

G. G. A. LINDHOLM.  
STEAM ENGINE.  
APPLICATION FILED FEB. 28, 1911.

997,627.

Patented July 11, 1911.

Fig. 1

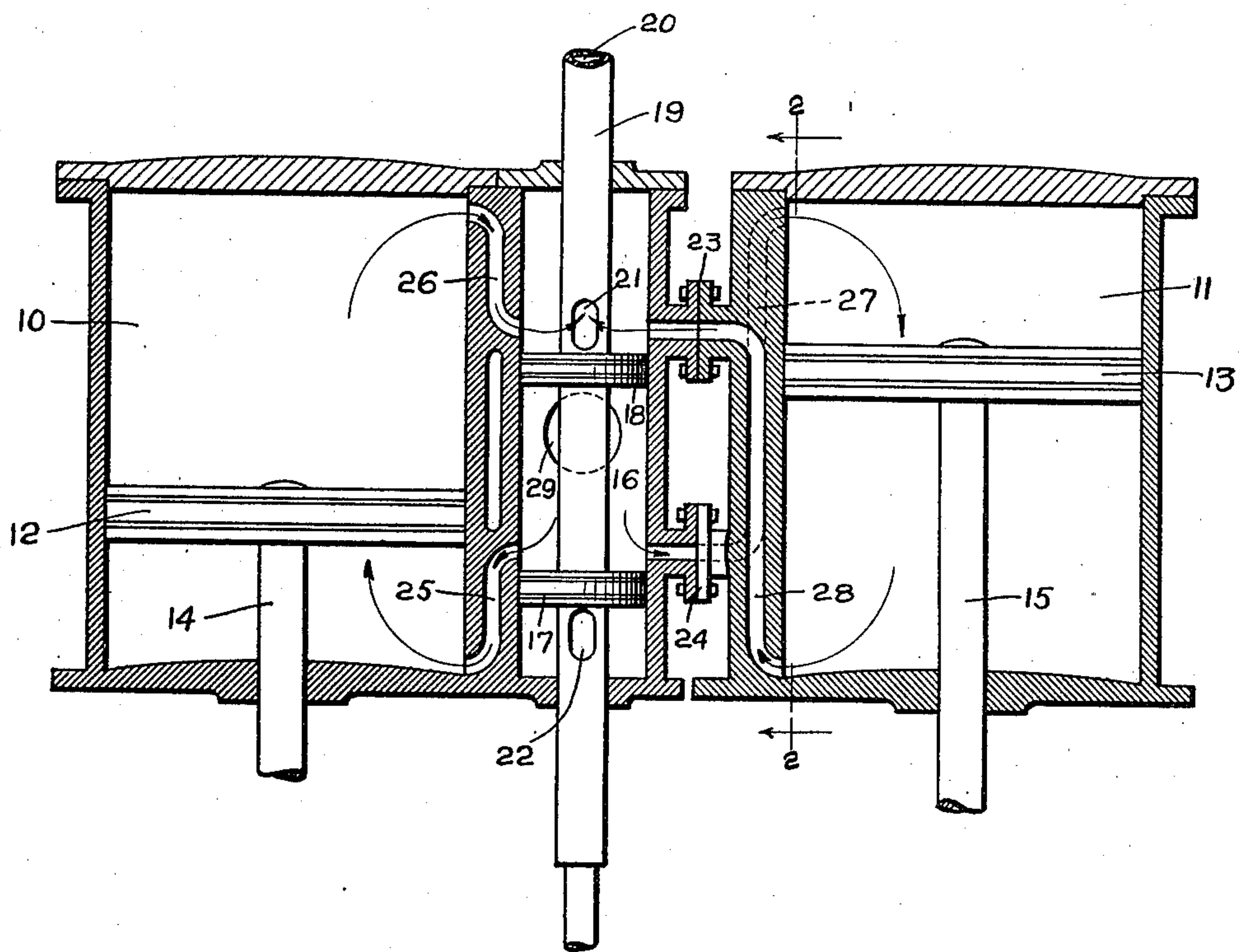
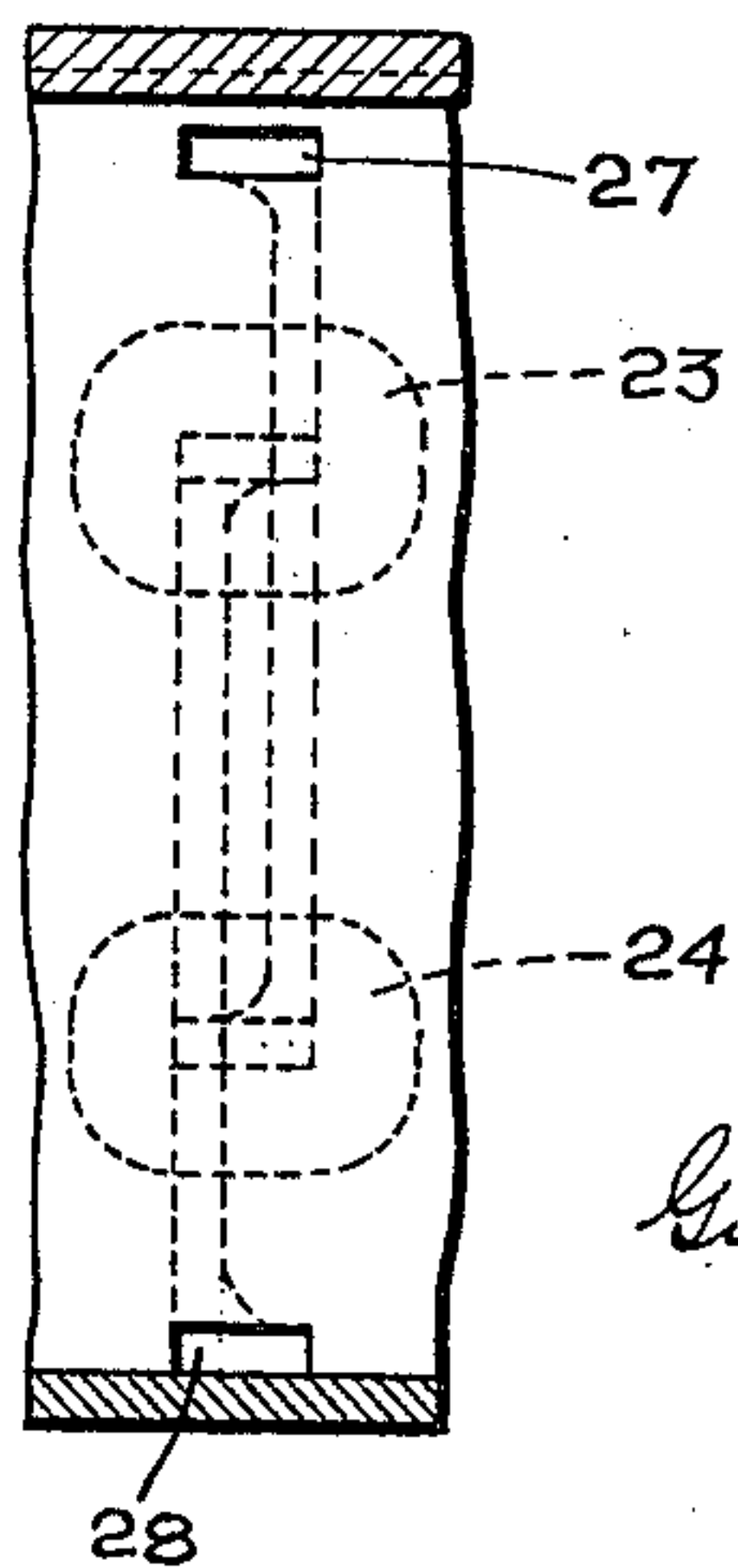


Fig. 2



WITNESSES:

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INVENTOR

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BY

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# UNITED STATES PATENT OFFICE.

GUNNAR G. A. LINDHOLM, OF ANSONIA, CONNECTICUT.

STEAM-ENGINE.

997,627.

Specification of Letters Patent.

Patented July 11, 1911.

Application filed February 28, 1911. Serial No. 611,474.

*To all whom it may concern:*

Be it known that I, GUNNAR G. A. LINDHOLM, a citizen of the United States, residing at Ansonia, county of New Haven, State of Connecticut, have invented an Improvement in Steam-Engines, of which the following is a specification.

This invention relates to steam engines and has for its primary object to provide a novel construction and arrangement of valves and ports that will simplify and improve the working of the engine and will greatly reduce the cost of construction.

With these and other objects in view I have devised the novel engine which I will now describe, referring to the accompanying drawing forming a part of this specification and using reference characters to indicate the several parts.

Figure 1 is a longitudinal section of my novel engine complete; and Fig. 2 is a section on the line 2—2 in Fig. 1, looking in the direction of the arrows.

The present invention is especially adapted for two cylinder engines and I have illustrated it as applied to that type of engine, although the principle is equally applicable to one cylinder or three cylinder engines.

10 and 11 denote the cylinders, 12 and 13 the pistons, 14 and 15 the piston rods, 16 the valve chamber and 17 and 18 the valves which reciprocate in the valve chamber and are carried by a valve rod 19 which is provided with a longitudinal exhaust passage 20 and with openings 21 and 22 leading into the exhaust passage. Steam is admitted to the valve chamber through a port 29 at its mid length. I preferably form cylinder 10 and the valve chamber in one casting and cylinder 11 in a separate casting which is rigidly secured to the valve chamber as by pairs of corresponding hubs 23 and 24. The wall between cylinder 10 and the valve chamber is provided with ports 25 and 26, and the opposite wall of the valve chamber, hubs 23 and 24 and the contiguous wall of cylinder 11 are provided with ports 27 and 28, port 27 extending from the top of cylinder 11 downward through the wall of said cylinder and through hubs 24 and communicating with the valve chamber below steam port 29, and port 28 extending from the bottom of cylinder 11 and upward through the wall of said cylinder and through hubs 23 and communicating with the valve chamber above steam port 29. In

other words, these ports extend past each other and communicate with the valve chamber on the side of the steam port opposite from their starting point. This arrangement of the ports of one cylinder causes the pistons to move in opposite directions. The heads of cylinders 10 and 11 and of the valve chamber are preferably separate castings, although the head of cylinder 10 and of the valve chamber may be made in one casting if preferred.

The operation will be readily understood from the drawing. As shown in the drawing, piston 12 is moving upward and piston 13 is moving downward. Steam is entering cylinder 10 from the valve chamber through port 25 and is exhausting from before piston 12 through port 26 and opening 21 and exhaust passage 20 in the valve rod and steam is entering cylinder 11 from the valve chamber through port 27 and is exhausting from before piston 13 through port 28 and opening 21 and the exhaust passage in the valve rod. As soon as the pistons have reached the extreme of their forward movement, the valve rod and valves will move upward from the position shown so that the valves instead of being below the corresponding ports, as shown in the drawing, will be above them. Steam will now enter cylinder 10 from the valve chamber through port 26 and will exhaust from before piston 12 through port 25 and opening 22 and the exhaust passage in the valve rod, and steam will enter cylinder 11 from the valve chamber through hubs 23 and port 28 and will exhaust from before piston 13, through port 27 and hubs 24 and opening 22 and the exhaust passage in the valve rod. When the pistons reach the extreme of their forward movement the valve rod and valve will move downward from the position just described to the position shown in the drawing and the taking and exhausting of steam will be again reversed and will be as first described, these operations being continuously repeated while the engine is in use.

Having thus described my invention I claim:

1. An engine comprising a cylinder provided with ports communicating with opposite ends thereof, said ports having their outer ends in spaced relation, a piston in said cylinder, a valve chamber in communication with said ports and provided with a



- central inlet port, a hollow piston rod slidable through said chamber and provided with ports adapted to be alternately placed in communication with said cylinder to receive the exhaust therefrom, a valve carried by said rod and arranged in spaced relation intermediate of the piston ports for controlling the exhaust from the cylinder ports.
- 10 2. An engine comprising a pair of cylinders, pistons therein, one of said cylinders being provided with upper and lower ports, a valve chamber interposed between said cylinders and provided with an admission port,
- 15 the other cylinder having one port that places its upper portion in communication with the lower portion of said chamber and another port that places its base in communication with the upper portion of said chamber, a hollow rod provided with upper and lower ports for receiving the exhaust from said cylinder ports, and valves carried by said piston rod and arranged in spaced relation to control the exhaust from said cylinders.
- 25 In testimony whereof I affix my signature in presence of two witnesses.
- GUNNAR G. A. LINDHOLM.
- Witnesses:  
A. M. WOOSTER,  
S. W. ATHERTON.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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