

No. 614,346.

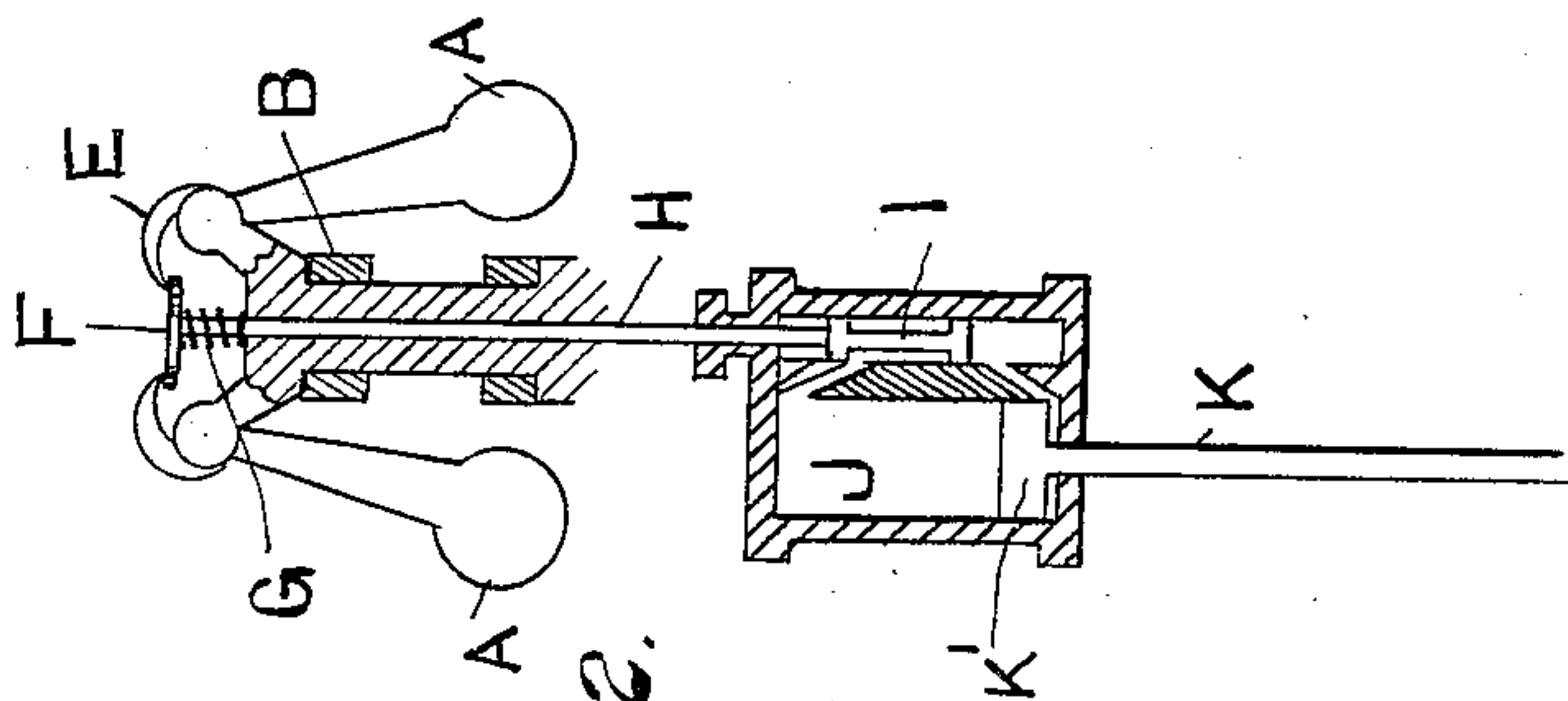
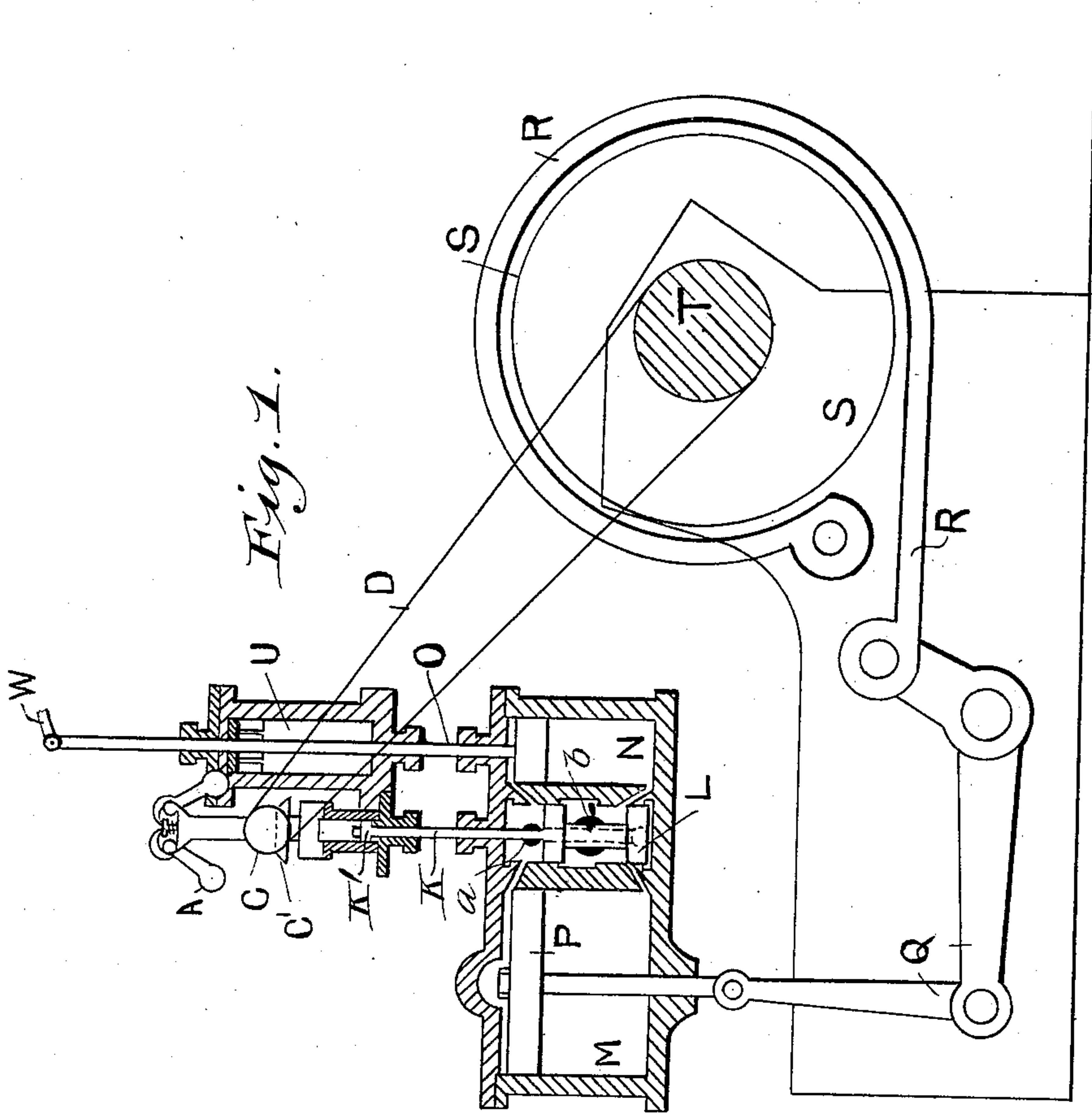
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F. W. REYNOLDS, Yr

GOVERNING DEVICE FOR PREVENTING RACING IN ENGINES.

(Application filed Dec. 20, 1897.)

(No Model.)



Witnesses

Russell Deverance
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Inventors

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by his atty
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UNITED STATES PATENT OFFICE.

FRANCIS WILLIAM REYNOLDS, YR., OF LIVERPOOL, ENGLAND, ASSIGNOR
OF ONE-HALF TO HERMANN STRAUS, OF SAME PLACE.

GOVERNING DEVICE FOR PREVENTING RACING IN ENGINES.

SPECIFICATION forming part of Letters Patent No. 614,346, dated November 15, 1898.

Application filed December 20, 1897. Serial No. 662,632. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS WILLIAM REYNOLDS, the younger, a subject of the Queen of Great Britain, residing in Mellor's buildings, Exchange street, east, Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in Governing Devices for Preventing Racing in Engines, of which the following is a specification.

This invention has for its object the prevention of racing in marine and other engines. Large numbers of governors have been designed for this purpose; but all with which I am acquainted act too late, as although the steam is cut off directly the engine begins to race there still remains sufficient steam in the passages and cylinders to cause a considerable amount of mischief. My invention therefore is designed so that the steam is cut off from the engine pretty much as in the best arrangements now existing; but also the residual steam and momentum of parts are used up by a brake apparatus put into and thrown out of operation by the governor instead of being exerted in what is technically known as "racing."

The invention is best described by aid of the accompanying drawings, in which—

Figure 1 represents a vertical central section through my improved device for preventing the racing of engines, portions thereof being shown in side elevation; and Fig. 2 is an enlarged detail sectional view of the governor and valve controlled by the same.

In the figures, A is the governor-balls. Any other well-known form of centrifugal governor can be used. This is driven in any desirable manner, such as by having its stem supported in bearings B B and driven by bevel-gearing C C' in any convenient manner from the engine, such as by belt D from the main shaft T. Beaks E on the continuation of the shanks of the governor-balls press on plate F against the pressure of spring G, and thus press down the rod H. This rod actuates the valve I of a cylinder J, the piston K' and piston-rod K of which actuate the valve L.

M and N are two cylinders, the ports of which are so arranged that the valve shall

first introduce steam into cylinder N and afterward into cylinder M. The port above the valve L and the port below are open to the exhaust *a* by a passage. (Not shown.) The interior of the valve itself on both sides is open to a steam-port *b*. It will be seen that whenever the valve I of the little cylinder falls sufficiently to open the lower port to the steam in the valve and to open the upper port to the exhaust in the valve-chest the piston rises and causes the valve L to rise. The valve L admits steam first to the open port of cylinder N, and it is only when it has risen nearly to its full height that it admits steam to the upper port of cylinder M. Cylinder N is connected by its piston-rod O with the stop-valve of the engine. (Not shown.) The piston P of cylinder M is united by its rod-and-link motion with the brake-strap R, capable of being brought against a brake-wheel S on the crank-shaft T of the engine.

U is a dash-pot consisting of a cylinder of oil and a piston on piston-rod O, having holes through it through which the oil can pass. This prevents any very rapid oscillation or jerking of the rod O.

The mode of operation is as follows: When the engine-shaft begins to go too fast, it increases the speed of the governor. The governor-balls, rising, press down plate F, by means of their beaks E, against the pressure of the spring G. This causes valve I to descend, admits steam below the piston K' in cylinder J, and connects the upper part of the cylinder J with the exhaust, piston K' ascends and admits steam into cylinder N, causing the piston to descend, thus actuating the valve-lever W. If the action continues, the valve L, further ascending, admits steam into cylinder M, depressing piston P and putting on the brake, thus preventing the shaft from racing. The moment the racing is stopped or prevented the governor-balls fall, thus allowing spring G to raise the valve I. This admits steam again above the piston K', which, descending, lowers the valve L, so as to admit steam into the lower part of cylinders N and M, thus taking off the throttling action from valve-rod W and throwing out of action the brake R.

I declare that what I claim is—

1. The combination with a governor, of a valve adapted to be operated thereby, the said valve being adapted to control ports leading to both sides of a piston, a piston-rod connecting said piston with a valve, whereby the said valve is positively carried with the said piston, means controlled by said valve for operating both a cut-off piston and a brake-piston, a cut-off piston, a brake-piston and cylinders inclosing each, substantially as described.

2. The combination with a governor of a valve adapted to be operated thereby, the said valve being adapted to control ports leading to each side of a piston, a valve connected to the piston-rod of said piston whereby it is operated positively with the piston and controls ports leading to each side of a cut-off and a brake-operating piston, a cut-off piston, a brake-operating piston and cylinders inclosing each, substantially as described.

3. In an apparatus for preventing racing of engines, the combination with a governor, of a valve connected therewith, a piston-rod carrying a piston at one end and a piston-valve at the other end, the said governor-valve being adapted to admit steam to either side of the said piston and the said piston-valve being adapted to control ports leading into separate cylinders, and a cut-off piston and a brake-operating piston mounted in the said cylinders, the construction being such that the cut-off and the brake will be operated according to the movement of the piston-valve, substantially as described.

4. In an apparatus for preventing the racing of engines, the combination with a centrifugal governor of a slide-valve adapted to be operated thereby, a cylinder connected with the said slide-valve by means of ports, a piston operating in the said cylinder the construction being such that the valve may permit steam to enter upon either side of the said piston, a valve mounted on the rod of the said piston whereby the said valve is moved positively with the piston for controlling ports leading into separate cut-off, and brake-operating cylinders, a cut-off-operating cylinder, a brake-operating cylinder and pistons operating in each, substantially as described.

5. In an apparatus for preventing the rac-

ing of engines, the combination with a governor connected with the working parts of an engine, of a valve operated by the said governor, the said valve controlling ports leading to each side of a piston, a piston controlled by the said valve, a valve connected with the said piston and controlling ports leading into separate cylinders for operating a cut-off piston and a brake-piston, substantially as described.

6. In an apparatus for controlling the speed of engines, the combination with a governor of a valve controlled thereby, a piston controlled by the said valve, a second valve operated by the said piston and controlling ports leading upon each side of a cut-off piston and a brake-piston, the arrangement of the ports being such that the pressure will be admitted to operate the cut-off first and if the speed of the engine continues the pressure will then be admitted to operate the brake, substantially as described.

7. In an apparatus for controlling the speed of engines, the combination with a governor of a relay of power actuated by the said governor, a valve actuated by the said relay of power and cylinders carrying pistons adapted to be controlled by the said valve, the construction being such that steam is admitted to one first for operating a cut-off and to the other afterward for operating a brake, substantially as described.

8. In an apparatus for controlling the speed of engines, the combination with a governor of a valve connected therewith, cylinders arranged upon either side of the said valve having ports connected with the valve-chest the two upper ports being arranged one a little above the other whereby upon the movement of the valve the steam will be admitted into one cylinder a little before it is admitted into the other for operating a cut-off and brake mechanism successively, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS WILLIAM REYNOLDS, Yr.

Witnesses:

WM. P. THOMPSON,

WILLIAM SUTHERLAND ROBINSON.