

No. 750,448.

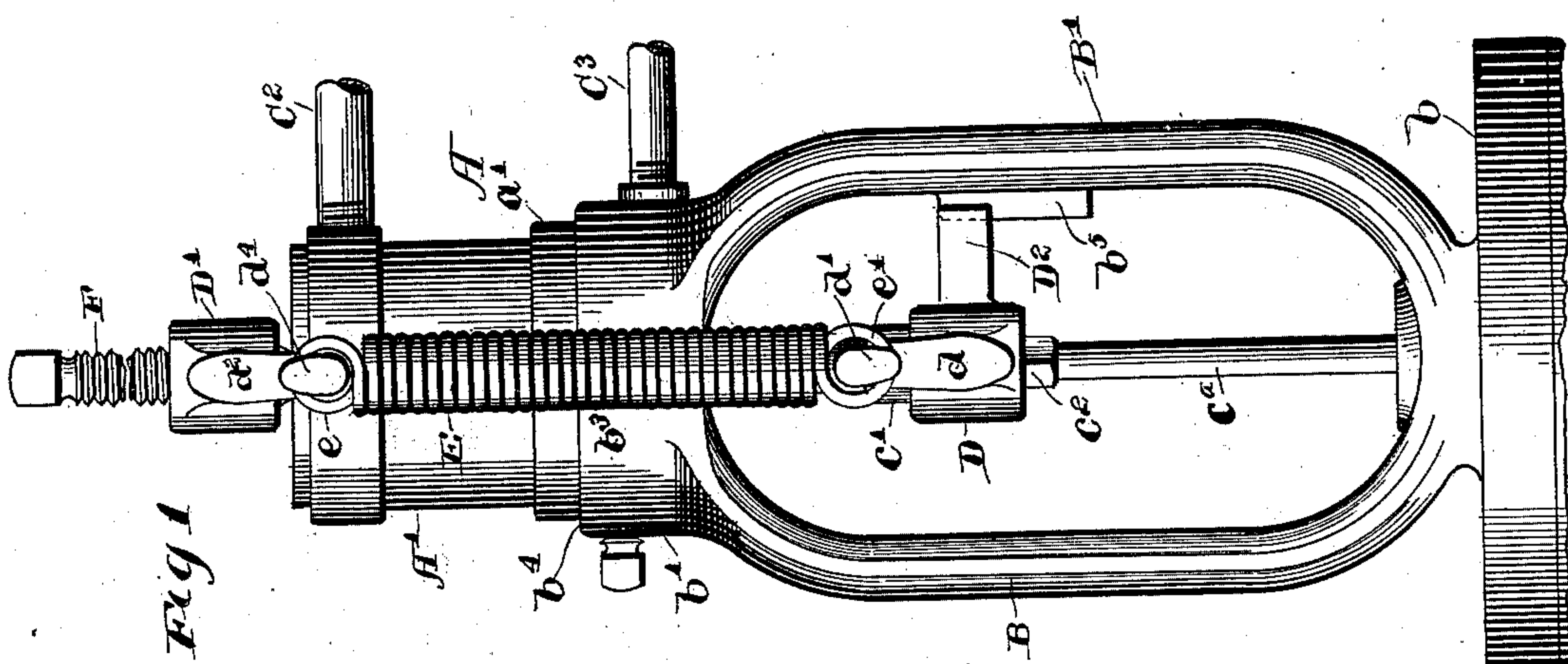
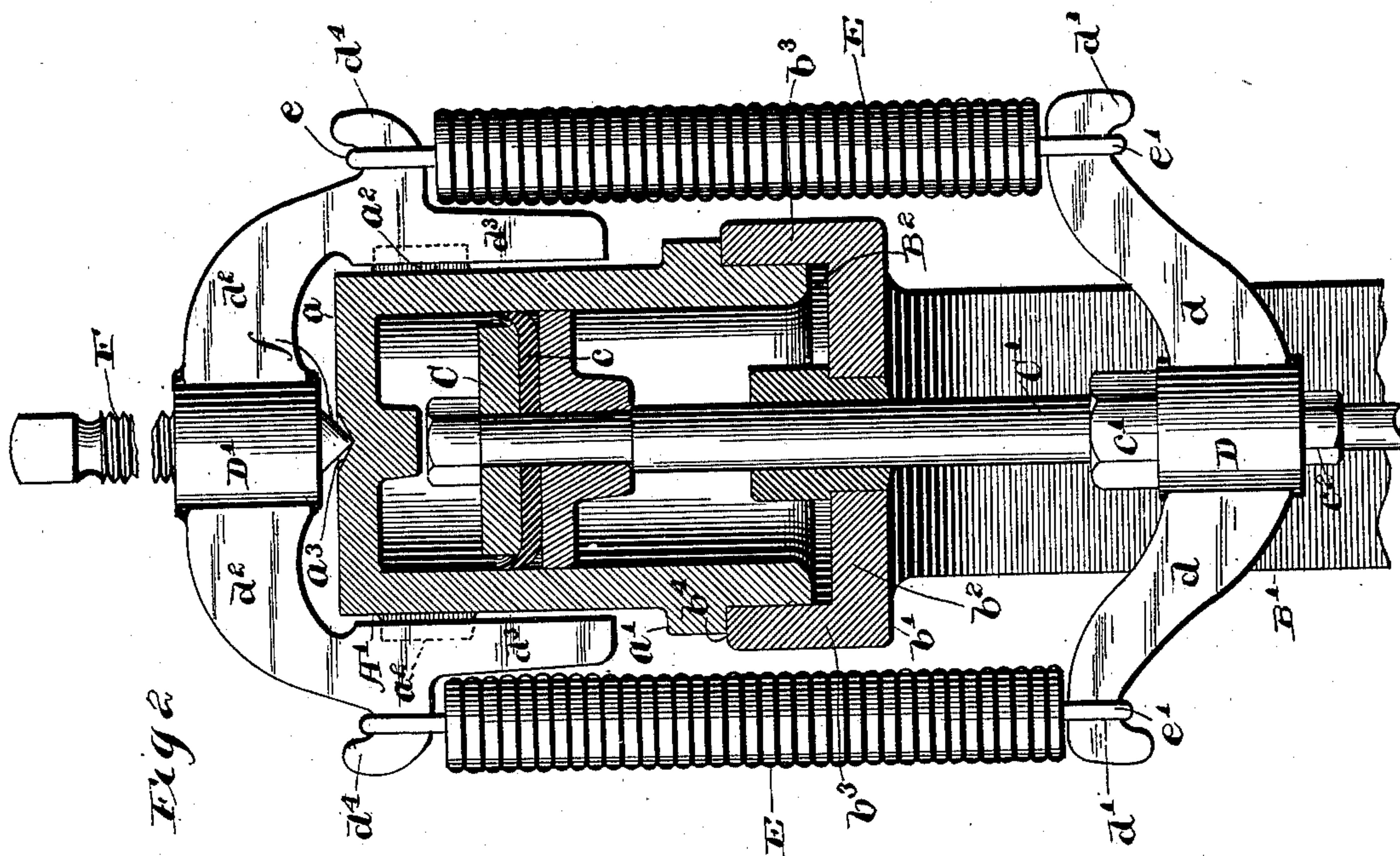
PATENTED JAN. 26, 1904.

J. W. GARDNER.

# PRESSURE REGULATOR FOR STEAM PUMP GOVERNORS.

APPLICATION FILED MAR. 19, 1902.

NO MODEL.



Witnesses:  
Carl S. Crawford  
Henry J. Corvley

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# UNITED STATES PATENT OFFICE.

JOHN W. GARDNER, OF QUINCY, ILLINOIS.

## PRESSURE-REGULATOR FOR STEAM-PUMP GOVERNORS.

SPECIFICATION forming part of Letters Patent No. 750,448, dated January 26, 1904.

Application filed March 19, 1902. Serial No. 99,025. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. GARDNER, of Quincy, in the county of Adams and State of Illinois, have invented certain new and useful  
5 Improvements in Pressure-Regulators for Steam-Pump Governors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the let-  
10 ters of reference marked thereon, which form a part of this specification.

This invention relates to steam-pump governors of that class employing as a means for regulating the engine a cylinder and a piston  
15 therein subject to the pressure of the fluid being pumped, whereby the speed of the engine is under the control of such pressure. The connection of the pump with the engine and with a tank into which the fluid is pumped  
20 and the connection of said tank with the device herein shown is generally like the construction and arrangement referred to in my prior United States Letters Patent, No. 673,575, dated May 7, 1901, and inasmuch as  
25 this arrangement is familiar it is not herein shown. In such devices it is necessary that the pressure-regulating cylinder be often cleaned, and the piston requires frequent re-  
30 pairing, and it is therefore desirable that the cylinder be so constructed as to provide ready access to the cylinder for the purpose of so cleaning the same and removing the piston.

The principal object of my invention, therefore, is the construction of a simple and eco-  
35 nomical pressure-regulating device for pump-governors so constructed as to permit of its being quickly dismembered and reassembled.

The invention consists in the novel devices and combinations of devices herein illustrated,  
40 described, and claimed, and it will be more fully understood by reference to the accompanying drawings and the subjoined description thereof.

In said drawings, Figure 1 is an outside view  
45 or elevation of a pump-governor and pressure-regulator. Fig. 2 is an enlarged central vertical sectional view of the regulating-cylinder and the upper portion of the governor-frame assembled in proper position, the view being

upon a plane at right angles to that shown in 50 Fig. 1.

A represents as a whole the cylinder of a standard type of steam-pump-governor pressure-regulator—such, for example, as that manufactured by the Gardner Governor Com- 55 pany.

B B' are the two arms of a frame or yoke, which unite at their lower ends with a flange or plate *b*, by which the frame may be suitably bolted to the governor in a familiar man- 60 ner. The arms B B' unite at their upper ends to form a support for the pressure-regulator. The upper portion of the yoke or frame is cylindrical, as shown at *b'*, and is provided in its upper face with an annular recess B<sup>2</sup>, thereby 65 forming the bottom head *b*<sup>2</sup> and a portion of the lower side walls *b*<sup>3</sup> of the pressure-regulating cylinder. The upper head *a* of the cylinder A is integral with the tubular walls, which together constitute the upper and re- 70 movable member A' of the cylinder, said member constituting the principal part of the cylinder. The upper part or member of the cylinder fits within or telescopes the lower member thereof and is provided with a flange 75 *a'*, which engages the upper margin of said lower section to limit the downward movement of the upper section or member.

Contained within the cylinder A is the usual piston C, provided with a cup-leather pack- 80 ing *c*, and said piston is attached in a familiar manner to the upper end of a rod or stem C'. Said stem C' extends downwardly through a stuffing-box in the bottom of the cylinder and is connected at its lower end with a yoke D, 85 having oppositely-extending arms *d d*, which terminate in downturned hook portions *d' d'*. Extending downwardly from the yoke D is a stem *c*<sup>a</sup>, which is adapted for connection with the governor-valve. A second yoke D' is lo- 90 cated above the cylinder A and is provided also with two oppositely-directed arms *d*<sup>2</sup> *d*<sup>2</sup>, each of which carries downwardly-directed guide-arms *d*<sup>3</sup> *d*<sup>3</sup>, which are adapted to fit and work between suitable guide flanges or ways 95 *a*<sup>2</sup> *a*<sup>2</sup> on the opposite sides of the cylinder A, as shown clearly in Fig. 2. Said arms *d*<sup>2</sup> *d*<sup>2</sup> are provided with upwardly-directed hook por-



tion  $d^4 d^4$ . The two yokes D and D' are united by two coiled springs E E, provided with loops  $e e'$ , which respectively engage the corresponding hooks  $d^4 d^4$  of the yoke-arms, thus  
 5 holding the cylinder and frame firmly together and acting, through the stem C', to hold the piston at the upper limit of its travel.

Upon the inner face of one of the arms B' of the frame are parallel guides  $b^5$ , (one only being shown in Fig. 1,) which are engaged by a guide-arm B<sup>2</sup>, extending outwardly from the yoke D. This arrangement, taken in connection with the guide-arms  $b^3 b^3$  and ways  $a^2$ , maintains the alinement of the yokes D and D'.

15 An adjusting-bolt F extends through an interiorly-screw-threaded opening in the upper yoke D' and engages at its conical lower end  $f$  a suitable recess  $a^3$  in the upper head  $a$  of the cylinder.

20 C<sup>2</sup> designates an inlet-pipe which enters the upper end of the cylinder and through which the fluid-pressure from the tank into which the pump discharges is transmitted to the upper end of the piston.

25 In the operation of the apparatus of which the device is designed to constitute a part the pressure from the storage-tank is transmitted, through the pipe C<sup>2</sup>, to the upper side of the piston, and as said pressure increases it acts  
 30 to force the piston downwardly against the action of the springs E E, thereby depressing the stem  $c^a$  and closing the governor-valve and cutting off steam from the engine. When the pressure in the tank diminishes, the springs  
 35 E raise the valve-stem  $c^a$  and opens the governor-valve to admit more steam to the engine. When it is desired to repair the pressure-regulator or to renew the piston packing or leather or to cleanse the interior of the cylinder, the springs E are removed from the  
 40 yoke-arms, the upper yoke-arm D' is lifted off, and the upper portion of the cylinder is raised from the lower portion thereof, at which time the interior of the cylinder will be exposed. The parts are reassembled by a reversal of this operation. Through the adjusting-bolt F the tension of the spring E may be varied.

I claim as my invention—

50 1. In a pressure-regulator for steam-pump governors, a two-part, telescopic cylinder, one of which parts is integral with the frame, a piston within the cylinder, a piston-stem extending through one head of the cylinder, a  
 55 yoke having oppositely-directed arms secured to the piston-stem outside of the cylinder, a second yoke having arms parallel with the arms of the first yoke and pressing downwardly on the cylinder, and two springs, one  
 60 at each side of the device, extending between and connecting said yokes.

2. In a pressure-regulator for steam-pump governors, a two-part, telescopic cylinder, one of which parts is integral with the frame, a

piston within the cylinder, a piston-stem which  
 65 extends through one of the cylinder-heads, a yoke secured to the piston-stem outside of the cylinder, a second yoke located above the cylinder, and springs extending between said  
 70 yokes and provided with loops which engage hooks on said yokes.

3. In a pressure-regulator for steam-pump governors, a cylinder comprising two parts which have telescopic engagement at their open ends, one of which is immovable, a piston  
 75 in the cylinder provided with a stem which extends outside of the cylinder, a yoke attached to said stem, a valve-stem attached to said yoke, a yoke bearing on the end of the cylinder remote from said stem, and springs extending between and connecting the arms of  
 80 said yokes.

4. In a pressure-regulator for steam-pump governors, a two-part, telescopic cylinder, one part of which is integral with the frame, a piston  
 85 within the cylinder, a piston-stem extending through one of the cylinder-heads, a yoke secured to said piston-stem and having oppositely-directed arms, a second yoke having arms parallel with the arms of the first  
 90 yoke, an adjusting-screw extending centrally through said second yoke and bearing on the adjacent cylinder-head, and springs extending between and connecting the ends of said yoke-arms.  
 95

5. In a pressure-regulator for steam-pump governors, a two-part telescopic cylinder, one part of which is integral with the frame, a piston within the cylinder, a piston-stem extending through one of the cylinder-heads, a yoke  
 100 secured to said piston-stem and having oppositely-directed arms, a second yoke having arms parallel with the arms of the first yoke, and an adjusting-screw extending centrally through said second yoke and bearing on the  
 105 adjacent cylinder-head, springs extending between and connecting the adjacent ends of said yoke-arms, and guide-arms on the upper yoke which engage guide-lugs on the side walls of the cylinder.  
 110

6. In a pressure-regulator for steam-pump governors, a two-part telescopic cylinder, one of which parts is integral with the frame, a ring on one part and a suitable stop or shoulder upon the other to limit the telescopic  
 115 movement, a yoke positioned to engage one of the cylinder members, a second yoke secured to the piston-stem, springs engaging the two yokes and an adjusting-bolt passing through the upper yoke and engaging the cylinder.  
 120

7. In a pressure-regulator for steam-pump governors, a two-part telescopic cylinder, one of which parts is integral with the frame, a ring on one part and a suitable stop or shoulder upon the other to limit the telescopic  
 125 movement, a yoke positioned to engage one of the cylinder members, a second yoke se-

cured to the piston-stem, springs engaging the  
two yokes, an adjusting-bolt passing through  
the upper yoke and engaging the cylinder, the  
cylinder being provided exteriorly with guides  
5 or ways engaging the adjacent yoke, and the  
other yoke having a guide-arm engaging a  
guideway in the frame, whereby the alinement  
of the two yokes will be maintained.

In testimony that I claim the foregoing as  
my invention I affix my signature, in presence <sup>10</sup>  
of two witnesses, this 8th day of March, A. D.  
1902.

JOHN W. GARDNER.

Witnesses:

GEORGE A. WALL,  
FRED H. BRADFORD.