J. W. MATHIESON.

Governor for Steam-Engines.

No. 168,165. Patented Sept. 28, 1875.

Fig. 1.

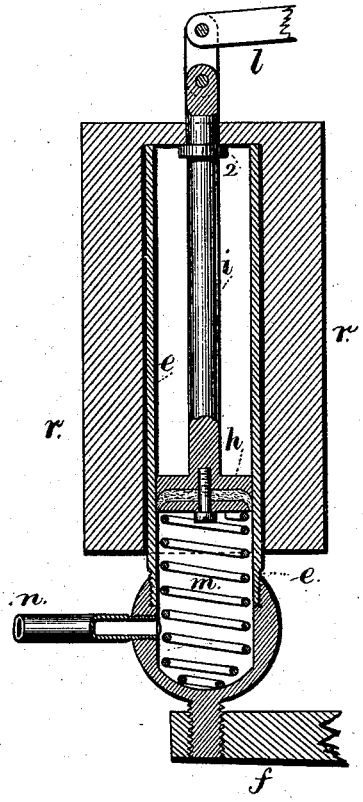
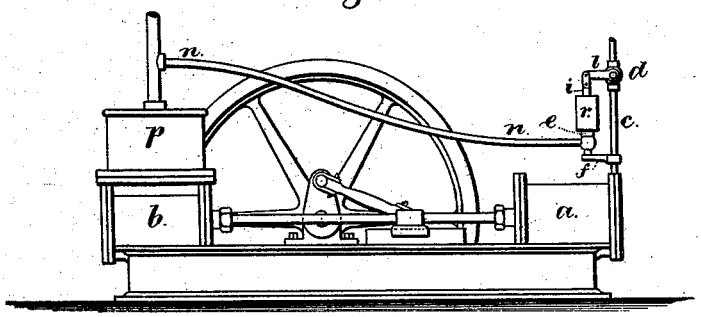


Fig. 2.



Witnesses.

Chas. A. Smith
Harold Serrell

Inventor.

James W. Mathieson.
per Lemuel W. Serrell atty

UNITED STATES PATENT OFFICE.

JAMES W. MATHIESON, OF BROOKLYN, NEW YORK, ASSIGNOR TO SARAH HARDICK, EXECUTRIX, AND JOHN RYER AND ABRAHAM H. VAN HOESEN, EXECUTORS OF CHARLES B. HARDICK, DECEASED.

IMPROVEMENT IN GOVERNORS FOR ENGINES.

Specification forming part of Letters Patent No. **168,165**, dated September 28, 1875; application filed August 30, 1875.

To all whom it may concern:

Be it known that I, JAMES W. MATHIESON, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Regulators or Governors for Pumping-Engines, of which the following is a specification:

Before my invention a regulator had been made to move the throttle-valve of an engine according to the pressure in the pump or the valve-chest, so as to regulate the amount of steam used, and, consequently, the speed of the engine, as required to maintain uniformity in the action of the pump.

I employ a piston moving in a cylinder, and the rod of this piston is connected to an arm or lever from the throttle-valve of the engine. A weight surrounds this cylinder, and is supported by said cylinder in its normal position.

The piston-rod passes through said weight, and is provided with a collar, so as to lift the weight during its upward movement.

The fluid in the cylinder acts against the under side of the piston, and is of the same pressure as that in the air-chamber or discharge-pipe of the pumping-engine; hence, if the maximum pressure is exceeded, the piston is moved against the action of the weight, the throttle-valve partially closed, and the speed of the engine lessened. As the pressure upon the piston diminishes the weight gradually lowers the piston, opens the throttle-valve wider, and admits more steam to the engine, thus regulating the speed according to the pressure of the fluid being pumped.

In the drawing, Figure 1 is a vertical section of the regulator, and Fig. 2 is an elevation of an engine and pump with the regulator applied thereto.

a represents the steam, and *b* the pumping, engine. *c* is the steam-pipe, and *d* the throttle-valve. These parts, being of usual character, do not require further description.

The cylinder of the regulator is supported by a bracket, *f*, extending from the steam-pipe *c*, and within this cylinder is the piston *h* and rod *i*, and said rod is connected to the throttle-valve *d* by the lever *l*. A spiral spring, *m*, below the piston-head assists the piston in its upward movement, and acts to prevent a sudden motion in either opening or closing the throttle-valve. A pipe, *n*, passes from the cylinder *e* below the piston to the air-chamber *p* or discharge-pipe of the pump, or to the reservoir, so that the pressure acting to force up the piston, and thereby to close the throttle-valve, is the same, or nearly so, as the pressure in the pump or reservoir. A weight, *r*, is provided around the cylinder *e*, and in a normal position it is supported upon said cylinder, as shown in Fig. 1. The piston-rod *i* passes through said weight, and a collar, 2, upon said rod serves to lift the weight when the piston is forced up by reason of the pressure in *e* increasing beyond a fixed point.

This weight acts against the pressure of air or other fluid in the cylinder *e*, and being of the proper weight to balance the maximum pressure, the weight will be lifted if that pressure is exceeded, and partially close the throttle-valve of the engine, to lessen the speed thereof, and as the pressure of the fluid in the pump lessens, the valve will be opened wider, so as to regulate the speed of the engine automatically by the pressure in the pump.

I claim as my invention—

The hollow weight *r*, resting upon a collar upon the piston-rod *i*, in combination with the piston *h*, cylinder *e*, throttle-valve *d*, pump *b*, and steam-engine *a*, for regulating the speed of the engine according to the pressure in the pump, substantially as set forth.

Signed by me this 25th day of August, A. D. 1875.

JAMES W. MATHIESON.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.