

D. C. DEMAREST & G. LILLIE.

SUCTION VALVE.

APPLICATION FILED APR. 18, 1905.

Fig. 1.

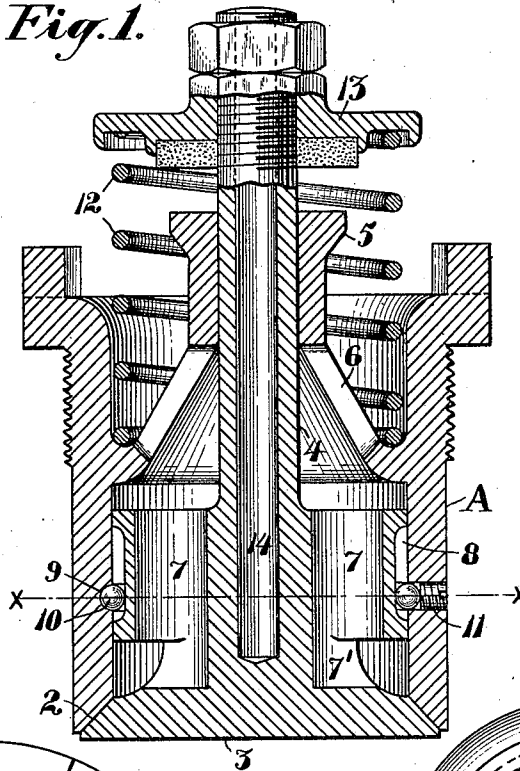


Fig. 2.

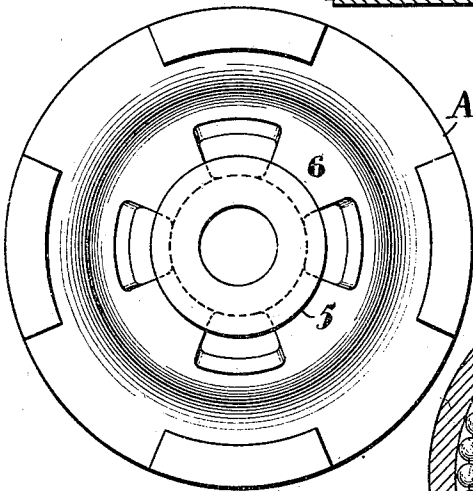


Fig. 3.

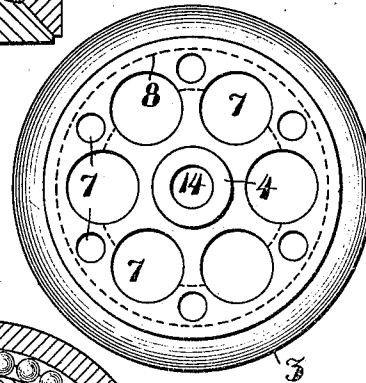
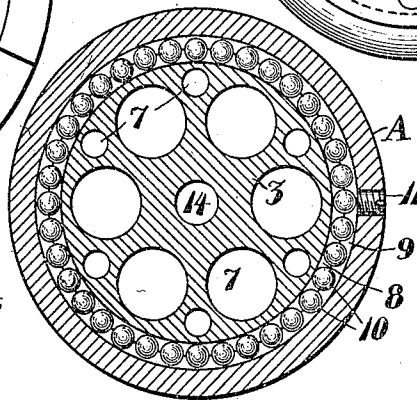


Fig. 4.



Witnesses:-

J. C. Fiedner
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Inventors

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UNITED STATES PATENT OFFICE.

DAVID C. DEMAREST AND GEORGE LILLIE, OF ANGELS CAMP, CALIFORNIA, ASSIGNORS TO ANGELS IRON WORKS, OF ANGELS CAMP, CALIFORNIA, A CORPORATION.

SUCTION-VALVE.

No. 825,588.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed April 18, 1905. Serial No. 256,236.

To all whom it may concern:

Be it known that we, DAVID C. DEMAREST and GEORGE LILLIE, citizens of the United States, residing at Angels Camp, in the county of Calaveras and State of California, have invented new and useful Improvements in Suction-Valves, of which the following is a specification.

Our invention relates to suction-valves, and especially to suction-valves for air-compressors and the like.

The present valve is an improvement on that shown in Patent No. 625,292, dated May 16, 1899, and its object is to strengthen the valve, lessen its weight, thereby lessening its tendency to crystallization, and to render it safer by changing the construction, so that in the event of anything happening to the valve or the valve-stem breaking the valve will not drop into the compressor-cylinder to cause damage.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a central vertical section of our valve and casing. Fig. 2 is a plan view of the valve-casing. Fig. 3 is a plan view of the valve-casing. Fig. 4 is a section on line *x x* of Fig. 1.

A represents a cylindrical casing adapted to be screwed into the cylinder of the compressor or other engine with which it may be used. The end of the casing within the compressor-cylinder is provided with an annular valve-seat 2, against which the valve 3 is adapted normally to seat. This valve is forged from machine-steel and has a body portion practically filling and sliding in the lower portion of the casing A and has a central reduced stem portion 4, movable and guided in a hub part 5, cast integral with the casing. The hub is supported from the inner periphery of the casing by the web 6, and the movements of the valve-body are between this web and the seat end of the casing, this space being sufficient to insure snug seating of the valve. The body of the valve immediately above the annular seating portion is longitudinally channeled to provide ports 7 for the passage of the air, these ports opening at one end to the space in the casing beyond the valve and at the other end into an annu-

lar groove 7' in the periphery of the body of the valve adjacent to the seating portion of the valve. These ports or air-passages are so positioned that the remaining solid portions of the body form a series of radiating wings, tying the valve proper to the steel body against all possibility of breakage.

On the outer periphery of the valve-body is a wide annular groove 8 between groove 7' and the inner end of the valve-body, and on the inner periphery of the casing complementary to groove 8 is a groove 9, which is substantially semicircular in cross-section. A series of antifrictional balls 10 are adapted to be inserted through an opening in the side of the casing when the latter and the valve are assembled, said opening being then closed by a screw-plug 11. These balls and grooves permit a limited and frictionless reciprocation of the valve in the casing and provide a safety device to hold the valve therein. The width of groove 8 is sufficient to allow the proper closing and opening of the valve.

The valve is held in normally closed position by means of the helical spring 12, having one end supported against a fixed part of the casing, as the web 6, and the other against the adjusting-nut 13 on the valve-stem. The intermittent opening of the valve is produced by the vacuum in the engine or compressor-cylinder.

In large valves the stem is preferably cored out, as shown at 14. This reduces weight, and therefore by lessening the shock minimizes the tendency to crystallization.

This lightening and strengthening of the valve is especially apparent in forming the body with the longitudinal ports 7, leaving the comparatively thin solid webs or radiating wings which extend the full length of the valve-body to bind the valve to the stem and body. Evidently the weakest point in the valve is either through the thread on the upper part of the stem or through the stem where it connects to the valve-body. Consequently in case of breakage at either point (and these are the only points where a break can occur) the steel balls will still hold the valve and prevent it from falling into the cylinder to cause damage.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

An improved suction-valve for air-com-

pressors said valve having in combination a casing or cylinder-head with an annular valve-seat at one end whose diameter is equal to the full interior diameter of the casing at said
5 end, a valve fitting said seat, having a diameter substantially equal to the opening in the valve-seat end of the casing, whereby a maximum valve area is obtained, said casing having a cone-shaped internal web with a hub
10 portion surmounting the same, and said valve having a stem extending through the cone and slidably fitting said hub, the body of said valve immediately above the seating portion being spaced from the latter and of
15 about the same diameter as the interior of the casing, and being longitudinally channeled to

form air-ports which lead respectively into the base of the cone and into the space between said body and the valve-seating portion, said body portion being, also, circum- 20
ferentially channeled on its outside between its ends, and means operating in said channel to limit the opening movement of the valve.

In testimony whereof we have hereunto set our hands in presence of two subscribing 25
witnesses.

DAVID C. DEMAREST.
GEORGE LILLIE.

Witnesses:

CHAS. P. SNYDER,
JAMES LAGOMARSINO.