

Patented Jan. 23, 1900.

STEAM ACTUATED DASH POT FOR ENGINES.

(Application filed May 16, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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No. 642,054.

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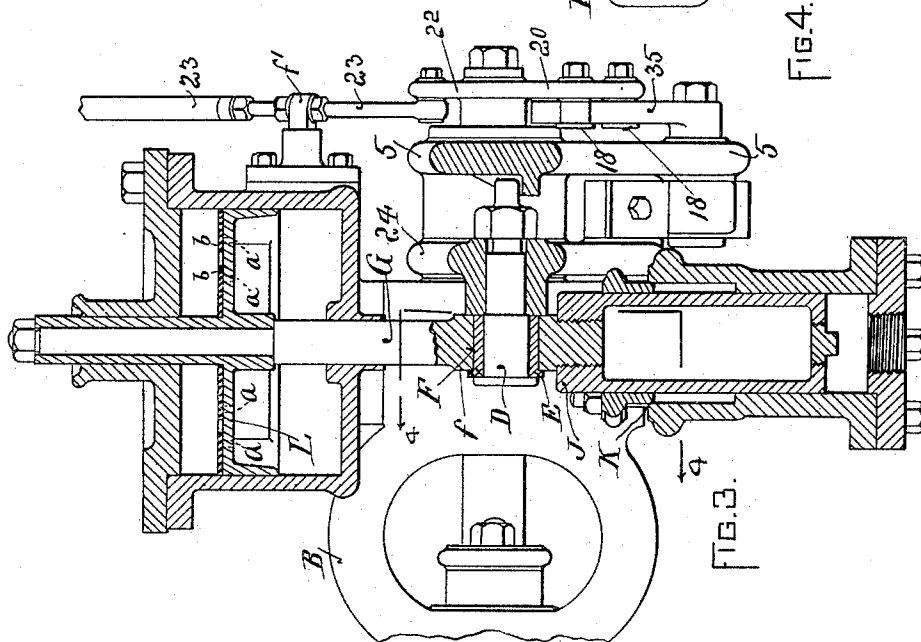
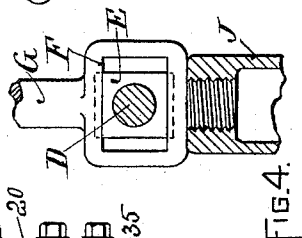
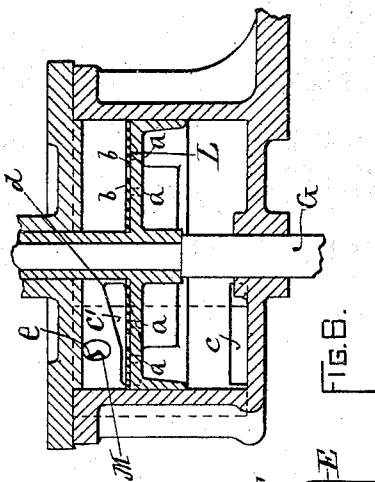
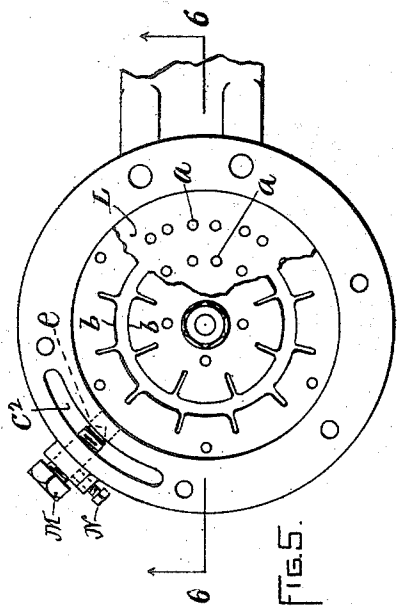
R. H. RICE & J. W. SARGENT.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

RICHARD H. RICE AND JOHN W. SARGENT, OF PROVIDENCE, RHODE ISLAND.

STEAM-ACTUATED DASH-POT FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 642,054, dated January 23, 1900.

Application filed May 16, 1898. Serial No. 680,877. (No model.)

To all whom it may concern:

Be it known that we, RICHARD H. RICE and JOHN W. SARGENT, citizens of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Valve-Controlling Mechanism for Engines, of which the following is a specification.

The nature of our invention consists in the combination of a steam-cylinder and steam-actuated plunger with an air-cushion cylinder and piston having an intervening space between the steam-cylinder and the air-cushion cylinder and intermediate connection with the valve-gear of the engine.

It also consists in so piping the steam-cylinder that the water of condensation will collect in the said cylinder.

It also consists in certain improved details of construction, as herein fully set forth and claimed.

In the accompanying drawings, Figure 1 represents a detail side view of the cylinder of an engine provided with a liberating valve-gear and our improved steam-actuated dash-pot. Fig. 2 represents a view of the valve-gear and dash-pot, taken at right angles to that of Fig. 1. Fig. 3 represents an enlarged axial section of the steam-actuated dash-pot, taken in the line 3 3 of Fig. 1. Fig. 4 represents a section taken in the line 4 4 of Fig. 3. Fig. 5 represents an enlarged section taken in the line 5 5 of Fig. 1. Fig. 6 represents a section taken in the line 6 6 of Fig. 5.

In the drawings, A represents the cylinder of a steam-engine provided with a liberating valve-gear, B B represent the steam-valve bonnets, and C C the exhaust-valve bonnets, the special valve-gear shown in the drawings being that shown and described in our Letters Patent of the United States No. 526,267, the valve-lever 24 being keyed to the valve-stem 7, as in the said Letters Patent, but in a reversed position with relation to the other parts of the valve-gear, the valve-lever 24 being now placed nearest to the bonnet. The valve-lever 24 is provided with a stud D, upon which is placed the square block E, the said block being held in the slot F of the cross-head *f* of the piston-rod G, thus allowing for a limited sliding movement of the block.

The steam-cylinder H is secured to a flange at the lower side of the forward end of the bonnet B, and the cushion-cylinder I is secured to a flange at the upper side of the forward end of the said bonnet, the axes of the said cylinders being in line with each other. The piston-rod G is provided at its lower end with a plunger J, which passes through the gland K of the steam-cylinder H and at its upper end with the cushioning air-piston L, which fits the bore of the cylinder I. The face of the piston L is provided with perforations *a a*, which are covered by the leather flaps *b b*, the said perforations serving to allow the air in the cylinder to pass directly from the under to the upper side of the piston at its downward movement instead of passing through the side ports *c c'* and the vertical connecting-passage *c²*. The port *c'* is inclined, as shown in Fig. 6, whereby the passage of the air into the port will be gradually checked and its pressure above the piston L gradually increased until the piston passes upward beyond the extreme corner *d* of the port *c'*, and thereafter the confined air, which forms the cushion above the piston L, will escape into the passage *c²* through the annular valve-opening *e*, the dimensions of which may be regulated by turning the valve-screw M, which is held in its adjusted position by means of the screw N. As the piston L moves up and down in the cylinder I the air will flow from one side to the other of the piston through the ports *c* and *c'* and the connecting-passage *c²*, and also upon its downward stroke through the perforations *a a* of the piston and upon the release of the steam-valve by the valve-gear the valve will be suddenly closed by the action of the steam upon the plunger J, the sudden movement of the connected parts being cushioned by the action of the confined air upon the piston L.

The steam-pipe O is connected with the steam-cylinder H by means of the downwardly-turned pipe P, whereby the water of condensation will be retained in the cylinder H and the leakage of steam therefrom be prevented.

In the liberating valve-gear shown in the drawings the valve-lever 24, which is keyed to the valve-stem 7, carries from a lug in the

rear a latch 30, which is engaged by the pivoted driving-toe 12 of the rocker 5 to cause the opening of the valve, and the cam-lever 35, which is keyed to the spindle 13 of the driving-toe 12, is carried between the two rollers 18 18, which are attached to the trip-lever 20, the said trip-lever being provided with an arm 22, which is connected by means of the adjustable rod 23 with the fixed stud f' at the side of the air-cylinder I, and by means of the fixed stud f the position of the rollers 18 18 may be varied, so as to cut off the steam at the desired point in the stroke of the piston, the driving-toe 12 being actuated to engagement and disengagement by means of cam-lever 35, which reciprocates between the said rollers. It is to be understood that any desired form of liberating valve-gear may be employed in connection with the steam-actuated dash-pot connected with the valve and valve-bonnet, substantially as shown and described.

We claim as our invention—

1. In a valve-controlling mechanism, the combination of the valve, with the steam-cylinder, the steam-actuated plunger and piston-rod, the cushioning air-piston at the opposite end of the piston-rod, the air-cushion cylinder, the valve-lever attached to the valve-stem, and means for connecting the valve-lever with the piston-rod between the steam-plunger and the air-piston, substantially as described.

2. In a valve-controlling mechanism, the combination of the valve and the valve-bonnet, with the steam-cylinder attached to the valve-bonnet, the steam-actuated plunger and piston-rod, the cushioning air-piston at the opposite end of the piston-rod, and means

for connecting the piston-rod and the valve-stem.

3. In a valve-controlling mechanism, the combination of the valve and the valve-bonnet, with the steam-cylinder and the air-cushion cylinder attached to the valve-bonnet, the steam-actuated plunger and piston-rod provided with the cross-head opening for connection with the valve, the cushioning air-piston at the opposite end of the piston-rod, the valve-stem and connecting means between the cross-head opening and the valve-stem, substantially as described.

4. In a valve-controlling mechanism, the combination of the steam-cylinder and the air-cushion cylinder, with the steam-actuated plunger and piston-rod, the packing-gland around the said piston-rod, the cushioning air-piston at the opposite end of the piston-rod, the steam-pipe, and the downwardly-directed connecting-pipe between the steam-cylinder and the steam-pipe, whereby the water of condensation will be retained in the steam-cylinder, and serve to prevent leakage.

5. In a valve-controlling mechanism, the combination of the steam-cylinder, and the air-cushion cylinder, with the steam-actuated plunger and piston-rod, provided with a cross-head opening, the cushioning air-piston at the opposite end of the piston-rod, the valve, and the valve-lever attached to the stem of the valve and connected with the piston-rod at the cross-head opening, substantially as described.

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Witnesses:

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