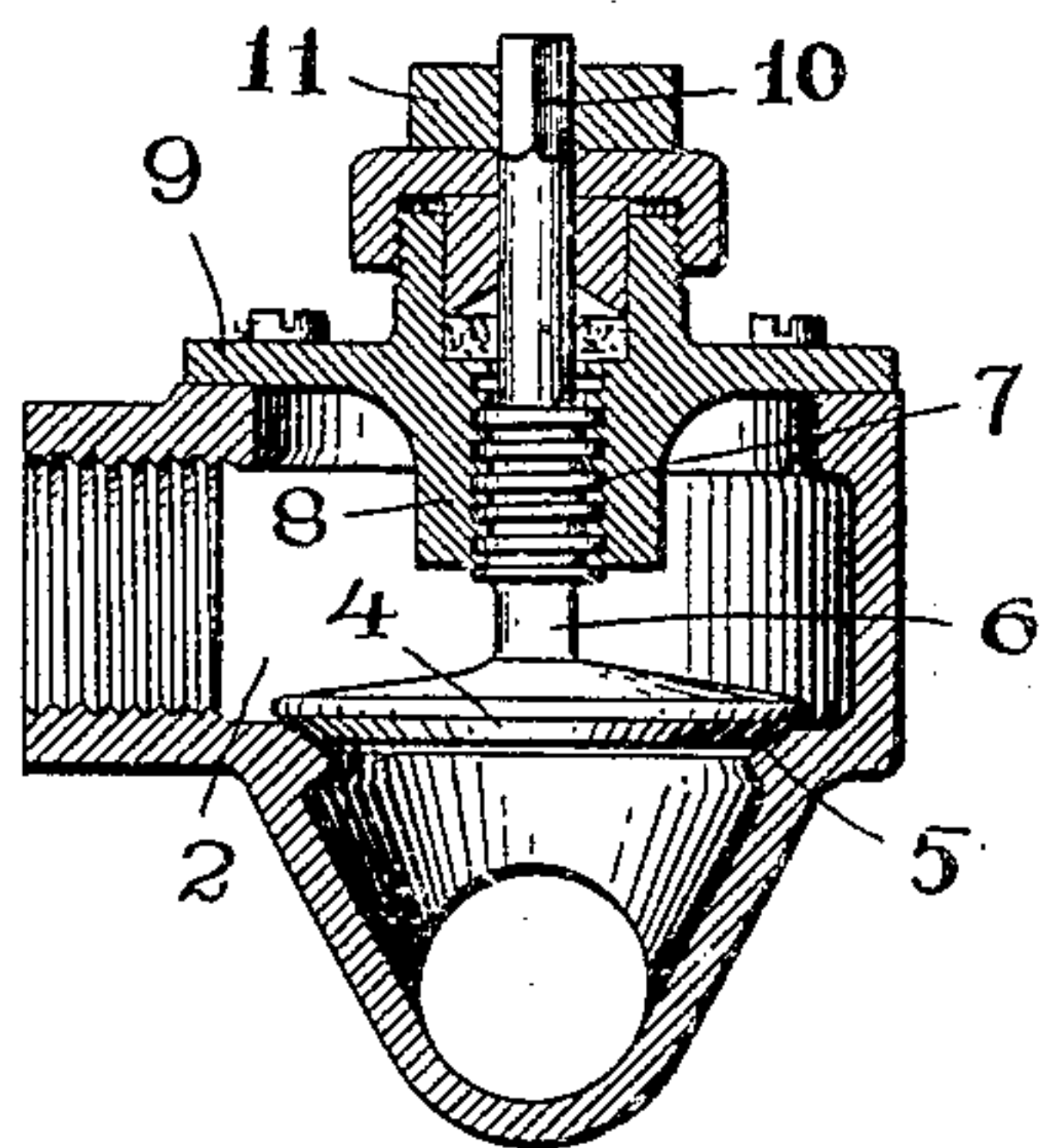
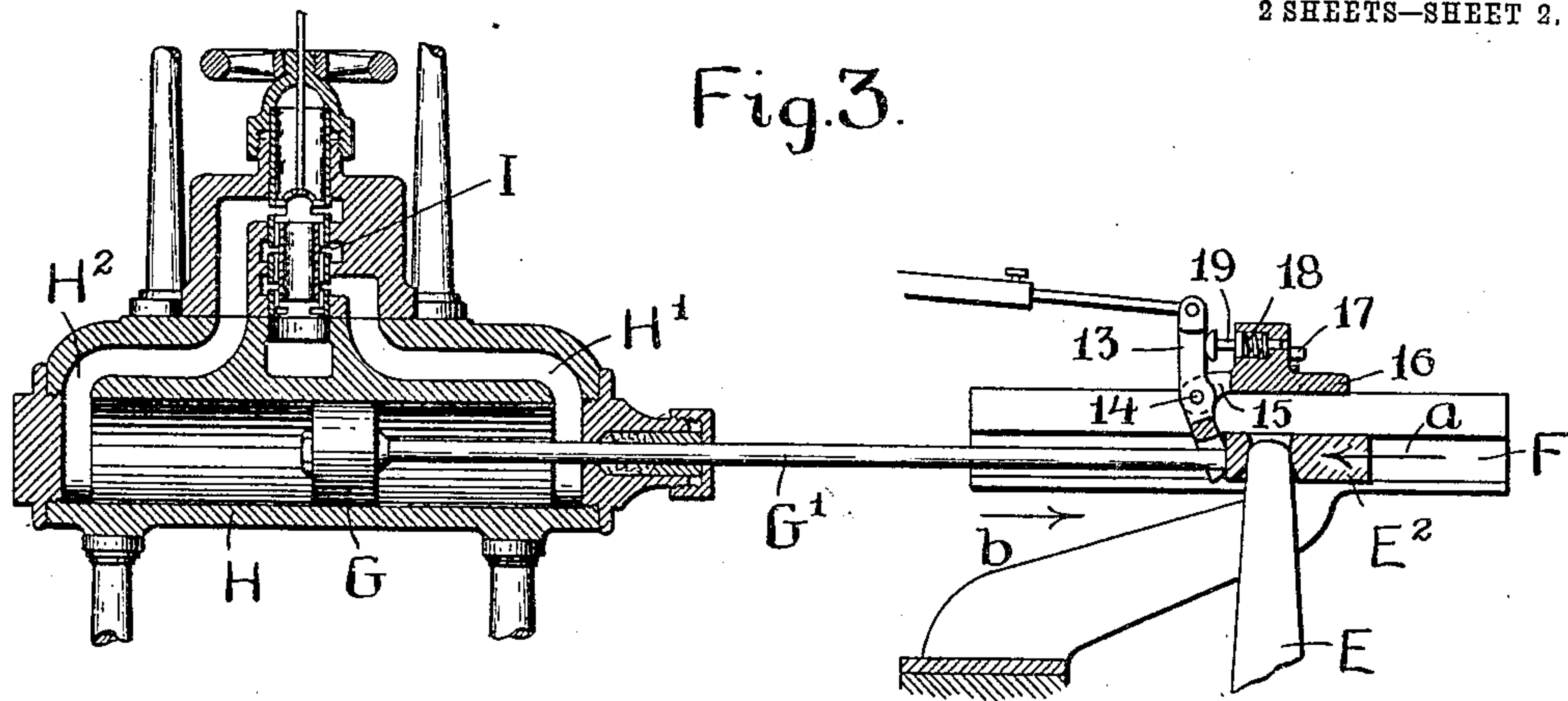


955,568.

2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM D. WHITE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO HOLYOKE MACHINE COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

WATER-WHEEL GOVERNOR.

955,568.

Specification of Letters Patent.

Patented Apr. 19, 1910.

Application filed November 19, 1906. Serial No. 343,966.

To all whom it may concern:

Be it known that I, WILLIAM D. WHITE, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Water-Wheel Governors, of which the following is a specification accompanied by drawings, forming a part of the same, in which—

Figure 1 is a rear elevation of a portion of a governor embodying my invention. Fig. 2 is a top view of the same. Fig. 3 is a view partly in section, showing the power cylinder and a portion of the operating rod, and Fig. 4 is a central vertical sectional view of the valve which controls the admission of fluid to the power cylinder.

Similar reference letters and figures refer to similar parts in the different views.

My present invention relates to the class of governors for regulating the speed of a motor, such as a water wheel, which comprise a power cylinder having a valve controlled passage for steam or water under pressure with the position of the valve determined by the speed of the motor. A governor of this class designed to open and close a gate as determined by the speed of a water wheel or other motor is shown and described in Letters Patent of the United States No. 754,469, issued to Nathaniel Lombard, March 15, 1904, to which reference may be had for a more particular description of the portions not herein described. The governor forming the subject of the aforesaid Lombard patent, as shown in the accompanying drawings, embodies a shaft A, operatively connected with the gate, usually by means of a rack and pinion, not shown. The shaft A is capable of being rotated in either direction by the driving mechanism of the governor through clutch connections B and C of the ordinary type; one clutch serving to drive the shaft A in one direction to open the gate and the other clutch to rotate the shaft in the opposite direction and close the gate. The clutches are thrown into and out of action by means of a slidable rod D, connected with a swing-

ing lever E, pivoted at one end at E¹ and connected with a sliding cross head E² sliding in ways F, as it is moved by a piston G and piston rod G¹ of a power cylinder H, provided at its ends with passages H¹ and H² for the admission and exhaust of steam or water as controlled by a valve I, the position of which is determined by the speed of the motor. All the above mentioned features, however, are embodied and fully described in detail in the aforesaid patent to Lombard No. 754,469, and form no part of my present invention, which relates solely to shutting off the power from the power cylinder at a predetermined point in the movement of the piston, and my present invention is therefore applicable to any type of governor, which comprises a power cylinder for controlling the action of the governor.

In the accompanying drawings I have shown in detail only such portions of the governor described in the patent to Lombard No. 754,469 aforesaid, as are directly concerned in the embodiment of my present invention.

Referring to the drawings 1 denotes an inlet pipe to the power cylinder communicating with a valve chamber 2, which is connected by a pipe 3 with preferably a source of water supply under pressure. The valve chamber 2 contains a valve 4 fitting a valve seat 5 and carried upon a valve stem 6 provided with a screw threaded section 7, engaging a fixed nut 8, held by the cap or cover 9 of the valve chamber. The upper end of the valve stem is squared at 10 to receive a radial arm 11 connected by a link 12 with the upper end of a bent lever 13, pivoted at 14 in a bracket 15, held by a plate 16 which is adjustably held in any desired position on the ways F by means of set screws 17. The lower end of the lever 13 extends downward into the path of the sliding cross head E², so that in the movement of the cross head in the direction of the arrow α , which is its movement while the gate is being opened, the lever 13 will be rocked to rotate the valve stem 6, and by the action of its screw thread close the valve, thereby

shutting off the supply from the power cylinder H and checking the further movement of the cross head in the direction of the arrow *a*, and the further opening of the gate.

5 When the valve I is shifted to admit water to the opposite side of the cylinder through the passage H² and opens the passage H¹ to the exhaust, the pressure will become relieved on the right hand side of the piston
10 but no water can yet enter on the opposite side of the piston until the valve 4 has been opened, which is accomplished by the pressure of a spring 18 held in the plate 16 and acting against the upper arm of the piv-
15 oted lever 13 through a sliding pin 19. As the pressure on the right hand side of the piston G is reduced by the opening of the passage H¹ to the exhaust, the force of the
20 spring will slightly rock the lever 13 and raise the valve 4 a short distance off its valve seat. Any slight upward movement of the valve 4 will be sufficient to admit water to the power cylinder with sufficient pressure to continue the movement of the
25 piston G and cross head E² in the direction of the arrow *b*, Fig. 3.

The removal of the cross head E² from contact with the lever 13 will permit the lever to be fully rocked by the spring 18 to
30 rotate the valve stem 6 and open the valve 4.

By means of the above described mechanism I absolutely check the sliding movement of the cross head E² in the direction of the arrow *a*, during which movement the gate is
35 being opened. The gate therefore will always be closed at a predetermined point preventing the use of water power beyond the fixed amount corresponding to the raising of the gate. This result I secure by closing
40 the power cylinder to the admission of fluid under pressure at a fixed point in the upward movement of the gate without applying unusual or injurious strain to the operative parts of the governor. As the plate
45 16 is adjustable along the ways F the pivoted lever 13 can be held in the path of the cross head E² at any desired point so as to check the further opening of the gate. This enables the governor to absolutely control
50 the amount of water to be supplied to a water wheel, and in cases where power is sold to different users it prevents the use of an excess of power beyond a predetermined quantity.

55 I claim,

1. In a governor for a motor, the combination with a piston equipped power cylinder, provided with inlet and exhaust ports and a valve for opening and closing said
60 ports, of means for supplying fluid under pressure to said valve, means arranged to operate in connection with the movement of the piston for checking said supply, and

means arranged to operate with relation to the movements of said valve for opening 65 said supply.

2. In a governor for a motor, the combination with a piston equipped power cylinder provided with inlet and exhaust ports, means for opening and closing said ports 70 with relation to the speed of the motor, of a pipe through which fluid under pressure passes to said cylinder, means for closing said pipe at a predetermined point in the movement of the piston in one direction, and 75 means for opening said pipe in order to reverse the piston.

3. In a governor for a motor, the combination with a piston equipped power cylinder, arranged to operate with relation to the 80 speed of the motor to open and close a gate for the admission of power to the motor, of means arranged to operate in connection with the movement of the piston for checking the admission of fluid under pressure to 85 said cylinder, and means arranged to operate with relation to the speed of the motor for readmitting fluid under pressure to said cylinder.

4. In a governor of the class described, 90 the combination with a piston equipped power cylinder provided with inlet and exhaust ports, means for opening and closing said ports, of a pipe through which fluid under pressure is supplied to said ports, a 95 valve in said pipe, means arranged to operate in connection with the movement of the piston for closing said valve, and means arranged to operate with relation to the opening and closing of said ports for opening 100 said valve.

5. In a governor of the class described, the combination with a power cylinder, of a pipe for supplying fluid under pressure thereto, a valve for closing said pipe, means 105 for operatively connecting said valve with said piston, whereby said valve is closed at a predetermined point in the movement of said piston, and means for adjustably controlling the movement of the piston by the 110 closure of said valve.

6. In a governor of the class described, the combination with a piston equipped power cylinder arranged to operate a gate for the admission of power to a motor, said 115 power cylinder being provided with inlet and exhaust ports, the opening and closing of said ports being controlled by the speed of the motor, of a pipe for the admission of power fluid to said ports, a valve in said pipe 120 arranged to close at a predetermined point in the movement of said piston to open said gate, and arranged to open when said forward movement of the piston ceases.

7. In a governor of the class described, 125 the combination with a piston equipped

power cylinder arranged to operate a gate
for the admission of power to a motor, the
admission of power to said cylinder being
normally controlled by the speed of the
motor, of a valve operated by the piston ar-
ranged to shut off the supply of power to
said cylinder at a predetermined point in the
movement of said piston to open said gate,

and means for opening said valve as soon as
pressure in the cylinder to move the piston 10
in the above direction ceases.

Dated this 14th day of November 1906.

WILLIAM D. WHITE.

Witnesses:

RUFUS B. FOWLER,
PENELOPE COMBERBACH.