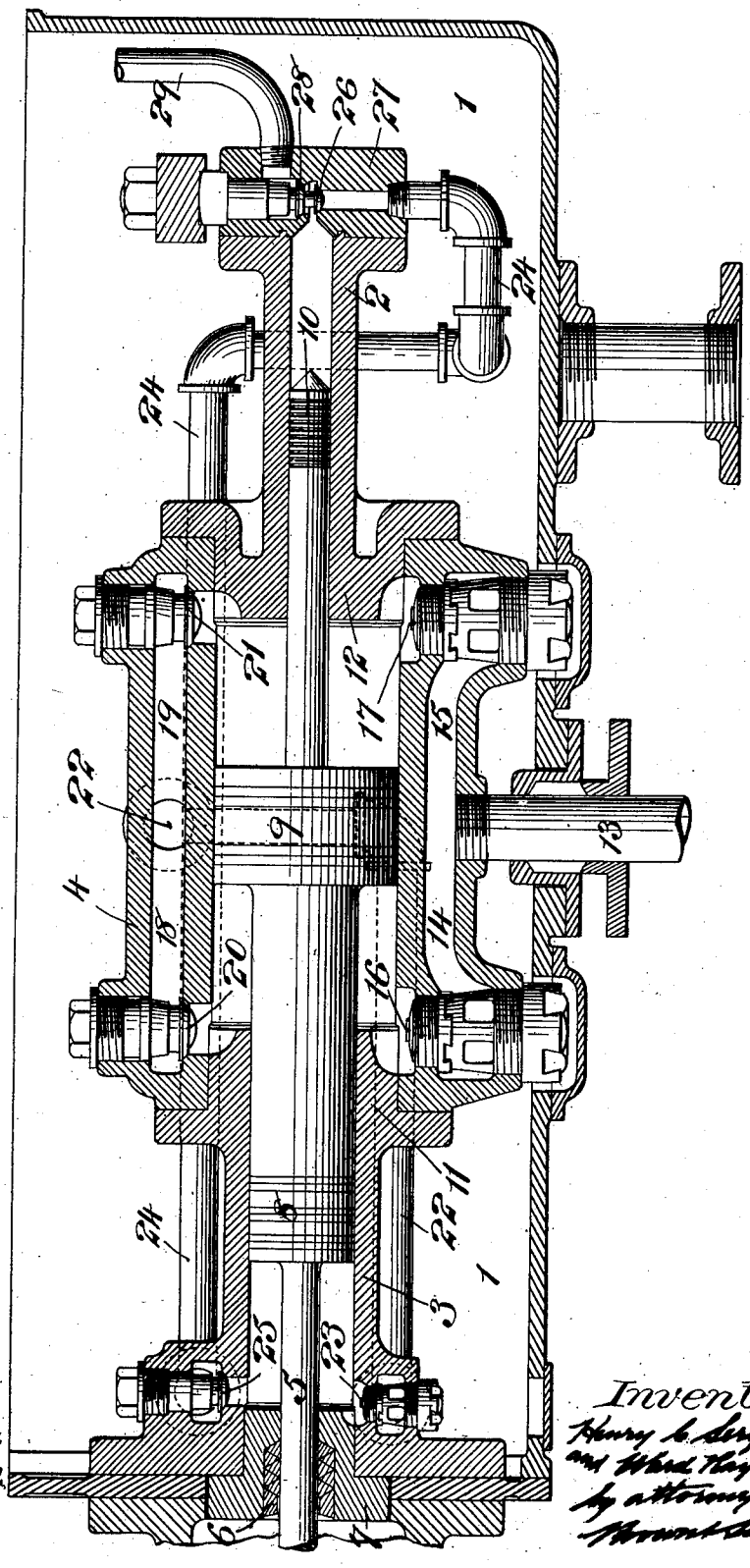
No. 745,298. PATENTED NOV. 24, 1903.

H. C. SERGEANT & W. RAYMOND.

COMPRESSOR FOR AIR OR OTHER AERIFORM BODIES.

APPLICATION FILED JAN. 23, 1903.

NO MODEL.



Witnesses.
George Barry.
Henry Pheine

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by attorneys
Mowat & Durand

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 745,298. Patented November 24, 1903.

UNITED STATES PATENT OFFICE.

HENRY C. SERGEANT, OF WESTFIELD, NEW JERSEY, AND WARD RAYMOND, OF EASTON, PENNSYLVANIA, ASSIGNORS TO THE INGERSOLL-SERGEANT DRILL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF WEST VIRGINIA.

COMPRESSOR FOR AIR OR OTHER AERIFORM BODIES.

SPECIFICATION forming part of Letters Patent No. 745,298, dated November 24, 1903.

Application filed January 23, 1903. Serial No. 140,206. (No model.)

To all whom it may concern:

Be it known that we, HENRY C. SERGEANT, a resident of Westfield, in the county of Union and State of New Jersey, and WARD RAYMOND, a resident of Easton, in the county of Northampton and State of Pennsylvania, citizens of the United States, have invented a new and useful Improvement in Compressors for Air or other Aeriform Bodies, of which the following is a specification.

This invention relates to what are known as "compound" compressors.

The object of this invention is to provide certain improvements in the construction, form, and arrangement of the several parts whereby a simple, strong, and effective structure is provided for use as a high-power compressor.

This invention consists in a compressor comprising a high-pressure cylinder, an intermediate-pressure cylinder, and a low-pressure cylinder placed between the two and in alinement therewith, pistons for the three cylinders connected to move together, and means for operating the pistons.

A practical embodiment of our invention is represented in the accompanying drawing, in which the compressor is shown in longitudinal central section together with its tank, the pistons being shown at points half-way between the limits of their strokes.

1 designates the tank within which the compressor is located, the tank being intended to contain water for keeping the several parts of the compressor at an even temperature.

The compressor as a whole comprises a high-pressure cylinder 2, an intermediate-pressure cylinder 3, and a low-pressure cylinder 4, placed in alinement with one another, the low-pressure cylinder being located between the high-pressure cylinder and the intermediate-pressure cylinder.

A single operating-rod 5 passes through a suitable stuffing-box 6 in the outer head 7 of the intermediate-pressure cylinder 3, which operating-rod 5 is developed into a piston 8 for the intermediate-pressure cylinder, a piston 9 for the low-pressure cylinder, and a piston 10 for the high-pressure cylinder.

A common head 11 is provided for the adjacent ends of the intermediate-pressure cylinder 3 and low-pressure cylinder 4, and a common head 12 is provided for the adjacent ends of the high-pressure cylinder 2 and the said low-pressure cylinder 4. These three cylinders are rigidly secured together, thus insuring their proper alinement. The low-pressure cylinder is represented as double-acting, and the high-pressure cylinder and intermediate-pressure cylinder are represented as single-acting.

The arrangement of the inlet and outlet and the several valves of the compressor is as follows: A main inlet-pipe 13 for the fluid to be compressed is in communication with a duct 14 15 in the wall of the low-pressure cylinder, the branch 14 of which duct leads to an inlet-valve 16 at one end of the low-pressure cylinder, and the branch 15 of the said duct leads to an inlet-valve 17 at the other end of the said low-pressure cylinder.

A discharge-duct 18 19 for the low-pressure cylinder is located in the wall of the said cylinder, the branch 18 of which leads to a discharge-valve 20 at one end of the cylinder, and the branch 19 of which leads to a discharge-valve 21 at the other end of the cylinder.

A tube 22 leads from the low-pressure cylinder discharge-duct 18 19 to the inlet-valve 23 at the outer end of the intermediate-pressure cylinder 3. A tube 24 leads from the discharge-valve 25 at the outer end of the intermediate-pressure cylinder 3 to an inlet-valve 26 in the outer cylinder-head 27 of the said high-pressure cylinder. A discharge-valve 28 is also located in the cylinder-head 27 of the high-pressure cylinder, which discharge-valve controls the escape of the compressed fluid into the discharge-pipe 29, from which the compressed fluid may be fed to a reservoir or other point. (Not shown herein.)

It is to be understood that the several valves herein mentioned may be made of any suit-

able form to suit the work to which they are subjected and may be provided with the usual valve boxes and seats.

In a compressor constructed as herein described we are enabled to provide a single operating-rod and stuffing-box for the three pistons, thus permitting only one point through which the fluid being compressed can escape to the atmosphere. By making the low-pressure cylinder double-acting and locating the high-pressure cylinder upon one side thereof and the intermediate-pressure cylinder upon the other side thereof, all in alinement, we are enabled to proportion the several cylinders so that for economical working the maximum strains in both directions are substantially equal and the average pressure or mean effective pressure is also nearly constant in both directions, thereby causing a smoothly-working machine. Furthermore, the capacity of the machine is not affected by the leakage of fluid by the high-pressure and intermediate pistons occurring during the compression strokes as the fluid passes back into the compression side of the low-pressure cylinder. By combining the three cylinders we are enabled to get them into a much smaller space than has been possible heretofore, and the construction at the same time is very rigid.

What we claim is—

1. A compressor comprising a high-pressure cylinder, an intermediate-pressure cylinder and a low-pressure cylinder placed between the two and in alinement therewith, pistons for the three cylinders connected to move together and means for operating the pistons.

2. A compressor comprising a single-acting high-pressure cylinder, a single-acting intermediate-pressure cylinder, and a double-acting low-pressure cylinder placed between the two and in alinement therewith, pistons for the three cylinders connected to move together and means for operating the pistons.

3. A compressor comprising a high-pressure cylinder, an intermediate-pressure cylinder, a low-pressure cylinder, pistons therefor, connected to move together, means for operating the pistons, a common cylinder-head for the adjacent ends of the high and low pressure cylinders and a common cylinder-head for the adjacent ends of the intermediate and low pressure cylinders.

In testimony that we claim the foregoing as our joint invention I have signed my name, in presence of two witnesses, this 2d day of January, 1903.

HENRY C. SERGEANT.

Witnesses:
FREDK. HAYNES,
C. S. SUNDGREN.

In testimony that we claim the foregoing as our joint invention I have signed my name, in presence of two witnesses, this 10th day of January, 1903.

WARD RAYMOND.

Witnesses:
ROBERT A. HAMILTON,
H. D. MAXWELL.