

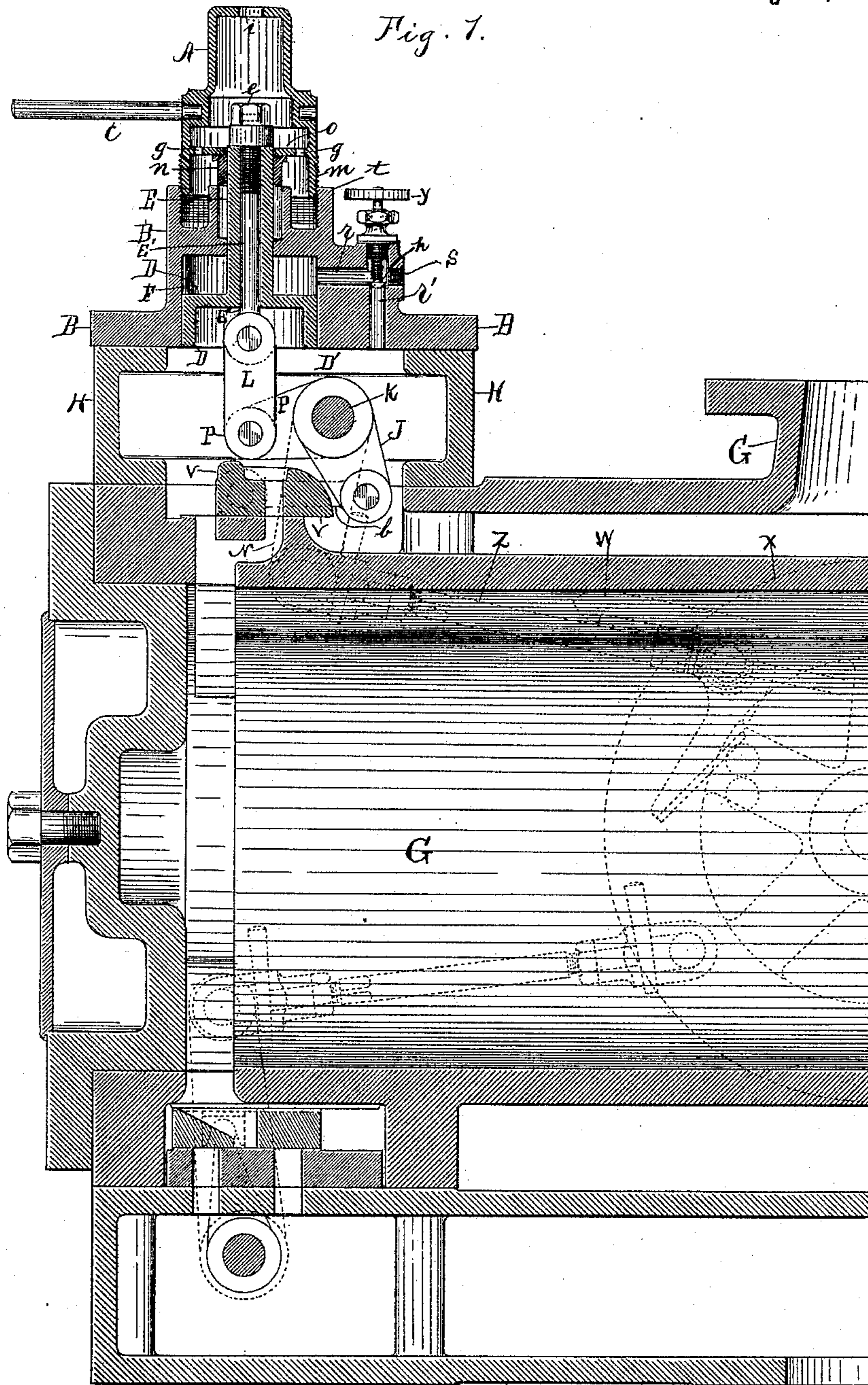
(No Model.)

2 Sheets—Sheet 1.

A. J. BATES.  
STEAM DASH POT.

No. 473,994.

Patented May 3, 1892.



Witnesses  
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(No Model.)

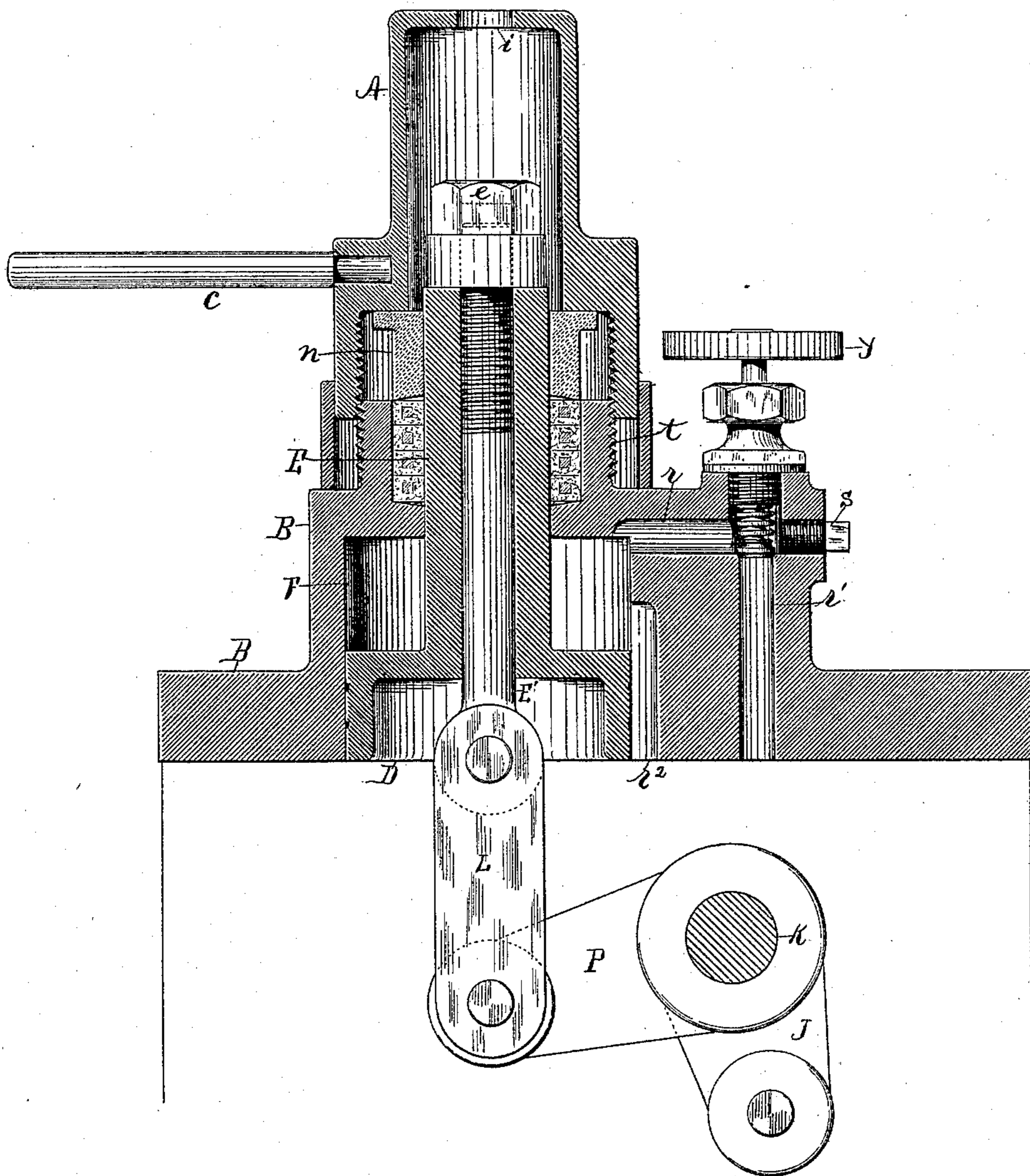
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Fig. 2



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# UNITED STATES PATENT OFFICE.

ALBERT J. BATES, OF JOLIET, ILLINOIS.

## STEAM DASH-POT.

SPECIFICATION forming part of Letters Patent No. 473,994, dated May 3, 1892.

Application filed October 26, 1891. Serial No. 409,778. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT J. BATES, a citizen of the United States of America, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Steam Dash-Pots, of which the following is a specification, reference being had therein to the accompanying drawings, and the letters of reference thereon, forming a part of this specification, in which—

Figure 1 is a central vertical cross-section of the steam dash-pot mechanism and of the steam-chest to which it is attached and a central longitudinal section of a portion of a four-valvesteam-cylinder connected with said steam-chest; and Fig. 2 is a central vertical cross-section of the steam dash-pot mechanism, showing two ports leading to its cylinder.

This invention relates to certain improvements in steam dash-pots for use in connection with the inlet-valves of a steam-cylinder to close them and cushion their stroke when released from the cut-off mechanism, which improvements are fully set forth and explained in the following specification and claims.

Referring to the drawings, G is a portion of a steam-cylinder of an engine having in its cylinder two inlet and two exhaust valves, which in this case are all slide-valves, adapted to be moved by rods connecting them with an oscillating disk journaled to the side of the cylinder and operated by means of an eccentric-rod, all of which in this device is of the ordinary pattern and in which only one of the inlet-valves and one exhaust-valve is shown, that being sufficient for illustrating this invention as applied to one of the inlet-valves of such a cylinder.

H is a steam-chest having an aperture D' in its upper plate opening into the lower end of the cylinder of the dash-pot.

B is a plate for covering the top of the steam-chest H, and plate B has formed therein a vertical chamber F, constituting a cylinder, having its lower end open and communicating with the interior of the steam-chest H through aperture D', and having its upper end head centrally bored to receive the vertically-extending stem of a plunger E, and provided in said head with a proper stuffing-box and gland *n* for packing said steam in said

head. Said cylinder F is provided with a port *r*, which enters the said cylinder at its side a short distance below its upper end and extends horizontally to communicate with the upper end of the vertical port *r'*, which opens at its lower end to the interior of the steam-chest H, so that steam may enter from the steam-chest into the upper part of cylinder F above the plunger-head. The said ports are controlled by a valve *y h* for the purpose of regulating the volume of steam passing through them, and S is a tap-hole designed to be closed by a screw-plug, and furnishes means for escape of accumulations in cylinder F above its plunger-head.

D is a plunger-head arranged to fit steam-tight in the cylinder F, and is provided with the vertically-extending hollow stem E, extending through the central bore of the head of said cylinder far enough to pass through the gland *n*.

E' is a rod located in the central bore of said stem E and plunger-head D. The upper end of said rod is screw-threaded, and is secured in place in said stem by means of screwing into a female screw in the upper end of said stem and extends far enough above said stem to receive a set-nut *e*, turned thereon. Vertical adjustment of said rod is obtained by means of turning the plunger and its stem around said rod, which vertical adjustment is for the purpose of causing said plunger to move the valve to which it attaches the proper distance. The lower end of rod E' is connected by means of a link L with a crank P, secured on rock-shaft K. Said rock-shaft extends entirely through the steam-chest H at right angles with the cylinder G, and has secured on it near each end within the steam-chest a pair of cranks J. These cranks are respectively connected with each end of the slide-valve V by means of links *b*, only one of which is shown in this view. One outer end of said rock-shaft is provided with a crank N, connected to rod Z, adapted to be engaged by the cut-off hook W, pivoted to the side of the oscillating disk X, arranged on the side of cylinder G, the said crank N, rod Z, hook W, and disk X being shown in broken lines only as they are ordinary. The rear end of rod Z reciprocates through the stud upon which cut-off hook W is pivoted, so as to per-

mit said rod to move quickly toward the valve when said hook is tripped and releases said rod, so as to close the valve V quickly and cause it to cut off steam earlier or later, according to the time it is released from the cut-off hook W.

A is a cap having the annular screw-thread *m* on its lower end for connecting it with the annular flange *t* of the plate B. Said cap is provided on its inner wall with the annular flange O, which bears upon the upper end of the gland *n* as said cap is turned down for the purpose of furnishing means for compressing the packing in the stuffing-box, as shown in Fig. 1. Said flange is provided with perforation *g* for the purpose of permitting accumulations to escape from around the stuffing-box and gland, and said cap A is provided at its upper end with an aperture *i*, so the atmosphere may pass in and out of said cap and permit stem E and rod E' to reciprocate therein. Said cap may be turned by means of a bar C, inserted in one of an annular row of sockets in the side of said cap.

The cap A also serves to protect the parts within and also to render the device more sightly. When the valve V is open, the plunger D is always down at the lower end of the cylinder F, as shown, and only moves upward when the said valve is closing. The tendency of the plunger is always to move upward, for the reason that there is greater steam-pressure on its lower end than on its upper side or end, caused by the area of steam-pressure on the upper side of the plunger-head D being reduced by the area of the diameter of its stem E. As a consequence of such greater steam-pressure on the lower end of the head D, as soon as the cut-off hook W is released from the rod Z, the plunger will immediately move upward very quickly and close the valve V by reason of the valve being connected with said plunger, as shown. As the plunger starts to move upward, the steam above its head D is forced out through the ports *r r'* back into the steam-chest. The volume of steam passing through said ports is controlled by the valve *y h*, so that the velocity upward of the plunger is regulated until the plunger-head D passes the port *r* and is cushioned by the steam in cylinder F above said port. Should said hook be released from said rod while they are in the position shown, the plunger would move upward and close said valve by reason of its said connection therewith, and said valve would remain closed until said cut-off hook again engages said rod and returns it with the parts connected therewith. It is designed to have one of these dash-pots arranged on each steam-chest. One only

is shown, as another would only be a duplicate of the one shown and a description of one answers for both. This dash-pot need not necessarily be arranged on the steam-chest, but may be attached to the engine at any suitable place where it can communicate with steam, either in the boiler or steam chest or cylinder, and so it can be attached to the inlet-valves, as and for the purpose specified. For the purpose of causing said plunger to move upward more rapidly, the cylinder F may be provided with a second lower port *r*<sup>2</sup>, as shown in Fig. 2, leading from the steam-chest into said cylinder immediately above the plunger-head D, and the port *r* in such case may be located at the extreme upper end of the cylinder, as shown in said figure, so that when the said head moves upward steam may escape from both ports simultaneously until the head has passed the port *r*<sup>2</sup>, thus causing it to start upward and close the valve, to which it attaches more quickly than when only one port *r* is used, and the volume of steam-escaping port *r* can be so regulated by means of the valve *y* as to cause the steam above port *r*<sup>2</sup> to form a cushion to cushion the stroke of said plunger similar to that shown in Fig. 1, the mode of operation and result obtained being the same in either case.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows, to wit:

1. The combination of the plate B, having the ports *r r'*, controlled by a valve and having the open-bottom cylinder F, opening into the steam-chest, the plunger-head D, arranged in said cylinder and having the vertically-extending hollow stem E, the rod E', arranged in said hollow stem and having its upper end screw-threaded therein and having a set-nut *e* on its upper end, and the link L for connecting said plunger with the valve mechanism, substantially as and for the purpose set forth.

2. The steam dash-pot shown and described, consisting of the combination of plate B, having the cylinder F, and ports *r r'*, leading from the steam-chest to the side of said cylinder near its upper end, valve *y h* for controlling said ports, plunger-head D, fitting said cylinder and having the hollow stem E, and the vertically-adjustable rod E', arranged in said hollow stem and adapted to be connected with the engine-valve, substantially as and for the purpose set forth.

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Witnesses:

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