

June 14, 1927.

C. W. VOLLMANN

1,632,155

GAS COMPRESSOR

Original Filed Feb. 15, 1922

Fig-1

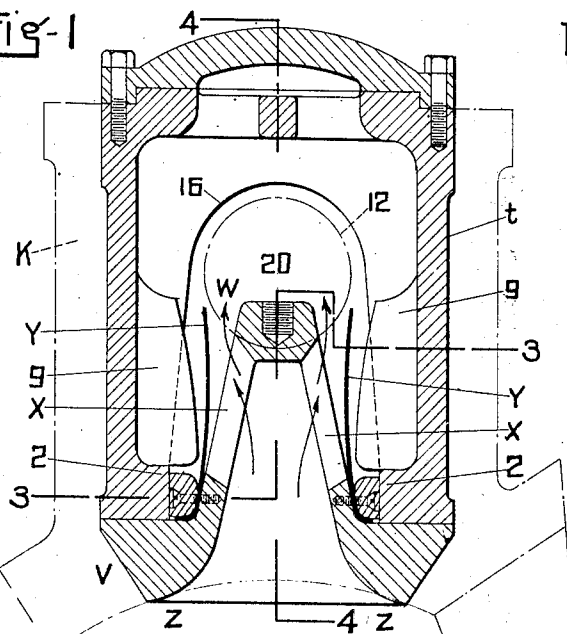


Fig-2

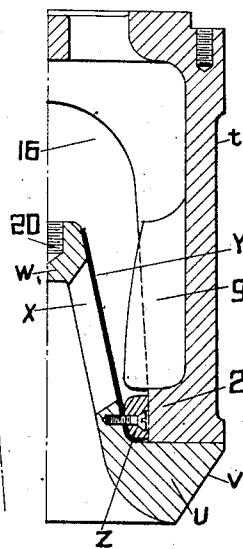


Fig-3

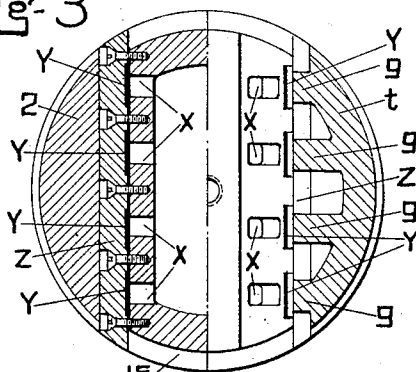


Fig-4

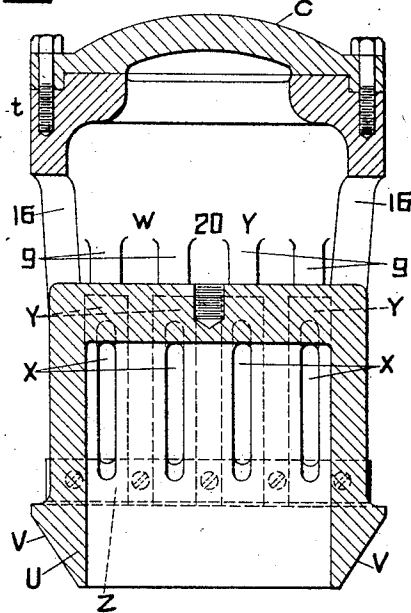
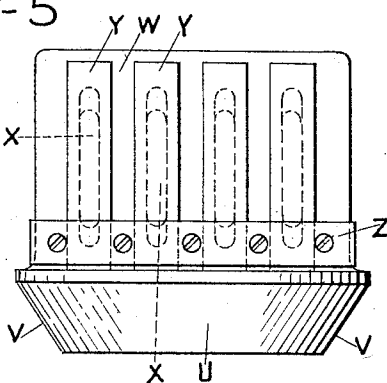


Fig-5



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GAS COMPRESSOR.

Original application filed February 15, 1922, Serial No. 536,626, and in Canada January 13, 1922.

Divided and this application filed November 7, 1923. Serial No. 673,283.

This invention relates to ammonia compressors and compressors for compressing air, carbonic acid gas or any other gaseous fluid requiring compression for manufacturing purposes; while the invention relates more particularly to the type of compressor in which flat steel springs are employed as valvular members.

The object of the invention is to increase the durability of the valves, ensure more efficient working thereof and increase the capacity of the valve and secure more perfect valvular action.

More specifically stated the invention consists of the construction, combination and particular arrangement of the parts of the discharge valves of a compressor of the type described in my pending application Serial No. 536,626 of which this is a divisional part. For full comprehension, however, of my invention reference must be had to the accompanying drawings in which similar reference characters indicate the same parts and wherein:

Figure 1 is an axial sectional view of a discharge valve constructed according to my invention, showing the check-valves in open positions;

Figure 2 is a similar view illustrating the check valves in closed positions;

Figure 3 is a transverse sectional view taken on line 3—3 Figure 1.

Figure 4 is an axial sectional view taken on line 4—4 Figure 1; and

Figure 5 is an elevation of the base member.

My improved discharge valve consists of a combined cylindrical discharge member and valve chamber or case *t*, the lower end of which is seated upon a circular base *u*, the configuration of the latter being converged as at *v* to fit the usual seat on the cylindrical cover. The base has a hollow tapered member *w* of substantially wedge form slotted to provide elongated parts *x*. Check valves in the form of flat steel spring valvular members *y* similar to the valvular members *p* are clamped to this base near one end of the slots by clamping bars *z*. These clamping bars are accommodated and clamped between the foot 2 of the cylindrical member *t* and the outer face of the wedge member. This hollow-wedge-like member *w* is slightly less in length than the diameter

of the housing *k*, and projects from the base *u* a sufficient distance to locate the contiguous ends of the ports *x* in close communication with a discharge port 12. Beds for supporting the valvular springs when thrown open in the discharge valve are indicated at 9.

Communication is effected between the valve chamber *t* and discharge port 12 by an outlet opening 16.

In order to increase the effective closing of the valves the bars *z* have the springs countersunk therein to slightly less than the full thickness of such springs. This countersinking also acts to prevent displacement of the springs from their proper engaging position relatively to the ports.

The flat top to the wedge-like member *w* has a screw-threaded hole 20 to permit a bolt to be screwed into it for the purpose of lifting the valves from its case.

The hollow tapered members *w* with their elongated ports impart to the valves the advantage of having maximum capacity for the flow within valves of given dimensions.

Operation.

During the operation of a compressor provided with my improved valves the force of discharge throws open the valvular springs to the position shown in Figure 1 and the flow of the fluid opens the valves by bending them away from the ports and as they are attached at the ends of the ports nearer the large discharge port 12. These valvular springs in opening are presented and supported substantially parallel to the line of flow as shown by the arrows in this figure thus offering minimum resistance. The supports 9 prevent these valvular members from being unduly sprung.

These supports for the valvular springs and the manner of attaching the springs with their attached ends upon the clamp increase the durability of the valves and ensure the more efficient working thereof; while the particular arrangement of these valves acting upon the outside of the wedge member *w* permits the valve seats to be readily machined and a perfectly tight joint to be secured between each valvular spring, and its seats, thus, with the particular arrangement of the valve mounting, securing maximum efficiency in operation. Another important

advantage is that the direct inward and outward flow from the ports x to the discharge port 12 affords relatively greater capacity than can be secured without the use of the hollow and wedge w or its equivalent.

Although I have illustrated and described the preferred embodiment of my invention many changes may be made in specific detail design and particular arrangement of devices and the relative dimensions thereof without departing from the spirit of my invention.

What I claim is as follows:—

In a gas compressor of the type described, the combination with a combined cylindrical discharge member and valve chamber, of a circular base with converged lower side, such base having a hollow upwardly tapered

member having in its sides parallel elongated ports, the lower end of such upwardly tapered member being spaced from the interior of the cylindrical member, flat steel spring check valves controlling the parallel elongated ports and having their lower ends within the said spaces, clamping bars accommodated within the said spaces and clamping the lower ends of the steel spring valves, the discharge member having a discharge opening in its side and an open top, a cap removably secured over the open top, and the top of the tapered member being flat and having a screw-threaded hole for the purpose set forth.

In testimony whereof I have signed my name to this specification.

CARL W. VOLLMANN.