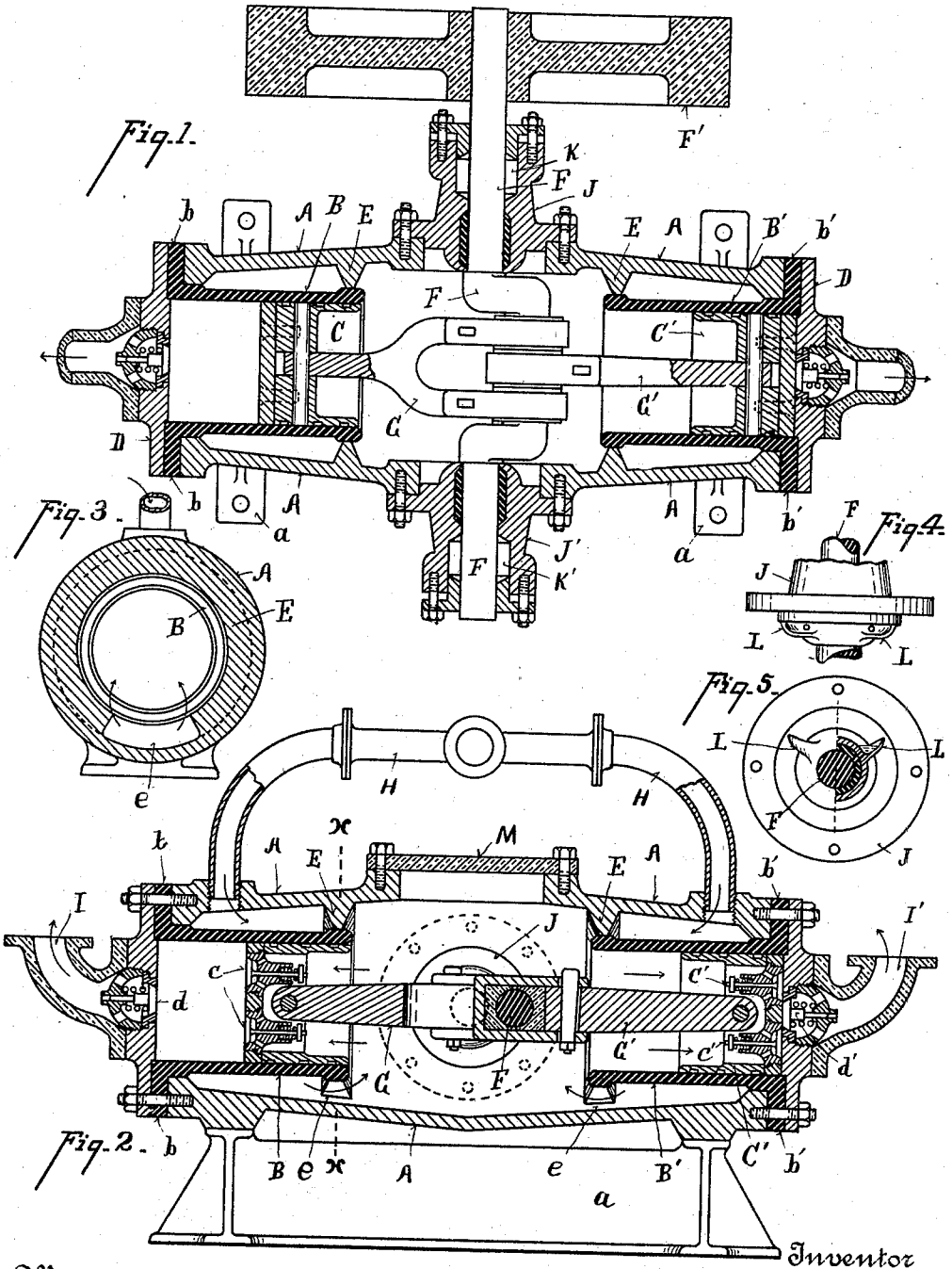
(No Model.)

S. S. MILES.

AIR OR GAS COMPRESSOR.

No. 591,137. Patented Oct. 5, 1897.



Witnesses
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UNITED STATES PATENT OFFICE.

STEPHEN S. MILES, OF CINCINNATI, OHIO.

AIR OR GAS COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 591,137, dated October 5, 1897.

Application filed July 9, 1896. Serial No. 598,589. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN S. MILES, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Air or Gas Compressors, of which the following is a specification.

My invention relates to air or gas compressors, and is particularly adapted to be used for refrigerating purposes. Its objects are, first, to provide a compressor the operative parts of which can be kept cool by the return gas and automatically lubricated by the oil circulated with said gas, and, second, in certain details of arrangement and construction, all of which will be fully set forth in the description of the accompanying drawings, in which—

Figure 1 is a central horizontal section through my compressor. Fig. 2 is a central vertical section through the same. Fig. 3 is a section on line *x x*, Fig. 2. Fig. 4 is a detail top plan view of one of the crank-shaft journals. Fig. 5 is an inside face view of the same, partly in section.

A represents the casing, which also serves as the main frame of the compressor; B B′, the cylinders; C C′, the plungers, and D D′ the cylinder-heads.

The casing A is of cylindrical form and is preferably mounted upon a bed-plate *a*. The cylinders, which are of plain tubular form, without jackets or other openings cast in their walls, are let into the ends of the casing and are secured thereto by means of stud-bolts passing through the flanges *b b′* at the outer ends of the cylinders, said stud-bolts also serving to clamp the cylinder-heads in place. The inner ends of the cylinders are preferably held in position by means of annular ribs E, cast with the casing A.

F represents the crank-shaft, F′ the driving-pulley, and G G′ pitmen connecting the plungers with the crank-shaft.

c c′ represent the inlet-valves, located in the plungers, and *d d′* the exit-valves, located in the cylinder-heads.

H represents a branch pipe through which the return gas is admitted at opposite ends through the wall of the casing.

I I′ represent the exit-passages, from which the gas is conveyed to the condenser by suitable piping.

The crank-shaft is mounted in journal-bearings formed in the removable head-plates J J′.

K K′ represent stuffing-boxes to prevent the passage of gas or air in either direction through the journals.

L represents oil-cups, preferably cast with and upon the inner faces of the head-plates J J′, the cups being provided with passages admitting oil into the journal-boxes, as shown in Figs. 4 and 5.

M represents a manhole by means of which the operative parts may be reached.

The mode of operation is as follows: A sufficient quantity of oil is supplied in the casing A, so that the crank-shaft and pitmen will dip in it at their lowest position. The pump is then started. The cool return gas enters through branch pipe H and passes around the cylinders and through the passage *e* in the rib E into the central chamber of the casing, from whence it passes through the inlet-valves *c c′* into the cylinder. From there it is forced by the plungers through exit-valves *d d′*, through passages I I′, and pipes to the condenser and is ultimately returned through pipe H. The oil in main frame is thrown by the crank-shaft and pitmen into the cylinders and onto the head-plates J J′, keeping the cylinders lubricated and supplying oil to the cups L, the oil and all parts of the compressor except the cylinder-heads being kept cool by the circulation of the return gas. A small quantity of oil works through the cylinders into the pipes and is finally returned with the gas through pipe H. The rib E may be omitted, but is preferably employed, as it serves to support the inner ends of the cylinders and also as a partition to direct the return gas and cause it to circulate entirely around the cylinders.

Considerable difficulty is experienced in casting cylinders without air-holes and otherwise suitable for gas-compression cylinders. These difficulties I reduce to a minimum by the construction herein shown. The cylinders and wearing parts are so arranged as to be readily produced and replaced without replacing the casing and inoperative parts.

Having described my invention, what I claim is—

1. In an air or gas compressor, the combination of a casing, a cylinder wholly inclosed in said casing and having an open end or mouth

projecting into said casing and its other end provided with a flange that closes that end of the casing, a cylinder-head that is bolted to the flanged end of the cylinder and also to the casing, there being an annular jacket-space between said cylinder and casing and wholly surrounding the said cylinder, an annular rib or partition between the casing and the inner end of the cylinder, said partition being provided with a passage for communication between the jacket-space and the main interior portion of the casing, a pipe for admission of return gas to the annular jacket-space and thence around the cylinder and to the casing through the passage in the annular partition, a plunger provided with an inlet-valve to the cylinder, an exit-valve in the head of the cylinder, and a pipe from said exit-valve to a condenser, substantially as described.

2. In an air or gas compressor, the combination of a casing having a cranked shaft centrally therein, cylinders projecting into opposite ends of said casing and wholly inclosed therein with intermediate annular jacket-spaces, annular ribs or partitions between the casing and the inner ends of said cylinders and each provided with a passage for communication between the jacket-spaces and the central portion of the casing, inlets for admission of return gas into the annular jacket-spaces to circulate around the cylinders and into the central portion of the casing, plungers carried by the central cranked shaft and provided with inlet-valves to the cylinders, exit-valves in the cylinder-heads, and pipes from said exit-valves to a condenser, substantially as described.

In testimony whereof I have hereunto set my hand.

STEPHEN S. MILES.

Witnesses:

WM. E. BROOKS,

C. W. MILES.