(No Model.)

J. T. LINDSTROM.

DASH POT FOR STEAM ENGINES.

No. 434,602. Patented Aug. 19, 1890.

Fig. 2.

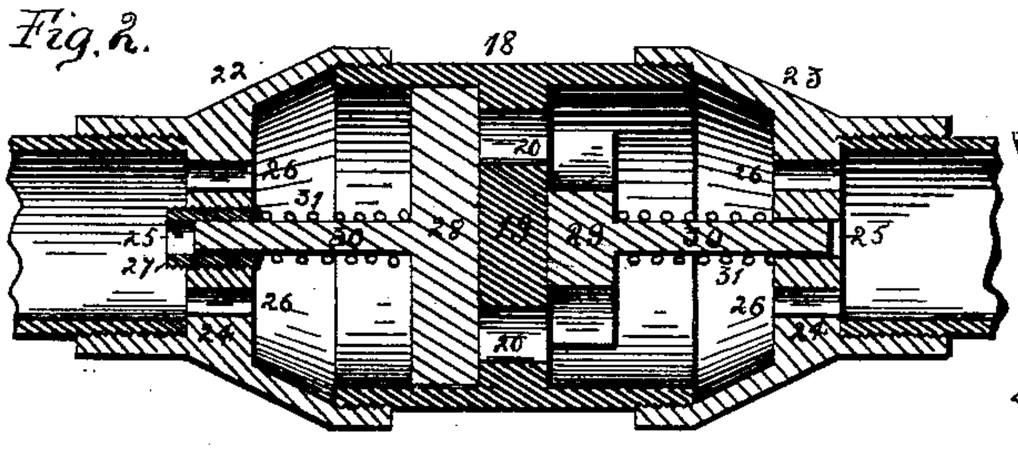


Fig. 1.

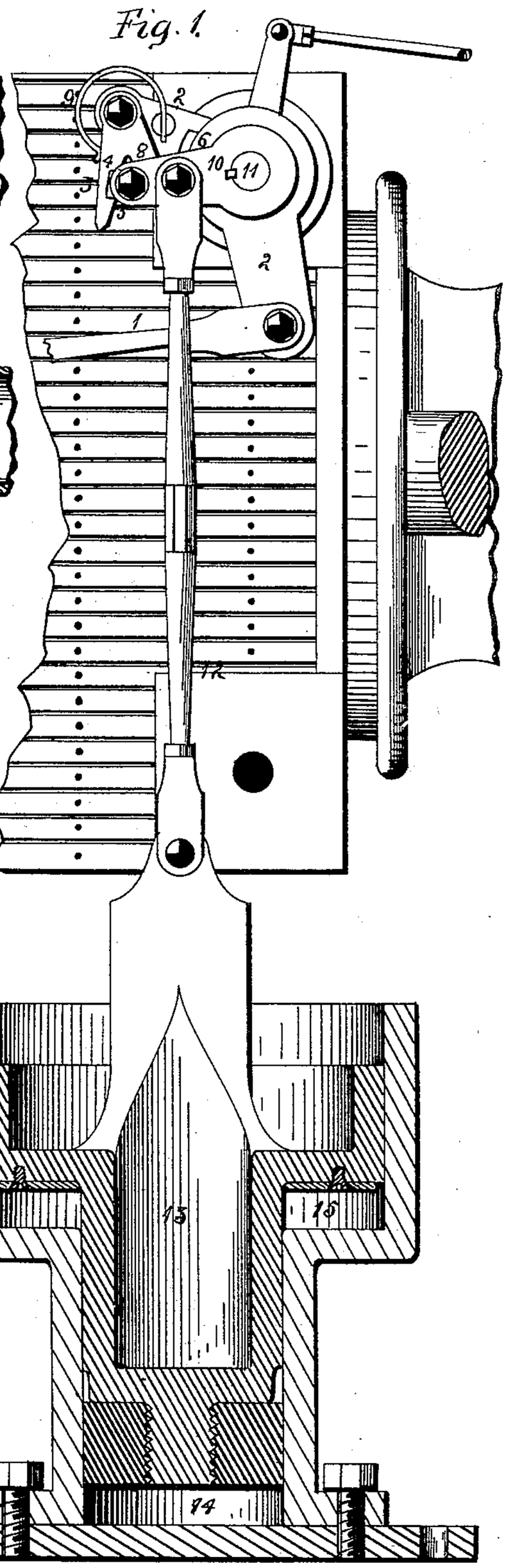


Fig. 3

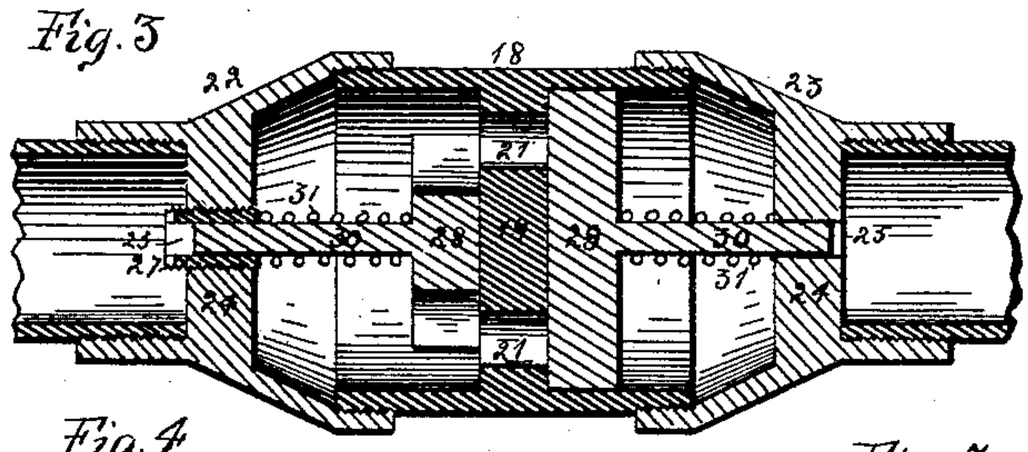


Fig. 4

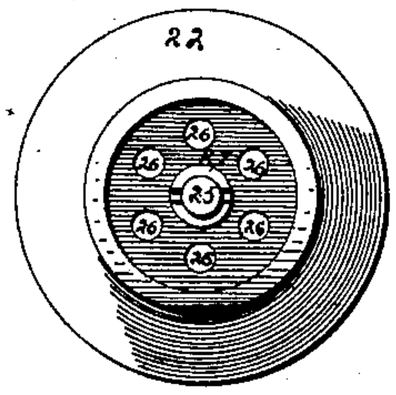


Fig. 5.

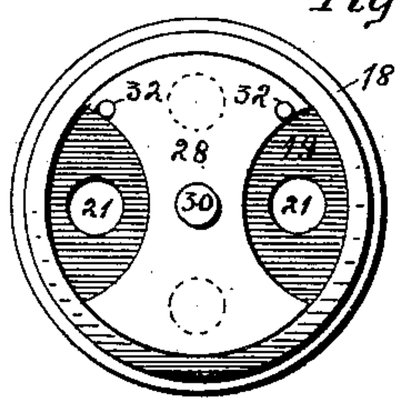


Fig. 6

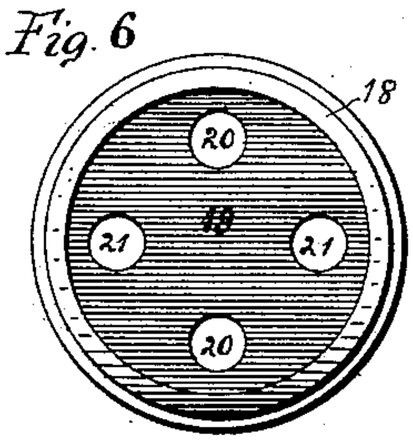
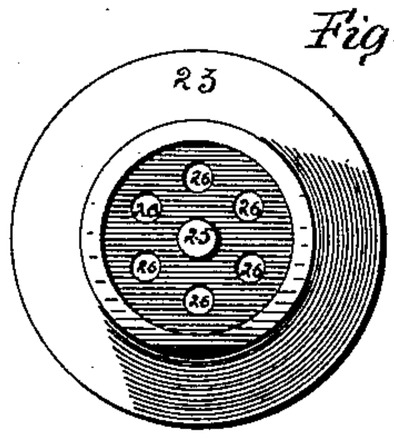


Fig. 7



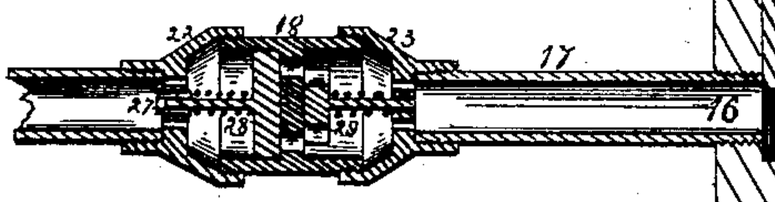
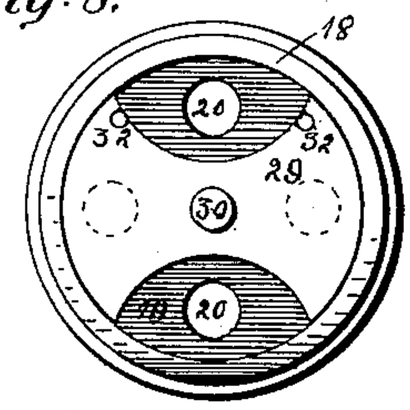


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN T. LINDSTROM, OF ROCKFORD, ILLINOIS.

DASH-POT FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 434,602, dated August 19, 1890.

Application filed May 5, 1890. Serial No. 350,631. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. LINDSTROM, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Dash-Pots for Steam-Engines, of which the following is a specification.

The object of this invention is to automatically regulate the quantity of air admitted and discharged from a dash-pot of a steam-engine to facilitate the proper workings of its pistons.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a Corliss steam-engine, with which my improvements have a close connection, and in which a dash-pot is shown in section. Fig. 2 is a lengthwise vertical section through my improved valve. Fig. 3 is a lengthwise horizontal section of the valve. Fig. 4 is an end view of the valve in which is located the adjustable screw. Fig. 5 is an end view of the center portion of the valve with the end 22 removed, showing the location of the valve 28. Fig. 6 is a view similar to that shown at Fig. 5, but in which the valve 28 has been removed. Fig. 7 is an end view of the valve opposite to that shown at Fig. 4. Fig. 8 is an end view of the center portion of the valve with the end 23 removed, showing the location of the valve 29.

The mechanism represented at Fig. 1 is used for admitting and cutting off the steam from the cylinder, and, briefly described, consists of a rod 1, which has a connection with the wrist-plate, and the wrist-plate has a connection with the eccentric of the engine from which it receives its motion. The rod 1 operates the bell-crank 2. Upon the end of this bell-crank is pivoted a latch-link 3, which has a recess 4 for the latch-block 5. During the admission the latch-block abuts against the lower end of the recess, and it is tripped therefrom by the cam 6, which operates upon the arm 8 of the latch-block, and a spring 9 keeps the end of the arm 8 against the hub and cam 6.

The operation is, the latch-block 5 will be seated in the recess 4 provided in the latch-link, and as the bell-crank 2 moves the latch-block will be raised by the latch-link, which is carried by a crank-arm 10, and as the crank-arm is fast upon the valve-spindle 11 the lifting of the crank-arm will open the valve for admission. As soon, however, as the end 8 of the latch-link meets the cam 6 the latch-link will be moved so that the recess will leave contact with the latch-block, and the dash-pot will cause rod 12 to descend instantaneously and close the valve, thus effecting the cut-off.

We now come to the means employed to close the valve quickly and without shock when the latch-block is released from the latch-link. The latch-block for the valve is carried upon the arm 10, to which is attached the rod 12 from the dash-pot piston 13, which has a stepped diameter, the lower half fitting into bore 14 and the upper half fitting into bore 15. The piston fits the bore 14 and fills it when the rod 12 is at the bottom of the stroke; hence as the valve is raised there is a vacuum at 14 that acts to cause the valve 13, rod 12, and crank-arm 10 to fall quickly and close the valve the instant the latch-block is released from the latch-link. To prevent the descent of rod 12 and piston 13 from ending in a blow, a cushion of air is given in 15 by the following construction.

The parts of an engine above described are all old, and they are referred to in this application for the purpose of giving a clear idea of the location of my improvements thereto.

Near the bottom of the bore 15 is an opening 16, into which in this instance is screw-threaded a section of pipe 17, and on the end of which is located an automatic valve for regulating the admission of air to and exit from the dash-pot. Said valve consists of a central cylindrical portion 18, screw-threaded at each end, and has a central division-wall 19, which is provided with holes 20 and 21. Upon each end of the central portion of the valve is screw-threaded caps 22 and 23, each of which has a transverse partition 24, provided with a central bore 25 and a series of smaller openings 26. In the central opening 25 of the partition 24 of the cap 22 is screw-threaded a bushing 27, for a purpose to appear hereinafter. Within the central portion of the valve, on each side of the central division-wall 19, are located valves 28 and 29, of the form shown at Figs. 5 and 8. The valve 28 closes the openings 20 in the division-wall

and the valve 29 closes the openings 21. Portions of each of the valves are cut away, so as to close only the openings opposite each other. From the valves proper extend guide-rods 30, which enter the openings 25, and are guided thereby in their lengthwise movement. Around each valve-stem is placed a coiled spring 31, which holds the valve to its seat against the division-wall 19. Pins 32 form guides for the valves and hold them in their position over their respective openings. In a valve of this construction it is necessary that the pressure with which each valve is held to seat should be nearly uniform one with the other, and by means of the bushings 27 such uniformity can be obtained. In the drawings I have shown but one bushing 27; but it is evident that one may be employed for each valve. With such a valve placed in position as shown at Fig. 1, as the dash-pot piston 13 is raised air will be admitted into the bore 15 through the openings 26 and 21 by reason of the suction created by the dash-pot piston. Upon the descent of the piston air can escape from the bore by forcing the valve 28 from its seat, allowing the air to pass through openings 26 and 20 until the piston has closed the opening 16, when the remaining air acts as a cushion for a piston.

I am aware that ordinary valves have been employed to regulate the supply and exit of air to and from the dash-pot; but in the employment of such valves it required the closest attention on the part of the engineer to properly regulate the action of the dash-pot piston. For instance, while the engine was carrying a certain load and the valve adjusted to properly cushion the dash-pot piston all would be well. Should an extra load be placed on the engine, the dash-pot piston will rise higher, and consequently take in more air during the same length of time, and as the piston is raised positively air will be sucked in, and upon the release of the piston the air cannot escape quick enough to let the piston down before the catch-link encounters it, thereby forcing it down. Meanwhile live steam will be admitted to both sides of the piston. Starting again where the engine was running smoothly, should some of the load be taken from the engine the dash-pot piston would not rise as high, as it would not require the same amount of steam to run the engine, there would not then be sufficient air admitted to the dash-pot cylinder to properly cushion the piston upon its descent, and the result would be a blow or pound which would soon destroy the proper workings of the engine.

By my arrangement of a valve after the springs holding the valves in their seats have been once regulated to the average load carried by the engine they will require no further attention, for the same quantity of air taken into the dash-pot cylinder will be forced therefrom, except what is necessary for the proper cushioning of its piston, no matter what load or steam the engine may be carrying.

I claim as my invention—

1. In a steam-engine, the combination of a dash-pot, a piston therein, and a self-adjustable valve to the dash-pot, consisting of an outside shell, a central perforated division-wall, and a valve on each side of the wall, one made to open during the admission of air to the dash-pot and the other to allow its escape, substantially as set forth.

2. A valve for a dash-pot of a steam-engine, consisting of an outer shell, a central perforated division-wall, and a valve on each side of the wall, one made to open during the admission of air and the other to allow its escape, both having a yielding movement, substantially as set forth.

3. A valve for a dash-pot of a steam-engine, consisting of an outer shell, a central perforated division-wall, a valve on each side of the wall, one made to open during the admission of air and the other to allow its escape, both having a yielding movement, and one or both having an adjustment to regulate the action of the valves, substantially as set forth.

4. A valve for a dash-pot of a steam-engine, consisting of a central portion having a central division-wall, end portions having a screw-threaded connection with the central portion, two valves, one located on each side of the central wall and having stems which are guided in their movements by the end portions, and a spring placed around each stem, which holds the valve to its seat in a yielding manner, substantially as set forth.

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