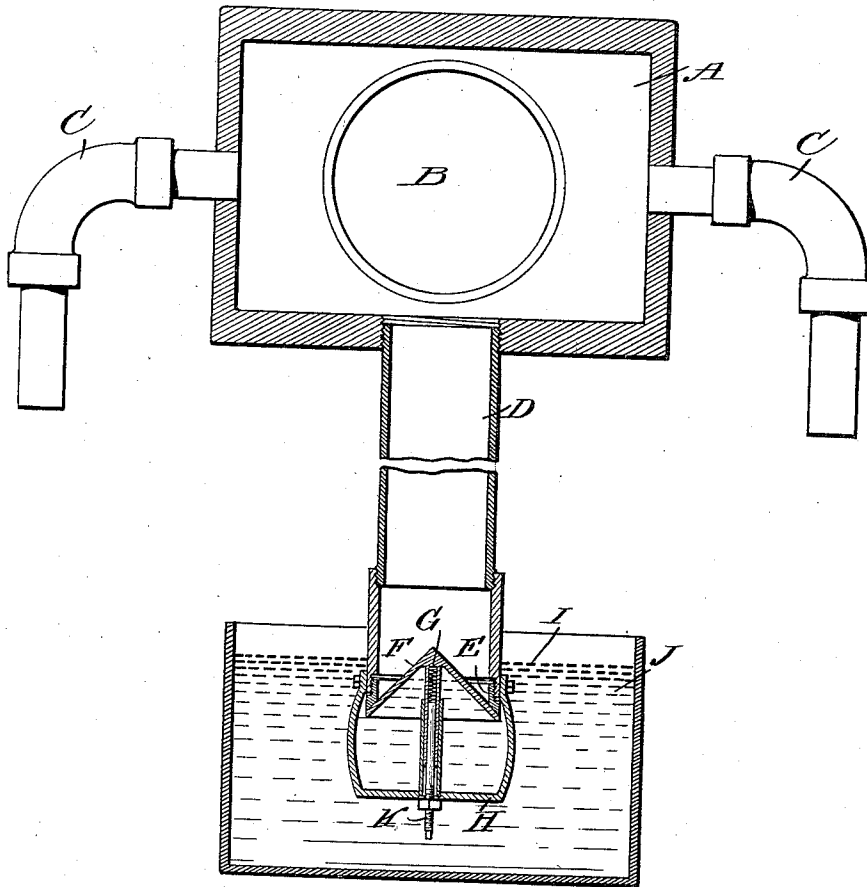


S. S. STEVENSON.
EXHAUST CONTROLLING MECHANISM.
APPLICATION FILED AUG. 7, 1911.

1,024,375.

Patented Apr. 23, 1912.



WITNESSES
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UNITED STATES PATENT OFFICE.

STERLING STANLEY STEVENSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

EXHAUST-CONTROLLING MECHANISM.

1,024,375.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed August 7, 1911. Serial No. 642,651.

To all whom it may concern:

Be it known that I, STERLING S. STEVENSON, a citizen of the United States, and a resident temporarily of Washington, in the District of Columbia, have invented certain new and useful Improvements in Exhaust-Controlling Mechanism, of which the following is a specification.

This invention is an exhaust controlling mechanism for use on steam engines, and the invention has for an object to provide means whereby the exhaust may be controlled in such manner as to secure a certain amount of back pressure upon the cylinder, so that steam will be retained in the cylinder to form a cushion therein; and the invention consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed, and means of attaching it to an engine.

In the drawing, the figure is a sectional view of an apparatus embodying my invention.

As shown, the apparatus comprises a chamber A into which the exhaust from the engine discharges at B. Suitable discharge pipes C lead from the chamber A and open to the atmosphere, said pipes C being of comparatively slight area compared to the exhaust discharge B, and a main outlet pipe D leads downwardly from the chamber A, may be of any suitable length and is provided at its lower end with a valve seat E which may preferably be separate from and screwed into the lower end of the pipe D and be formed to cooperate with the conical valve F which is pressed by a spring G against the seat E, the spring supporting devices for the valve F being carried in the spider frame H, as shown. This valve F is submerged in water I in a tank J and the area of the pipe C is less than that of the exhaust B.

In operation, a certain amount of the exhaust is permitted to escape freely to the atmosphere through the pipes C while the remaining surplus portion of the exhaust discharges through the submerged valve controlling the outlet from the main discharge pipe D. The free outlet or discharge at C from the chamber A furnishes a factor of safety in case the controlling valve F should at any time become stuck or otherwise fail to operate and the advantage of submerging the retaining valve F is that it serves as a means to increase the regular-

ity and control of the said valve, thus making a perfectly balanced system eliminating any jar upon the engine such as would result from an entire uncontrolled discharge of the exhaust, the apparatus thus acting somewhat on the same principle as a governor.

By my invention, I seek to eliminate the use of lead in setting the valve as by the improved retaining valve mechanism, a sufficient amount of steam is retained in the cylinder to act as a cushion to relieve all jar that would ordinarily occur to an engine not given lap, allowing the engine to pass the center and to commence the forward stroke. The degree of travel is calculated to be about 10° when the valve is open to admit sufficient steam for completing the stroke, cutting off at its former point and thus forming the cushion and affording power for 10° of the arc. On the forward stroke, a similar action will occur on the opposite side of the engine. I accomplish this by the use of the exhaust chamber with the small outlets to the atmosphere and the main relief pipe D, having the spring pressed valve submerged as before described, in order to secure a complete and uniform means of controlling the back pressure on the cylinder.

By providing an adjusting bolt K for varying the tension of the spring G, the valve is under the control of the operator and can be set with any desired degree of tension against its seat. By retaining the exhaust steam and utilizing the same to perform the office of the live steam ordinarily admitted to cushion the stroke, a great saving of fuel results. It will also be understood that when the piston is moving forward to compress the steam at one end of the cylinder, there is the same pressure in the opposite end of the cylinder, at mean effective pressure point, and that there is no resistance occurring until the stroke is nearly completed and this pressure with the travel of the fly wheel is sufficient to avoid any retarding of the speed of the stroke, besides eliminating the impact of inrushing steam against the piston head before passing center.

It will be understood that by the described construction, I seek to secure an increase of power and strength under working conditions by providing for the reusing of the expansion of the gas.

I claim:

1. An exhaust controlling mechanism, substantially as herein described, comprising a chamber having an inlet for the exhaust and provided with the outlet pipes opening to the atmosphere, a main discharge pipe leading from said chamber and of an area, combined with that of the outlet pipes opening to the atmosphere, less than that of the exhaust inlet, a valve controlling the discharge end of the main outlet pipe, a spring pressing said valve to its seat, and means for submerging said valve, all substantially as and for the purposes set forth.
2. An exhaust controlling mechanism comprising a chamber having an inlet for exhaust and an unobstructed discharge to the atmosphere relatively smaller than the exhaust inlet, a main outlet pipe leading from the said chamber, a valve controlling the discharge from said outlet pipe and means for submerging the said valve, substantially as set forth.
3. An exhaust controlling mechanism comprising a chamber receiving the exhaust from the engine and having an unrestricted

discharge to the atmosphere of limited area, a main outlet or discharge from said chamber, a valve controlling such discharge, and means for submerging said valve, substantially as set forth.

4. An exhaust controlling mechanism comprising a chamber having an inlet for the exhaust, an outlet pipe leading from said chamber, a valve controlling the discharge from said outlet pipe and means for submerging the said valve, substantially as set forth.

5. In an apparatus, substantially as herein described, the combination of a chamber for the reception of exhaust, an outlet pipe leading from said chamber, a valve seat in said pipe, preferably at the discharge end of said pipe and a valve fitting to said seat, and means for supporting and actuating the valve, and means for submerging the valve, substantially as set forth.

STERLING STANLEY STEVENSON.

Witnesses:

C. C. EDELSON,
S. EDELSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."