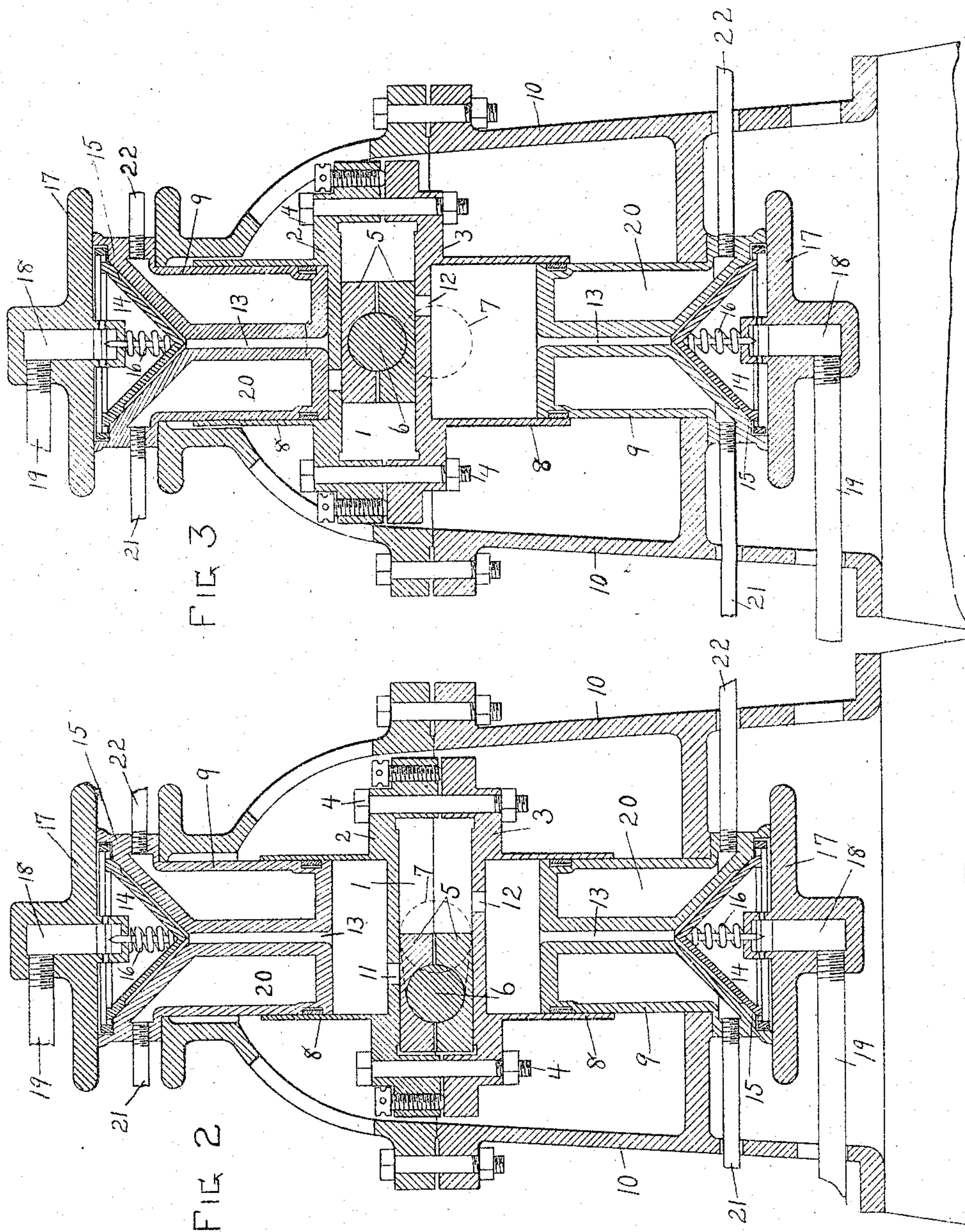
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H. E. Curtis.  
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# UNITED STATES PATENT OFFICE.

JOHN STURGESS, OF TROY, NEW YORK.

## AIR-COMPRESSOR.

No. 881,498.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed July 11, 1907. Serial No. 383,220.

*To all whom it may concern:*

Be it known that I, JOHN STURGESS, a subject of the King of Great Britain, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Air-Compressors, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification. Similar characters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in side elevation of my improved air-compressor. Fig. 2 is a central vertical section of the same taken on the broken line 2—2 in Fig. 1, showing the moving parts in mid position. Fig. 3 is a similar view showing the moving parts in the position which they assume at the end of the upward movement.

The principal object of the invention is to provide a simple and efficient mechanism for compressing air and other gases, and the apparatus is especially designed for operation at high speed although it may be operated at any speed desired.

Referring to the drawings wherein the invention is shown in preferred form, 1, represents a slideway in a yoke formed by the two members, 2 and 3, secured together by bolts, 4, within which slideway is adapted to reciprocate a split bearing-block, 5, for a crank-pin, 6, on the crank-shaft 7.

Projecting from the yoke in opposite directions are a pair of cylinders, 8, each adapted to receive and fit a stationary piston, 9, mounted upon the frame, 10, of the machine, whereby the yoke is guided in its to-and-fro movement induced by the rotation of the crank-shaft, which movement is accompanied by a movement of the bearing-block, 5, to-and-fro in its slideway; 1.

An inlet opening, 11, is formed through one wall of the slideway, 1, leading into the upper cylinder, 8, and a similar opening, 12, is formed through the opposite slideway surface leading into the lower cylinder 8.

Each of the openings, 11 and 12, is adapted to be closed at certain times by the bearing-block, 5, and said openings are so arranged that the opening to the upper cylinder is uncovered and opened at about the time that

the downward movement of the yoke and cylinders begins, and is closed by the bearing-block, 5, at about the time that the upward movement of the yoke and cylinders begins, while the opening into the lower cylinder is uncovered and opened at about the time that the upward movement begins, and is closed by the bearing-block, 5, at about the time that the downward movement begins.

As the yoke and cylinders are reciprocated by the action of the crank, at each upward movement the air will be compressed within the upper cylinder, and at each downward movement within the lower cylinder, the air entering the respective cylinders through the yoke, and openings, 11 and 12, in the yoke-slideway when said openings are uncovered. An outlet for the air thus compressed in the respective cylinders is formed by a passageway, 13, extending axially through each piston and terminating in a conical chamber containing a conical valve, 14, adapted to engage an annular valve-seat, 15, at the larger end of said conical chamber.

The valve is yieldingly held to its seat by a coil-spring, 16, which yields to the controlling pressure within the neighboring cylinder to permit the escape of the compressed air from said cylinder through said valve-seat.

The opening surrounded by the valve-seat is of substantially the same diameter as the cylinder, so that a very small movement of the valve is required.

At its outer end the piston is provided with a cap or head, 17, closing the conical chamber, through which cap or head extends a passageway, 18, through which the compressed air escapes to the delivery pipe, 19, when the valve is open.

I have shown each of the stationary pistons provided with a water-jacket, 20, with connecting inlet and outlet pipes, 21 and 22, whereby the parts can be kept cool if desired.

It is obvious that air can be compressed in either cylinder, independently of the other, and that if only one of the cylinders is utilized for compressing the air, the other cylinder and its piston simply perform their functions of guiding the moving parts.

I have described my improved apparatus in its use for compressing air, but it is equally adapted for compressing any gas.

What I claim as new and desire to secure by Letters Patent is

1. In an apparatus of the class described,



the combination with a yoke having a slideway provided with an opening therethrough; a crank and crank-pin; and a bearing-block for the crank-pin fitting and movable along said slideway and adapted to open and close said opening; of a piston and cylinder, one mounted upon a fixed support and the other upon said yoke with the space inclosed by said piston and cylinder communicating with said opening; and a check-valve controlling an outlet from said inclosed space.

2. In an apparatus of the class described, the combination with a yoke having a slideway provided with a pair of openings therethrough; a crank and crank-pin; and a bearing-block for the crank-pin fitting and movable along said slideway and adapted to alternately open and close the respective openings; of a piston and cylinder, one mounted upon a fixed support and the other upon one side of said yoke with the space inclosed by said piston and cylinder communicating with one of said openings; a piston and cylinder, one mounted upon a fixed support and the other upon the opposite side of said yoke with the space inclosed between said last mentioned piston and cylinder communicating with the other of said openings; and a check-valve controlling an outlet from each of said inclosed spaces.

3. In an apparatus of the class described, and in combination, a pair of members comprising a cylinder, and a piston fitting therein, said cylinder being provided with an inlet-opening to the space inclosed by said piston and cylinder, and the piston being provided with an outlet-opening leading from said inclosed space and being provided in its outer end with an enlarged chamber communicating with said outlet-opening; an automatically closing check-valve adapted when closed to substantially fill said chamber and to close an outlet therefrom of substantially the diameter of said

cylinder; means for moving one of said members toward and from the other; and means for opening and closing the inlet-opening to the cylinder.

4. In an apparatus of the class described, and in combination, a pair of members comprising a cylinder, and a piston fitting therein, said cylinder being provided with an inlet-opening to the space inclosed by said piston and cylinder, and the piston being provided with an axial passageway communicating with said space and with a conical chamber communicating at its apex with said passageway and having at the larger end of said chamber a valve-seat surrounding an outlet-opening of approximately the diameter of the cylinder; an automatically closing conical check-valve adapted when closed to engage said seat and substantially fill said chamber; means for moving one of said members toward and from the other; and means for opening and closing the inlet-opening to the cylinder.

5. In an apparatus of the class described, and in combination, a pair of yoke members secured together with a slideway therebetween, and each having on its outer side a hollow cylinder and provided with an aperture leading from said slideway within said cylinder; a crank and crank-pin; a bearing-block for the crank-pin fitting and movable along said slideway and adapted to alternately open and close said inlet-openings; a pair of pistons fixedly mounted within the open ends of said respective cylinders; and a check-valve controlling an outlet from the space inclosed by each piston and its cylinder.

In testimony whereof, I have hereunto set my hand this 21st day of June, 1907.

JOHN STURGESS.

Witnesses:

E. M. O'REILLY,  
J. DONSBAUGH.