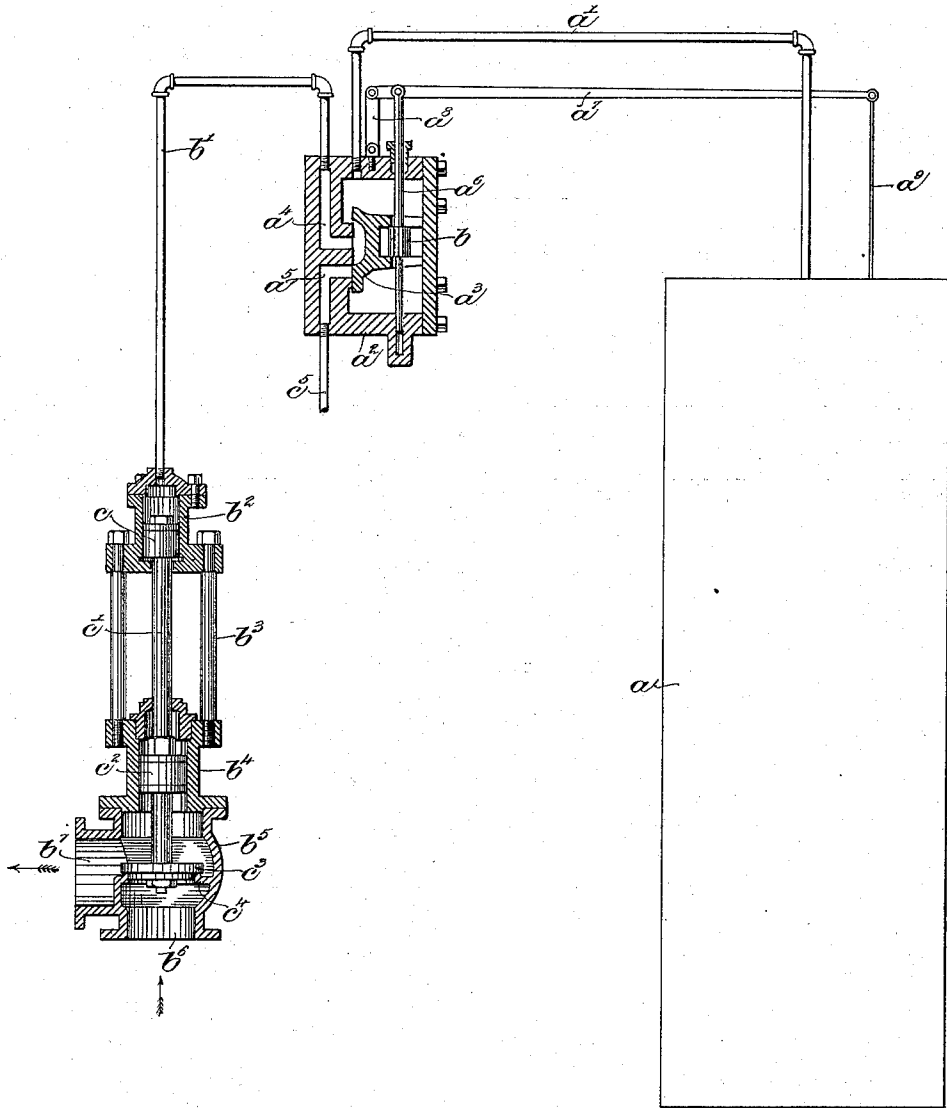


(No Model.)

C. H. ATKINS.  
HYDRAULIC GOVERNOR FOR STEAM PUMPS.

No. 406,615.

Patented July 9, 1889.



Witnesses.

*Fred. S. Chickleaf  
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# UNITED STATES PATENT OFFICE.

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## HYDRAULIC GOVERNOR FOR STEAM-PUMPS.

SPECIFICATION forming part of Letters Patent No. 406,615, dated July 9, 1889.

Application filed July 16, 1888. Serial No. 280,027. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. ATKINS, of Palmer, county of Hampden, State of Massachusetts, have invented an Improvement in Hydraulic Governors for Steam-Pumps, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawing representing like parts.

My invention has for its object to provide a hydraulic governor for the steam-engine of a pump, which is controlled in its operation by the position of the ram in an accumulator, whereby steam is cut off and the pump arrested when the ram in the accumulator has attained a certain or predetermined position, and whereby steam is supplied to the engine to again start the pump when the ram in the accumulator has fallen below said predetermined position.

My invention therefore consists, essentially, in a hydraulic governor for steam pumping-engines, of the combination, with a valve-casing provided with a steam-inlet port and a steam-outlet port connected to the pump, and a valve in said casing to control the supply of steam to the pump, of a cylinder  $b^2$ , a piston in said cylinder connected to said valve, an independent valve-chest, an accumulator tank or vessel, a pipe connecting said valve-chest with said accumulator, a port in said valve-chest connected to the cylinder  $b^2$ , a valve in said valve-chest to control the supply of water to said cylinder, and a float or ram in said accumulator-tank connected to the valve in the valve-chest, to operate substantially as will be described.

The drawing in elevation and section shows a sufficient portion of an apparatus embodying my invention to enable it to be understood, the accumulator being in elevation.

The accumulator or storage-tank  $a$ , into which water or other fluid is discharged by a pump, (not herein shown, but which may be of any usual or well-known construction,) has connected to it by pipe  $a'$  a valve-chest  $a^2$ , provided, as herein shown, with a slide-valve  $a^3$ . The slide-valve  $a^3$ , as herein shown, controls two ports or passages  $a^4$   $a^5$ , and is itself operatively connected by rod  $a^6$  to a lever  $a^7$ ,

pivoted to a link  $a^8$ , secured to the valve-chest, the lever  $a^7$  having connected to it a rod  $a^9$ , which is extended into the accumulator and provided therein with a ram or float, (not herein shown, but which may be of any suitable or well-known construction,) the valve being herein shown forked, to embrace a collar  $b$  on the rod  $a^9$ . The port or passage  $a^4$  is connected by a pipe  $b'$  to a cylinder  $b^2$ , herein shown as supported by rods  $b^3$ , fastened to a cylinder  $b^4$ , secured to or forming part of a casting  $b^5$ , provided with two openings or ports  $b^6$   $b^7$ . The cylinder  $b^2$  contains within it a piston  $c$ , having its piston-rod  $c'$  extended through the cylinder  $b^4$  into the casting  $b^5$ , the said rod having mounted upon it within the cylinder  $b^4$  a piston  $c^2$ , and having secured to it in the casting  $b^5$  a valve  $c^3$ , normally resting on a valve-seat  $c^4$ , when the water in the accumulator has reached the desired level or amount.

As shown in the drawing, the valve  $c^3$  is seated and the supply of steam to the pump cut off, the valve  $a^3$  being in such a position that the water from the accumulator can pass through port  $a^4$  and pipe  $b$  and act upon the piston  $c$ , holding said valve  $a^3$  on its seat, thus arresting the pump in the accumulator when the ram has reached the desired position.

When the ram in the accumulator falls below the predetermined position, said ram, through the lever and rod, moves the valve down, as herein shown, so as to connect the port  $a^4$  with the port  $a^5$ . The water in the cylinder  $b^2$  and the water in pipe  $b$  and cylinder  $b^2$  is locked therein to maintain the valve  $c^3$  seated until the water-level in the accumulator falls below the normal, and pipe  $b'$  is thus permitted to escape or run to waste through the pipe  $c^5$ , the valve  $c^3$  being opened by the pressure of the steam on its under side, thus permitting steam to enter the valve-casing and pass out through the opening 7, the said steam acting on the piston  $c^2$  to move the same to the end of its cylinder and open wide the valve  $c^3$  to supply a full head or pressure of steam to the pump, to start the same, as indicated by arrows. When the ram in the accumulator has again reached the predetermined position, said ram moves

the valve  $a^3$  through the rod  $a^6$  and lever  $a^7$  upward into the position shown, the valve  $c^3$  being closed.

5 With the construction shown in the drawing, the steam after passing by the valve  $c^3$  acts on the piston  $c^2$ , to gradually complete the opening of the valve.

I claim—

10 1. In a hydraulic governor for steam pumping-engines, the combination, with a valve-casing provided with a steam-inlet port and a steam-outlet port connected to the pump, and a valve in said casing to control the supply of steam to the pump, of a cylinder 15  $b^2$ , a piston in said cylinder connected to said valve, an independent valve-chest, an accumulator tank or vessel, a pipe connecting said valve-chest with said accumulator, a port in said valve-chest connected to the cylinder 20  $b^2$ , a valve in said valve-chest to control the supply of water to said cylinder, and a float or ram in said accumulator-tank connected to the valve in the valve-chest, to operate substantially as described.

25 2. In a hydraulic governor for steam

pumping-engines, the combination, with a valve-casing provided with a steam-inlet port and a steam-outlet port connected to the pump, and a valve in said casing to control the supply of steam to the pump, of a cylinder 30  $b^2$ , and a cylinder  $b^4$  intermediate of the cylinder  $b^2$  and valve-casing, pistons  $c^2$  in said cylinders connected to the said valve, an independent valve-chest provided with an outlet-port  $a^4$ , connected to the cylinder  $b^2$ , and 35 an exhaust-port  $a^5$ , an accumulator tank or vessel, and a pipe connecting said tank with the said valve-chest, a valve in said valve-chest to control the supply of water to the cylinder  $b^2$ , and a float or ram in said accumulator-tank connected to the valve in the 40 said valve-chest, substantially as described.

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

CHARLES H. ATKINS.

Witnesses:

JAS. H. CHURCHILL,  
MABEL RAY.