

E. A. SUTCLIFFE.
Governors for Engines.

No. 150,266.

Patented April 28, 1874.

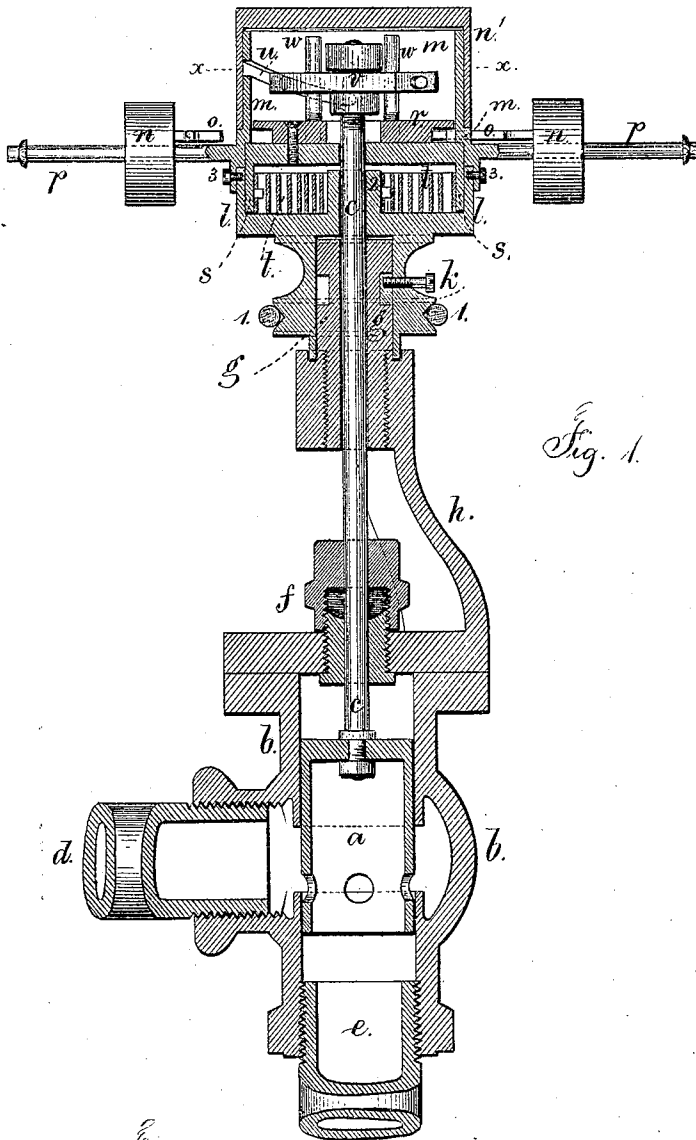
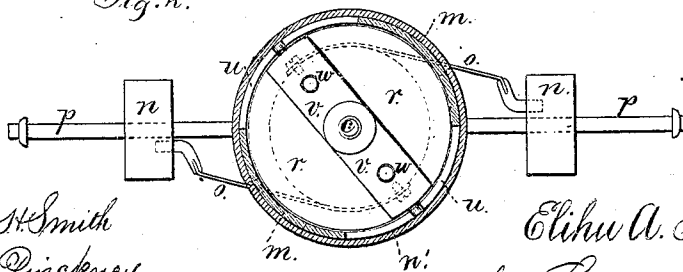


Fig. 1.

Fig. 2.



Witnesses

Chas. H. Smith
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Inventor

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ELIHU A. SUTCLIFFE, OF NEW YORK, N. Y.

IMPROVEMENT IN GOVERNORS FOR ENGINES.

Specification forming part of Letters Patent No. 150,266, dated April 28, 1874; application filed October 18, 1873.

To all whom it may concern:

Be it known that I, ELIHU A. SUTCLIFFE, of the city and State of New York, have invented an Improvement in Governors for Engines, &c., of which the following is a specification:

I make use of weights sliding upon horizontal, or nearly horizontal, arms, revolved by a spindle; and a spring acts to draw in the weights, and balance the centrifugal force tending to throw off these weights. The partial revolving movement between the parts resulting when the speed of revolution is increased or decreased is made operative by inclines to give motion to the valve or gate that opens or closes the orifice for the steam or other material operating as force in the engine.

In the drawing, Figure 1 is a vertical section of the improved governor, and Fig. 2 is a sectional plan at the line *x x*.

The valve *a* is in the case *b*, between the supply and delivery pipes *d e*. I prefer the cylindrical valve represented. The spindle *c* passes through the packing-gland *f*, and extends through the stationary gudgeon *g* upon the frame *h*, around which gudgeon *g* the pulley *k* is revolved by a belt, *l*, or otherwise, driven by the engine to be regulated or governed. To the pulley *k* is attached a shell, *l*, extended upwardly by the case *m* and cap *n'*. From the case *m* the arms *p* extend, and upon these the governor balls or weights *n* slide; and it will be observed that the pulley *k*, case *m*, shell *l*, and parts carried by and contained in the same, all are revolved around the spindle *c*, and said spindle *c* only receives an end movement, as hereafter described, when the speed varies. The weights *n* are connected, by flat bands *o*, or cords or chains, with the grooved disk *r* within the case *m*; and hence, as the centrifugal force throws the weights *n* farther out, this disk *r* is moved relatively to the case *m* and shell *l*. To this disk *r* the spring-barrel *s* is attached, and within the latter is the spring *t*, connected at its outer end to the barrel *s*, and at the inner end to the hub 2 of the shell *l*; and this spring *t*, acting to

turn the disk *r*, tends to draw in the weights *n*. The power of this spring is increased or lessened by turning the case *m* and arms *p* upon the shell, and thereby winding up or unwinding such spring until its power is properly proportioned to the weights *n* and the velocity of rotation. The screw 3 secures these parts when adjusted. A cross-head, *v*, is introduced within the case *m*, and its ends enter inclined slots *u*, standing in reverse, so that the cross-head is raised or lowered by a partial revolution relatively to the case *m*, and this is effected by the studs *w*, that project from the disk *r* and pass loosely through holes in this cross-head; and this cross-head also has a hole for the spindle *c*, and a washer or nut above and below the cross-head, so that said cross-head is free to revolve around the spindle; but it moves the spindle endwise, to lessen or increase the steamway of the valve, when the cross-head is moved up or down by the action of the weights on the spring to wind up the same, or to allow the spring to draw in the weights, as aforesaid.

The spindle *c* might be in a horizontal position, but it is preferable when vertical.

The weights may be drawn inwardly by the revolving movement, acting through a pinion and racks, or otherwise; and this volute spring, and the revolving movement therefrom, may be applied, in any convenient manner, to operate upon the centrifugal weights.

I claim as my invention—

1. The combination of a revolving shell, a volute spring, a disk, and governor-balls connected thereto, substantially as specified.

2. The pulley *k*, shell *l*, case *m*, and spring-barrel *s*, in combination with the arms *p*, weights *n*, and connections *o*, and the cross-head *v* and valve-rod *e*, substantially as and for the purposes set forth.

Signed by me this 15th day of October, A. D. 1873.

ELIHU A. SUTCLIFFE.

Witnesses:

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