

No. 636,391.

Patented Nov. 7, 1899.

W. H. SMYTH & P. H. REARDON.

VALVE.

(Application filed Apr. 28, 1898.)

(No Model.)

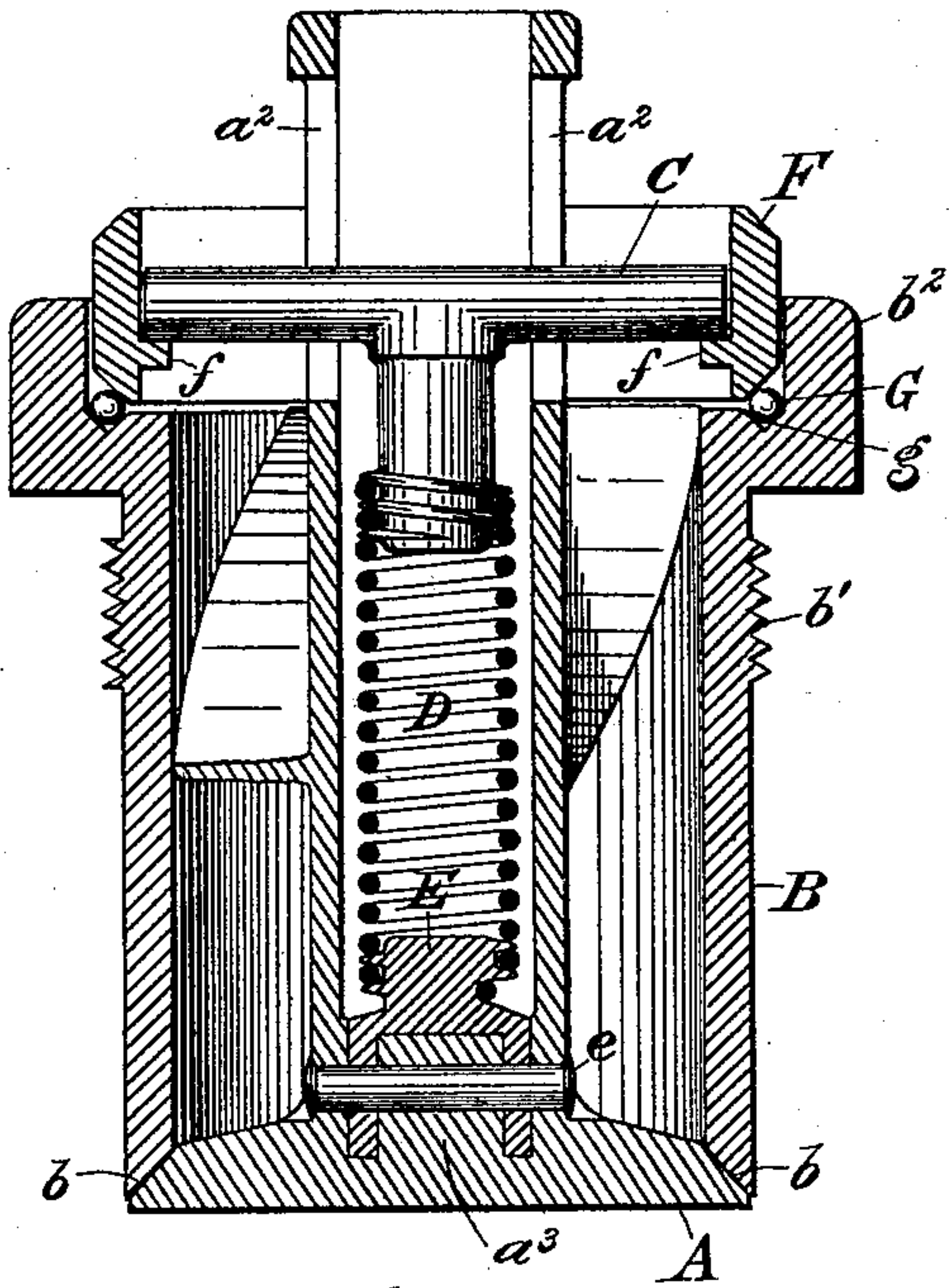


Fig. 1.

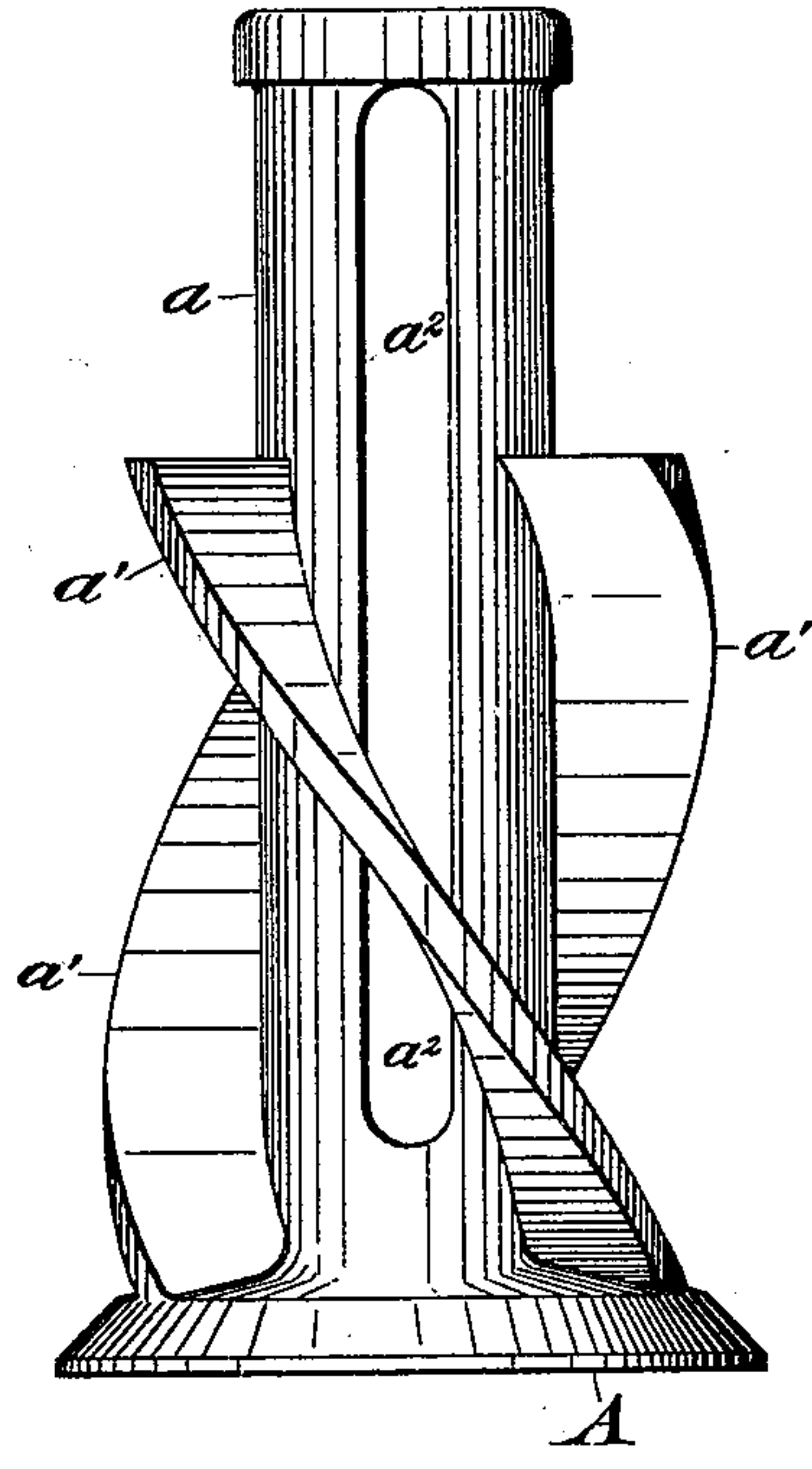


Fig. 2.

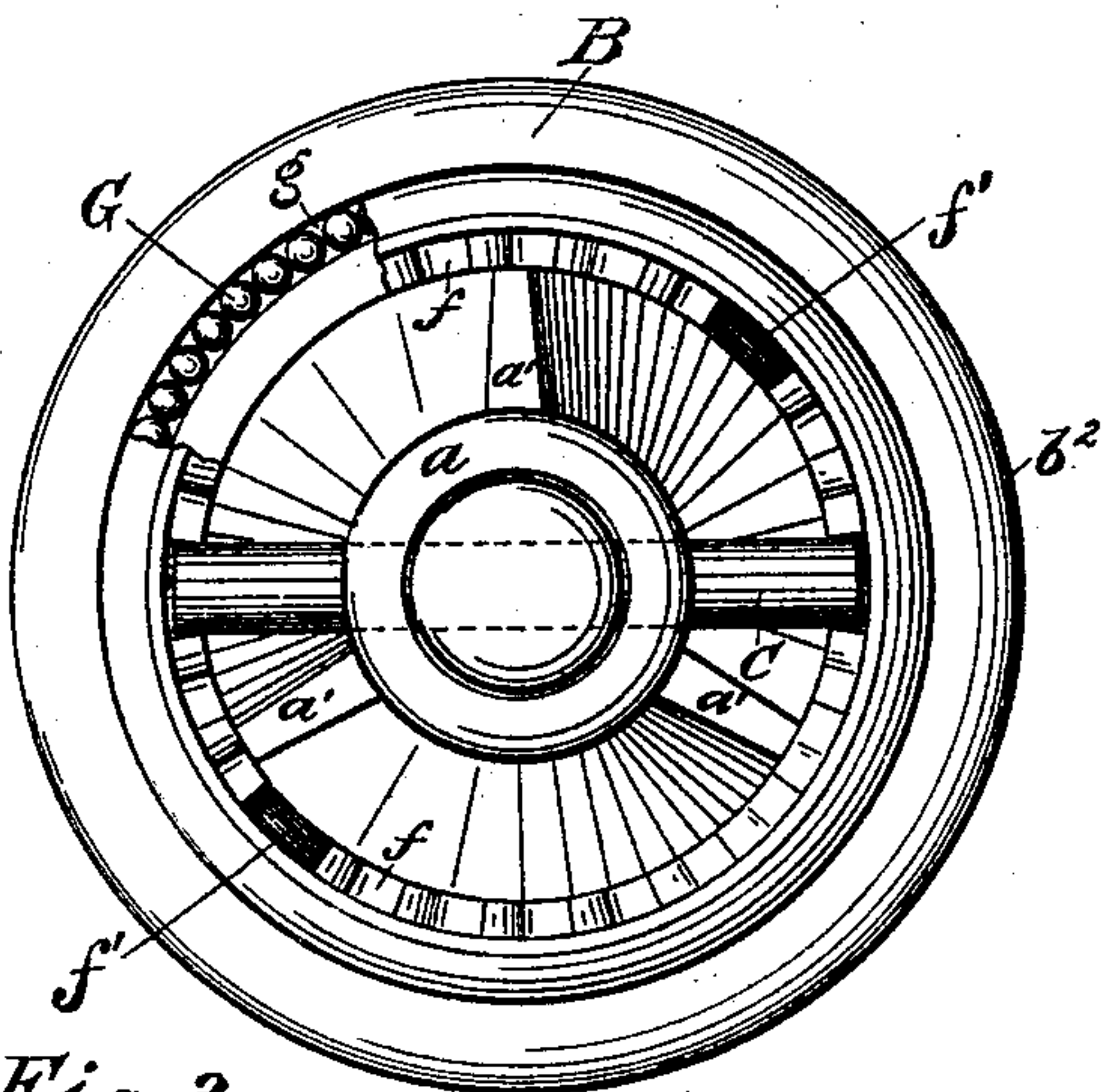


Fig. 3.

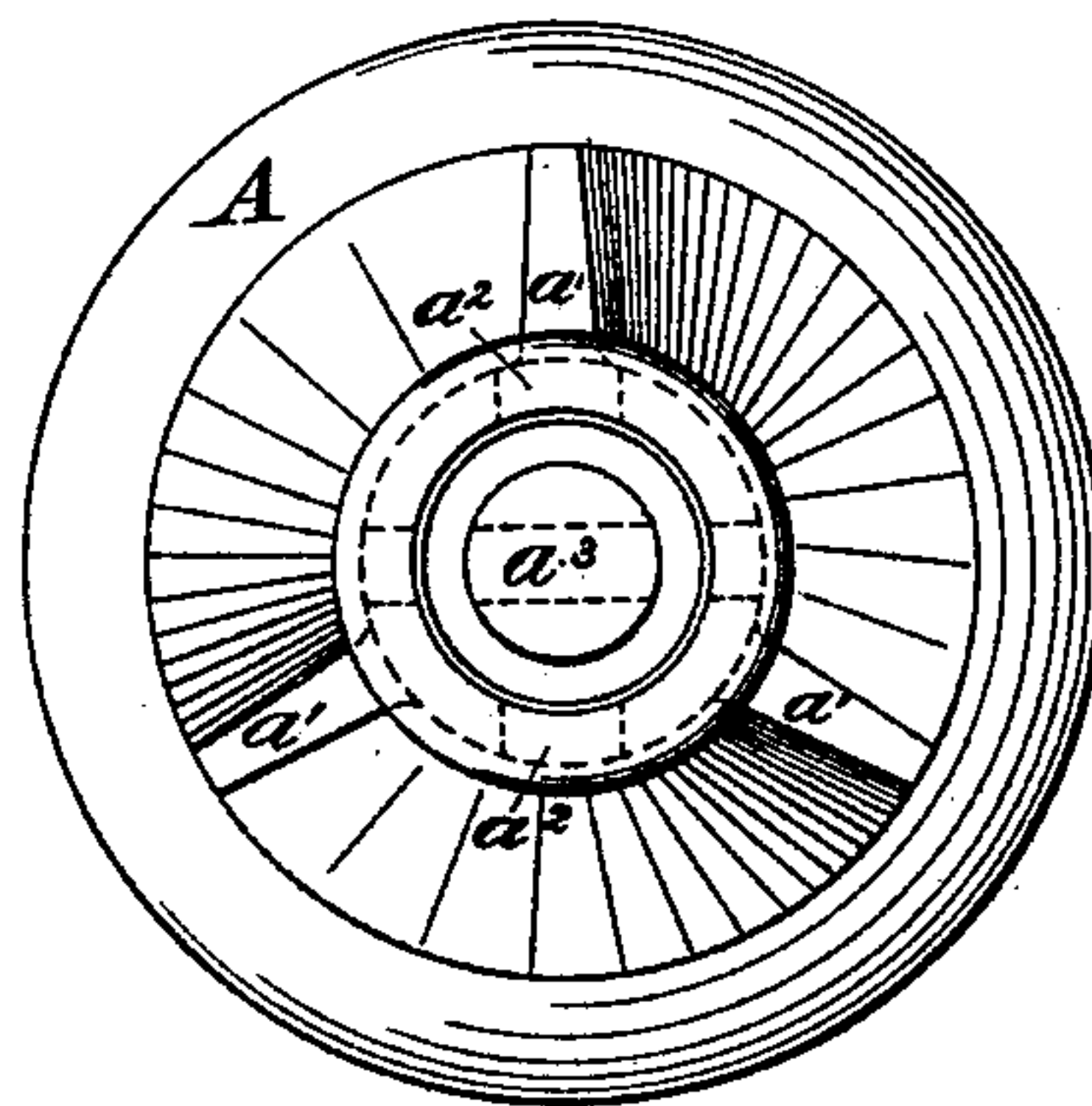


Fig. 4.

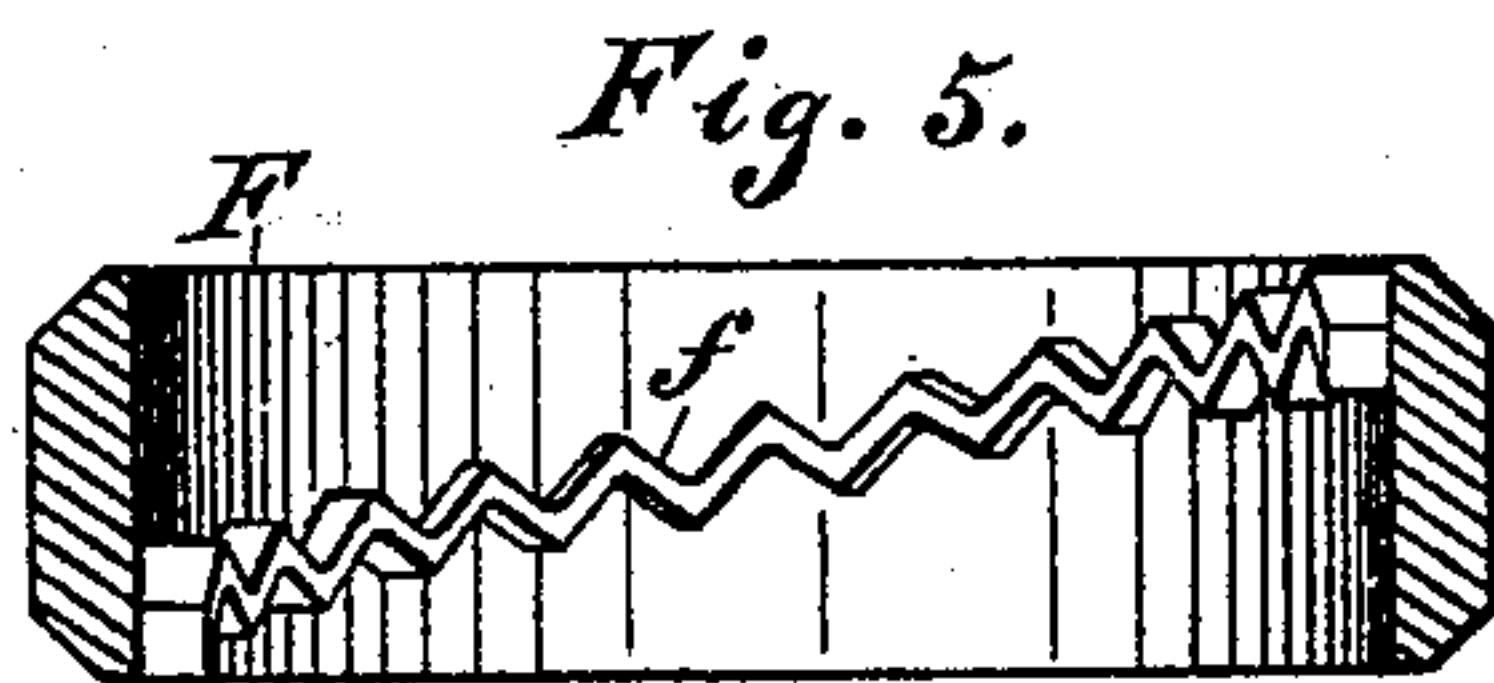


Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM H. SMYTH, OF BERKELEY, AND PATRICK H. REARDON, OF SAN FRANCISCO; CALIFORNIA; SAID SMYTH ASSIGNOR TO SAID REARDON.

VALVE.

SPECIFICATION forming part of Letters Patent No. 636,391, dated November 7, 1899.

Application filed April 28, 1898. Serial No. 679,135. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. SMYTH, residing at Berkeley, Alameda county, and PATRICK H. REARDON, residing at San Francisco, in the county of San Francisco, State of California, citizens of the United States, have invented certain new and useful Improvements in Valves; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to an improvement in valves.

The object of the invention is to provide a valve, more particularly adapted to the inlet of air-compressors, which shall give the largest and freest inlet compatible with due strength, so arranged that in case of accidental breakage or disconnection of any of the parts no piece can fall or be carried into the cylinder; also, that the force of the return of the valve to its seat is adjustable and controllable, and, further, that the valve rotates upon its seat, whereby the wear is made even and the valve thus continues always tight. These very desirable objects are accomplished by means of the devices illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of the invention. Fig. 2 is an elevation of the valve proper, showing the spiral wings or vanes upon its stem. In this view the yoke-slots are shown as being carried down to near the bottom to increase the air-inlet capacity. Fig. 3 is a plan view, portions being broken away to show the bearing-balls. Fig. 4 is a plan view of Fig. 2. Fig. 5 is a sectional elevation of loose ring.

Referring to the accompanying drawings, A is a taper-valve provided with a hollow stem a , having radial spiral wings or vanes a' a' and longitudinal slots a^2 a^2 . The valve A is in a casing B, provided with a suitable seat, with which the valve A engages. It is also provided with suitable means for securing it in position in the compressor. (Shown in the drawings as the screw-threads b' and flange b^2 .)

C is a yoke or cross-rod passing through the slots a^2 of stem a . To this yoke is attached a spring D, preferably a pull or tension spring.

The lower end of the spring is attached to a device for securing it to the valve A, (shown as the socket E.) This socket rests over a boss or projection a^3 , forming part of valve A. Through stem a , socket E, and bars a^3 passes a pin e . The yoke C rests in a loose ring F, of peculiar construction, which is shown clearly in Figs. 1, 3, and 5. It consists of a ring preferably beveled on its upper and lower outer edges. Attached to the inner surface of the ring are two similar zigzag or stepped spiral projecting flanges f , opposite to each other, forming two semicircular inclines, preferably each a little short of half the inner circumference of the ring, so leaving the space f' for the entrance of the yoke C. The ring F is preferably let into the casing B, as shown in Fig. 1, the flange b^2 being counterbored for this purpose. In the face of the counterbore is provided a groove or depression g for bearing-balls G.

In practice the spiral form of the wings or vanes a' a' causes the valve to turn by the impact of the inrushing air. This form also provides a good bearing or guide for the valve in the casing, besides by the turning in connection with this form keeping the bore of the casing clean, smooth, and free from grooves. The bearing-balls lessen the friction between the ring F and its seat and so facilitate the turning of the valve.

More or less tension may be put upon the spring D by moving the yoke-pin C into a higher or lower notch of the spiral flange f .

The long slot shown in Fig. 2 permits free ingress and egress of air into and from the interior of the hollow stem of the valve.

Should the spring break, the closed end of the slots a^2 stops the valve from being forced into the cylinder, and if, as sometimes occurs owing to the constant and long-continued jarring of the valve in seating, the plate portion of the valve parts from the stem the spring still retains its control, being attached to it by the boss E, and thus prevents its falling into the cylinder.

Having thus described this invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A valve provided with a hollow stem hav-

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ing spiral wings or vanes and suitable means within said stem attached to a rotatable ring to move the valve, and a suitable valve-seat.

2. A valve provided with a hollow stem having exterior spiral wings or vanes thereon and suitable means within said stem attached to a movable ring to move the valve, and a suitable valve-seat.

3. A valve provided with a hollow stem having exterior spiral vanes or wings, a suitable valve-seat and a tension device within said stem, and a movable adjusting-ring, to return the valve to its seat.

4. A valve provided with a hollow stem having exterior spiral wings or vanes, a suitable valve-seat and a tension-spring in the hollow stem, connected with the surrounding ring, to return the valve to its seat.

5. In a valve having a spring for returning the valve to its seat an adjusting device provided with a double reverse series of steps and suitable connections with the spring, whereby tension on said spring is increased or diminished at will.

6. In a valve having a spring for returning

the valve to its seat an adjusting device comprising a ring provided with a double reverse series of steps and suitable connections with the spring whereby the tension is changed at will.

7. An inlet-valve comprising a valve having a stem set in a shell or casing, a ring surrounding said stem resting loosely upon said shell and a yoke passing through the stem and resting upon said ring.

8. A valve provided with a hollow stem having exterior vanes or wings, a suitable valve-seat and a spring in the hollow stem attached independently to both stem and valve.

9. An inlet-valve comprising a valve having a stem set in a shell or casing, a ring surrounding said stem and a yoke passing through the stem and resting upon said ring, a spring connecting the valve with the yoke and bearing-balls intermediate of the ring and casing.

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