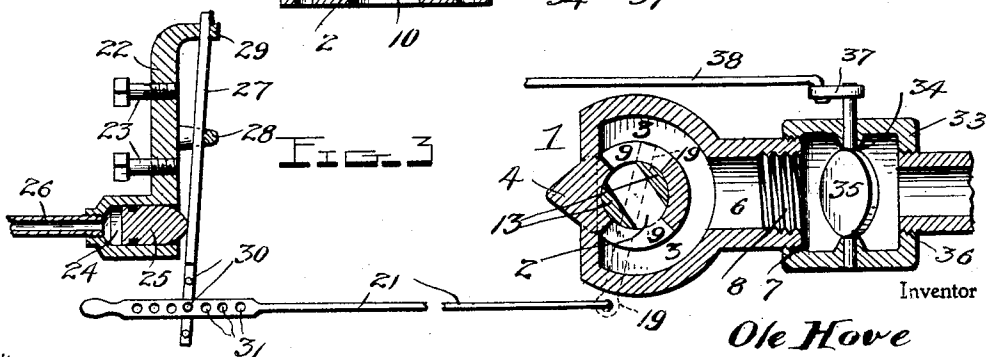
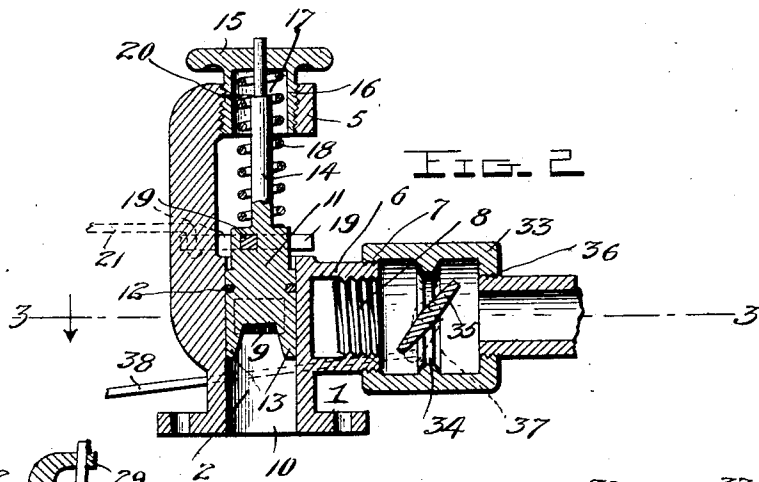
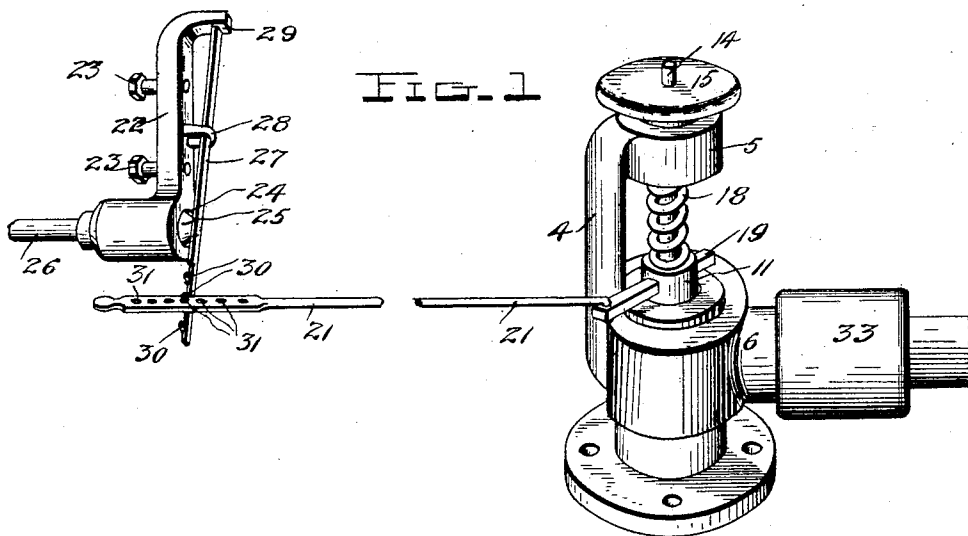


No. 750,649.

PATENTED JAN. 26, 1904.

O. HOVE.  
ENGINE GOVERNOR.  
APPLICATION FILED AUG. 20, 1903.

NO MODEL,



Witnesses

*J. A. Griebner, Jr.*  
*J. H. Wilson*

By

*A. B. Wilson*

Attorney

Ole Hove

# UNITED STATES PATENT OFFICE.

OLE HOVE, OF ELLSWORTH, WISCONSIN.

## ENGINE-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 750,649, dated January 26, 1904.

Application filed August 20, 1903. Serial No. 170,209. (No model.)

*To all whom it may concern:*

Be it known that I, OLE HOVE, a citizen of the United States, residing at Ellsworth, in the county of Pierce and State of Wisconsin, have  
5 invented certain new and useful Improvements in Engine-Governors; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it apper-  
10 tains to make and use the same.

My invention relates to engine-governors; and it consists in certain new and useful improvements upon the governor described in Patent No. 720,432, issued to me February 10,  
15 1903. The governor disclosed in said patent is designed more particularly for use in connection with engines to which steam is supplied continuously without cut-off, and the construction of said governor is such that  
20 when the engine is working under a heavy load the valve will automatically raise to allow of the passage of a greater amount of steam to the engine to keep up the speed and when a part or the entire load is removed from  
25 the engine the valve will be lowered to reduce the steam-supply to the engine. In other words, the valve in said governor is automatically controlled by the load upon the engine or by the steam-pressure in the same.

30 One object of the present invention is to provide means for mechanically operating the governor-valve to vary the speed of the engine, which means shall be independent of its automatic operation.

35 Another object is to provide automatic means for opening and closing said valve, according to the variation of the steam-pressure in the boiler.

40 Another object is to provide means for adapting the governor for use in connection with single-acting reciprocating engines.

A further object is to provide a governor of this character which is simple in construction, comparatively inexpensive to manufacture, durable in use, and efficient in operation.

45 With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be more fully described, and

particularly pointed out in the appended 50 claims.

In the accompanying drawings, Figure 1 is a perspective view of my improved governor. Fig. 2 is a vertical sectional view through the same. Fig. 3 is a horizontal sectional view 55 on line 3 3 of Fig. 2.

Referring to the drawings by numerals, 1 denotes a casing formed with a vertical cylindrical bore 2, which forms a valve-chamber, a semi-annular equalizing-chamber 3 about 60 said bore, and a standard 4, having at its upper end a nut 5, which is alined with the bore 2. Said casing is formed at one side with a steam-inlet through which steam is admitted into the equalizing-chamber and which is in 65 the form of a nipple 6, having exterior screw-threads 7 and interior screw-threads 8, provided for a purpose hereinafter explained. Said equalizing-chamber is in communication with the upper portion of the bore 2 through 70 two diametrically opposite openings or ports 9, and the lower end 10 of said bore forms an outlet-port, which is adapted to be placed in communication with the engine.

Mounted both to rotate and to reciprocate 75 in the upper portion of the bore or valve-chamber 2 is the governor-valve 11, which is adapted to open and close the openings or ports 9. Said valve is in the form of a solid piston provided with steam-packing 12 and formed 80 with two diametrically opposite depending lugs 13, which are each slightly greater in width than said ports 9. It will be seen that when the valve is lowered sufficiently the ports 9 will be closed by the solid upper portion of 85 the valve and when the same is raised and properly rotated the lugs 13 will close or partially close said ports 9 to regulate the passage of steam through the governor. Said valve is also formed with a vertical stem 14, the reduced 90 upper end of which projects through a hand-wheel 15, having a hub 16, which has a screw-threaded engagement with the nut 5. Said hub 16 is recessed, as shown at 17, to receive the upper end of a coil-spring 18, which surrounds 95 said stem and has its lower end bearing upon the top of said valve to force the same down to its closed position. The downward movement

of said valve under the action of this spring is limited by a transverse pin 19, which projects through the upper portion of said valve and is adapted to engage the top of the casing. A shoulder 20, formed by reducing the upper end of the stem, limits the upward movement of the valve. As in my former patent, the valve 11 after it has been raised to open ports 9 will have a free reciprocating movement under the varying action of steam-pressure and the load upon the engine. By operating the hand-wheel 15 the tension of the spring may be varied in order to increase or decrease the sensitiveness of said valve; but said spring should not be compressed to such a degree that said valve will be prevented from acting under the lightest load.

In order to quickly vary the speed of the engine mechanically at the will of the operator and without altering the tension of the spring 18 upon the valve, I rotate the valve to move the lugs 13 over the ports 9, and thus vary the amount of steam passing through them. I accomplish this by loosely securing one end of an operating-rod 21 in one end of the transverse pin 19, which limits the downward movement of the valve. As clearly shown in Figs. 1 and 3, the movement of this rod or link will rotate said valve, and it will be seen that the rotary movement of the same will in no way interfere with its reciprocating or sliding movement.

In order to compensate for the variation of the steam-pressure in the boiler and to supply the same amount of steam to the engine to maintain a steady speed, I provide means for automatically operating the rod or link 21 to rotate the valve 11. Said means comprises a plate 22, which may be secured by bolts 23 to a suitable supporting-bracket (not shown) and which is formed at one end with a cylindrical chamber 24, in which a sliding piston 25 is mounted. The space in the chamber in rear of said piston is in communication with the steam-space of the boiler through a pipe 26, and the front or outer end of said piston engages a spring 27, one end of which is secured upon said plate 22 by passing the same under a yoke 28 and through a lug 29. The free end of said spring is provided with a series of pins or studs 30, formed by cutting away a portion of said end, and the free end of said rod or link 21 is formed with a series of apertures 31, one of which is adapted to be engaged with one of said pins 30. By this construction it will be seen that the rise and fall of steam-pressure within the boiler will reciprocate the piston 25, which will in turn actuate the spring 27 to move the rod 21 and rotate the valve 11. By providing the adjustable connection between the valve-operating rod 21 and the spring 27 the degree of rotation of said valve may be varied, as will be readily understood.

When my governor is used in connection with double-cylinder, rotary, or other types

of engines to which steam is supplied continuously without cut-off, the steam-supply pipe (not illustrated) is screwed into the screw-threads 8 in the nipple 6; but when it is desired to use the same upon single-acting reciprocating engines I provide a valve-casing 33, which I screw upon the threaded portion 7 of said nipple 6 and which is formed with a valve-seat 34. A rotary or butterfly valve 35 is adapted to coact with said seat to open and close the steam-passage through said casing. The steam-supply pipe is screwed into a threaded opening 36 in the end of said casing, and the shaft of the valve 35 is provided with a crank 37, which is connected by a rod 38 to the valve-gear of the engine. The operation of this valve is such that the same is closed to prevent the passage of steam whenever the cut-off valve of the engine overlaps both ports.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. A governor-valve having reciprocatory motion under the varying engine-pressure and rotary motion under the varying boiler-pressure, and means for effecting said motions, substantially as described.

2. In a governor, the combination with a casing having inlet and outlet ports, of a valve having reciprocatory motion to vary the inlet of steam to the engine under the varying engine-pressure, and means for manually rotating said valve to vary the inlet of steam to the engine, substantially as described.

3. In a governor, the combination with a casing having inlet and outlet ports, of a valve having reciprocatory motion to vary the inlet of steam to the engine under the varying engine-pressure, means for rotating said valve to vary the inlet of steam to the engine, and an adjustable connection between said means and said valve whereby the movements of said connected parts may be varied, substantially as described.

4. In a governor, the combination with a casing having inlet and outlet ports, of a valve having reciprocatory motion to vary the inlet of steam to the engine under the varying engine-pressure, and means for rotating said valve to vary the inlet of steam to the engine, substantially as described.

5. In a governor, the combination with a casing having inlet and outlet ports, a valve-chamber, an equalizing-chamber, and ports

affording communication between said chambers, of a rotary reciprocatory valve in said valve-chamber adapted to close said communicating ports by its reciprocatory motion and provided with lugs adapted to close said communicating ports by its rotary motion, means for reciprocating said valve, and means for rotating said valve, substantially as described.

6. In a governor, the combination with a casing having inlet and outlet ports, a valve-chamber, an equalizing-chamber, and ports affording communication between said chambers, of a rotary reciprocatory valve in said valve-chamber adapted to close said communicating ports by its reciprocatory motion and provided with lugs adapted to close said communicating ports by its rotary motion, a spring for actuating said valve against the engine-pressure, means for adjusting the tension of said spring, a stem for said valve adapted to limit its upward movement, a cross-pin carried by said valve and adapted to limit the downward movement of the same, and an operating-rod connected to said pin whereby said valve may be manually rotated, substantially as described.

7. In a governor, the combination with a casing having inlet and outlet ports, a valve-chamber, an equalizing-chamber, and ports affording communication between said cham-

bers, of a rotary reciprocatory valve in said valve-chamber adapted to close said communicating ports by its reciprocatory motion and provided with lugs adapted to close said communicating ports by its rotary motion, a spring for actuating said valve against the engine-pressure, means for adjusting the tension of said spring, a stem for said valve adapted to limit its upward movement, a cross-pin carried by said valve and adapted to limit the downward movement of the same, an operating-rod, and means for automatically operating said rod upon the variation of the boiler-pressure, substantially as described.

8. The combination with a governor having a valve for controlling the inlet of steam to an engine, of an operating-rod connected to said valve, a cylinder having connection with the steam-space of a boiler, a piston in said cylinder, and a rod connected to said operating-rod and actuated by said piston, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

OLE HOVE.

Witnesses:

P. A. HAESSLY,  
F. B. WHITE.