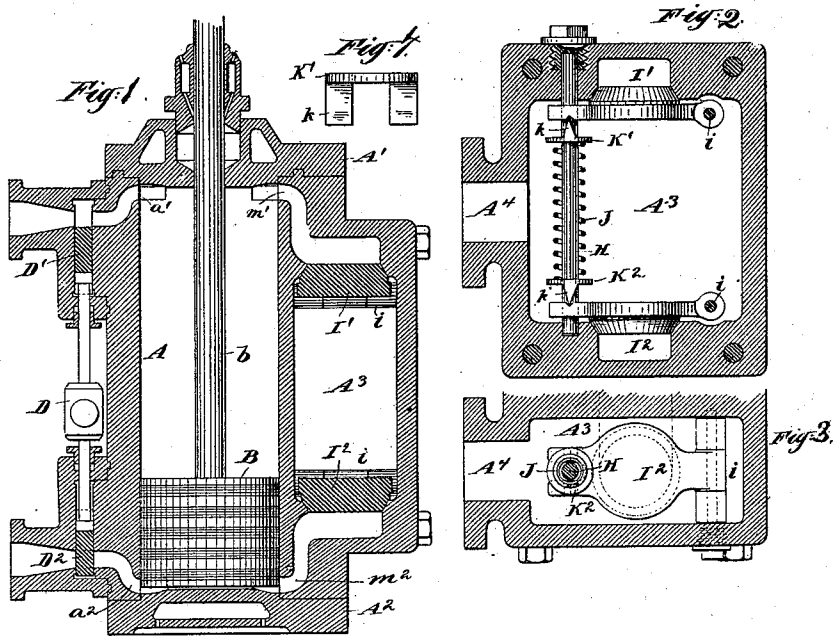


(No Model.)

P. DIETER.
VALVE FOR GAS COMPRESSORS.

No. 471,787.

Patented Mar. 29, 1892.



Witnesses:
Charles R. Searle.
Rae Harrison.

Inventor:
Peter Dieter
by his attorney
Thomas D. Jones

UNITED STATES PATENT OFFICE.

PETER DIETER, OF BROOKLYN, NEW YORK.

VALVE FOR GAS-COMPRESSORS.

SPECIFICATION forming part of Letters Patent No. 471,787, dated March 29, 1892.

Application filed April 7, 1891. Serial No. 388,024. (No model.)

To all whom it may concern:

Be it known that I, PETER DIETER, a citizen of the United States, residing in Brooklyn, Kings county, in the State of New York, have invented a new and useful Improvement Relating to Valves for Gas-Compressors, of which the following is a specification.

The compressor is intended more particularly for compressing ammonia in the gaseous or, more properly, vaporous condition to be afterward cooled and condensed into liquid form for subsequent expansion for the production of cold in refrigerating-machines, and the invention will be described as thus applied.

The invention relates to the valves and other connections, as will be fully set forth in the claim.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a central vertical section through the compressor. Fig. 2 is an elevation of the valves with a vertical section of the valve-chest, seen from the right in Fig. 1. Fig. 3 is a horizontal section. Fig. 4 is on a larger scale and is an elevation of one of the bearing-pieces by which, with the aid of the guiding-bolt extending loosely through its center, a spring is connected with the respective valves and transmits a sufficient and practically constant force thereto tending to hold the valve gently closed.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is the body of the compressor, A' the upper head, and A² the lower head. Each head is hollow and is equipped for allowing an active circulation of cold water to convey away the heat generated by the compression of the gas. The gas is received through the ports a' a², which ports are opened and closed at the right periods by flatslides or gates D' D², which are fitted to match tightly against the seats on their outer faces. The connected stem which operates each slide extends through a stuffing-box. I have used these stems as connected directly together and worked by a single eccentric, and prefer to so use them, arranging proportions and the motions with reference to

what is in steam-engineering called "lap and lead," so that a single eccentric will open and close both valves at the right period; but two eccentrics, each connected to one valve independently, may be used, if preferred.

B is the piston of the compressor, and b the piston-rod playing through a stuffing-box, with provisions for lubricating liberally. It receives motion through a forked connection from a crank C² on the main shaft, (not shown,) which is powerfully rotated by a steam-engine on the opposite side of the frame and acting through a crank-pin C'. At each descent of the piston B the gas is drawn in through the port a', the valve D' in which is then open. At each ascent of the piston B the valve D' is closed and the gas is compressed. A corresponding operation takes place below the piston, the gas being drawn in through the port a² during the ascent of the piston and compressed during its descent. The motions of the valves D' D² are so timed that the thin gas will be allowed to come in freely so soon as the pressure in its respective end of the cylinder is sufficiently reduced to allow it, and will be forbidden to return so soon as the return motion of the piston commences to raise the pressure.

The ports through which the compressed ammonia is expelled alternately are marked the uppermost m' and the lowermost m². They communicate with the valve-chest A³, which serves to discharge the compressed ammonia through a pipe connected to the nozzle A⁴.

I' I² are self-acting valves opening inward in the valve-chest A³, each turning on its respective axis i, arranged as shown. In the opening motion each valve moves toward its mate. A single helical spring J, guided by a fixed rod H, acts on the two valves through the medium of a peculiarly-constructed bearing-piece.

K' is the upper bearing-piece and K² is the lower. Each receives the force of the spring and is so loosely fitted on the bolt H that it has a little liberty for lateral movement. Each is provided with a knife-edge k, which rests in shallow bearing-grooves in the proper faces of two parallel arms formed integral with the respective valve and loosely embrac-

ing the guide-rod H between them. The gently-descending force of the spring J is communicated through the knife-edges to the upper valve I', and the lower bearing-piece K² communicates a corresponding force through its knife-edges to the lower valve I². The gravity of the upper valve I' tends to hold it open. The pressure of the spring must be a little more than sufficient to overcome the gravity of this valve and induce a sufficient closing force on both valves.

It will be observed that my arrangement allows by liberty for lateral movement of the bearing-pieces K and their slight tilting for the circular movement of each valve around its axis *z*, while the spring J is efficiently guided by the rod to insure its being kept in

position and serving always in the proper line to promptly and gently close each valve.

I claim as my invention—

In a gas-compressor, the valves I' I², turning on hinges and provided each with parallel arms, in combination with each other and with the guide-rod H, helical spring J, and bearing-pieces K' K², arranged for joint operation as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

PETER DIETER.

Witnesses:

CHARLES R. SEARLE,
M. F. BOYLE.