

No. 788,071.

PATENTED APR. 25, 1905.

D. SCHIFFBAUER.
COMBINED ENGINE AND AIR COMPRESSOR.

APPLICATION FILED OCT. 17, 1904.

Fig. 1.

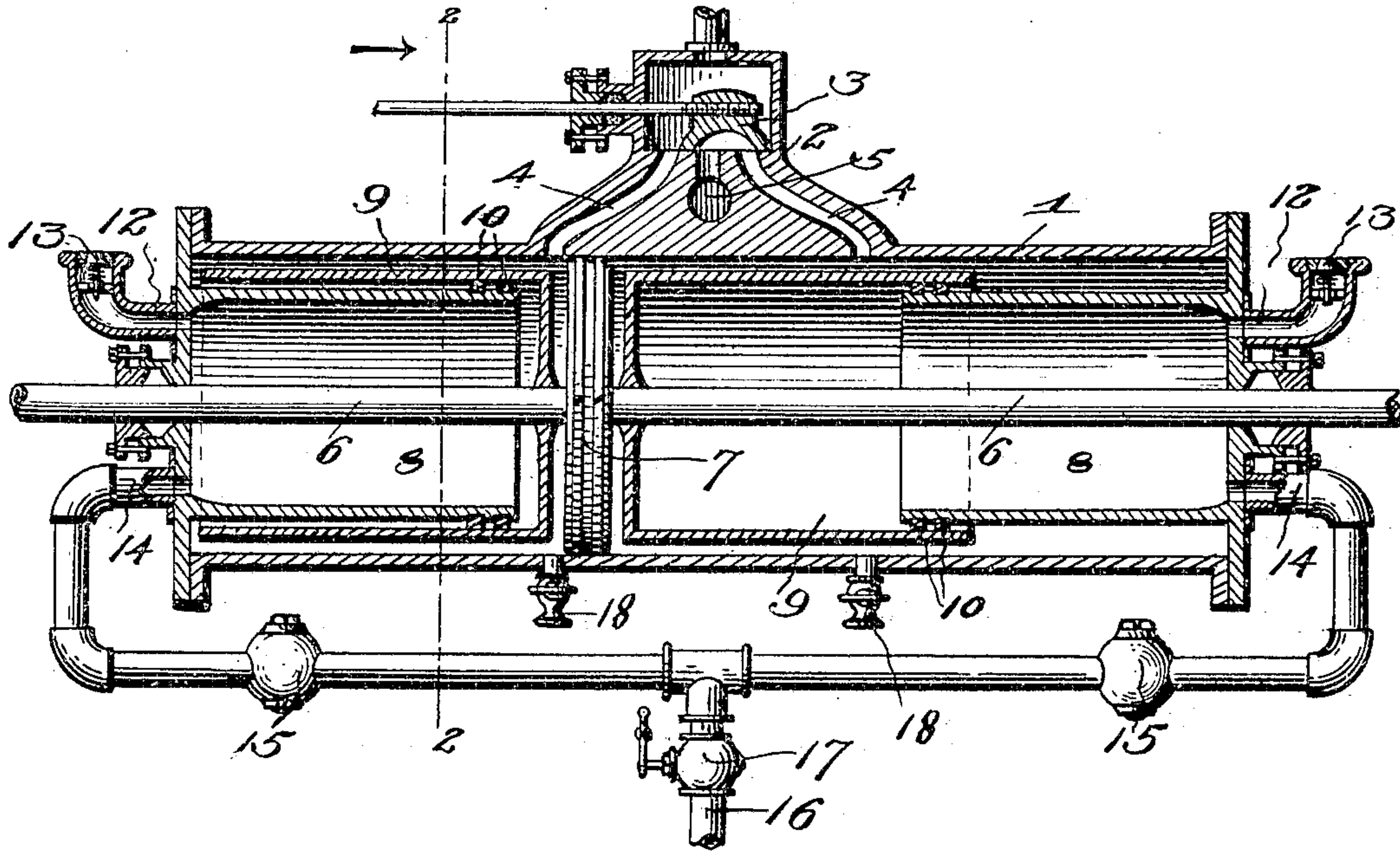
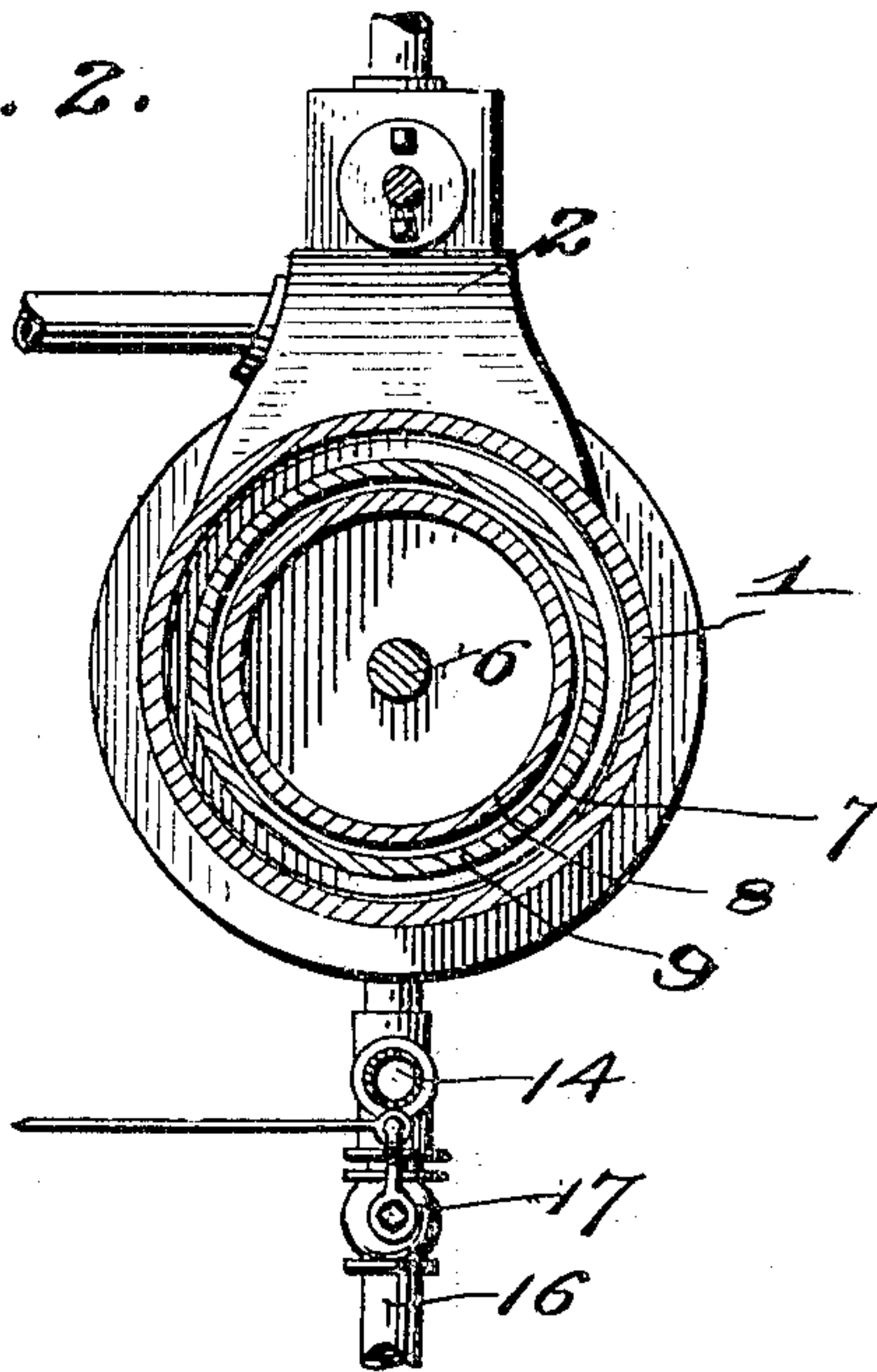


Fig. 2.



Witnesses
C. E. Hunt.
C. H. Griesbauer.

Inventor
Daniel Schiffbauer.
by *A. B. Wilson*
Attorney

UNITED STATES PATENT OFFICE.

DANIEL SCHIFFBAUER, OF STAUFFER, PENNSYLVANIA.

COMBINED ENGINE AND AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 788,071, dated April 25, 1905.

Application filed October 17, 1904. Serial No. 228,827.

To all whom it may concern:

Be it known that I, DANIEL SCHIFFBAUER, a citizen of the United States, residing at Stauffer, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in a Combined Engine and Air-Compressor; and I do 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.

This invention relates to improvements in a combined engine and air-compressor.

The object of the invention is to provide an engine having in connection therewith an air-pump whereby air is forced into a suitable reservoir at each stroke of the piston.

A further object is to provide an engine of this character in which the steam-space between the piston and the cylinder-heads will be occupied by the pumping apparatus, thereby partially filling this space, thus requiring less steam, and consequently affording a saving in water and fuel in running the engine.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a central longitudinal vertical sectional view of an engine-cylinder constructed in accordance with the invention, and Fig. 2 is a transverse vertical sectional view on the line 2 2 of Fig. 1.

Referring more particularly to the drawings, 1 denotes an engine-cylinder on which is arranged the usual steam-chest 2, containing a slide-valve 3. In the steam-chest 2 is arranged steam-ports 4, which are alternately inlet and exhaust ports, and discharge-port 5. These parts may be of the usual or any suitable construction.

Within the cylinder 1 is slidably mounted a piston-rod 6, on which is fixed a piston 7, adapted to slide between the ports 4. The cylinder 1 is extended on each side of the steam-chest, and on the inner walls of the heads of the same are arranged hollow cylinders 8, which are open at their inner ends.

Secured to the piston-rod 6, adjacent to each side of the piston, are hollow cylinders 9, which are open at their outer ends and adapted to slide over or to telescope with the cylinders 8 when the piston-rod 6 is reciprocated. The inner ends of the cylinders 8 are provided with suitable packing-rings 10, whereby a steam and air tight joint is formed between said telescoping cylinders.

In each head of the cylinder is arranged an inlet-pipe 12, in each of which is mounted a check-valve 13. Within said heads are also connected discharge-pipes 14, in which are arranged check-valves 15, said pipes 14 being connected with a common air-conduit 16, by which air from said discharge-pipes is conducted to a suitable compressed-air receptacle or reservoir. (Not shown.) In the conduit 16 is arranged a cut-off valve 17, which may be controlled by the engineer in any suitable manner. In the cylinder 1, on each side of the piston, are arranged the usual drip-cocks 18, through which the cylinder may be drained.

In operation as the piston and piston-rod are reciprocated within the cylinder of the engine the air-cylinders 8 and 9 on each side of said piston will be alternately opened and closed, thereby drawing air into the same through the valved inlet-pipes and then forcing the same out through the valved discharge-pipes, from whence it is conducted through the conduit-pipe 16 to an air-reservoir or other place of use. By this arrangement the power of the engine is utilized to compress air without detracting from its usefulness as a motor.

By arranging the pumping mechanism within the cylinders of the engine the space between the piston and the heads of the cylinder will be partially filled thereby, thus requiring less steam to fill said space, and consequently necessitating less fuel and water to run the engine. The arrangement of the pumping-cylinders as herein described will also assist in stopping the engine, this assistance being had by closing the cut-off valve 17, thereby causing a back pressure of air within said pumping-cylinders and retarding the movement of the piston within the engine-cyl-

inder, thus causing the engine to be more quickly stopped.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a combined engine and air-compressor, in combination with an engine-cylinder having an inwardly-extending cylinder at one end, a piston operating in the engine-cylinder and having a piston-rod, cylinders in the engine-cylinder secured to the piston-rod, movable with the piston, and having slidable telescopic connections with the first-named interior cylinders, a valve to admit air to the telescopically-disposed cylinder, and an air-duct leading from said telescopically-disposed cylinders, and having a valve, substantially as described.

2. In a combined engine and air-compressor, the combination with the cylinder, of a piston-rod slidably mounted therein, a piston fixed on said rod, a pumping mechanism arranged in said cylinder, said pumping mechanism consisting of a pair of hollow telescoping cylinders arranged on each side of said piston, one member of each of said pairs of cylinders being secured to the inner wall of one of the cylinder-heads and the other member of each of said pairs being secured to the piston-rods adjacent to each side of said piston whereby when said piston-rod is reciprocated said pairs

of cylinders will be alternately opened and closed thereby pumping air to a suitable storage receptacle or reservoir, a valved inlet-pipe, and a valved discharge-pipe arranged in each head of said cylinder whereby the admission and discharge of air to and from said pumping-cylinders will be automatically controlled, substantially as described.

3. In a combined engine and air-compressor, the combination with the cylinder, of a piston-rod slidably mounted therein, a piston fixed on said rod, a pumping mechanism arranged in said cylinder, said pumping mechanism consisting of a pair of hollow telescoping cylinders arranged on each side of said piston, one member of each of said pairs of cylinders being secured to the inner wall of one of the cylinder-heads and the other member of each of said pairs being secured to the piston-rod adjacent to each side of said piston whereby when said piston-rod is reciprocated said pairs of cylinders will be alternately opened and closed thereby pumping air to a suitable storage receptacle or reservoir, a valved inlet-pipe, and a valved discharge-pipe arranged in each head of said cylinder whereby the admission and discharge of air to and from said pumping-cylinders will be automatically controlled, an air-conduit connecting said discharge-pipes and a manually-operated cut-off valve arranged in said conduit whereby the air may be held in said cylinders, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DANIEL SCHIFFBAUER.

Witnesses:

W. O. STEEBER,
WM. E. SHAFFER.