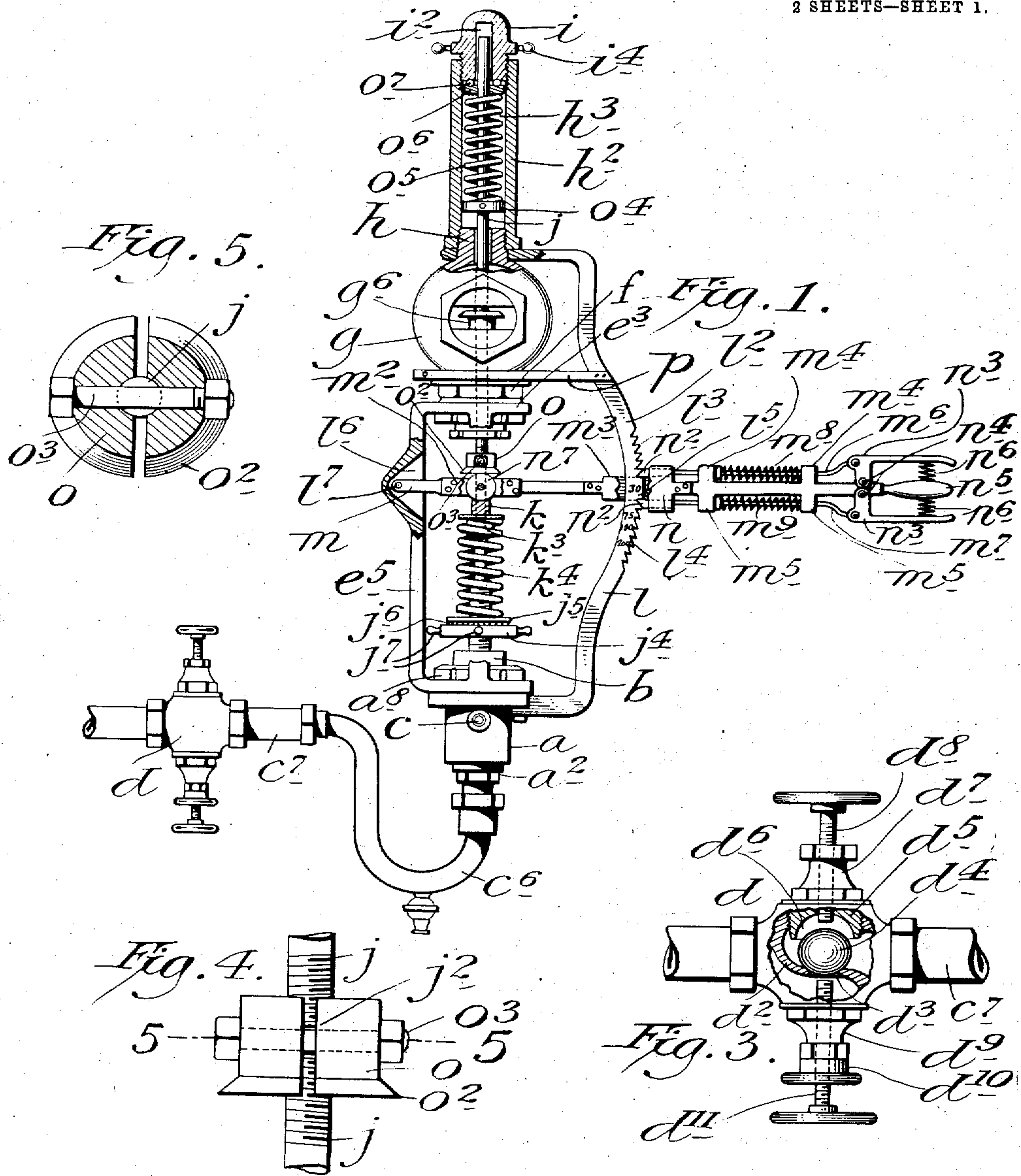


C. P. McMULLEN.
 AUTOMATIC STEAM PUMP GOVERNOR.
 APPLICATION FILED JUNE 30, 1908.

924,097.

Patented June 8, 1909.

2 SHEETS—SHEET 1.



WITNESSES

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INVENTOR.

Charles P. McMullen.

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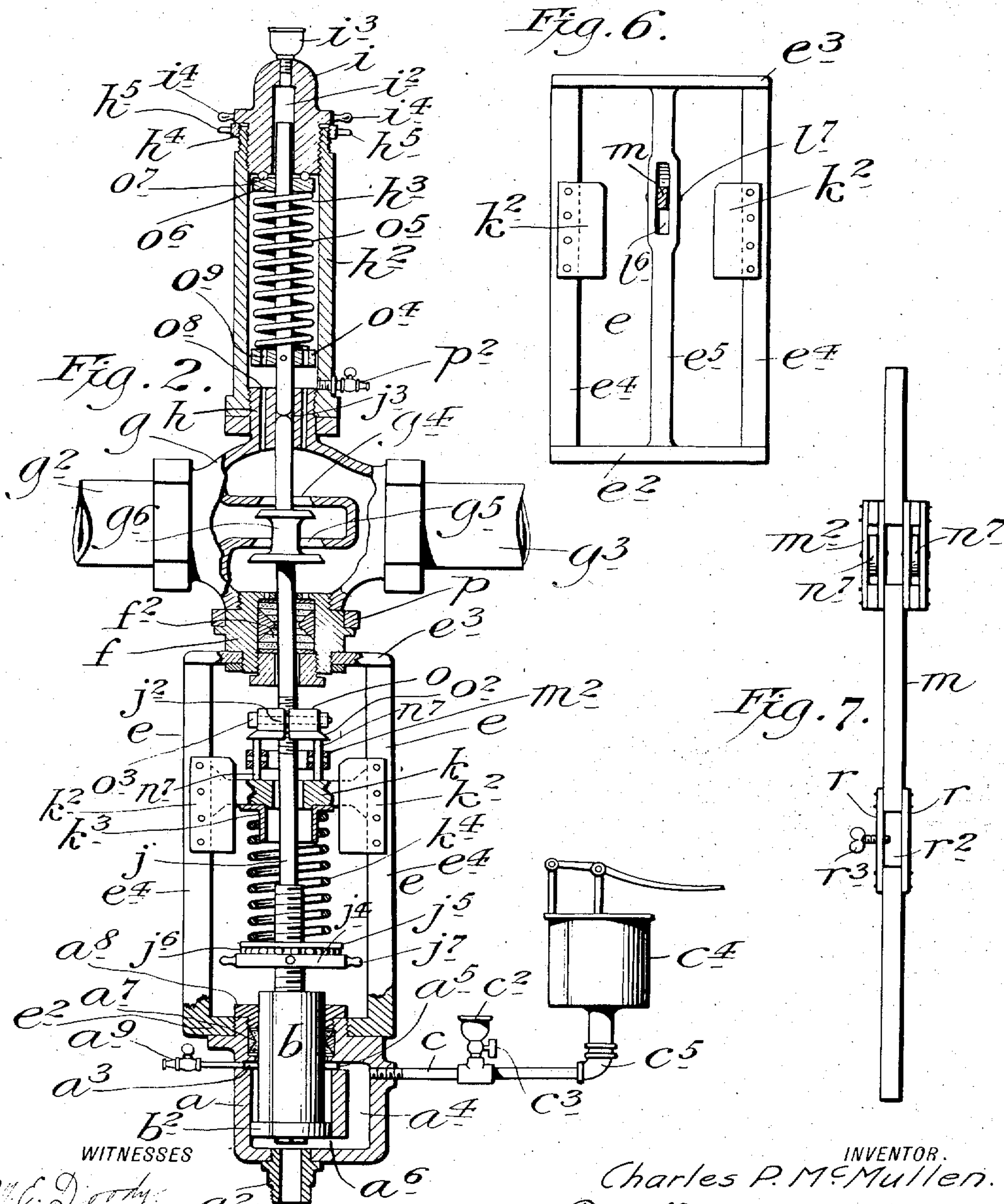
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WITNESSES
 W. C. Dooly
 C. E. Mulvaney

INVENTOR.
 Charles P. McMullen.
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UNITED STATES PATENT OFFICE.

CHARLES P. McMULLEN, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE IDEAL AUTOMATIC MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

AUTOMATIC STEAM-PUMP GOVERNOR.

No. 924,097.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed June 30, 1908. Serial No. 441,186.

To all whom it may concern:

Be it known that I, CHARLES P. McMULLEN, a citizen of the United States, and residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Automatic Steam-Pump Governors, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to governors for steam pumps, and particularly to devices of this class which employ a steam throttle valve device through which steam passes to the pump, together with a hydraulic cylinder in communication with the water discharge end of the pump, said cylinder being provided with a piston in operative connection with the throttle valve device and operated in one direction by the pressure of water from the discharge end of the pump and in the opposite direction by mechanical devices, so as to control the flow of steam by which the pump is operated, the hydraulic cylinder being also provided with means for supplying a lubricant thereto, or to the end thereof which is in communication with the water discharge end of the pump so as to lubricate said cylinder and piston and maintain said parts in perfect operative condition at all times.

The objects of the invention are as follows:—First. To provide improvements in governors of the class specified for supplying oil to the cylinder without shutting off the governor or stopping the operation of the pump. Second. To provide means whereby the pressure exerted by the mechanical devices to move the piston in one direction may be regulated so as to accommodate the governor to heavy or light work. Third. To provide a governor of the class specified which is automatic in its operation under ordinary conditions, and which will operate under high or low pressure, and which is also provided with a throttle valve which operates automatically to regulate the pressure, when the governor is in operation, and which may be operated by a lever or other hand-operated device to form a complete cut-off or stop valve. Fourth. To provide a governor of the class specified with a lever operated device for changing the pressure exerted on the piston by the mechanical devices so as to

adapt the governor for light or heavy work when desired, and to entirely shut off the steam supplied to the pump when necessary. Fifth. To provide a governor of the class specified with means whereby the pressure of water in the pipe which is in communication with the cylinder may be controlled or regulated so as to prevent a too quick opening of the governor or the steam valve thereof when pressure is reduced in the water end of the cylinder; and with these and other objects in view the invention consists in the construction, combination and arrangement of parts hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which;—

Figure 1 is a side view of an automatic steam pump governor involving my invention, part of the construction being in section; Fig. 2 a view at right angles to Fig. 1 and on an enlarged scale and showing modifications, part of the construction being in section; Fig. 3 an enlarged side view of a combination automatic and hand operated cut off valve used in the water pipe connection for the cylinder of my improved pump governor, and shown in Fig. 1, part of the construction being in section; Fig. 4 a side view on an enlarged scale of a coupling block shown in Figs. 1 and 2 and forming part of the mechanical means for moving the piston in one direction; Fig. 5 a section on the line 5—5 of Fig. 4; Fig. 6 a side view of the main frame of the governor detached, said frame being shown in Figs. 1 and 2, and;—Fig. 7 a plan view of a modified form of lever constituting a part of the mechanical devices for moving the piston in one direction, and on an enlarged scale.

This invention is an improvement on governors for pumping engines of the class described and claimed in United States Letters Patent granted to me Nov. 8, 1904, No. 774,266 and reissued Jan. 10, 1905, No. 12,303; also in Letters Patent of the United States granted to me Jan. 23, 1906, No. 810,666; July 9, 1907, No. 859,327 and July 9, 1907, No. 859,407, said governors employing cylinders, one end of which is in communication with the discharge end of

the pump and being provided with a piston operated in one direction by pressure of water from the discharge end of the pump, and in the opposite direction by mechanical devices, and said cylinder being provided with means for maintaining a supply of oil in the end of the cylinder which is connected with the pump.

In the drawings forming part of this specification, I have shown at *a* the cylinder of a pump governor of the class specified, and said cylinder is provided at its lower end with a coupling *a*² with which, in practice, is connected a trap which is in turn connected with the discharge end of the pump or a pipe connected therewith.

The cylinder *a* is provided with a differential piston *b*, the lower end portion *b*² of which exactly fits said cylinder in the form of construction shown, and the upper end portion of which is smaller than the lower end, and in the top portion of said cylinder is an annular groove *a*³, and in one side wall thereof is a by-pass *a*⁴ which communicates with the groove *a*³ at *a*⁵ and with the bottom portion of the cylinder at *a*⁶. Connected with the cylinder is an oil supply pipe *c* with which is connected an oil cup *c*² between which and the pipe is a valve *c*³, and a force pump *c*⁴ is also connected with the pipe *c* at *c*⁵. In practice oil is placed in the cup *c*² and allowed to flow into the pipe *c* and into the by-pass *a*⁴, after which the valve *c*³ is closed and the oil may be forced into the cylinder *a* so as to maintain a supply of lubricating material therein without stopping the pump or interfering with the operation thereof.

The connection between the bottom of the cylinder *a* and the water discharge end of the pump is preferably made by means of a trap *c*⁶ shown in Fig. 1, and said trap is connected with the coupling *a*² and with a pipe *c*⁷ which may be connected directly with the discharge end of the pump or with a water pipe connected with said pump. The pipe *c*⁷ is provided with an automatic and hand operated cut off valve *d* also shown in Fig. 1, and in detail in Fig. 3, and in practice a quantity of oil is always maintained in the trap *c*⁶, and this oil may be forced into said trap by means of the pump *c*⁴, and through the cylinder *a* as hereinbefore described.

The top portion of the cylinder *a* is provided with a stuffing box *a*⁷ closed by a gland *a*⁸, and the top portion of the piston *b* passes upwardly through said gland and is movable therethrough. In the form of construction shown the top portion of the piston *b* is reduced in size, but the said piston may be of the same transverse dimensions throughout its length, in which event it would fit the inner walls of the cylinder *a* and the piston would be lubricated through the annular groove *a*³, and in this

event the stuffing box *a*⁷ and the gland *a*⁸ would be correspondingly enlarged. The top portion of the cylinder *a* is also provided with an air discharge or vent device *a*⁹ which is in communication with the annular groove *a*³. Mounted on the top portion of the cylinder *a* is a yoke or frame *e* comprising a bottom member *e*², a top member *e*³, parallel side members *e*⁴, and a back member *e*⁵ parallel with said side members.

Connected with the top of the frame *e* is a bonnet *f* containing a stuffing box *f*², and the stuffing box *a*⁷ at the top of the cylinder *a* and the stuffing box *f*² are of the same style as the stuffing boxes described and claimed in U. S. Letters Patent, No. 859,327 and No. 859,407 granted to me July 9, 1907.

The cylinder *a*, the frame *e* and the bonnet *f* are arranged vertically as shown, and connected with the top of the bonnet *f* is a throttle valve or valve casing *g* having an inlet pipe *g*² and an outlet pipe *g*³, and the pipe *g*², in practice, is connected with a steam boiler, and the pipe *g*³ conveys the steam to the pump.

The throttle valve or valve casing *g* is of the same style as that shown and described in U. S. Letters Patent granted to me July 9, 1907, No. 859,407 and is provided with two ports or passages *g*⁴ and *g*⁵ and corresponding valve seats, the port or passage *g*⁴ being smaller than the lower port or passage *g*⁵.

The top of the throttle valve or casing *g* is provided with a screw threaded nipple *h* with which is connected a tubular casing *h*² forming a spring chamber *h*³, and the top of the casing *h*² is closed by a screw threaded plug *i* having a central bore or passage *i*² with the top of which is connected an oil cup *i*³. The top of the casing *h* is also provided with a jam nut *h*⁴ having handle projections *h*⁵, and the plug *i* is provided with projections *i*⁴ forming handles by which it may be turned.

Connected with the top of the piston *b* is a rod *j* composed, in the form of construction shown in Fig. 1, of two parts connected at *j*², and in the form of construction shown in Fig. 3 of three parts, the bottom and middle parts being connected at *j*² and the middle and top parts abutting at *j*³ where they pass through the nipple *h*. The rod *j* passes vertically through the frame *e*, through the bonnet *f* and the stuffing box therein, and through the throttle valve casing *g* and into the tubular casing *h*², and the top part of said rod in Fig. 1 and the middle portion thereof in Fig. 2 is provided with a double valve device *g*⁶ the same as in the patent last referred to.

The bottom part of the rod *j* is enlarged and screw threaded as shown in Figs. 1 and 2, and mounted thereon is a spring tension regulating nut *j*⁴ above which is mounted a disk *j*⁵ through which the rod *j* loosely passes, and between the disk *j*⁵ and the nut *j*⁴ are

placed ball bearings j^6 , and said nut is provided with handles j^7 by which it may be turned.

Mounted in the yoke or frame e is a cross head k , and said yoke or frame or the side portions e^4 thereof are provided with guides k^2 , in which said cross head is movable, and the rod j passes loosely through said cross head. Connected with the bottom of said cross head is a tube or sleeve k^3 , and mounted between said cross head and the disk j^5 is a spiral spring k^4 , and the tube or sleeve k^3 extends downwardly into said spring and serves to hold it in proper position under all conditions.

At the front of the yoke or frame e and connected with the top of the cylinder a and with the top of the throttle valve casing g is a bar l having a segmental central portion l^2 provided with ratchet teeth l^3 and l^4 , the upper ratchet teeth l^3 extending upwardly, and the lower ratchet teeth l^4 extending downwardly. Between the teeth l^3 and l^4 is a blank space l^5 , and the back bar e^5 of the yoke or frame e is provided with a socket l^6 in which is pivoted at l^7 a lever m which carries a yoke m^2 forming a part thereof and through which the rod j passes, and said lever is also provided with another yoke m^3 through which the segmental part l^2 of the bar l passes. The lever m is also provided outwardly of the yoke m^3 with top and bottom guides m^4 and m^5 through which are passed top and bottom rods m^6 and m^7 on which are mounted springs m^8 and m^9 , and mounted on the outer end portion of the yoke m^3 is a keeper n . The ends of the rods m^6 and m^7 are provided with dogs n^2 which are adapted to engage the teeth l^3 and l^4 , and connected with the outer ends of the rods m^6 and m^7 are bell cranks n^3 which are pivoted to the lever m at n^4 , and said lever is provided at its end with a handle n^5 between which and the ends of the bell cranks n^3 are placed springs n^6 . The lever m is also provided in the opposite sides of the yoke m^2 with wheels n^7 which are adapted to bear on the cross head k , and the separate parts of the rod j as shown in Fig. 1, and the bottom portions of said rod are connected as shown in Fig. 2 by a coupling block o which is preferably provided at the bottom with a flared base o^2 which rests on the wheels n^7 . The block o is preferably composed of two parts as shown in Figs. 2, 4 and 5 and said parts are connected by a bolt o^3 which is passed therethrough and between the ends of the separate parts of the rod j as shown in Fig. 4, and the bottom portions of said rod in Fig. 2.

The top part of the rod j in the construction shown in Fig. 1 is provided just above the nipple h of the valve casing g with a disk o^4 on which is placed a spiral spring o^5 which is weaker than the spring k^4 and above which is placed a disk o^6 between which and the

plug i are placed ball bearings o^7 , and the tension of the spring o^5 may be regulated at any time by turning said plug, and the tension of the spring k^4 also may be regulated by turning the nut j^4 .

The nipple h of the valve casing g is provided, in the construction shown in Fig. 2, with ports o^8 forming a communication between said valve casing and the spring chamber h^3 , and the disk o^4 is also preferably provided with ports o^9 . The bar l containing the segmental rack member l^2 is provided with a brace member p by which it is connected with the bottom portion of the valve casing g , and the bottom portion of the spring chamber h^3 is provided with a drain device p^2 .

The valve d in the water pipe c^1 is constructed as shown in Fig. 3, the said valve comprising a casing provided with a diaphragm d^2 in which is a port or passage d^3 adapted to be closed by a ball valve d^4 which is placed over said port or passage and above which is a bonnet plug d^5 screwed into the top of the valve casing and provided with a semi-spherical recess d^6 . The top portion of the bonnet plug d^5 is provided with a stuffing box d^7 , and passed downwardly therethrough and through the plug d^5 is a screw d^8 . The bottom part of said valve casing is provided with a stuffing box construction d^9 , at the bottom of which is a jam nut d^{10} , and passed upwardly through the stuffing box construction and into the valve casing is a screw d^{11} .

In Fig. 7 of the accompanying drawings, I have shown a modified form of the lever m , in which the outer end portion thereof is composed of two parts connected by parallel side members r which take the place of the yoke m^3 in Fig. 1, and which form a spacer through which the segmental part l^2 of the bar l passes. A set screw r^3 is passed through one of the side members r^2 and is adapted to bear on said bar l and by means of this construction the lever m may be locked to the bar l at any point, and the ratchet teeth l^3 and l^4 and the dogs n^2 and means for operating said dogs are rendered unnecessary.

The object of the bolts or passages o^8 in the nipple h and the ports or passages o^9 in the disk o^4 is to provide for a free circulation through the spring chamber h^3 . It will be understood, of course, that any pressure in the spring chamber h^3 will not interfere with the operation of the spring therein nor with the operation of the governor in any way, and the ports or passages o^8 enable the spring chamber h^3 to free or drain itself when the valve casing g is closed, this drainage taking place through the pipe g^3 leading to the pump.

It will be understood, of course, that the operation of this apparatus is, in the main,

the same as the operation of the apparatus described and claimed in the pump governor patents hereinbefore referred to. When the apparatus is in operation the steam from the boiler passes into the throttle valve casing g at g^2 and passes out at g^3 and is conveyed to the pump which is not shown; the pump is thus put in operation and the pipe c^7 which is connected with the water delivery end of the pump either directly or indirectly conveys water under pressure to the lower end of the cylinder a .

The lower end of the cylinder a and the trap c contains, at all times, a body of oil as hereinbefore described, the object of which is to lubricate the cylinder and the piston and prevent corrosion and keep said parts in proper operative condition at all times. The pressure of the water in the trap c^6 and in the bottom of the cylinder operates against the oil by which the pressure is transmitted to the bottom of the piston and the vertical movement of the piston will operate the rod j vertically and cause the valve g^6 in the valve casing g to close the ports or passages g^4 and g^5 , and this, of course, will cut off the supply of steam to the pump.

It will be understood that the springs o^5 and k^4 control this vertical movement of the piston and the pressure by which it is operated, and this control is effected according to the pressure which is desired on the pump. If a low pressure is required, say up to from 20 to 35 pounds or thereabout the spring o^5 only is used, and the tension of this spring can be regulated at all times by means of the screw threaded plug i as will be readily understood. If the pump be set to work, say at 30 pounds pressure the piston b and spring o^5 will operate to control the flow of steam through the valve casing g in order to accomplish this result without the aid of the lower spring k^4 .

If it is desired to work the pump on a higher pressure, say from 40 to 150 pounds or higher still if desired the bottom spring k^4 is brought into operation in addition to the spring o^5 . The control of the spring k^4 is effected both by means of the nut j^4 and by the lever m . The position of the lever m shown in Fig. 1 is its normal position, or that in which the spring k^4 is not operating and in which the pump is controlled by the spring o^5 only. If now it is desired to increase the pressure of the pump the bell cranks n^3 are operated to withdraw the dogs n^2 from their engagement with the ratchet teeth l^3 and l^4 , and the outer end of said lever is depressed to the desired extent the degree of the downward movement of said lever being controlled or indicated by scale numbers on the quadrant or rack bar l^2 .

The bottom dog n^2 will lock the lever m in any desired position below the horizontal, and in this way the spring k^4 may be com-

pressed quickly or instantly so as to change the pressure on the pump immediately, and said pressure will be maintained as long as the lever m is left in its depressed position.

If the regulation of the tension of the spring k^4 is not sufficiently exact when the lever m is brought into operation as above described, the nut j^4 may be operated to exactly regulate the tension of said spring to any desired extent.

If at any time it becomes necessary to cut off entirely the flow of steam to the pump, either by reason of a breakage in the pipe connections, water or steam, hose connections or any other part of the apparatus, the lever m may, as will be understood, be moved upwardly so as to force the valve rod j upwardly and cause the valve g^6 to cut off the flow of steam through the valve casing g , and the lever m may be locked in this position by the upper dog n^2 thereof.

In the downward operation or movement of the lever m as above described the wheels n^7 bear on the cross head k , and this facilitates the operation of the lever and of said cross head and reduces friction, and in the upward movement of said lever in order to cut off the flow of steam through the valve casing g the wheels n^7 bear on the flanged nut o for the same purpose.

The object of making the nut o in two parts is to facilitate the detachment and disconnection of the separate parts of the rod j and the separate parts of the governor when the same becomes necessary, and also the assembling of said parts; and the object of dividing the upper portion of the rod j into two parts as shown in Fig. 2 is to provide means whereby governors of this class already installed may be easily repaired while in place, or the improvements described and claimed herein applied thereto.

The ball valve d^4 in the valve device d with which the water pipe c^7 is provided is a metal valve, and the object of this valve device is to control the opening of the valve g^6 in the throttle valve casing g so as to regulate the speed of the movement of said valve g^6 , and thereby regulate the force applied to the main pumping engine so as to prevent a too quick movement of the engine at the start thereof. The normal position of the valve d^4 when the apparatus is in operation is the unseated position in which the water is free to pass through the port or passage d^3 , and said valve is held in this position by the screw d^{11} , and as the pressure in the pipe c^7 increases the valve d^4 is raised higher in proportion to the amount of pressure in said pipe.

When the pressure in the trap c or cylinder a is decreased the valve d^4 will move downwardly to its seat or until it is stopped by the screw d^{11} , and the movement of this valve when it is not locked against movement entirely will be controlled, as will be under-

stood, by the pressure on the opposite sides of the valve casing whatever that pressure may be.

When it is desired to use the valve device *d* as a stop valve the screw *d*¹¹ is run down so that the valve *d*¹ will drop to its seat and the screw *d*⁸ is turned down until it presses on said valve. It will be understood that the use of the lever *m* shown in Fig. 7 will be exactly the same as the use of said lever as shown in Fig. 1 as far as the control of the spring pressure is concerned, the only difference being that the set screw *r*³ is used to lock the lever at any desired point on the quadrant or segmental bar *l*².

Although I have described my improved governor as particularly adapted for use in connection with a pump for pumping water, it will be apparent that the same may be used in connection with a pump used for pumping any other liquid, air, gas or similar substance under pressure, and my improvement may be employed in connection with apparatus of this class used for any purpose.

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

1. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the throttle valve device, a water pressure pipe connected with said cylinder and adapted to be connected with a pump, the piston in said cylinder being operated by water pressure from said pipe to close said throttle valve device, a low pressure regulator adapted to operate said piston in the opposite direction and open said valve, and a high pressure regulator also adapted to operate said cylinder in the opposite direction, said pressure regulating devices being adapted to operate separately or together.

2. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the throttle valve device, a water pressure pipe connected with said cylinder and adapted to be connected with a pump, the piston in said cylinder being operated by water pressure from said pipe to close said throttle valve device, a low pressure regulator adapted to operate said piston in the opposite direction and open said valve, and a high pressure regulator also adapted to operate said cylinder in the opposite direction, said pressure regulating devices being adapted to operate separately or together, and means whereby the high pressure regulator may be operated to close the throttle valve device.

3. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the

throttle valve device, a water pipe adapted to connect the delivery end of the pump with the hydraulic cylinder, means for supplying oil to said cylinder, a tensional device adapted to hold the throttle device open under low pressure, and a supplemental tensional device used in combination with the first named tensional device under high pressure conditions.

4. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the throttle valve device, a water pipe adapted to connect the delivery end of the pump with the hydraulic cylinder, means for supplying oil to said cylinder, a tensional device adapted to hold the throttle device open under low pressure, a supplemental tensional device used in combination with the first named tensional device under high pressure, and means for throwing the supplemental tensional device into and out of operation.

5. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the throttle valve device, a water pipe adapted to connect the delivery end of the pump with the hydraulic cylinder, means for supplying oil to said cylinder, a tensional device adapted to hold the throttle device open under low pressure, a supplemental tensional device used in combination with the first named tensional device under high pressure, and means for throwing the supplemental tensional device into and out of operation and for regulating the force of both of said tensional devices.

6. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the throttle valve device, a water pipe adapted to connect the delivery end of the pump with the hydraulic cylinder, means for supplying oil to said cylinder, a tensional device adapted to hold the throttle device open under low pressure, and a supplemental tensional device used in combination with the first named tensional device under high pressure conditions, the water pipe which is in communication with the cylinder being also provided with an automatic regulating and hand operated cut off valve.

7. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the throttle valve device, a pipe connected with the hydraulic cylinder and adapted to supply water from the pump thereto, means for forcing oil into said cylinder and water pipe against the pressure of water therein and while the pump is in operation, said piston

being operated by pressure of water in the water pipe to close the throttle valve device and being operated in the opposite direction by tensional devices.

8. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the throttle valve device, a pipe connected with the hydraulic cylinder and adapted to supply water from the pump thereto, means for forcing oil into said cylinder and water pipe against the pressure of water therein and while the pump is in operation, said piston being operated by pressure of water in the water pipe to close the throttle valve device and being operated in the opposite direction by tensional devices, and said water pipe being also provided with an automatic regulating and hand operated cut off valve.

9. In a governor for steam pumps, a hydraulic cylinder, a frame one end of which is connected with one end of said cylinder, a steam throttle valve casing connected with the other end of said frame, a piston mounted in said cylinder and provided with a rod which passes through said frame and through said throttle valve casing, a cross head mounted in said frame and movable longitudinally thereof, a tensional device for holding the throttle valve open, the tension of said tensional device being adapted to be increased or reduced by the movement of said cross head, a lever mounted in said frame and adapted by its movement in one direction to increase the tension of said tensional device, and by its movement in the opposite direction to open the throttle valve and decrease the tension of said tensional device,

and means for locking said lever in different positions.

10. In a governor for steam pumps, a hydraulic cylinder, means for supplying water to one end thereof under pressure, a frame one end of which is connected with the frame end of said cylinder, a steam throttle valve casing connected with the other end of said frame, a spring casing connected with the throttle valve casing opposite said frame, a piston mounted in said cylinder, a rod connected with said piston and passing through said frame and through said throttle valve casing and into said spring casing, said rod being provided with a valve within said throttle valve casing adapted to open and close the passage therethrough, and a spring tensional device mounted in the spring casing and operating on said rod to open said valve, said valve casing and said spring casing being in communication.

11. In a steam pump governor, a low pressure regulator and a supplemental high pressure regulator, a lever adapted to control the operation of either of said regulators, a quadrant device having graduations corresponding to the pressure it is desired to carry on the pump, and means carried by said lever and co-acting with said quadrant device to lock the parts in any desired position.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 29th day of June 1908.

CHARLES P. McMULLEN.

Witnesses:

C. E. MULREANY.
A. R. APPLEMAN.

Correction in Letters Patent No. 924,097.

It is hereby certified that in Letters Patent No. 924,097, granted June 8, 1909, upon the application of Charles P. McMullen, of Brooklyn, New York, for an improvement in "Automatic Steam-Pump Governors," an error appears in the printed specification requiring correction as follows: Page 5, lines 40-41 and lines 56-57, the word "cylinder" should read *piston*; and that the proper correction has been made in the files and records of the Patent Office and is hereby made in said Letters Patent.

Signed and sealed this 10th day of May, A. D., 1910.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.

being operated by pressure of water in the water pipe to close the throttle valve device and being operated in the opposite direction by tensional devices.

8. In a governor for steam pumps, a throttle valve device placed in the steam pipe, a hydraulic cylinder provided with a piston in operative connection with the valve of the throttle valve device, a pipe connected with the hydraulic cylinder and adapted to supply water from the pump thereto, means for forcing oil into said cylinder and water pipe against the pressure of water therein and while the pump is in operation, said piston being operated by pressure of water in the water pipe to close the throttle valve device and being operated in the opposite direction by tensional devices, and said water pipe being also provided with an automatic regulating and hand operated cut off valve.

9. In a governor for steam pumps, a hydraulic cylinder, a frame one end of which is connected with one end of said cylinder, a steam throttle valve casing connected with the other end of said frame, a piston mounted in said cylinder and provided with a rod which passes through said frame and through said throttle valve casing, a cross head mounted in said frame and movable longitudinally thereof, a tensional device for holding the throttle valve open, the tension of said tensional device being adapted to be increased or reduced by the movement of said cross head, a lever mounted in said frame and adapted by its movement in one direction to increase the tension of said tensional device, and by its movement in the opposite direction to open the throttle valve and decrease the tension of said tensional device,

and means for locking said lever in different positions.

10. In a governor for steam pumps, a hydraulic cylinder, means for supplying water to one end thereof under pressure, a frame one end of which is connected with the frame end of said cylinder, a steam throttle valve casing connected with the other end of said frame, a spring casing connected with the throttle valve casing opposite said frame, a piston mounted in said cylinder, a rod connected with said piston and passing through said frame and through said throttle valve casing and into said spring casing, said rod being provided with a valve within said throttle valve casing adapted to open and close the passage therethrough, and a spring tensional device mounted in the spring casing and operating on said rod to open said valve, said valve casing and said spring casing being in communication.

11. In a steam pump governor, a low pressure regulator and a supplemental high pressure regulator, a lever adapted to control the operation of either of said regulators, a quadrant device having graduations corresponding to the pressure it is desired to carry on the pump, and means carried by said lever and co-acting with said quadrant device to lock the parts in any desired position.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 29th day of June 1908.

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A. R. APPLEMAN.

Correction in Letters Patent No. 924,097.

It is hereby certified that in Letters Patent No. 924,097, granted June 8, 1909, upon the application of Charles P. McMullen, of Brooklyn, New York, for an improvement in "Automatic Steam-Pump Governors," an error appears in the printed specification requiring correction as follows: Page 5, lines 40-41 and lines 56-57, the word "cylinder" should read *piston*; and that the proper correction has been made in the files and records of the Patent Office and is hereby made in said Letters Patent.

Signed and sealed this 10th day of May, A. D., 1910.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.

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