

W. V. TURNER.
 STEAM PUMP DEVICE.
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1,131,182.

Patented Mar. 9, 1915.

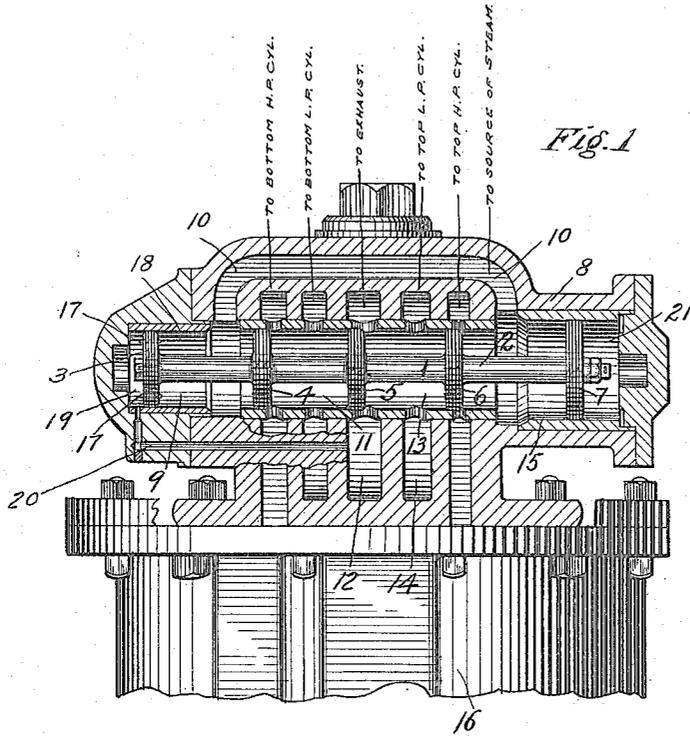


Fig. 1

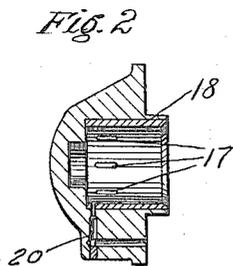


Fig. 2

WITNESSES
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UNITED STATES PATENT OFFICE.

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STEAM-PUMP DEVICE.

1,131,182.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER V. TURNER, a citizen of the United States, residing at Edgewood, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Steam-Pump Devices, of which the following is a specification.

This invention relates to steam pumps, and more particularly to a locomotive steam pump of the type provided with a piston valve mechanism for controlling the admission and exhaust of steam to and from the steam cylinders of the pump.

Where a piston valve mechanism is employed, especially in high capacity pumps, some trouble has been experienced on account of pounding when the piston valve mechanism moves to the end of its stroke and as a consequence of continued pounding the piston cylinder heads are sometimes broken.

The principal object of my invention is to provide means for preventing or eliminating the pounding of the piston valve mechanism.

In the accompanying drawing; Figure 1 is a sectional view of a piston valve mechanism applied to the cylinder head of a steam pump and Fig. 2 a central sectional view of the cylinder head of the piston valve mechanism.

While the piston valve mechanism shown in the drawing is designed for a cross compound pump, it will be understood that my improvement may also be applied to the valve mechanism of a single stage steam pump, if desired.

As shown in Fig. 1 of the drawing, the piston valve mechanism 1 may consist of a piston stem 2 carrying five pistons 3, 4, 5, 6, and 7 adapted to reciprocate in chambers provided in a casing 8, secured to the pump cylinder 16. Chamber 9 formed by pistons 3 and 4 is constantly open to a steam supply passage 10. Chamber 11 formed by pistons 4 and 5 is constantly open to the bottom of the low pressure cylinder. Chamber 13 formed by pistons 5 and 6 is constantly open to a passage 14 leading to the top of the low pressure pump cylinder. Chamber 15 formed by pistons 6 and 7 is constantly open to the steam supply passage 10.

According to my improvement a number of grooves 17 are provided in the bushing 18

of piston 3, said grooves being somewhat longer than the width of the piston and so located that upon movement of the piston valve mechanism toward the left, a point is reached at which communication is established through said grooves around the piston 3 from the chamber 9 to the chamber 19 at the outer face of said piston. A restricted passage 20 also leads from said chamber 19 to exhaust port 12.

The piston valve mechanism is operated in the usual manner by means of a valve device operated by the pump pistons for admitting and releasing steam to and from the chamber 21 at the outer face of piston 7, and as this mechanism forms no part of the present improvement and is not essential to a clear understanding of the operation of said improvement, for the sake of simplicity, said controlling valve device is not shown in the drawing.

In operation, when steam is admitted to the chamber 21, the piston valve mechanism 1 is thereby shifted toward the left and upon reaching the position shown in Fig. 1, communication is established from the chamber 9, containing steam under pressure, to chamber 19.

As the flow of steam from chamber 9 into chamber 19 is much greater than can be taken care of by the restricted exhaust passage 20, the steam pressure builds up rapidly in the chamber 19 and acting on the face of piston 3 tends to retard the movement of the piston valve mechanism 1. Upon further movement of the valve piston mechanism, the piston 3 closes the exhaust passage 20 and the steam pressure is sealed in chamber 19. By this means the piston 3 is prevented from pounding on the cylinder head, thus eliminating the possibility of breakage.

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

1. In a steam pump, the combination with a fluid actuated piston valve mechanism comprising a plurality of pistons for controlling the admission and exhaust of steam to and from the pump cylinders, of an additional piston carried by said valve mechanism and constantly subject on one side to steam pressure and having a chamber on the opposite side and ports controlled by said piston and in position to be opened near the end of the outward stroke of the piston into

the chamber for supplying steam from the steam side of the piston to said chamber.

2. In a steam pump, the combination with a fluid actuated piston valve mechanism 5 comprising a plurality of pistons for controlling the admission and exhaust of steam to and from the pump cylinders, of an additional piston mounted on one end of said valve mechanism and subject on the inner 10 side to steam pressure and on the outer side to the pressure of a chamber, ports controlled by said piston for connecting the steam pressure side of the piston with said chamber near the end of the outward stroke 15 thereof as the piston recedes from the steam pressure side, and an exhaust port leading into said chamber.

3. In a steam pump, the combination with a fluid actuated piston valve mechanism 20 comprising a plurality of pistons for controlling the admission and exhaust of steam to and from the pump cylinders, of an additional piston mounted on one end of said valve mechanism and subject on the inner 25 side to steam pressure and on the outer side to the pressure of a chamber, ports controlled by said piston for connecting the

steam pressure side of the piston with said chamber near the end of the outward stroke thereof, and a restricted exhaust port leading into said chamber and adapted to be closed by a further outward movement of said piston.

4. In a steam pump, the combination with a fluid actuated piston valve mechanism 35 comprising a plurality of pistons for controlling the admission and exhaust of steam to and from the pump cylinders, of an additional piston mounted on the end of said valve mechanism, an exhaust port leading 40 from the chamber at the outer face of said piston and tending to normally maintain said chamber at atmospheric pressure, and ports controlled by said piston for supplying 45 steam to said chamber upon movement of the piston valve mechanism toward said chamber.

In witness whereof I have hereunto set my hand.

WALTER V. TURNER.

Witnesses:

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