

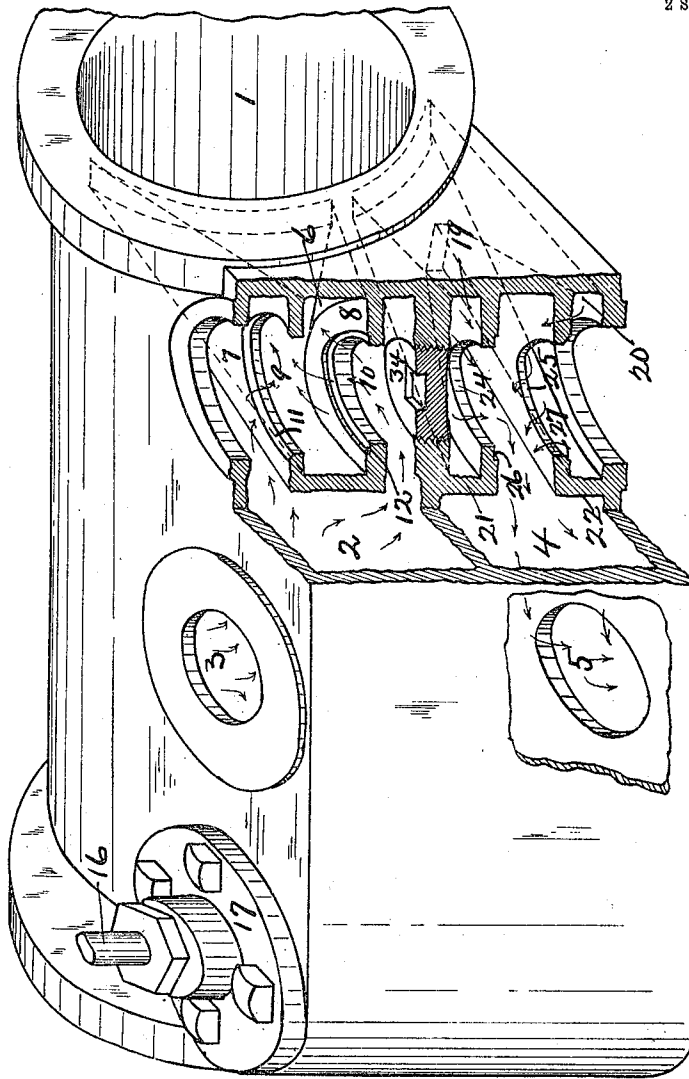
E. J. ARMSTRONG.
STEAM ENGINE VALVE.
APPLICATION FILED MAR. 23, 1909.

946,000.

Patented Jan. 11, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



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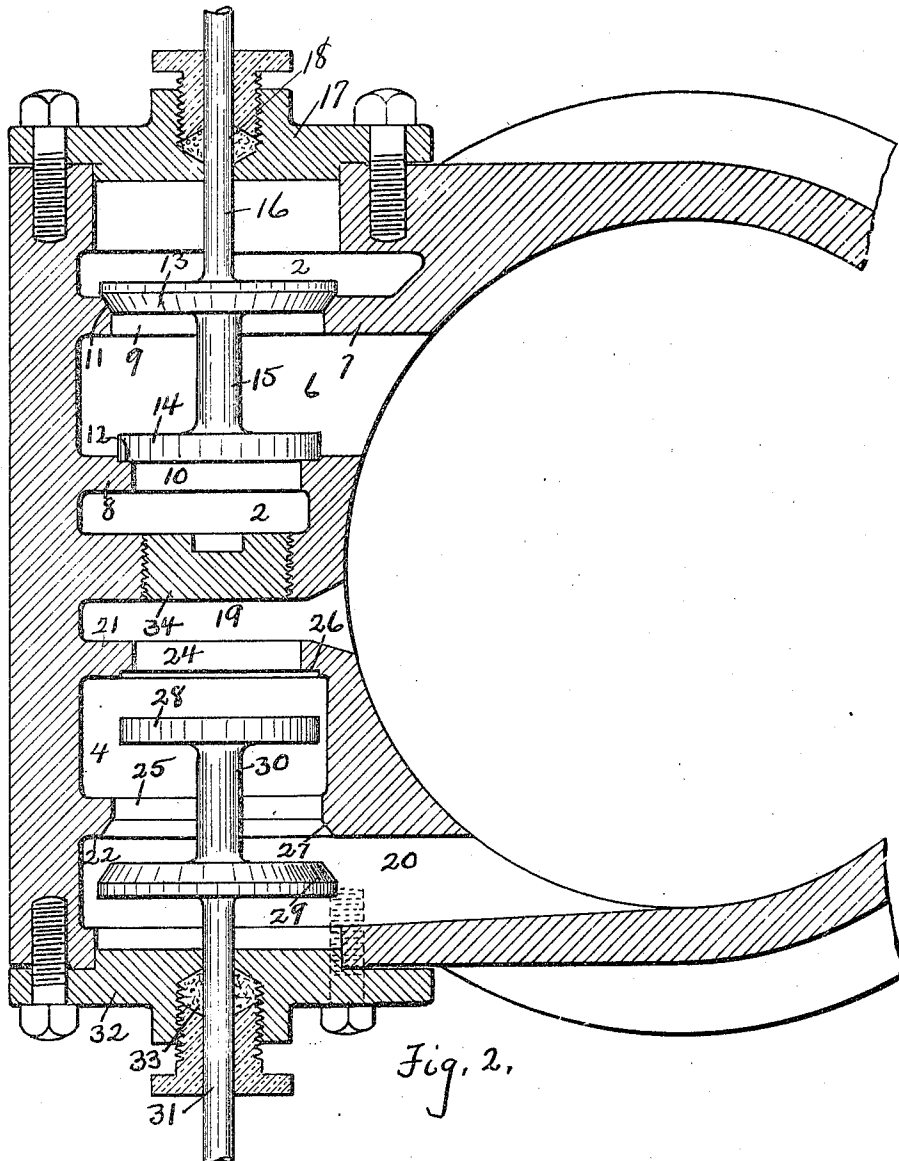


Fig. 2.

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UNITED STATES PATENT OFFICE.

EDWIN J. ARMSTRONG, OF ERIE, PENNSYLVANIA.

STEAM-ENGINE VALVE.

946,000.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed March 23, 1909. Serial No. 485,274.

To all whom it may concern:

Be it known that I, EDWIN J. ARMSTRONG, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Steam-Engine Valves, of which the following is a specification.

This invention relates to steam engine valves, and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

More particularly the invention relates to that type of steam engine valves commonly known as puppet valves.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 shows a perspective view of the engine cylinder and steam chamber partly in section showing the valve seats. Fig. 2 a transverse section through the cylinder and axis of one set of valves.

1 marks the cylinder; 2 the steam chamber, provided with a steam supply opening 3, and 4 the exhaust chamber having an exhaust or discharge opening 5.

The cylinder is arranged in a horizontal position, and the steam port 6 leads to the upper part of this cylinder. The steam port is separated from the steam chamber by the walls 7 and 8, and the passages 9 and 10 extend through these walls. The valve seats 11 and 12 are arranged around these passages, one of them being preferably flat and the other conical, to compensate for the expansion and contraction of the valve. The valve is made up of the disks 13 and 14, each being provided with a face adapted to operate on the seats 11 and 12 respectively. These valve disks are connected by a rod 15, and a valve stem 16 extends through the cover 17. A gland 18 is provided for forming the joint.

The exhaust ports are arranged at the bottom of the cylinder, one of said ports being preferably as low as the lowest point of the cylinder. These exhaust ports 19 and 20 are separated from the exhaust chamber by the walls 21 and 22 respectively. The walls 21 and 22 have the passages 24 and 25 leading to the exhaust chamber. These passages are surrounded by the valve seats 26 and 27, the seat 26 being flat, and the seat 27 being conical. The valve disks 28 and 29 operate upon these seats respectively, and are properly shaped for this

purpose. These disks are connected by rod 30 and a stem 31 extends from the valve through the cover 32, a gland 33 being provided for the stem.

In forming the valve seats or valve case, it will be noted that the steam valve is above the exhaust valve and preferably in alinement therewith. All these seats and ports can be readily machined. To facilitate the machine operation, I prefer to make the opening continuous, and afterward close the opening between the steam and exhaust sides with a plug 34.

The steam entering the steam port 6 impinging on the walls of the cylinder follows the cylindrical surface and sweeps before it any condensation into the port 20, so that there is little loss by condensation and re-vaporation in the cylinder.

The part of the chest and exhaust chamber having the walls 7, 8, 21 and 22, and the adjacent walls form what I term a valve case. It will be noted that the cylinder is horizontal, and that this valve case is at the end and side of the cylinder; that a continuous opening is formed through it, so that all parts of the case may be readily machined and accessible. After the completion of the case, the steam and exhaust portions of it are separated by the plug 34.

What I claim as new is:

1. In a steam engine, the combination of a horizontal cylinder; a vertical valve case arranged at the side of the cylinder and having puppet steam and exhaust valve seats therein with steam ports leading to the upper side of the cylinder, and an exhaust port at the bottom of the cylinder; and vertically acting puppet valves operating upon said seats.

2. In a steam engine, the combination of a horizontal cylinder with a vertical valve case at the side thereof having puppet steam and exhaust valve seats one above the other, said seats being arranged in pairs and having passages leading through them, the steam passages leading from the double passages to a single port, and the exhaust passages leading from double ports to a single exhaust passage; and double puppet valves operating upon said seats.

3. In a steam engine, the combination of a horizontal cylinder; a vertical valve case at the side thereof having steam and exhaust valve seats one above the other, said case being formed with a continuous opening

from end to end; and means secured in the case for separating the steam and exhaust ports of the case.

4. In a steam engine, the combination of
5 a horizontal cylinder; a vertical valve case at the side thereof having steam and exhaust valve seats one above the other, said case being formed with a continuous opening from end to end; and a plug secured in the

case for separating the steam and exhaust 10 ports of the case.

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

EDWIN J. ARMSTRONG.

Witnesses:

CHARLES G. BREVILLIER,
K. R. KANE.