

No. 831,982.

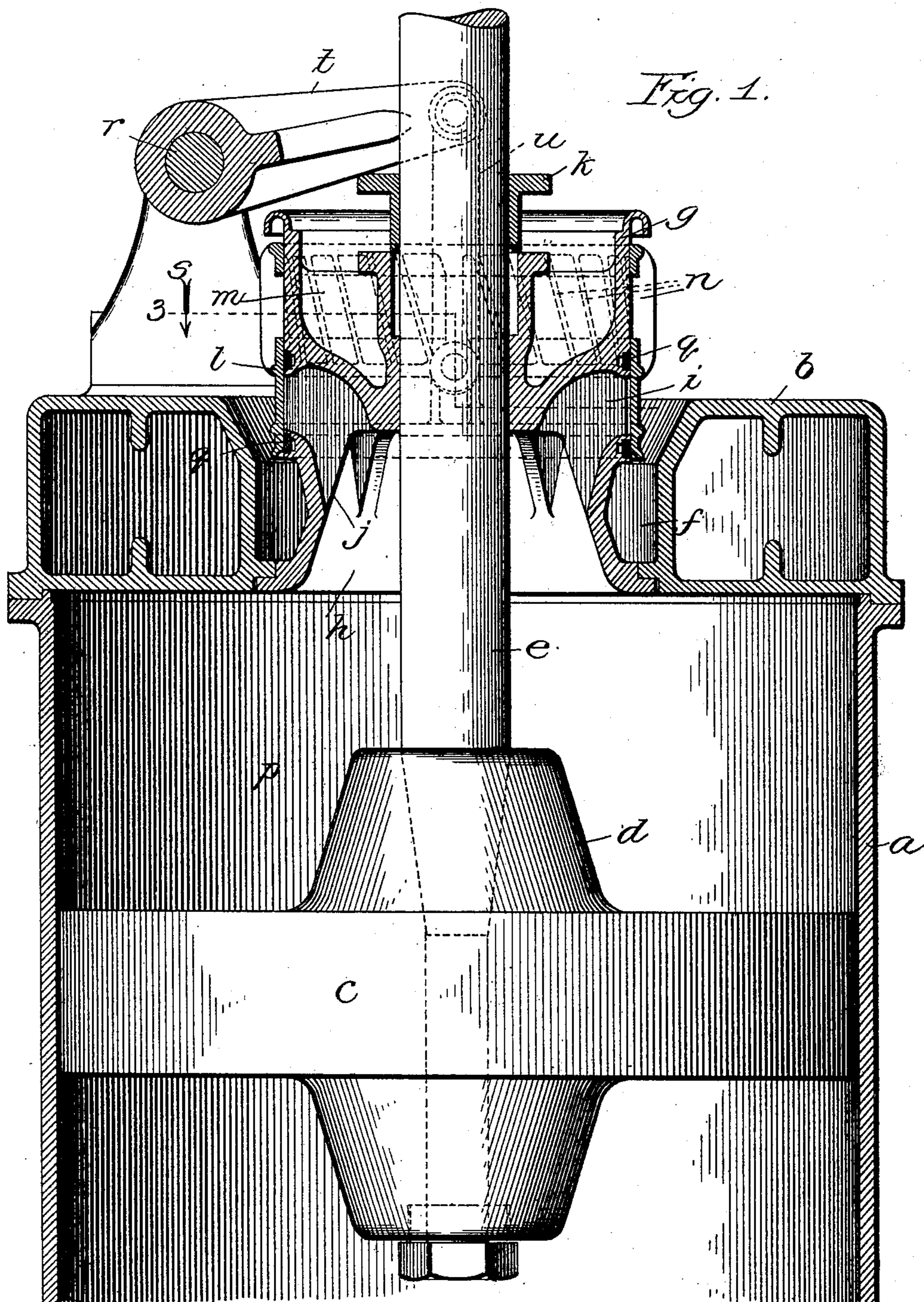
PATENTED SEPT. 25, 1906.

J. F. M. PATITZ.

VALVE FOR BLOWING ENGINES.

APPLICATION FILED DEC. 16, 1902. RENEWED APR. 25, 1906.

2 SHEETS—SHEET 1.



Witnesses:
Edw. J. Taylor.
Geo. C. Dawson.

Inventor:
J. F. M. Patitz,
By *Thomas F. Sheridan,*
Att'y

No. 831,982.

PATENTED SEPT. 25, 1906.

J. F. M. PATITZ.
VALVE FOR BLOWING ENGINES.

APPLICATION FILED DEC. 16, 1902. RENEWED APR. 25, 1906.

2 SHEETS—SHEET 2.

Fig. 2.

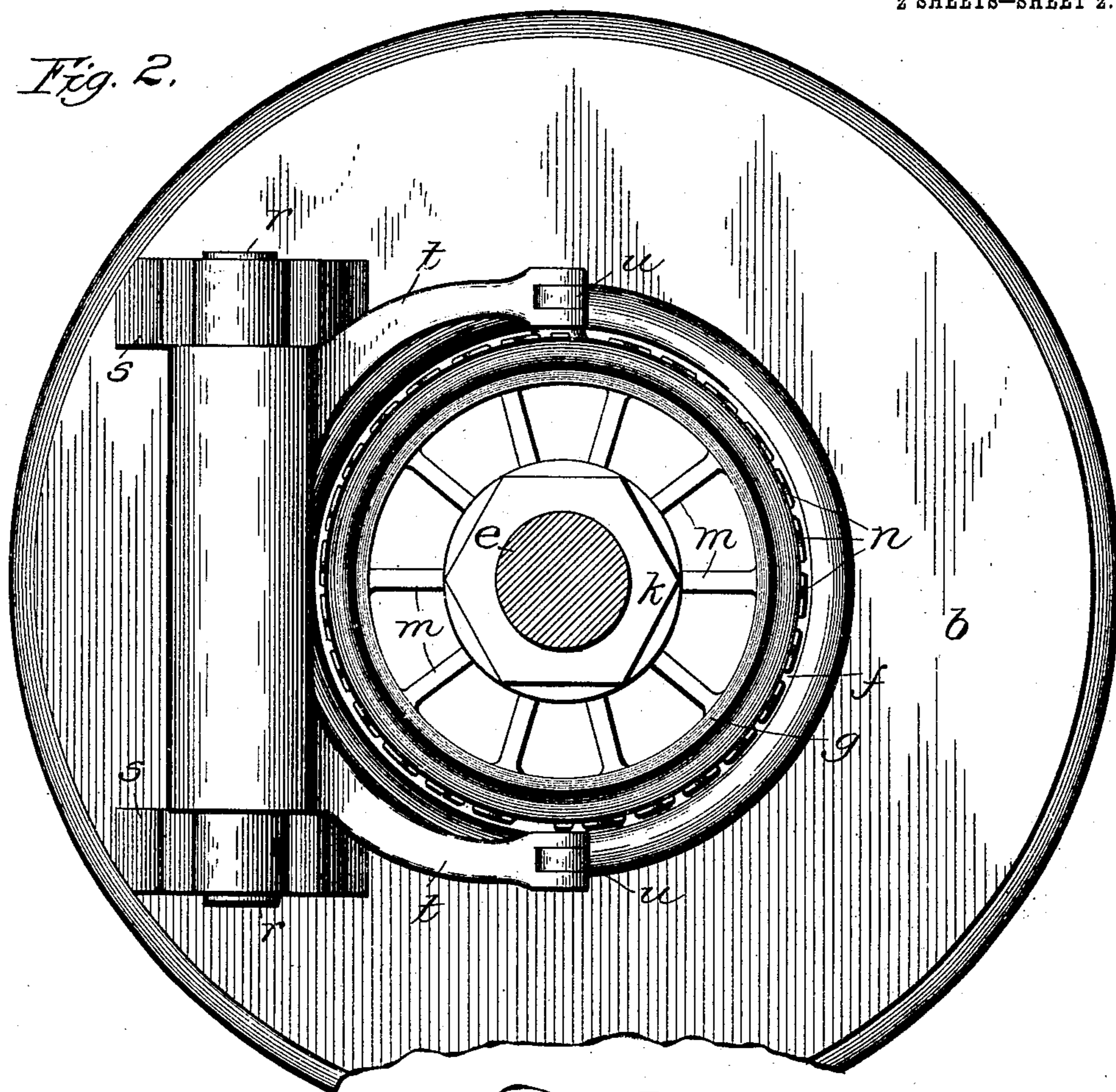
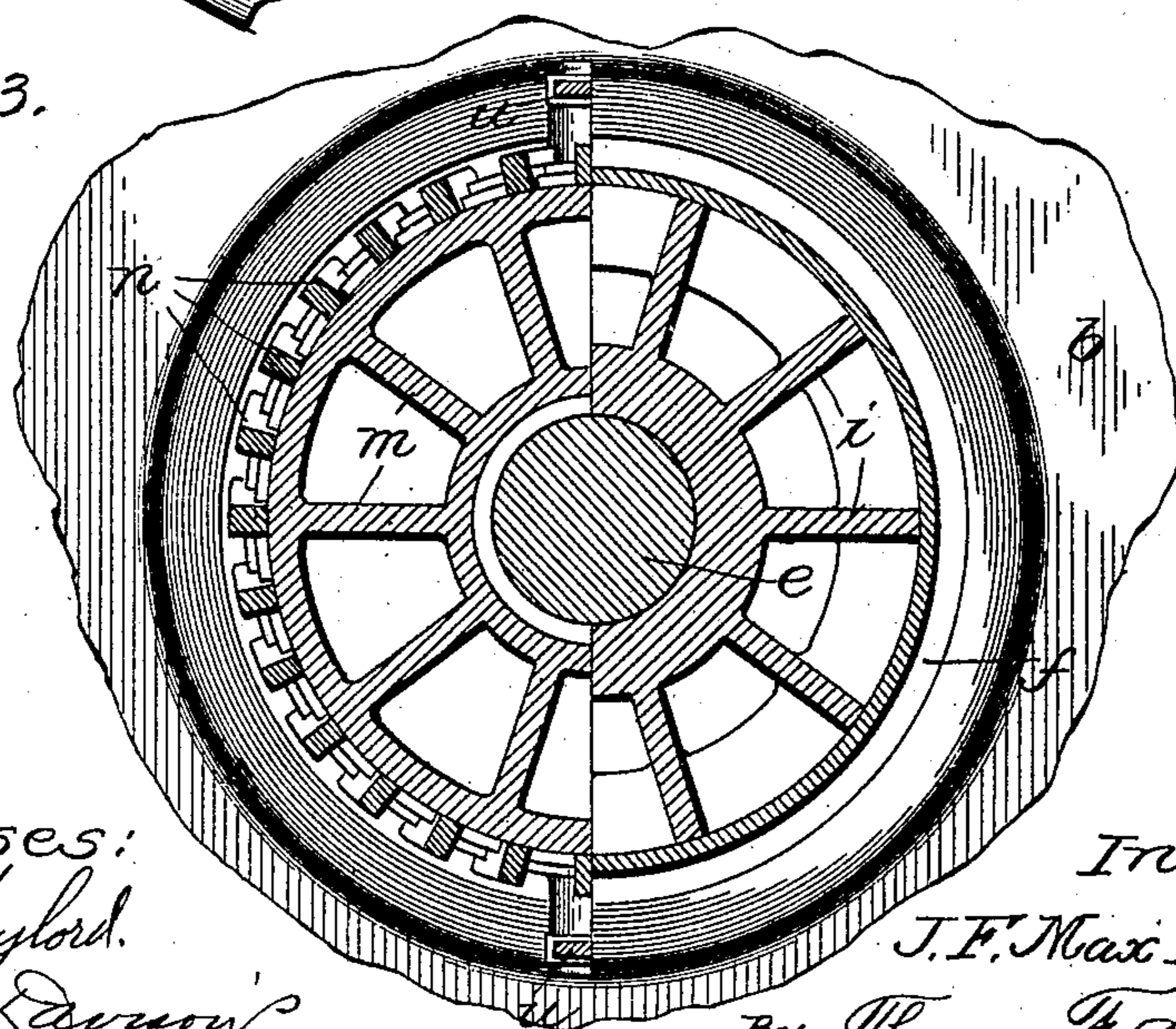


Fig. 3.



Witnesses:
Edw. Chylord.
Geo. C. Dawson.

Inventor:
J. F. Max Patitz,
By *Thomas F. Sheridan,*
Att'y

UNITED STATES PATENT OFFICE.

JOHANN FREDERICK MAX PATITZ, OF MILWAUKEE, WISCONSIN,
ASSIGNOR TO ALLIS-CHALMERS COMPANY, OF MILWAUKEE,
WISCONSIN, A CORPORATION OF NEW JERSEY.

VALVE FOR BLOWING-ENGINES.

No. 831,982.

Specification of Letters Patent.

Patented Sept. 25, 1906.

Application filed December 15, 1902. Renewed April 25, 1906. Serial No. 313,678.

To all whom it may concern:

Be it known that I, JOHANN FREDERICK MAX PATITZ, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Valves for Blowing-Engines, of which the following is a specification.

This invention relates to an improvement in valves for air-compressing and blowing engines, and has especial reference to that class of valves which is used for controlling the inlet of air to the compressing mechanisms, all of which will more fully hereinafter appear.

The principal object of the invention is to provide a simple, economical, and efficient type of balance-valve for air-compressing and blowing engines.

A further object of the invention is to provide a simple, economical, and durable construction of valve which is readily accessible for repairs and so arranged with reference to the other parts that the breakage of such will not cause any falling of parts into the compressing mechanism to injure the same.

Further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists principally in the combination of a cylinder provided with a cylinder-head, a cylindrical valve-guide secured thereto and projecting therefrom and having lateral openings in its side walls, and a shell-valve surrounding and mounted on the outer surface of the guide to cover and uncover the lateral air-inlet openings in the same.

The invention consists, further, in a blowing-engine in which there are combined a cylinder, a cylinder-head thereon having a central opening therein, a cylindrical valve-guide secured thereto and projecting therefrom and having a plurality of lateral air-inlet openings in its side walls, and a cylindrical shell-valve mounted on the valve-guide provided with perforate and imperforate parts to open and close the air-inlet passages in the valve-guide.

The invention consists, further and finally, in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional elevation of an engine fitted with an inlet-valve constructed in accordance with these improvements; Fig. 2, a plan view of the same, and Fig. 3 a plan sectional view taken on the irregular line 3 of Fig. 1 looking in the direction of the arrow.

In constructing an engine in accordance with these improvements I make a compressing-cylinder *a* of the desired size, shape, and strength to withstand the ordinary stress and strains incident to the use thereof. Detachably secured to at least one end of this compressing-cylinder is a hollow cylinder-head *b*, which is secured thereto in any ordinary manner, such as by the use of bolts, studs, and the like. The compressing-cylinder is provided with a piston portion *c*, having a truncated-cone-shaped central hub *d* and a piston-rod *e* extending outwardly therefrom and in axial alinement therewith.

To provide a simple, economical, and efficient inlet-valve that permits the introduction of air at the proper times and cuts it off at all other times, the cylinder-head is provided with a central aperture or opening *f* in axial alinement with the axis of the piston-rod and surrounding the same. Detachably secured to such cylinder-head in axial alinement with the central opening thereof is a valve-guide *g*, circular in contour when looking at it in cross-section or plan view and extending outwardly from such cylinder-head, so as to leave a reasonable amount of space between its walls and the walls of the aperture *f* of the cylinder-head, in which a controlling-valve may play or operate. This valve-guide is provided with an inner truncated-cone-shaped chamber *h*, which the truncated cone-shaped "boss" on the piston substantially fills, so as to reduce the lost or waste space in the guide to a minimum, and thereby take as much advantage of the compressing action of the piston as possible. The cylindrical valve-guide is further provided with a plurality of lateral air-inlet openings or perforations *i*, formed in the side walls thereof by a plurality of ribs *j*, which connect the upper and lower portions of the cylindrical valve-guide together, as shown particularly in Fig. 1. The central portion of this valve-guide is provided with a stuffing-box *k*, through which the piston-rod

passes, which acts to prevent any loss or leakage of air therefrom.

To open and close the air-inlet passages of the valve-guide at the proper time, a cylindrical shell-valve *l* is provided and reciprocatingly mounted on the cylindrical valve-guide. The lower part of this shell-valve is imperforate, and the upper part is provided with a plurality of perforations *m*, diagonally arranged therein and which are really formed by an annular opening divided into a plurality of diagonal openings by means of a plurality of diagonally-arranged ribs *n*. When the shell-valve is in one position, the imperforate part closes the inlet-passage in the valve-guide, and when it is at its other position or near its other limit of motion the diagonally-arranged perforations in the shell-valve are opposite the inlet-passages in the valve-guide and serve to admit air therethrough and into the compressing-chamber *p* of the engine-cylinder.

The valve-guide is provided with packing-rings *q*, which serve to prevent leakage of the air between it and the shell-valve, excepting at the desired times, and also assists in taking up "wear" of the parts. From an examination of the drawings it will be seen that the cylindrical shell-valve is arranged outside the engine-cylinder and where it is not subjected to any substantial fluid-pressure and as a consequence may be operated by the minimum amount of energy. To operate or reciprocate this cylindrical shell-valve, a rock-shaft *r* is provided and vibratantly mounted in brackets *s*, attached to the cylinder-head. This rock-shaft is provided with a lever arm or arms *t*, which, by means of links *u*, are connected with the cylindrical shell-valve. It will also be understood that this rock-shaft may be connected by any desired mechanism, preferably an eccentric-rod and eccentric, (not shown,) with some rotatable part of the engine, by which the necessary vibrations are imparted thereto, so that the shell-valve is reciprocated by the instrumentality thereof by and during the ordinary operations of the engine, all of which will be understood and appreciated by those skilled in the art.

I claim—

1. In an engine of the class described, the combination of an engine-cylinder, a cylinder-head detachably secured thereto and provided with a central opening or aperture, a valve-guide removably secured to the cylinder-head in axial alinement with the central opening or aperture therein and provided with a truncated-cone-shaped chamber in its inner surface and a plurality of air-inlet passages or openings in its side wall, a compressing-piston in such cylinder provided with a truncated-cone-shaped boss or hub adapted to enter and substantially fill the truncated-cone-shaped chamber in the valve-guide, and

a cylindrical shell-valve for opening and closing the air-inlet passages in such valve-guide, substantially as described.

2. In an engine of the class described, the combination of a cylinder, a cylinder-head detachably secured thereto and provided with a central aperture or opening, a cylindrical valve-guide detachably secured thereto in axial alinement with the opening in such cylinder-head and provided with an axially-arranged tapered chamber in its inner end the larger end of which opens into the compressing-cylinder and with a plurality of air-inlet passages in its side walls, a hollow cylindrical shell-valve mounted on the valve-guide to open and close the air-inlet passages, means for reciprocating such shell-valve by and during the movements of the engine, and a piston provided with a tapered boss or projection substantially fitting the tapered chamber in the inner surface of the valve-guide, substantially as described.

3. In an engine of the class described, the combination of a cylinder, a cylinder-head detachably secured thereto and provided with a central aperture or opening, a cylindrical valve-guide detachably secured to the cylinder-head in alinement with the central aperture therein and provided with a plurality of air-inlet passages in its side walls and with an axially-arranged stuffing-box and an inner truncated-cone-shaped chamber, a piston provided with a truncated-cone-shaped boss or projection substantially fitting the truncated-cone-shaped chamber in the valve-guide, a piston-rod secured to such piston and extending out through the stuffing-box in the valve-guide, a cylindrical shell-valve reciprocatingly mounted on the valve-guide and provided with perforate and imperforate parts to open and close the air-inlet passages in such valve-guide, and means for reciprocating such shell-valve by and during the operation of the engine, substantially as described.

4. In an engine of the class described, the combination of a cylinder, a cylinder-head detachably secured thereto and provided with a central aperture or opening, a cylindrical valve-guide detachably secured to the cylinder-head in axial alinement with the opening therein and provided with an inner truncated-cone-shaped chamber and with air-inlet passages in its side walls connecting such truncated-cone-shaped chamber with the outer air, a stuffing-box at its axial center, a piston in the compressing-cylinder provided with a truncated-cone-shaped hub or boss substantially fitting the truncated-cone-shaped chamber in the guide, a piston-rod extending out through the stuffing-box in the valve-guide, a cylindrical shell-valve mounted on the valve-guide and provided with a plurality of diagonally-arranged perforations and an imperforate part to open and close the

air-inlet passages in such valve-guide, and means for reciprocating such shell-valve by and during the movements of the engine, substantially as described.

5 5. In an engine of the class described, the combination of a hollow cylinder-head provided with a cylindrical central opening formed of an imperforate wall, a valve-guide having perforate and imperforate portions
10 secured therein and projecting outwardly therefrom so as to form an annular space between it and the imperforate cylindrical wall of the cylinder-head, a cylindrical shell-valve mounted on the outside of such valve-guide
15 to open and close the perforations therein, and means to reciprocate said valve by and during the movements of the engine, substantially as described.

20 6. In an engine of the class described, the combination of a cylinder provided with a

cylinder-head having a cylindrical aperture or opening therein formed of an imperforate cylinder-wall, a cylindrical valve-guide secured to the inner portion of the cylinder-head in axial alinement with the opening
25 therein and extending outwardly therefrom and provided with an upper imperforate part and a lower perforate part forming in connection with the imperforate cylindrical wall of the cylinder-head an annular air-space, a cy-
30 lindrical shell-valve mounted on the valve-guide and provided with an upper perforate portion and a lower imperforate portion, and means for reciprocating the shell-valve by
35 and during the movements of the engine, substantially as described.

JOHANN FREDERICK MAX PATITZ.

Witnesses:

IRVING H. REYNOLDS,
JOHN DAY, Jr.