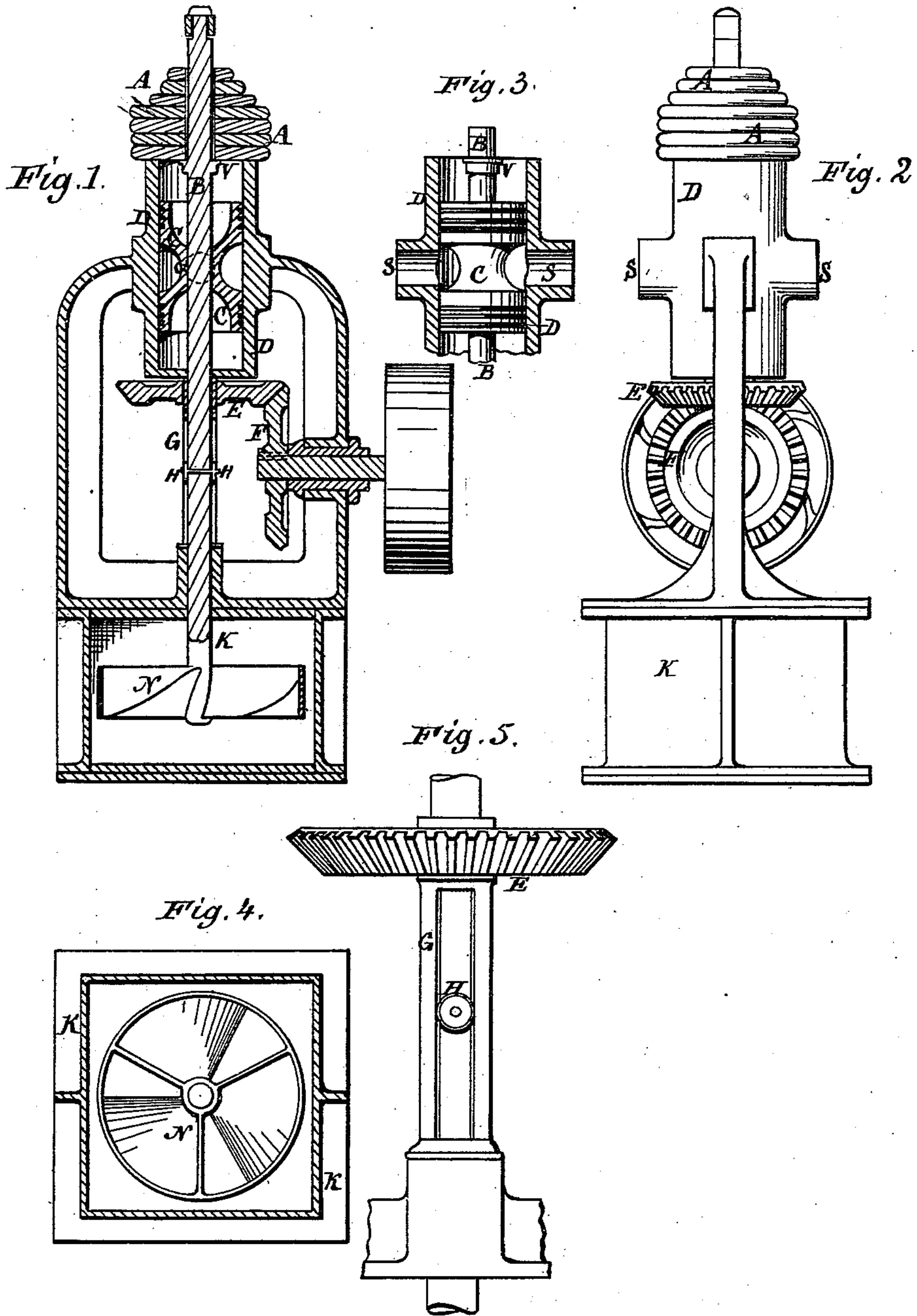


F. BURNS.  
Governors for Engines.

No. 212,185.

Patented Feb. 11, 1879.



Witnesses:  
W.B. Masson  
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Inventor  
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# UNITED STATES PATENT OFFICE.

FRANK BURNS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO CHARLES MARQUEDANT BURNS, JR., OF SAME PLACE.

## IMPROVEMENT IN GOVERNORS FOR ENGINES.

Specification forming part of Letters Patent No. **212,185**, dated February 11, 1879; application filed December 14, 1878.

*To all whom it may concern:*

Be it known that I, FRANK BURNS, of the city and county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Improvement in Governors for Steam-Engines, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention is intended to govern the speed of the steam-engine by regulating the supply of steam admitted to the cylinder.

Referring to the accompanying drawings, Figure 1 represents a sectional view of the governor. Fig. 2 represents a general outside view. Fig. 3 represents the valve enlarged. Fig. 4 represents a plan of the screw-wheel and box containing the liquid. Fig. 5 represents an enlarged view of the jacket and the wheel H, with the gear-wheel attached.

D represents the case, in which the valve C is allowed to turn and rise and fall, its motion being governed by the rod B, fastened through its center. A A are loose weights resting on the top of the case D, with holes in the center, to allow them to be readily taken off or put on the rod B. V is a collar fastened to the rod B, and capable of bearing the weights A A. F is a gear-wheel on the shaft with the belt-pulley. E is a gear-wheel on the loose jacket G, which is kept in position by having bearings on the box K and the under side of the case D. This loose jacket has slots or openings pierced on two sides, sufficient to allow the wheels H H to pass freely the full distance which the motion of the rod may require.

The small wheels H H have a pin, on which they revolve, passing through the rod B. These wheels are used to avoid the friction which a simple pin might have in passing up or down in the slot.

K is a box, containing the liquid in which the screw-wheel N revolves.

The operation will be seen by referring to the drawings, in which the valve C and parts connected with it—viz., H H and N—by the

rod B are shown in the positions it is intended they shall hold when the engine is at ordinary speed. When the governor is at rest the rod B rests on the bottom of the box K, containing the liquid. The valve C will then nearly close the steam-ports S S. Sufficient opening is, however, allowed to give the engine enough steam to start it. The motion is communicated to the wheels F and E. The latter, being fastened to the jacket G, carries the rod with it in revolving. The screw-wheel N, having the resistance of the liquid, lifts the valve, which is the only weight it has to lift, until the collar V meets the weights A A, as shown in drawings.

So long as the engine revolves at ordinary speed (which may be adjusted by putting on or taking off the weights,) the resistance of the screw-wheel to the liquid will sustain the valve in this position; but should the speed be increased, the resistance of the screw-wheel to the liquid will overcome the resistance of the weights, and, rising, tend to close the valve and reduce the supply of steam. When the speed is diminished the weights tend to carry the valve down to its former position.

Another advantage is, that should the driving-belt break or run off the pulley, so as to disconnect the governor, the valve, being no longer sustained by the motion of the screw-wheel N, falls by its own weight, and cuts off the supply of steam.

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

The combination of the valve C, screw-wheel N, operating in a liquid, and the weights A A, all three mounted upon a shaft having a collar, V, to carry the weights, said shaft being provided with wheels or rollers, which move in a slot in a loose jacket, G, substantially as and for the purpose specified.

FRANK BURNS.

Witnesses:

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