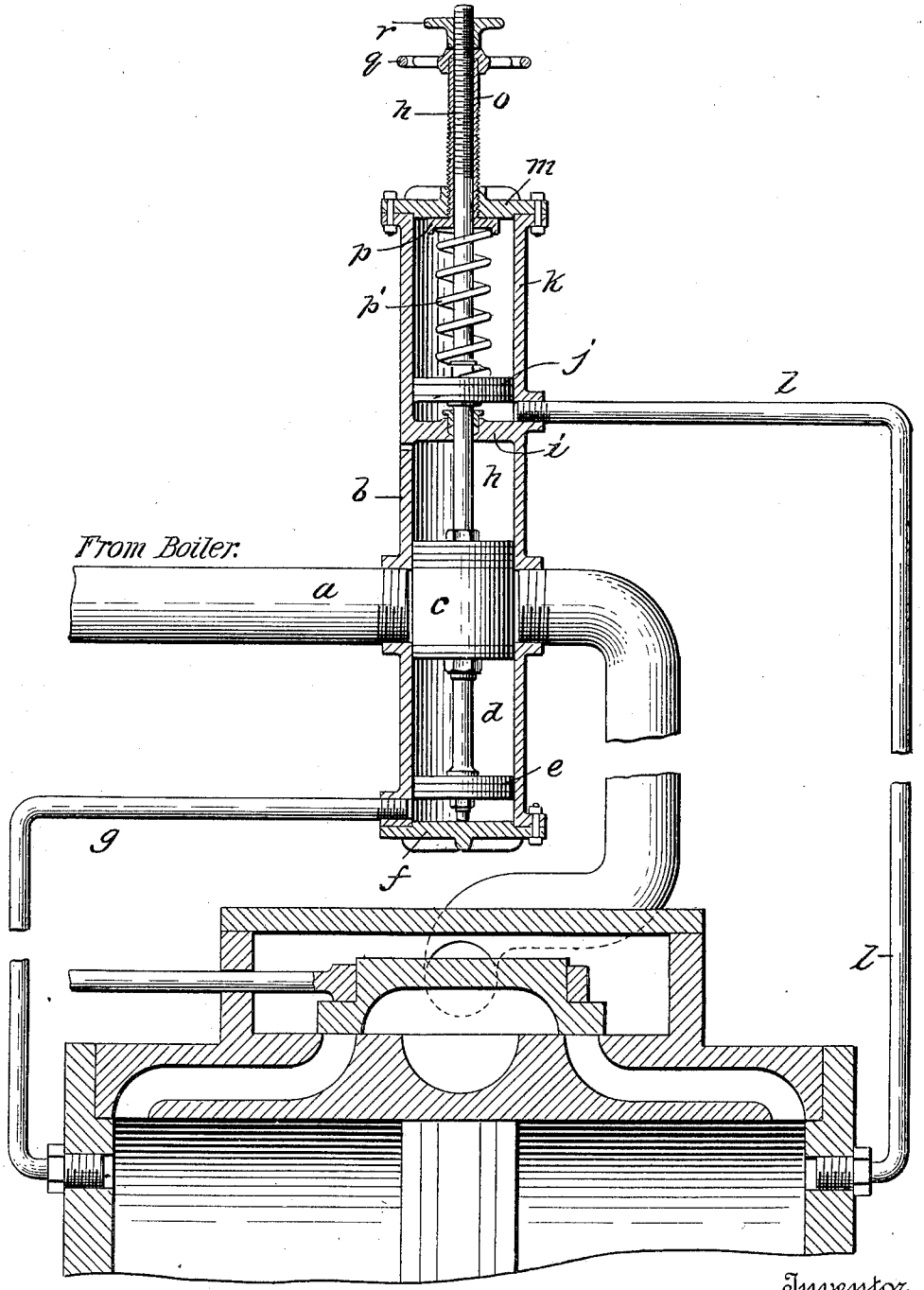
E. E. ADAMS.

STEAM ENGINE THROTTLE VALVE.

APPLICATION FILED MAR. 3, 1913.

1,067,233. Patented July 15, 1913.



Witnesses
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EDWARD E. ADAMS, OF QUITO, ECUADOR.

STEAM-ENGINE THROTTLE-VALVE.

1,067,233. Specification of Letters Patent. Patented July 15, 1913.

Application filed March 3, 1913. Serial No. 751,974.

To all whom it may concern:

Be it known that I, EDWARD ERNEST ADAMS, a citizen of the United States of America, and a resident of Quito, Ecuador, South America, have invented certain new and useful Improvements in Steam-Engine Throttle-Valves, of which the following is a full and clear specification, reference being had to the accompanying drawing, in which is represented a vertical sectional view of my device connected up to a well-known type of reciprocating steam-engine.

The object of this invention is to provide means for automatically throttling the engine through the medium of pressure in the engine cylinder whereby the supply of steam will be determined not by the speed of the engine but by the amount of work the engine is called upon to do, as more fully hereinafter set forth.

In the drawing *a* designates the live steam supply pipe which is connected up to the valve box of the cylinder in any suitable manner.

The letter *b* designates a cylinder which is inserted in the supply pipe at a suitable point in its length in such manner that the steam on the way to the engine must pass transversely through this cylinder. A piston throttle valve *c* works in this cylinder and is adapted to stop the passage therethrough of the live steam. At one side or end this piston is provided with a rod *d* which at its end carries a piston *e* which fits and works within the cylinder *b*. At this end of the cylinder the cylinder is closed by a head *f*, and the space between this head and said piston *e* is connected to one end of the engine cylinder by a suitable pipe *g*. The other end or side of the throttle valve *c* is provided with a rod *h* which extends through the adjacent head *i* of the cylinder *b*, and this projecting end of the rod *h* is provided with a piston *j* of the same diameter as the piston *e*. This piston *j* works in a cylinder *k* of a diameter equal to that of the cylinder *b*, and between the piston *j* and the head *i* enters one end of a pipe *l*, the other end of this pipe *l* being in communication with the end of the cylinder opposite the connection thereto of pipe *g*. In the upper head *m* of the cylinder *k* is centrally tapped a sleeve *o* which on its inner end is provided with a circular flange *p*, between which and the piston *j* is confined a coil spring *p'* whose tendency is to expand. To conveniently rotate the sleeve *o* for the purpose of varying the tension on the spring I provide the same with a hand wheel *q*.

The piston rod *h* is extended axially through the cylinder *k* and up through the sleeve *o*, its projecting end being provided with a thumb nut *r* which bears upon the upper face of the hand wheel *q*.

To start the engine, the hand wheel *q* is turned to the left to bring its flange *p* up against the head *m*, in which position there is very little if any tension on the spring provided the piston *j* be at the opposite end of the cylinder *k*. Then the nut *r* is turned to the right, thereby raising the pistons *e* and *j* and thus putting the spring under increased tension and opening the throttle valve, whereupon steam will pass to the engine and put the same in motion. All the movable parts of the device are then bodily lowered (by turning the hand wheel *q*) to a point where the piston valve will close the steam supply when pressure is removed from under the pistons *e* and *j*. The space between the piston *e* and the piston valve *c* will of course be filled with live steam at boiler pressure but as these pistons are equal in area there will be no tendency on the part of the live steam to force the pistons in either direction.

During the running of the engine, the pressure of steam at the opposite sides of the engine piston will be communicated to the pistons *e* and *j* in such manner that the pressure will oppose the expansive tension of the spring, the tendency of the spring being at all times to force the pistons *j* and *e* downwardly and the throttle valve to closed position. It will be observed therefore that the position of the throttle valve will at all times be determined by the pressures in the cylinder, these pressures being determined of course by the resistance the piston meets with in performing its work. In this way I govern the engine not by the speed of the engine but altogether by piston resistance.

It will be observed that during the running of the engine, by the time one of the actuating pistons *e* or *j* is relieved from pressure by exhaustion of steam from one end of the engine cylinder live steam pressure has been brought from the other end of the cylinder under the other piston *j* or *e*, so that at all times one or the other of the actuating pistons will be sustained against

the action of the spring by cylinder pressure.

It will be understood that the point at which the throttle is intended to close may be varied by varying the tension on the spring; and it will be understood further that the construction and location of the cut off devices can be varied very greatly without departing from my invention, the spirit of which is that the cut off devices shall be so constructed and located as to govern the admission of live steam to the cylinder by means of cylinder resistance or pressure instead of by the speed of the engine.

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

1. In combination with a reciprocating engine, of an automatic safety throttle therefor embodying a pair of cylinders and pistons of equal diameter, a throttle valve connected to said pistons and adapted to be actuated thereby, adjustable resilient means tending to close the throttle valve, and independent steam connections between the opposite ends of the engine cylinder and the respective ends of the aforesaid cylinders, for the purpose set forth.

2. In combination with a reciprocating steam engine, of an automatic safety throttle therefor, consisting of a means for governing the admission of live steam to the cylinder and means whereby said governing device is actuated by the intermittent steam pressures at opposite sides of the piston.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

EDWARD E. ADAMS.

Witnesses:
B. S. ABAD L.,
CEFERINO A. CILLZ.

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