

No. 827,522.

PATENTED JULY 31, 1906.

F. W. FELSBURG.
VALVE CONSTRUCTION.
APPLICATION FILED JULY 31, 1905.

Fig. 2.

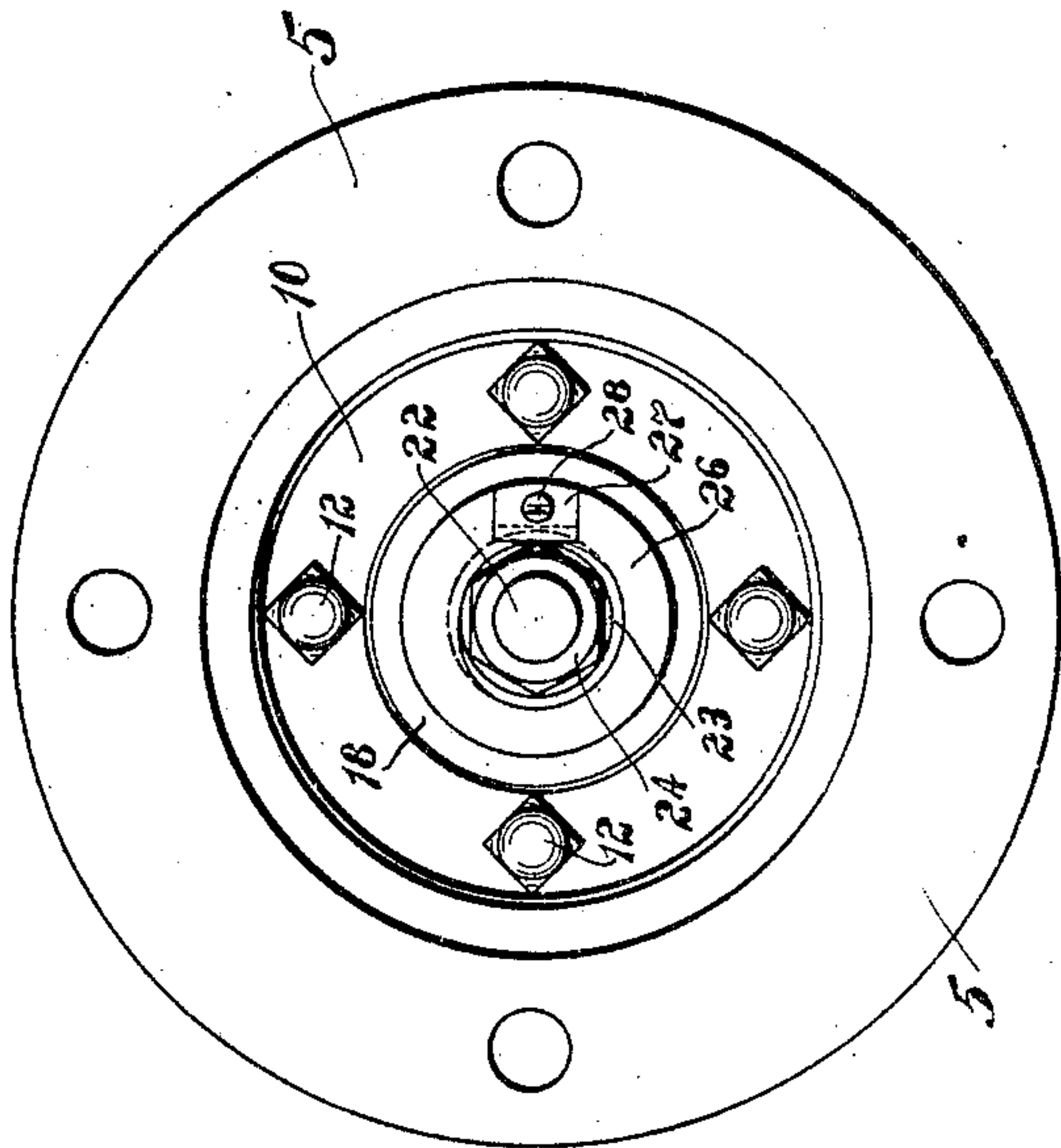
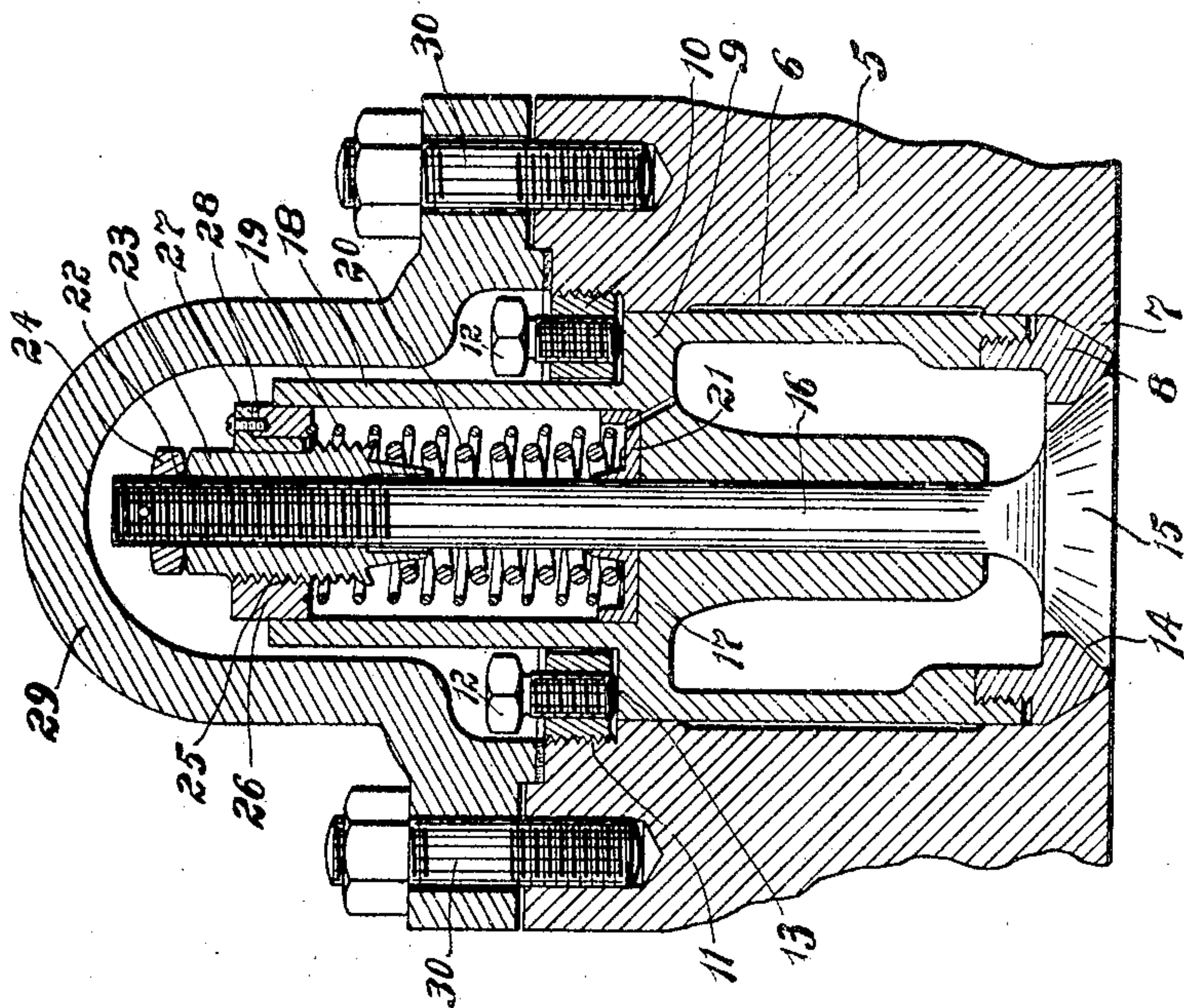


Fig. 1.



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UNITED STATES PATENT OFFICE.

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VALVE CONSTRUCTION.

No. 827,522.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK W. FELSBERG, a citizen of the United States, residing at Dayton, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Valve Constructions, of which the following is a full, clear, and exact specification.

My present invention relates to improvements in valves for air or gas compressors, and particularly to such valves as are especially adapted for use in the ammonia-compressors of refrigerating and ice-making machinery.

The object of the invention is to simplify the construction and arrangement of the valve-controlling mechanism and also of the means for fastening and adjusting the valve-housing in the machine-casing.

In valves for ammonia-compressors it is customary to employ a working spring, the tension of which is adjustable to obtain a certain definite rate of movement of the valve under different conditions of operation, inasmuch as the duty devolved upon such springs varies in accordance with the pressures in the refrigerating system, which are directly dependent upon the temperatures of the condensing medium, the amount of work being performed by the compressor, the amount of freezing medium in the system, and other conditions which fluctuate from time to time. To reduce the jar and noise when the valves operate and also to cushion the blow of the valve-disk upon its seat, it has been customary to employ independent cushioning or buffer-springs. These buffer-springs are designed to come into play at a definite part of the valve travel and exert a retarding action upon the valve. It often happens that after the springs have been in use for some time they change their physical condition, thereby producing an improper and imperfect cushioning action upon the valves, permitting them to engage their seats with considerable jar and noise. To remedy this, it has heretofore been necessary to remove the old cushioning-spring and to replace same by one properly adjusted.

In my improved arrangement it is not necessary to replace the buffer-spring, as means are provided for varying the relative position of the abutments between which said buffer-spring operates, so as to bring said spring

into play during any desired portion of the stroke of the valve. Furthermore, by my improved arrangement it is possible to use the same size of buffer-spring in valves employed with machines of different capacities, and operating under different pressures. Such an arrangement also permits the cushioning action to be delicately adjusted to produce the most satisfactory results. Furthermore, difficulty has been experienced in so fastening the valve-housing in position within the casing of the compressor that a gas-tight joint is obtained, while at the same time permitting a ready removal of the valve and its housing from said casing.

The invention therefore consists in one of its aspects of a valve having a working spring and a buffer-spring and means for independently adjusting the tension on the working spring and the limits of action of the buffer-spring.

The invention further comprises improvements in details of construction and combinations of parts of the valve and valve-housing, which will be hereinafter described, and more particularly pointed out in the appended claims.

In the accompanying drawings, which illustrate the preferred embodiment of the invention, Figure 1 is a vertical section through my improved valve-housing, showing the valve proper in elevation. Fig. 2 is a plan view of the valve with the bonnet removed.

Referring now to the drawings, the casing of the machine or compressor is indicated at 5 and has formed therein the passage-way 6, having the conical seat 7 at the inner end thereof. Against said seat rests the conical end 8 of the valve-housing 9, which is securely fastened in position, so as to make a gas-tight joint at the seat 7. Said fastening means comprises the annular member 10, threaded into the casing 5 at 11 and carrying the independently-adjustable bolts 12, which rest against the shoulder 13 of said valve-housing and force said housing tightly against its seat 7. Such a construction admits of the application of considerable pressure directly downward upon the valve-housing.

The valve-housing 9 is provided at its inner end with the valve-seat 14, against which seats the valve-disk 15, carrying the valve-

spindle 16. The spindle is reciprocally mounted in and is guided by the diaphragm 17, formed integral with or otherwise rigidly attached to the valve-housing. Said diaphragm is formed with the cylindrical extension 18, containing the working spring 19 and the cushioning or buffer spring 20 and also the abutments with which said springs coact. Said springs both rest upon the lower abutment 21, which is fixed in the cylindrical extension 18. The outer end of the spindle is threaded at 22 to receive the nut 23, which acts as the movable abutment co-acting with the cushioning-spring 20. This abutment 23 is adjustable upon the spindle and is locked in place by the jam-nut 24. The position of said abutment on the spindle fixes the point in the stroke of the valve at which the buffer-spring is called into play, and therefore when adjusted varies the cushioning effect brought to bear upon said valve. The nut 23 is also threaded at 25 to receive the nut 26, which acts as the movable abutment for the working spring 19. The nut 26 can be adjusted relative to nut 23 and spindle 16 to vary the tension on the working spring. It will thus be seen that the tension on the working spring 19 and the cushioning action of spring 20 may be independently adjusted. The nut 26 is locked in position by means of the key 27, held in place by screw 28. The movable abutments carried by valve-spindle 16 reciprocate freely in the cylindrical extension which acts as a guide for same and

as an additional guide for the valve-spindle. The valve-springs and housing are covered by the protecting-bonnet 29, fastened to the casing 5 by means of bolts 30.

In the appended claims I aim to cover all modifications of my invention which do not involve a departure from its spirit and scope.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination, a valve, a working spring for said valve, means for adjusting the tension of said spring, a buffer-spring for said valve, and means for independently adjusting the limits of action of said buffer-spring.

2. In combination, a valve-disk, a valve-seat, a spindle attached to said valve-disk, a working spring and a buffer-spring surrounding said spindle and supported between a relatively fixed abutment and abutments mounted on said spindle, and means whereby the relative positions of the abutments on said spindle may be changed so as to adjust independently the tension on the working spring and the limits of action of the buffer-spring.

In testimony whereof I affix my signature in the presence of two witnesses.

FREDERICK W. FELSBURG.

Witnesses:

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