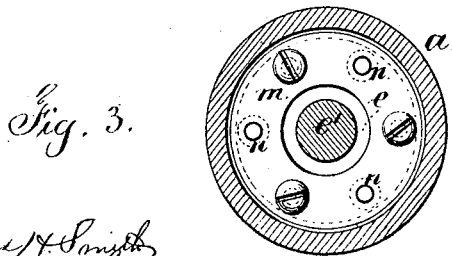
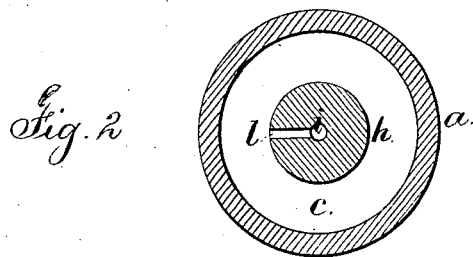
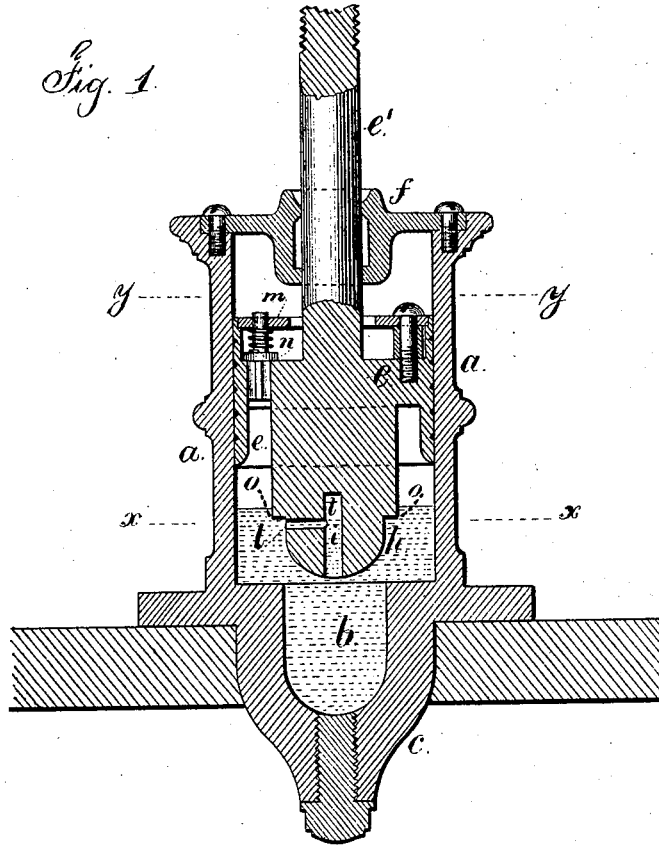


F. STEELE.  
Dash-Pot for Engines.

No. 167,950.

Patented Sept. 21, 1875.



Witnesses,  
Chas. H. Smith  
Harold S. Sewell

Inventor  
Ferdinand Steele  
per Lemuel W. Perrell  
Att'y.

# UNITED STATES PATENT OFFICE.

FERDINAND STEELE, OF BROOKLYN, NEW YORK, ASSIGNOR TO AMERICAN STEAM AND WATER RECORDER COMPANY, OF SAME PLACE.

## IMPROVEMENT IN DASH-POTS FOR ENGINES.

Specification forming part of Letters Patent No. 167,950, dated September 21, 1875; application filed August 20, 1875.

*To all whom it may concern:*

Be it known that I, FERDINAND STEELE, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Dash-Pots for Engines, of which the following is a specification:

Dash-pots are well known in connection with trip cut-offs in steam-engines, said dash-pot serving to arrest the motion of the valve and prevent concussion on the seat.

Great difficulty arises in using these dash-pots, because the differences of temperature, consistency of the liquid, friction, and expansion and contraction, render it necessary to frequently adjust the connection between the dash-pot and valve, and this necessity for adjustment frequently arises from the varying amount of motion to which the valve is at times subjected.

The object of my present invention is to insure uniformity of action in the dash-pot, so as to allow the valve to close upon its seat without concussion, and that regardless of the distance the valve may fall, the conditions of temperature, the pressure of steam, or the fluidity of the liquid in the dash-pot.

In the drawing, Figure 1 is a vertical section of the dash-pot complete. Fig. 2 is a sectional plan at the line *x x*, and Fig. 3 is a sectional plan at the line *y y*.

The cylinder *a* is made with a well, *b*, in the base *c*, and within the cylinder *a* is a piston, *e*, actuated by a rod, *e'*, that passes through the head *f*; and is adjustably connected with the engine-valve, and upon the lower part of the piston *e* there is a plunger, *h*, that is of a size to fit the well *b*, and it has a rounded or tapering lower end, an air-chamber, *t*, and a lateral discharge, *l*. There are holes passing through the piston *e*, with valves *n* closing downwardly by the action of springs between the valves and the guiding *m*.

Oil or other material is introduced into the cylinder *a* through a suitable cock or otherwise, and the parts are adjusted so that the seat or offset *o* of the plunger *e* does not quite touch the inner surface of the cylinder-

base *c* when the valve of the engine rests upon its seat.

The operation is, that as the valve and piston are raised the oil runs into the well *b*, and as the cut-off drops the valve and piston *e* the plunger *h* strikes into the well *b*, and the space through which the oil escapes around the plunger becomes less and less until it is finally closed by the cylindrical portion of such plunger filling the mouth of the well. After this the oil continues to escape through the lateral opening *l*, and this is gradually closed, and then entirely closed, as the plunger passes down; hence, the oil that is confined in the well acts to entirely stop the movement of the valve of the engine just as the said valve rests upon its seat, thereby the hammering and concussion, especially of puppet-valves, is prevented. There is no opportunity for the valve to vibrate; but there is a gradual checking of the movement of the dash-pot piston by the space for the escape of oil from the well lessening, and being finally entirely closed, and the particles of oil between the seat *o* and the bottom form a cushion for the plunger as the valve rests upon its seat.

The space *t* above the lateral outlet *l* will contain air, and it will be under compression by the liquid, but it will furnish the small amount of elasticity necessary to insure a perfect seating of the valve of the engine.

The valves *n* in the piston *e* opening outwardly, serve to allow surplus oil to escape, and, also, air to pass out when the engine is first started.

As the plunger is raised the liquid passes back through the holes *l i* to lessen the vacuum action in lifting the valve.

I claim as my invention—

1. The plunger *h*, having a rounded or tapering lower end, an opening through it, and the shoulder *o*, in combination with the cylinder *a* and well *b*, substantially as set forth.

2. The air-chamber *t* in the plunger *h* of the dash-pot, in combination with the lateral discharge-opening *l*, and the well *b*, as set forth.

3. The dash-pot cylinder *a*, piston *e*, and openings through the piston, in combination with the valves *n*, opening outwardly, for the purposes set forth.

4. The combination, with a dash-pot having a well, *b*, in the bottom and a plunger, *h*, upon the piston *e*, entering such well of the seat *o*, surrounding the plunger *h*, and rest-

ing upon the bottom of the dash-pot, for the purposes set forth.

Signed by me this 18th day of August, A. D. 1875.

F. STEELE.

Witnesses:

GEO. T. PINCKNEY,  
CHAS. H. SMITH.