

No. 686,865.

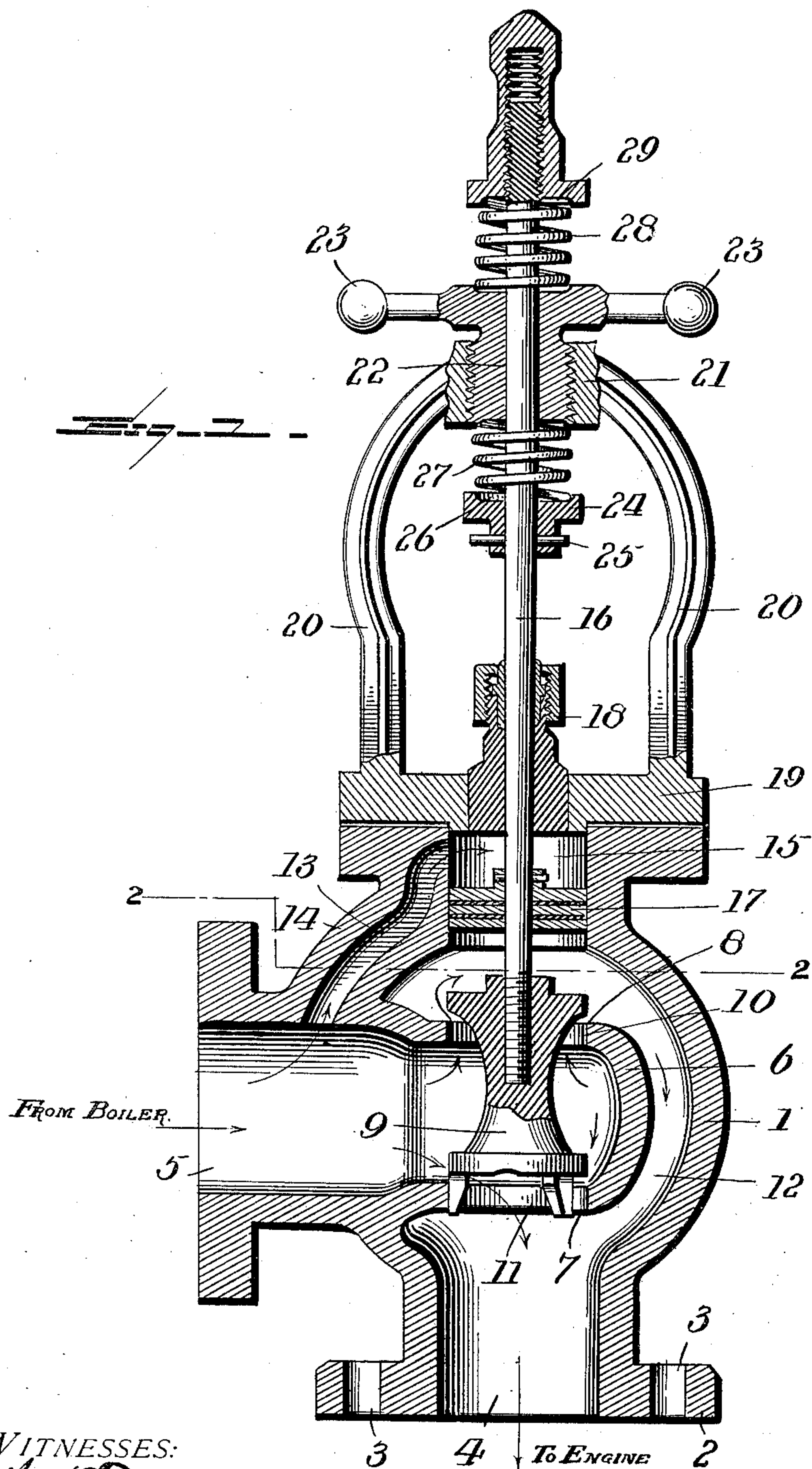
Patented Nov. 19, 1901.

C. F. SLEIGH.
SPEED REGULATOR.

(Application filed Mar. 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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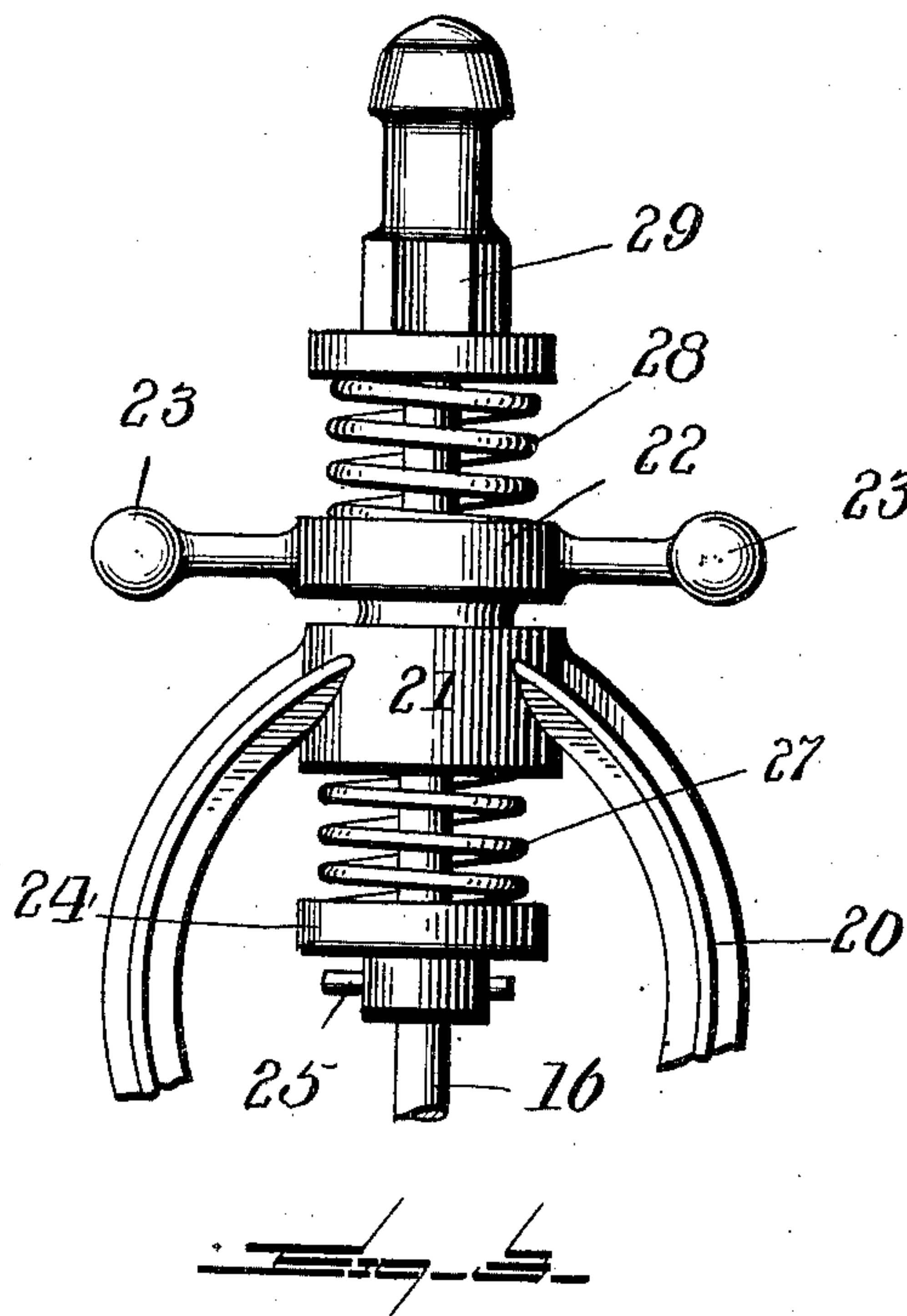
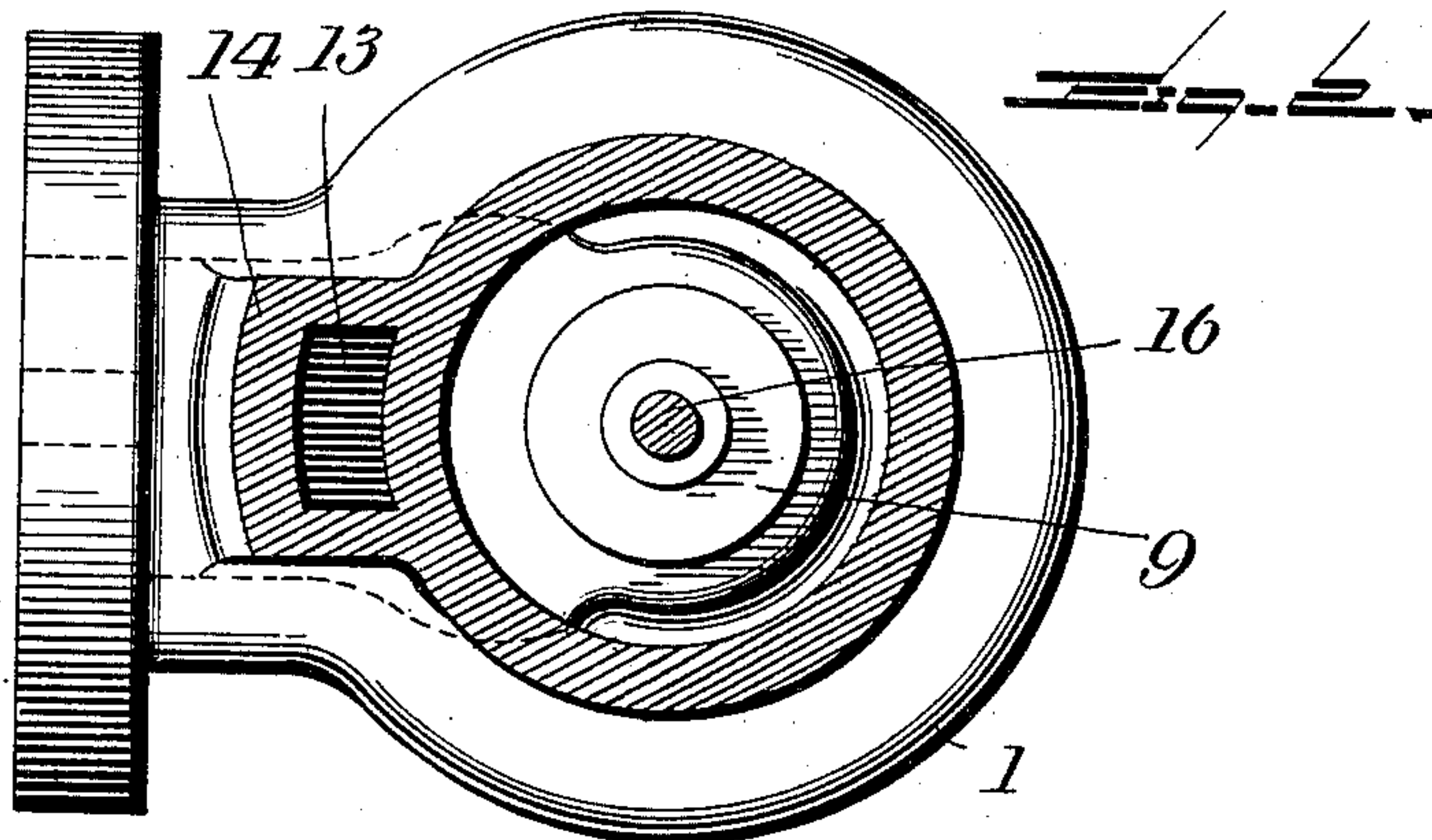
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UNITED STATES PATENT OFFICE.

CHARLES F. SLEIGH, OF PARKERSBURG, WEST VIRGINIA, ASSIGNOR OF
ONE-HALF TO RICHARD E. KLINE AND L. P. KESSELMAN, OF WOOD
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SPEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 686,865, dated November 19, 1901.

Application filed March 22, 1901. Serial No. 52,402. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SLEIGH, a citizen of the United States, residing at Parkersburg, in the county of Wood and State of West Virginia, have invented certain new and useful Improvements in Speed-Regulators; and I do hereby 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 appertains to make and use the same.

This invention relates to certain new and useful improvements in speed-regulators, and while primarily adapted for steam, air, or gas engines it is evident that the same may be used in connection with pumps or applied to other uses.

The invention has for its objects, among others, to provide a simple and inexpensive yet reliable and efficient regulator that shall be automatic in its action, whereby the speed of the engine is automatically regulated without the necessity of the employment of a governor or balls and controlled by the pressure of steam in the line between the boiler and engine.

I aim further at improvements in the details of construction by which I am enabled to produce a speed-regulator not dependent upon momentum, thus rendering it more positive and quick in its action and dispensing with the employment of pipe connections.

Still another object is compactness of arrangement of the parts, the valve and piston on the rod being disposed within the valve-casing and a by-pass being provided whereby the steam is admitted to act upon the upper face of the piston. This rod is extended through the top of the valve-casing, being made steam-tight by stuffing-box or similar means, and above the top of the said bowl or chamber I provide two springs, between which is arranged a regulating-screw, the lower spring resting upon a collar secured to the rod and the top spring resting on the said screw and regulated by a nut upon the end of the rod. The regulating-screw is provided for the purpose of raising or lowering the valve on the lower end of the rod according to the amount

of speed at which the engine is to run. The required tension of the springs is attained by adjustment of the nut on the upper end of the rod. The placing of the valve and piston within the valve-casing avoids the necessity of a separate chamber for the piston and the consequent pipe connections.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a substantially central vertical section through my improved speed-regulator. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1 looking down. Fig. 3 is a detail in elevation of the springs and their retaining and adjusting means.

Like numerals of reference indicate like parts throughout the different views.

Referring now to the drawings, which illustrate the preferred form of embodiment of my invention, 1 designates the valve-casing, shown as provided with a flange 2 with openings 3, by which it may be secured in the desired position. The port or passage-way 4 is designed to communicate with the engine, as will be readily understood.

5 is the communication with the boiler.

6 is the inside shell or diaphragm, having seats 7 and 8 for a valve 9 of any ordinary or approved form of construction. The ports 10 and 11 through the inside shell afford communication between the inlet opening or port 5 and the port or passage-way 4 and also by way of the passage 12 to the port 4 and to the engine, all as indicated by the arrows in Fig. 1.

13 is a by-pass or port for supplying steam from the port 5 to the upper side of the piston, soon to be described. In this instance this pressure-port is shown as in the portion 14 of the valve-casing; but it is evident that this is not necessary, as this port may be otherwise provided—as, for instance, by pipe connection from the port 5 to the chamber or

extension 15 of the valve-casing—as will be readily understood.

16 is a rod carrying at its lower end the valve 9, and 17 is a piston fast upon the rod 5 above the valve, as seen in Fig. 1, and this piston may be of any suitable form of construction suited to the purpose. This piston works within the chamber 15 steam-tight and may be affixed to the rod in any suitable manner. 10 The rod 16 extends upward above the top of the valve-casing 1, passing through a stuffing-box 18, in which it is free to reciprocate. The stuffing-box 18 is held in the base 19 of a yoke or arched support 20, which may be secured 15 to the top of the valve-casing in any suitable manner or cast with and made a part of the valve-casing, if preferred. The upper portion of the yoke 20 has an internally-threaded boss 21, into which is screwed the regulating-screw 22. This screw is provided with a suitable handle or means 23 for turning it, and it serves to regulate the movement of the valve, raising or lowering it, as may be required, and thus regulate the speed of the 25 engine.

24 is a collar secured to the rod 16 below the regulating-screw in any suitable manner, as by pin 25, and the upper face of this collar is recessed, as shown at 26 in Fig. 1, to 30 receive the lower end of a spring 27, which surrounds the rod 16, the upper end of this spring finding a bearing against the under side of the body portion of the regulating-screw 22, as is clearly seen in Fig. 1.

28 is another spring around the rod 16, disposed between the upper end of the body portion of the regulating-screw 22 and the nut 29, which is adjustable on the threaded upper end of the rod 16, as will be clearly seen 40 from Fig. 1. The adjacent faces of the body portion of the regulating-screw and of the nut 29 are shown as recessed to better retain the ends of the spring; but it is evident that this is not necessary.

45 With the parts constructed and arranged substantially as above described the operation is as follows: The springs are adjusted to suit the boiler-pressure. Steam being admitted through the passage-way 5 from the 50 boiler, it passes through the port 11 and port 4 to the engine. At the same time a portion of the steam passes through the port 10 and passage-way 12 to the engine. At the same time steam passes through the port 13 to 55 chamber 15 and acts upon the top of the piston 17, pushing the same downward proportionate to the amount of pressure required to run the engine. Should the boiler-pressure increase, it will be seen that there would 60 be a greater pressure on top of the piston, which would close the valve proportionately, and consequently admit less steam to the engine. Should a load be thrown on, the engine, pressure will increase in the line between the piston and engine, and, acting upon 65 the under face of the piston, will raise the same and with it the valve, and thus admit

more steam through the ports 11 and 4 to the engine, it of course being understood that at the same time steam passes through the ports 70 10, 12, and 4 to the engine. Should a greater speed of the engine be required, the regulating-screw 22 is turned upward, which raises the valve. Should less speed be required, the regulating-screw is turned downward, so as to 75 lower the valve. It will be understood that movement of the regulating-screw does not affect the tension of the springs 27 and 28, but that as the screw is moved it moves the valve, piston, collar 24, springs, and nut 29, 80 which all retain their same relative position with respect to the rod 16, by which they are carried. When the regulating-screw is adjusted to move the valve and adapt the device for any predetermined rate of speed, the 85 device automatically adjusts itself to that speed at any change or variation of load or boiler-pressure until the device is again regulated by adjustment of the said regulating-screw. The rod 16 is mounted to reciprocate 90 freely through the regulating-screw as well as through the stuffing-box 18.

It will thus be seen that I have devised a simple, inexpensive, positive, and efficient speed-regulator, and while the structural embodiment 95 of the invention as hereinbefore illustrated and described is what I at the present time consider the preferable one I do not intend to restrict myself to such embodiment, as it is evident that the same is subject to 100 changes, variations, and modifications without departing from the spirit of the invention or sacrificing any of its advantages, and I therefore reserve the right to make such changes, variations, and modifications as 105 come properly within the scope of the protection prayed.

What is claimed as new is—

1. In a speed-regulator, a valve-casing, a rod and a valve and piston on said rod both 110 within said casing, and means for admitting boiler-pressure back of the piston, as set forth.

2. In a speed-regulator, a valve-casing, a valve-rod, a valve and piston carried thereby, and a passage-way in said casing for admitting 115 steam to the upper side of the piston, as set forth.

3. In a speed-regulator, a valve-casing having an auxiliary passage-way from the steam-inlet to the upper portion of the casing, a 120 valve in said casing, a valve-rod, and a piston on said rod within said casing and adapted to receive steam at boiler-pressure upon its upper face.

4. In a speed-regulator, a valve-casing, a 125 valve-rod, a valve and piston thereon, means for admitting steam at boiler-pressure back of the piston, and a regulating-screw for varying the throw of the valve.

5. In a speed-regulator, a valve-casing, a 130 valve-rod carrying a valve and piston both disposed within said casing, means for admitting steam at boiler-pressure back of the piston, springs around said rod, and means

between said springs and independent of the rod for adjusting the tension of the springs, as set forth.

6. In a speed-regulator, a valve-casing, a valve-rod passed through the upper portion thereof, a valve and piston on said rod both within the casing, means for admitting steam at boiler-pressure back of the piston, springs with means for adjusting their tension, and means for setting the valve to regulate the speed of the engine without affecting the tension of the springs.

7. In a speed-regulator, a valve and piston within the valve-casing and movable together, means for admitting steam at boiler-pressure back of the piston, springs with means for adjustment of their tension, and a regulating-screw for raising and lowering the valve to regulate the speed of the engine without affecting the tension of the said springs.

8. In a speed-regulator, a casing, having an auxiliary pressure-port to the upper portion thereof, a valve-rod, a valve and piston carried thereby, the piston movable in the upper part of the casing below the inlet of said pressure-port thereinto, and means for raising and lowering said valve to regulate the speed of the engine.

9. In a speed-regulator, a valve and piston movable together within the valve-casing, means for admitting steam at boiler-pressure back of the said piston, means, adjustable to boiler-pressure, and means for regulating the throw of the valve independent of the said adjustable means.

10. In an automatic governorless speed-regulator, the combination with means adjustable to boiler-pressure, of means adjustable to varying speeds without affecting said adjustment to boiler-pressure, both of said

means being upon the valve-rod and the rod fixedly attached to its valve and piston, as set forth.

11. A speed-regulator comprising a valve-casing having an auxiliary passage for the inlet of steam above the piston, a valve and piston therein, a rod carrying said valve and piston, a guide for the rod near its upper end, and springs around the rod upon opposite sides of said guide.

12. In a speed-regulator, a casing, with auxiliary pressure-port, a valve and piston in said casing, a valve-rod, a regulating-screw through which the rod freely passes, and springs around the rod upon opposite sides of said screw.

13. In a speed-regulator, the combination of a casing with an auxiliary pressure-port, a valve and piston in said casing, a rod carrying said valve and piston, a regulating-screw through which said rod is free to reciprocate, springs on said rod upon opposite sides of the said screw, and means for adjusting the upper spring.

14. In a speed-regulator, the combination of a casing with auxiliary pressure-port, a piston arranged to receive pressure through said port upon its upper face, a valve movable with the piston, a valve-rod, a regulating-screw through which the rod freely passes, a collar fast on the rod, a spring around the rod between said collar and screw, and an adjustable spring around the rod above said screw.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES F. SLEIGH.

Witnesses:

E. H. BOND,

GEO. E. FRECH.