No. 676,848. Patented June 18, 1901.

C. S. PRESCOTT.

STEAM ENGINE VALVE.

(No Model.) (Application filed Nov. 1, 1900.)

2 Sheets—Sheet 1.

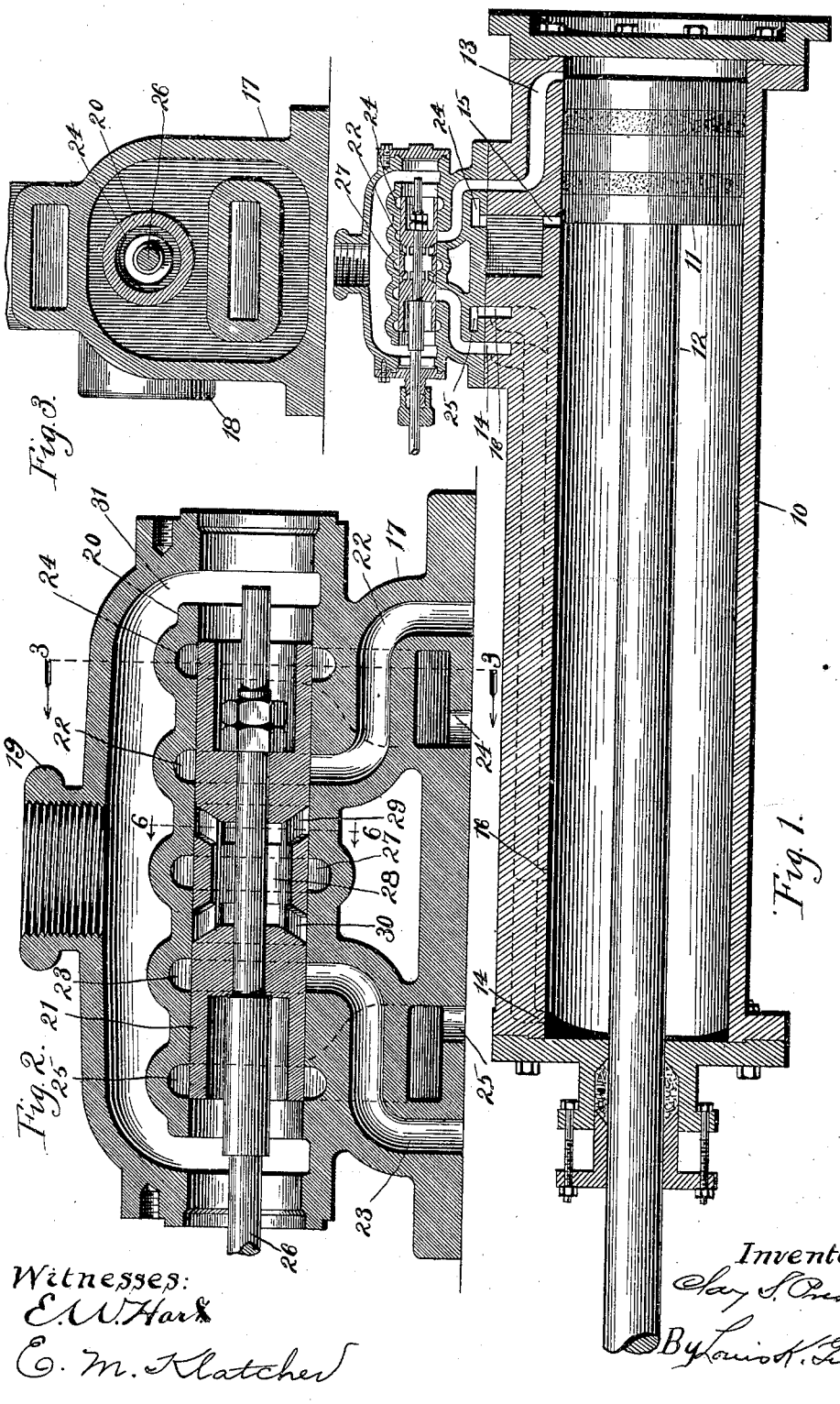

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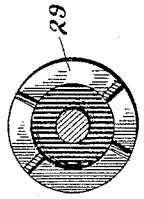
Fig. 6.



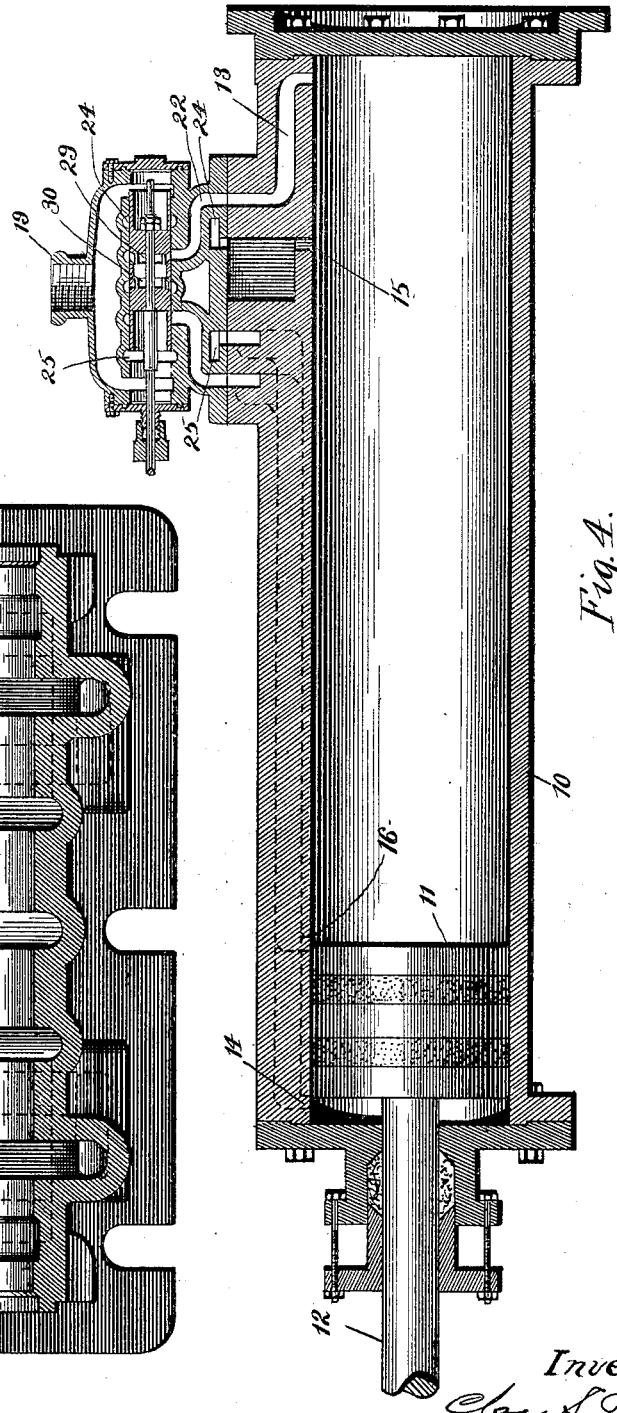
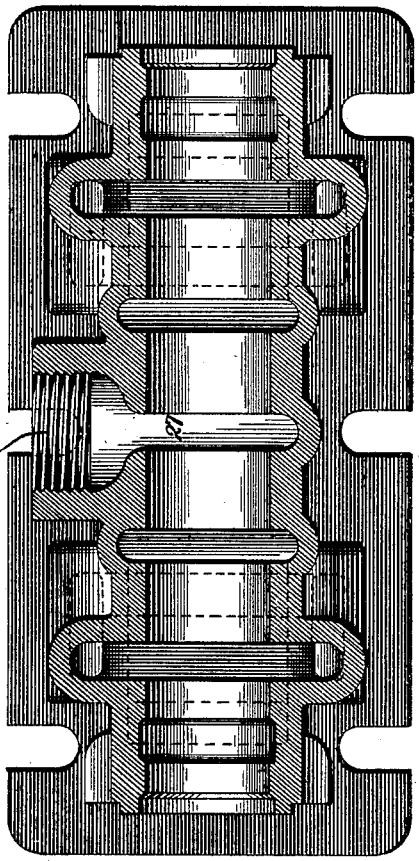


Fig. 4.

Fig. 5.



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CLAY SEARLE PRESCOTT, OF MENOMINEE, MICHIGAN, ASSIGNOR OF ONE-HALF TO THE D. CLINT PRESCOTT CO., OF WISCONSIN.

STEAM-ENGINE VALVE.

SPECIFICATION forming part of Letters Patent No. 676,848, dated June 18, 1901.

Application filed November 1, 1900. Serial No. 35,138. (No model.)

To all whom it may concern:

Be it known that I, CLAY SEARLE PRESCOTT, a citizen of the United States, and a resident of Menominee, county of Menominee, and State of Michigan, have invented certain new and useful Improvements in Steam-Engine Valves, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to reciprocating steam-engines, and particularly to such engines as are adapted for use in situations where no crank-shaft is used, the object of the invention being to provide improved means for cushioning the piston by cutting off the exhaust before the piston reaches the end of the cylinder. This object is attained by means of the mechanism hereinafter described, and which is illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section of a steam-engine cylinder and its controlling-valve and valve-casing. Fig. 2 is a central longitudinal section of the valve and valve-casing, drawn to a larger scale. Fig. 3 is a sectional view on the line 3 3 of Fig. 2. Fig. 4 is a similar view to Fig. 1, the piston and valve being shown in different positions. Fig. 5 is a plan section of the valve-casing; and Fig. 6 is a transverse section of the valve, taken on the line 6 6 of Fig. 2.

The engine-cylinder is shown at 10, its piston at 11, and piston-rod at 12. Steam-service passages 13 and 14 lead to the opposite ends of the cylinder from the valve-casing 17 and are preferably cored in the walls of the cylinder, as shown. Exhaust-passages 15 and 16 lead from points more remote from the ends of the cylinder to the valve-casing. The valve-casing or steam-chest 17 is adapted to be secured to the cylinder 10 and is provided with a nipple 18 for the attachment of a steam-pipe and a nipple 19 for the attachment of an exhaust-pipe.

Within the casing 17 there is located a barrel 20, within which there reciprocates a cylindrical valve 21, provided with a stem 26, passing through a suitable stuffing-box. Steam-ports 22 23, adapted to communicate, respectively, with the cylinder-passages 13 14, lead to the chamber of the barrel 20, and exhaust-passages 24 25, adapted to communicate, respectively, with the exhaust-passages 15 and 16 of the cylinder, also lead to the chamber of this barrel, the steam and exhaust passages at each end of the valve-casing crossing, so that while the steam-service passages 13 and 14 enter the cylinder nearer its ends than do the exhaust-passages 15 and 16 the steam-ports 22 and 23 enter the chamber of the barrel 20 more remotely from the ends of the latter than do the exhaust-ports 24 and 25. The ports 22, 23, 24, and 25 preferably terminate within the chamber of the barrel 20 in the form of annular grooves encircling the latter, and a similar groove 27 is in communication with the steam-induction nipple 18.

The valve 21 is provided with a central cavity 28, having ports 29 and 30, which are spaced apart a distance equal to the throw of the piston, so that they come alternately into register with the channel 27 as the valve reaches its extreme positions. The ports 22 and 23 are spaced a corresponding distance from the channel 27, so that they are alternately brought into communication therewith through the chamber 28 and the ports 29 and 30.

The ends of the barrel 20 are open to the exhaust-chamber 31 of the valve-casing, so that the exhaust-ports 24 25 are alternately brought into communication therewith.

When the valve is in its central position, as shown in Fig. 1, all of the steam and exhaust ports are closed. Upon shifting the valve to the position shown in Fig. 4 steam enters the cylinder 10 through the port 22 and steam-passage 13, crossing the piston 11 to the opposite end of the cylinder, the exhaust-passage 16 and port 25 being opened so as to admit of the escape of steam before the moving piston. When the piston reaches the adit of the passage 16, it cuts off the exhaust, and thereby provides a steam-cushion to arrest its flight. Upon the shifting of the valve 21 to its opposite extreme position the movement of the piston is reversed, and a corresponding cushioning effect is secured by the cutting off of the exhaust-passage 15.

The adits of the exhaust-passages 15 16 are located a greater distance from the ends of

the cylinder than the thickness of the piston 11, so that if the steam-cushion proves inadequate to arrest the piston under the expansive effect of the steam behind it the exhaust-passage is opened before the piston reaches the cylinder end, and the pressure is thereby relieved.

I claim as my invention—

1. In a reciprocating steam-engine, in combination, a cylinder, a valve-chest in barrel form, two ports leading from each end of the cylinder and located at different distances from the end thereof, each port terminating in an annular channel in the barrel and such barrel having an additional central annular channel, induction and exhaust ports for the valve-casing, one of such last-named ports opening to the central channel and the other to the end channels of the barrel, and a valve adapted to reciprocate within the barrel and having passages for alternately bringing the central channel into communication with the two channels adjacent to it.

2. In combination, a cushioning reciprocating fluid-engine having an induction and an exhaust port adjacent to each end of its cylinder, the exhaust-port being the farther from the cylinder end, a valve-casing consisting of a barrel having an annular internal channel connected with each of said cylinder-ports, the channels connected with the exhaust-ports being the nearer to the ends of the barrel, such barrel also having an annular internal channel located between the channels connected with the induction-ports of the cylinder, an exhaust-port leading from the casing and open to the ends of the barrel, a pipe leading to the central channel, and a chambered valve adapted to reciprocate within the barrel and having two sets of annularly-arranged ports opening to its chamber and adapted to bring the central channel alternately into communication with the two adjacent channels.

3. In a steam-engine, in combination, a cylinder, a piston reciprocating therein, a valve-casing, a distributing-valve having a medial steam-chamber, steam and exhaust passages leading from the valve-casing to each end of the cylinder and the exhaust-passages entering the cylinder more remote from its ends than the steam-passages.

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Witnesses:
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