

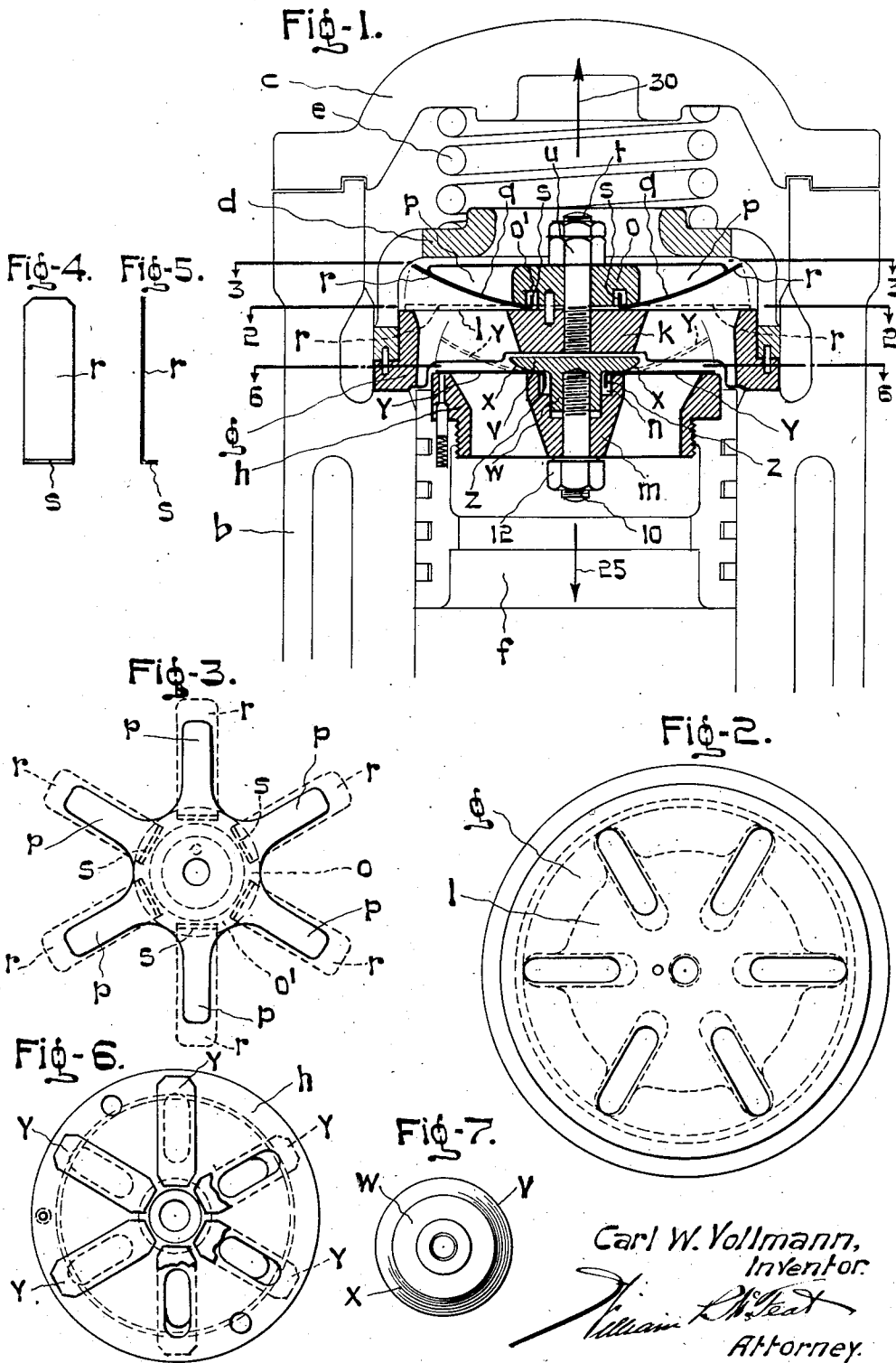
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VALVE FOR GAS COMPRESSORS

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VALVE FOR GAS COMPRESSORS.

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My invention relates particularly to the valves of vertical ammonia compressors and has for its object to increase the durability of compressors of this type by reducing the chance of breakage of the steel blade valves.

To this end the invention consists of a particular construction and arrangement of a device whereby the blades are clamped in place and at the same time supported in their open position and prevented from being strained beyond their elastic limit.

More specifically speaking my improved device for clamping and supporting the blade-valves consists in the case of the discharge valves of a spider adapted to engage the inner ends of the blade-valves and be secured in clamping relation therewith, and having relatively long arms the sides of which towards the valves conform to the position of the latter when in full open position. Coacting with this discharge valve support is a second clamping device for the suction valves consisting of a disc secured in clamping relation with the inner ends of the suction valves and the periphery of the side thereof towards the valves conforming to the position assumed by the suction valves when in open position and thereby supporting the portions of these blades most liable to break.

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 compressor cylinder provided with my invention;

Figure 2 illustrates the discharge ports as they appear in plan view of the seat on section line 2—2 Figure 1;

Figure 3 is a plan view of the discharge valve spider as viewed on section line 3—3, the blade-valves being indicated in dotted lines;

Figure 4 is a plan view of one of the discharge valves;

Figure 5 is a side elevation of the discharge valve;

Figure 6 illustrates the suction ports as they appear in plan view of the seat on section line 6—6 Fig. 1, some of the suction valves being shown in position; and

Figure 7 is a plan view of the underside of the clamping disc for the suction valves.

The cylinder *b* and head *c*, valve cage *d*,

spring *e* and piston *f* are of the usual construction and arrangement in double piston vertical ammonia compressors and cognated with my invention only in that the new parts combine therewith in the performance of their functions.

The discharge valve seat is indicated at *g* and the suction valve seat at *h*. To accommodate and coact with my improved clamping supports the hub *k* of the discharge seat has a flat horizontal upper face *l* and the hub *m* of the suction discharge seat has its upper end chambered as at *n* and this chamber is extended radially while the face of the upper end of the hub is flat and horizontal.

The spider by which the discharge valves are clamped and supported consists of a hub *o* with radial arms *p*, the undersides of which are curved as at *q* to conform to the position assumed by the discharge valves *r* when thrown to open position; while the underside of this hub has a concentric circular chamber *o*¹, the valves consist of oblong spring steel blades having their inner ends turned upwardly as at *s* and accommodated in the circular chamber *o*¹. This spider is clamped in place by a bolt *t* threaded in the hub *k* and having clamping nuts *u* locking the spider in place. The arms *p* are relatively long, extending to within a short distance of the ends of the valves when in contact therewith.

The disc clamp for fastening in place and supporting the suction valves consists of a disc *v* having a hub *w* and the underside *x* of the periphery of the disc being curved to conform to the position assumed by the inner ends of the suction valves *y* when in open position. These valves like valves *r*, are in the form of resilient steel blades and have their inner ends bent downwardly as at *z*. When the suction valves are assembled, the valves are placed with their turned down inner ends in the chambers *n* over which the clamping disc is seated with its hub in a chamber of hub *m* and a bolt 10 and a clamp nut 12 are employed to secure the parts together and to the hub *m*.

Operation.

As the piston moves in the direction indicated by arrow 25 on the suction stroke the valves *y* lift from their seats and the valves *q* are seated, while on the delivery stroke indicated by arrow 30 valves *r* are thrown

open and valves *y* are seated. This is as usual. With my invention the valves *r* which have in the past been of considerable trouble, because of distortion or breakage, are now protected by being received upon and supported in their full open position by the curved faces of the spider-arms *p*, thus preventing them from being sprung beyond their elastic limit and damaged. The inner and relatively fragile portion of the valves *y* are also, in a like manner, supported by the periphery of the disc *x*.

What I claim is as follows:

1. In a compressor, the combination with a valve cage, of a valve seat having a hub presenting a flat face, spring steel valves having their inner ends located within the area of the hub and turned or bent at right angles to their main length, and a chambered device for accommodating the turned ends of the spring valves, and means coacting with the chambered device for clamping the turned ends of the valves in place.

2. In a compressor of the type described, a valve seat presenting a flat face with radial valvular openings and a hub disposed in close proximity to the middle of the valve

seat and having radial arms with their sides towards the valve seat curved away from the latter, such hub having a circular chamber *o*¹ and a series of discharge valves having their inner ends turned upwardly and accommodated in the chamber for the purpose of augmenting the clamping of the valves in place, and means for clamping the hub to the seat.

3. In a compressor of the type described, a valve seat having a hub presenting a flat face, a series of flat spring steel valves in the form of blades, such blades lying on the valve seat with their inner ends lying upon the hub, a disc lying upon the flat face of the hub and having its underside upwardly curved and means whereby the disc clamps the inner ends of the valves on the hub consisting of the flat upper side of the hub being chambered, the valves having their inner ends turned down and engaged in the chamber and means for clamping the disc to the hub.

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

CARL W. VOLLMANN.