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N. A. CHRISTENSEN.
COMPRESSOR VALVE.
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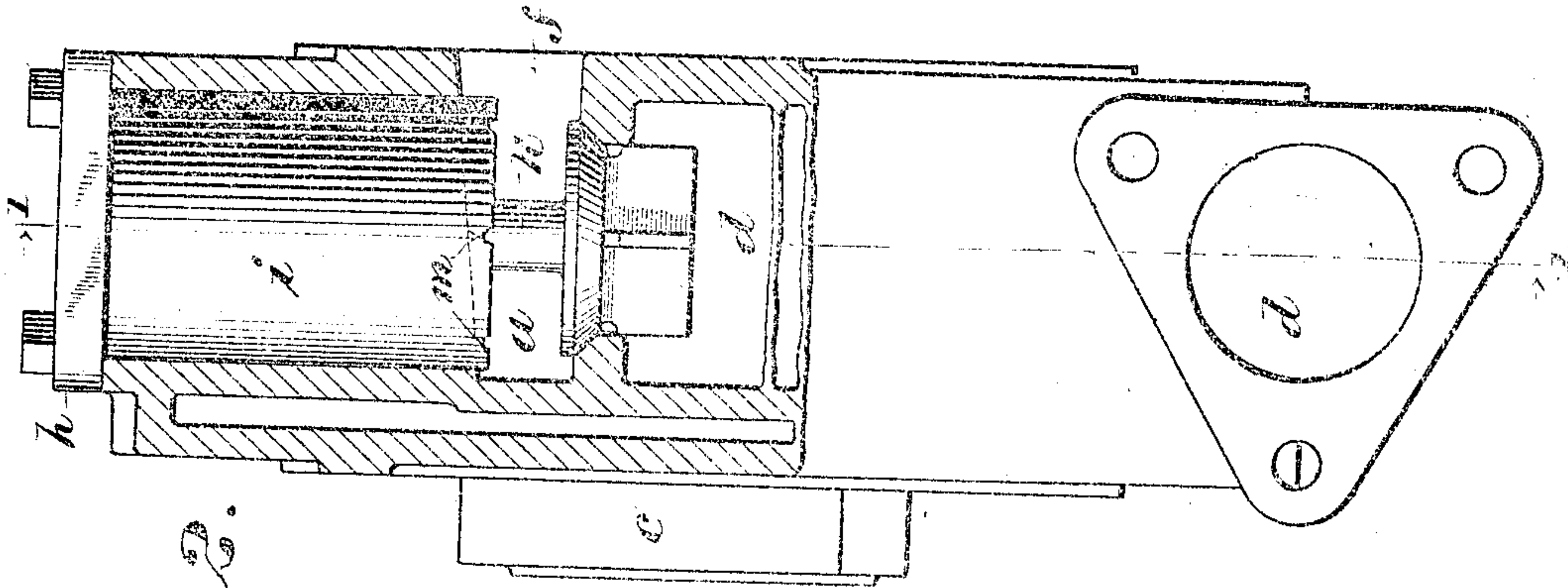
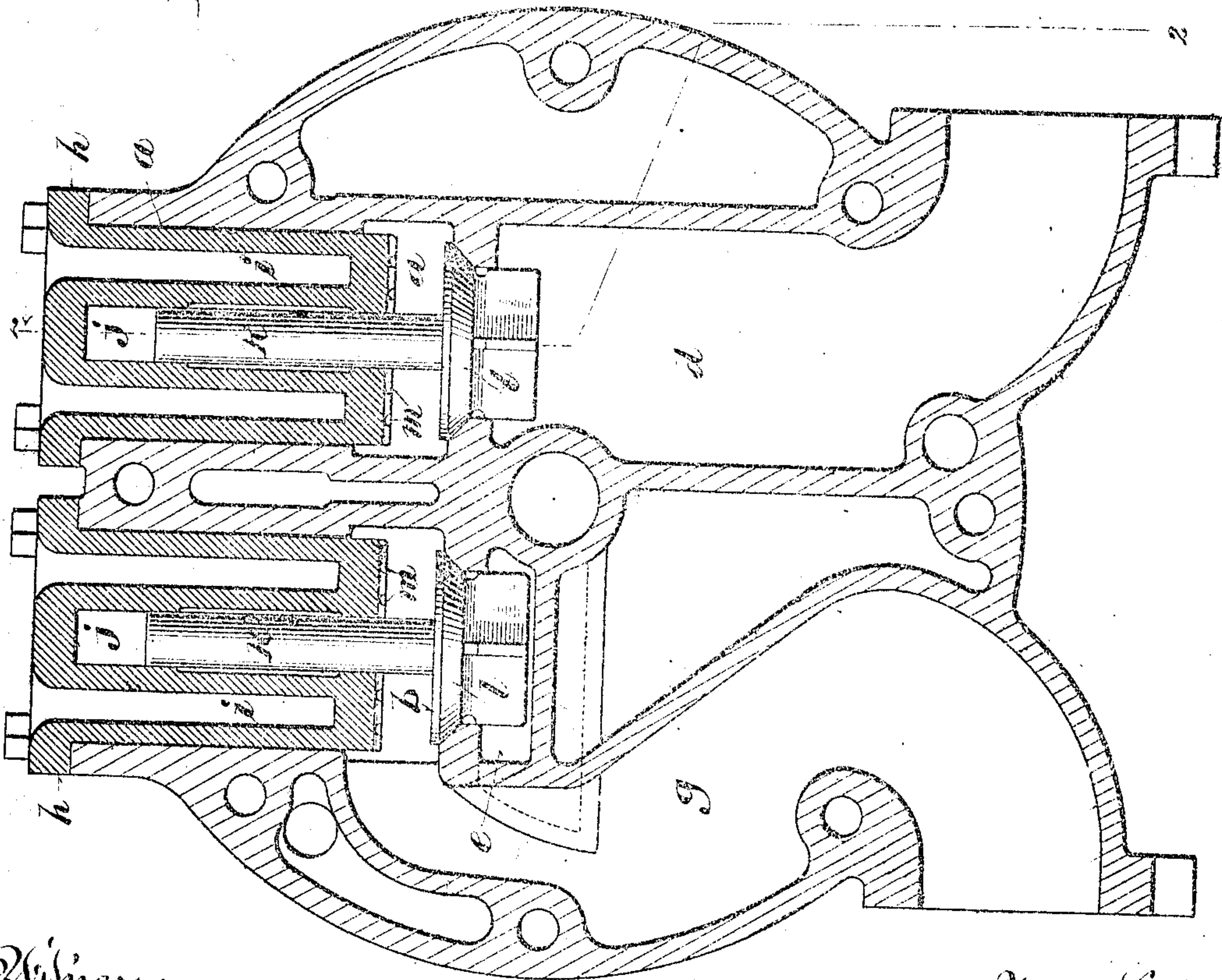


Fig. 2.



Witnesses:
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Fig. 1.

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UNITED STATES PATENT OFFICE.

NIELS A. CHRISTENSEN, OF MILWAUKEE, WISCONSIN.

COMPRESSOR-VALVE.

No. 849,597.

Specification of Letters Patent.

Patented April 9, 1907.

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To all whom it may concern:

Be it known that I, NIELS A. CHRISTENSEN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Compressor-Valves, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates particularly to compressors which have automatic valves actuated by changes in pressure and are designed to operate on air or elastic fluids and in which it is desirable to reduce the clearance-space as much as possible, particularly when high pressures are to be produced and maintained. Its main objects are to reduce the clearance-space, to make the suction and discharge valves interchangeable, thus preventing increase of the clearance-space if the valves are accidentally misplaced and avoiding the necessity of making and keeping on hand two kinds of valves, and generally to improve the construction and operation of compressors of this class.

The invention consists in certain novel features of construction and in the peculiar arrangement of parts hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in both figures.

Figure 1 is a vertical section of one head of a compressor to which my improved valves are applied in a plane indicated by the line 1 1, Fig. 2, perpendicular to the axis of the cylinder and cutting the suction and discharge valve chambers lengthwise and centrally; and Fig. 2 is a vertical longitudinal section in a plane indicated by the line 2 2, Fig. 1, cutting the suction-valve chamber lengthwise and centrally.

a and *b* designate the suction and discharge valve chambers, which in the present case are shown as formed side by side in a head *c* of a compressor-cylinder. They are open at their upper ends, and at their lower ends valve-seats are formed or provided around ports, one of which on the suction side communicates with the air inlet or supply passage *d* and the other on the discharge side with a port *e*, opening directly into the compressor-cylinder. Above the valve-seat on the suction side the valve-chamber *a* communicates through a port *f* directly with the compressor-cylinder, and above the valve-seat on the discharge side the chamber *b*

communicates with the outlet or discharge passage *g*. The valve-chambers are closed at their upper ends by caps or covers *h*, bolted or otherwise secured thereto and formed or provided with plugs *i*, which extend downwardly into and fill the valve-chambers to within a short distance of the valve-seats at their lower ends.

The plugs *i* are formed with central vertical sockets *j*, in which the stems *k* of the suction and discharge valves *l* are fitted and guided. These valves are of the disk or puppet type and are preferably formed below their beveled working faces with guiding-wings, as shown. The lower ends of the plugs *i*, which constitute stops for limiting the lift or upward movement of the valves, are preferably provided with grooves *m* to prevent the valves from sticking thereto. The plug *i*, nearly filling the suction-valve chamber *a*, which is in constant communication with the compressor-cylinder, reduces the clearance-space of the compressor, just enough space being left between the lower end of the plug and the valve-seat to allow for the required lift or opening of the suction-valve. The sockets *j*, formed in the plugs *i*, afford long guiding-bearings for the valve-stems and serve to hold the valves securely in the proper relation to their seats. The valves, as well as the covers and plugs, with their guiding-sockets, are made exactly alike, so that if they are accidentally interchanged or misplaced the clearance-space will not be increased and the operation of the compressor will not be affected.

Various changes in minor details of construction may be made within the principle and intended scope of the invention:

I claim—

1. In a compressor, the combination of a suction-valve chamber formed with an inlet below a valve-seat, and with a port above the valve-seat for constant communication with a compressor-cylinder, a plug projecting into and in cross-section filling the valve-chamber within a short distance of the valve-seat, and a suction-valve provided with a stem which is fitted and guided in said plug, substantially as described.

2. In a compressor, the combination of a discharge-valve chamber formed with a port below a valve-seat to open into a compressor-cylinder and a discharge-passage leading from the chamber above the valve-seat, a plug projecting into and in cross-section fill-

ing said chamber within a short distance of the valve-seat, and a discharge-valve provided with a stem fitted and guided in said plug, substantially as described.

5 3. In a compressor the combination of suction and discharge valve chambers provided with valve-seats, interchangeable plugs each adapted to project into and in cross-section fill the suction-valve chamber within a short
10 distance of its seat and formed with a socket,

and interchangeable suction and discharge valves having stems fitted and guided in the sockets of said plugs, substantially as described.

In witness whereof I hereto affix my signature in presence of two witnesses.

NIELS A. CHRISTENSEN.

Witnesses:

E. H. BOTTUM,
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