

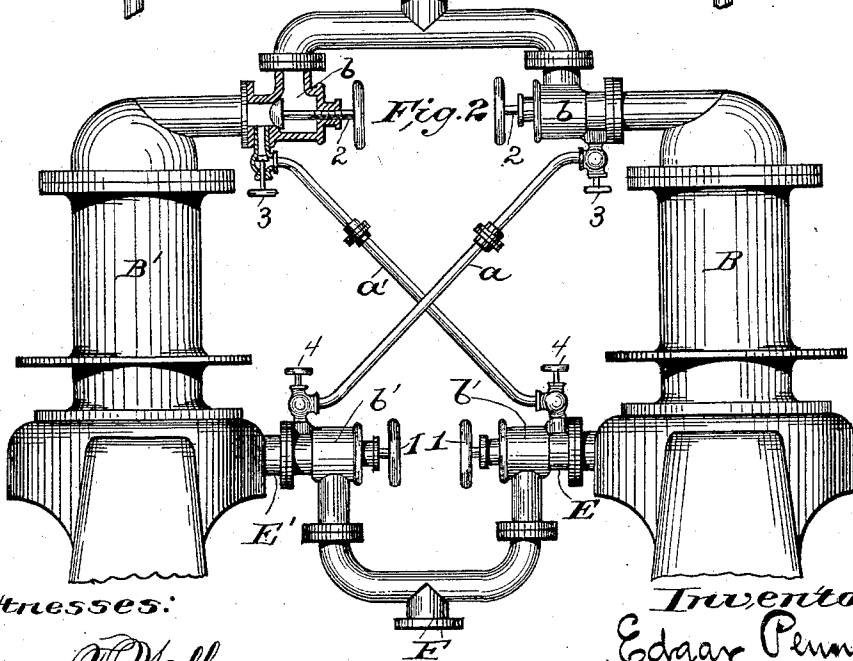
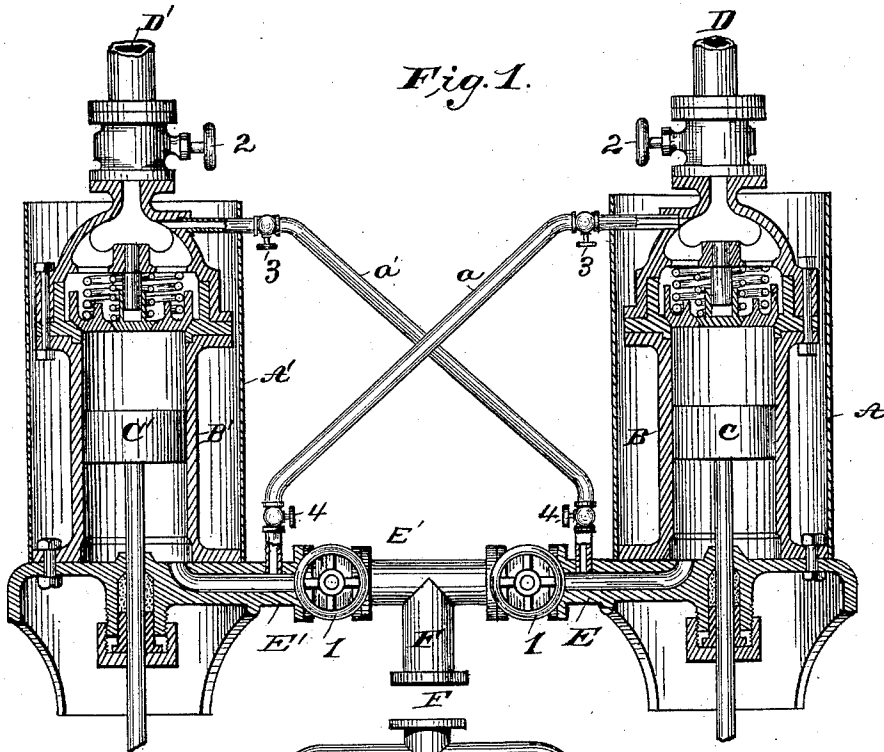
(No Model.)

E. PENNEY.

COMPRESSOR PUMP FOR REFRIGERATING MACHINES.

No. 416,072.

Patented Nov. 26, 1889.



Witnesses:

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# UNITED STATES PATENT OFFICE.

EDGAR PENNEY, OF WAYNESBOROUGH, PENNSYLVANIA.

## COMPRESSOR-PUMP FOR REFRIGERATING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 416,072, dated November 26, 1889.

Application filed January 19, 1887. Renewed May 28, 1889. Serial No. 312,370. (No model.)

*To all whom it may concern:*

Be it known that I, EDGAR PENNEY, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Compressor-Pumps for Refrigerating-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to double compressor-pumps for refrigerating apparatus.

It has for its object to provide such pumps with a construction whereby either one may be freed from gas quickly and without loss of material.

In order that my invention may be clearly understood, it is shown in the annexed drawings as applied to two forms of compressor-pumps, and will be fully described in the ensuing specification and distinctly pointed out in the claims at the close thereof.

Referring to the drawings, Figure 1 represents a vertical section of the cylinders of a double compressor-pump with my invention applied thereto. Fig. 2 represents an elevation of another form of double compressor-pump with my invention applied thereto, two of the valves being shown in section to more clearly show their construction.

In Fig. 1 of the drawings, A A' designate the two pumps, B B' the pump-cylinders, and C C' the pistons of said pumps. D D' are the outlet-pipes of said pumps. The inlet-pipes are E E', connecting with a common pipe F. Each inlet-pipe is provided with a cock 1 1, by which the passage of the gas into the cylinders may be regulated or cut off when desired. The outlet-pipes of the cylinders are provided with cocks 2 2, which control the outlet from the pumps. These cylinders have the usual dome and discharge-valves. Each cylinder has a pipe connecting with the upper part of the same, preferably above the discharge-valve of the cylinder and below the cock 2, and also connecting with the inlet-pipe of the other cylinder between cock 1 and the cylinder. The pipes *a a'* are provided with cocks 3 and 4. It is not necessary that

the pipes *a a'* should have more than a single cock, though I prefer to provide them with two, as shown. The cocks 4 may be made in the form of check-valves, if preferred. The pipes *a a'* are normally closed.

In case it is desired to free the cylinder A' at the left from gas, its inlet and outlet pipes are closed by turning cocks 1 and 2. The cock 3 in pipe *a'* is opened, and cock 4, when employed, put into operative condition and the pump continued in operation. The piston in pump A' will then force the gas out through pipe *a'*, and pump A will draw the same from the pipe *a'*, with the gas supplied by the inlet-pipe E. A few reciprocations of the pistons of the pumps serve to clear the cylinder of pump A' of gas when the cocks 3 and 4 in pipe *a'* are closed, so that the pump A' may be opened for repairs or any purpose desired. The cylinder of pump A may be freed from gas in a similar manner.

In Fig. 2 I have shown the domes of the cylinders provided with lateral discharge-pipes. These pipes are connected with valve-chambers *b* of the form shown, which in turn connect with short pipes leading to a common discharge-pipe. A similar construction is employed in the inlet-pipes, the valve-chambers of which are shown at *b'*. The pipes *a a'* are connected to the valve-chambers *b* and *b'* between the valve-seat and the cylinder. This arrangement permits the removal of the dome by detaching it from the cylinder and from the valve-chamber *b* without disturbing the pipes *a a'*.

I do not limit myself to the application of my device to pumps having two compressing-cylinders, as it may be applied to such pumps having more than two cylinders; nor do I limit myself to the exact construction of parts, as they may be considerably varied without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with a series of single-acting compressor-pumps, said series consisting of two or more of such pumps, each cylinder being provided with a supply-passage independent of the other cylinders, of a passage connecting the outlet of one cylinder

with the inlet of another, and positive controlling-valves in said passage, substantially as described.

2. The combination, with a series of single-acting compressor-pumps, said series consisting of two or more of such pumps, each cylinder being provided with a supply-passage independent of the other cylinders and valves controlling said supply-passages, of passages connecting the discharge end of each cylinder with the supply end of another cylinder between the valve in the supply-passage and the cylinder, substantially as described.

3. The combination, with a series of compressor-pumps, said series consisting of two or more such pumps provided with inlet and outlet cut-off cocks, of passages connecting each pump-cylinder above the discharge-valve and below the cut-off cock with the inlet of another cylinder, and cocks in such connecting-passages, substantially as described.

4. The combination, with a series of pump-cylinders, said series consisting of two or more, each of said cylinders being provided with an

inlet at one end and an outlet at the other end, said inlet and outlet having cut-off cocks, of pipes communicating with the outlet of each cylinder above the discharge-valve, and also communicating with the inlet of another cylinder, and cocks in such communicating pipes, substantially as described.

5. The combination, with a series of pump-cylinders, said series consisting of two or more, each of said cylinders being provided with inlet and outlet cut-off cocks, each cylinder having also a dome detachably connected to the cylinder and with the outlet-pipe, of pipes communicating with the outlet-pipe of each cylinder between the cut-off cock and the dome, and also communicating with the inlet of another cylinder and cocks in such communicating pipes, substantially as described.

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

EDGAR PENNEY.

Witnesses:

D. M. GOOD, Jr.,

C. E. BESORE.