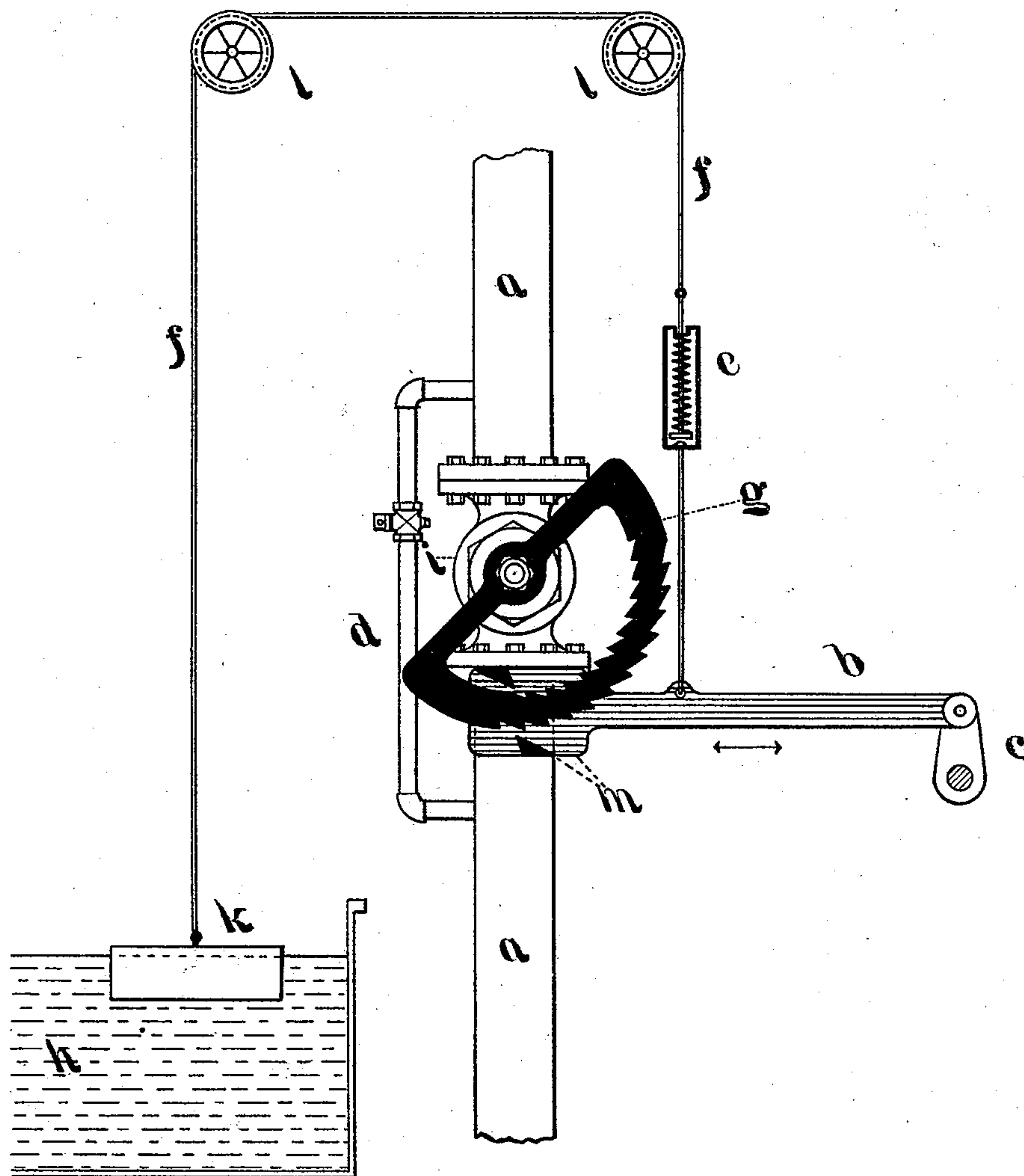


(No Model.)

T. SHAW.  
GOVERNOR FOR PUMPING ENGINES.

No. 515,371.

Patented Feb. 27, 1894.



Witnesses

Sept. R. Nikon.

Charles H. Sterens

T. Shaw

Inventor

# UNITED STATES PATENT OFFICE.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

## GOVERNOR FOR PUMPING-ENGINES.

SPECIFICATION forming part of Letters Patent No. 515,371, dated February 27, 1894.

Application filed September 12, 1891. Serial No. 405,449. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS SHAW, of the city and county of Philadelphia, Pennsylvania, have invented a new and Improved Governor for Pumping-Engines; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists in the provision of a double pawl operated by the pumping engine, arranged to control the throttle valve by operating on rack provided on the periphery of a section of throttle wheel, connected with throttle valve of the pumping engine and controlled by a float. All operating in the manner and for the purpose hereinafter described, and is a further improvement upon my Patent No. 453,671, adapting the same to mine use, &c.

The object of the invention is to provide a governor for pumping engines in mines, quarries, &c., that will control the engine by the height of water in the absence of the engineer, and is particularly serviceable in times of accident compelling the engineer to leave his engine by reason of foul gases or otherwise.

In order to enable others to use and practice my invention, I will proceed to describe its construction and operation.

The drawing represents a side view of the governor of which *aa*, is the steam pipe leading to the pumping engine, (engine not shown on the drawing,) said steam pipe is connected with ordinary throttle valve *i*, and is provided with a smaller steam pipe *d*, to run steam to engines independent of throttle valve *i*, which pipe is provided with ordinary stop cock shown. All operating in the manner and for the purpose hereinafter described. A double pawl *b*, is pivoted on one end with crank arm *c*, of any portion of engine that will give a vibrating motion to said double pawl arm *b*, of one or two inches stroke. An ordinary float *k*, of sufficient size to give large excess of any demands made upon said float when operating in the manner hereinafter described. A wire or chain cable *f*, connects said float *k*, with said double pawl *b* and is provided with ordinary guide pulleys *l*, to lead said cable in

any suitable direction, and is provided with ordinary spring sockets *e*, all for the purpose hereinafter explained.

The pawl arm *b*, is provided with strong metallic teeth *M* arranged to engage in the teeth *g*, cut in periphery of section of said throttle wheel *g*. A sump or reservoir can be located at various distances from the pump, and where the distance is great enough to cause weight of cable *f*, to work an interference, ordinary counterbalance weights are screwed to cable on opposite side of suspension to secure a balance of load on cable.

The governor is operated in this wise—Steam is run to engines around throttle *i*, by pipe *d*, and is kept on all the time that engines are wanted for duty, for the purpose of keeping the engines warmed up ready for work, and for the purpose of insuring at all times a slight motion from the engines on crank arm *c*, to operate double pawl *b*. The position of the throttle wheel is that of open throttle with engines set to run maximum speed, because the reservoir *h*, is full of water. After the water is lowered by the action of the pumps, the float *k*, sinks a predetermined distance, the effect of which is to raise the pawl arm *b*, permitting the bottom tooth of said pawl to engage in the rack teeth of throttle wheel *g*, and by a succession of strokes of said pawl arm *b* derived from the engine. The throttle valve is closed and the steam shut off from the engine, with the exception of steam that passes through pipe *d*, as afore described. When in course of time the water rises in reservoir *h*, the float *k*, causes pawl arm *b*, to lower sufficiently for the upper tooth *m*, in said pawl, to engage on the inner rack of wheel and by successive strokes as afore described, open said throttle valve and start up the engines until the water is again lowered, when the operation is again repeated in the manner aforementioned for any number of occasions, without interruption in a manner completely automatic, in a practical manner adapted to mine uses.

It will be evident that the several parts can be modified in configurature, location, &c., without any alteration in the result. I there-



fore do not wish to confine myself to the exact location or configurature here represented.

What I claim, and desire to secure by Letters Patent, is—

- 5 In governors for pumping engines, the combination with a pipe leading to the engine and having a throttling valve therein, a pipe around the throttle valve arranged to supply steam to the engine sufficient to continuously operate the same independent of the  
10 throttle valve, a toothed wheel or sector connected to the throttle valve and having a dou-

ble set of reversely arranged ratchet teeth, a vibrating double pawl connected to the engine and arranged to engage at different 15 times the separate sets of ratchet teeth, and a float connected to said double pawl and arranged to control its operation on said wheel or sector, substantially as described.

THOMAS SHAW.

Witnesses:

JOSEPH R. HILSON,  
L. SHUGARD.