

No. 743,845.

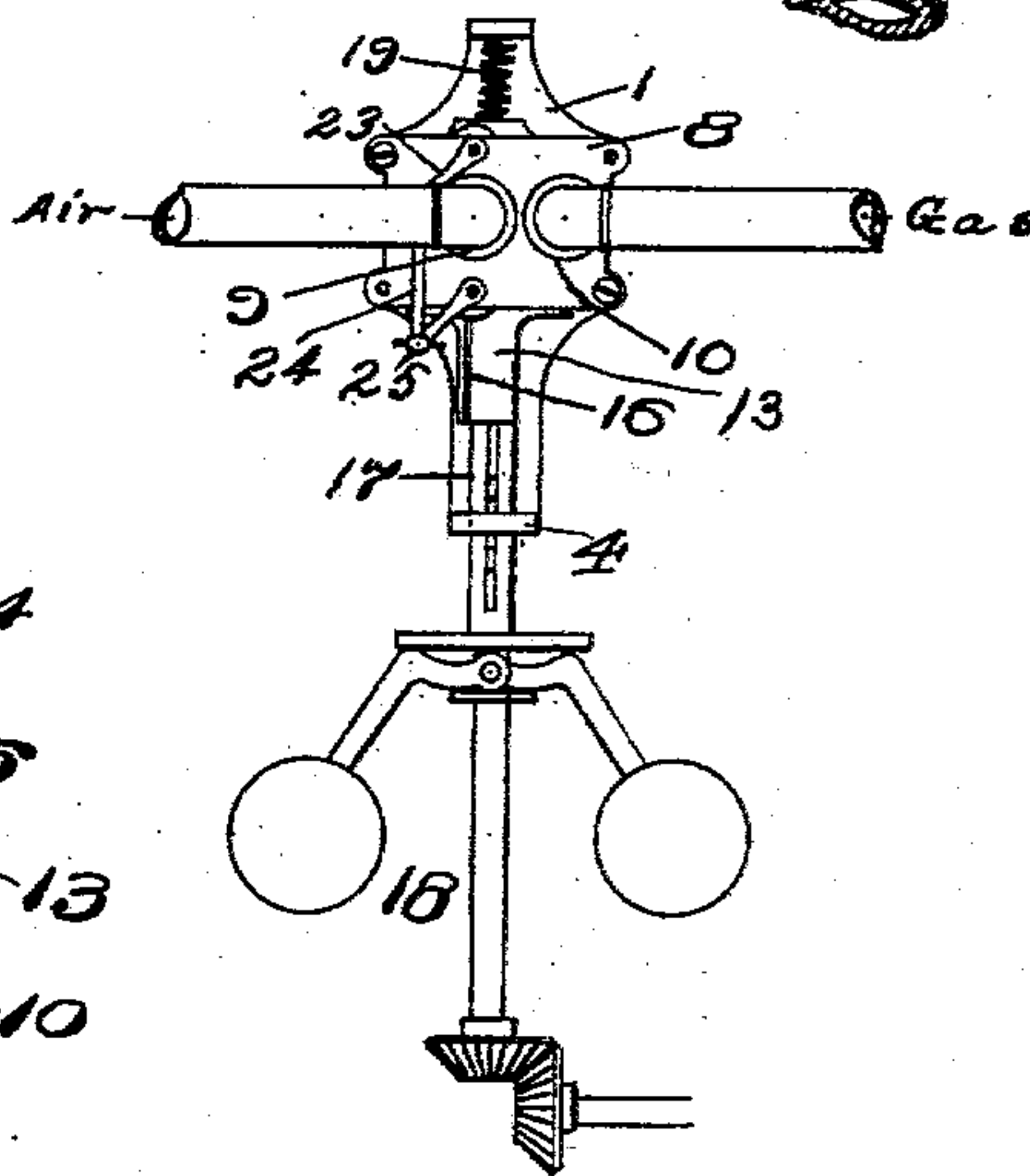
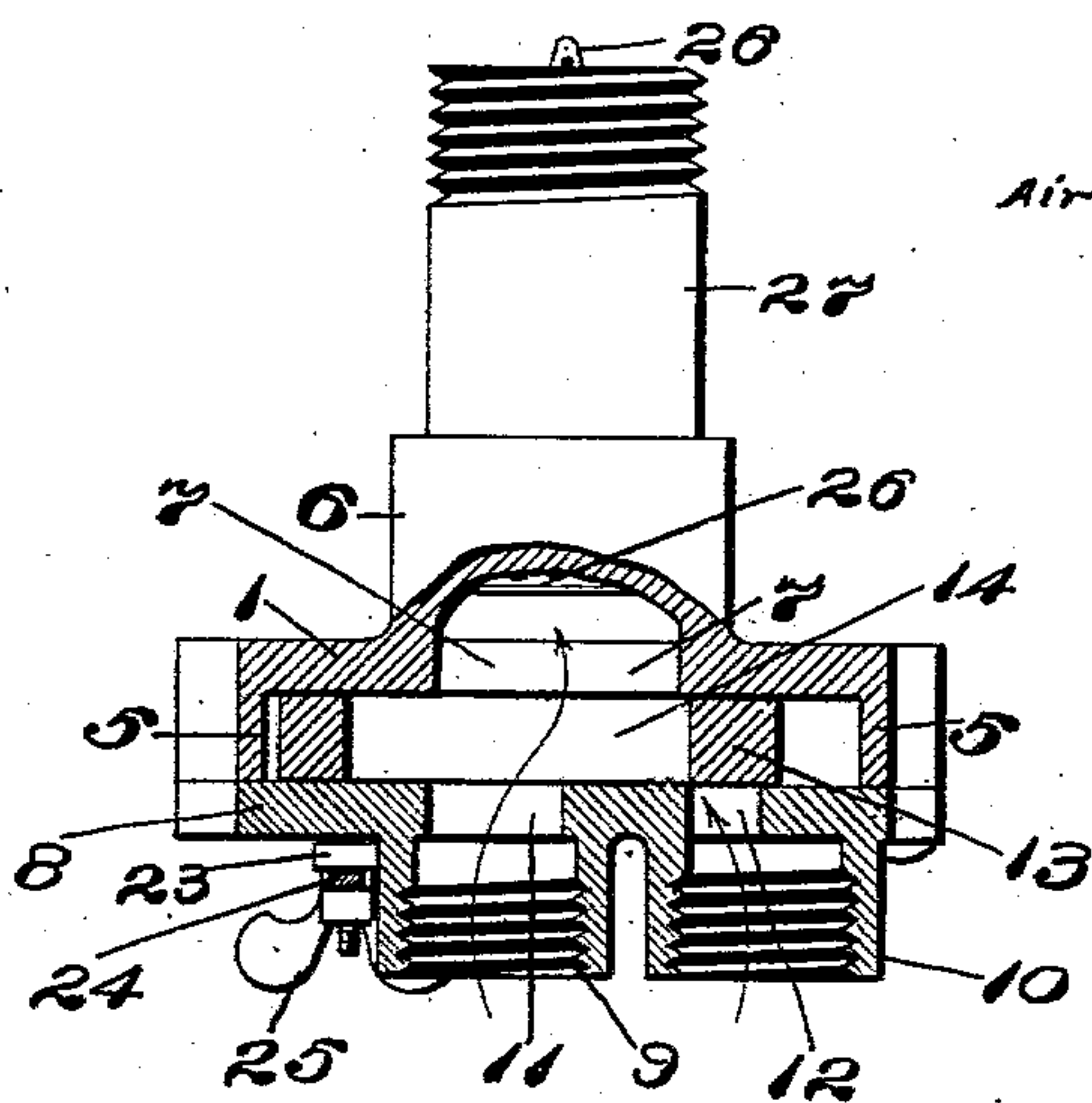
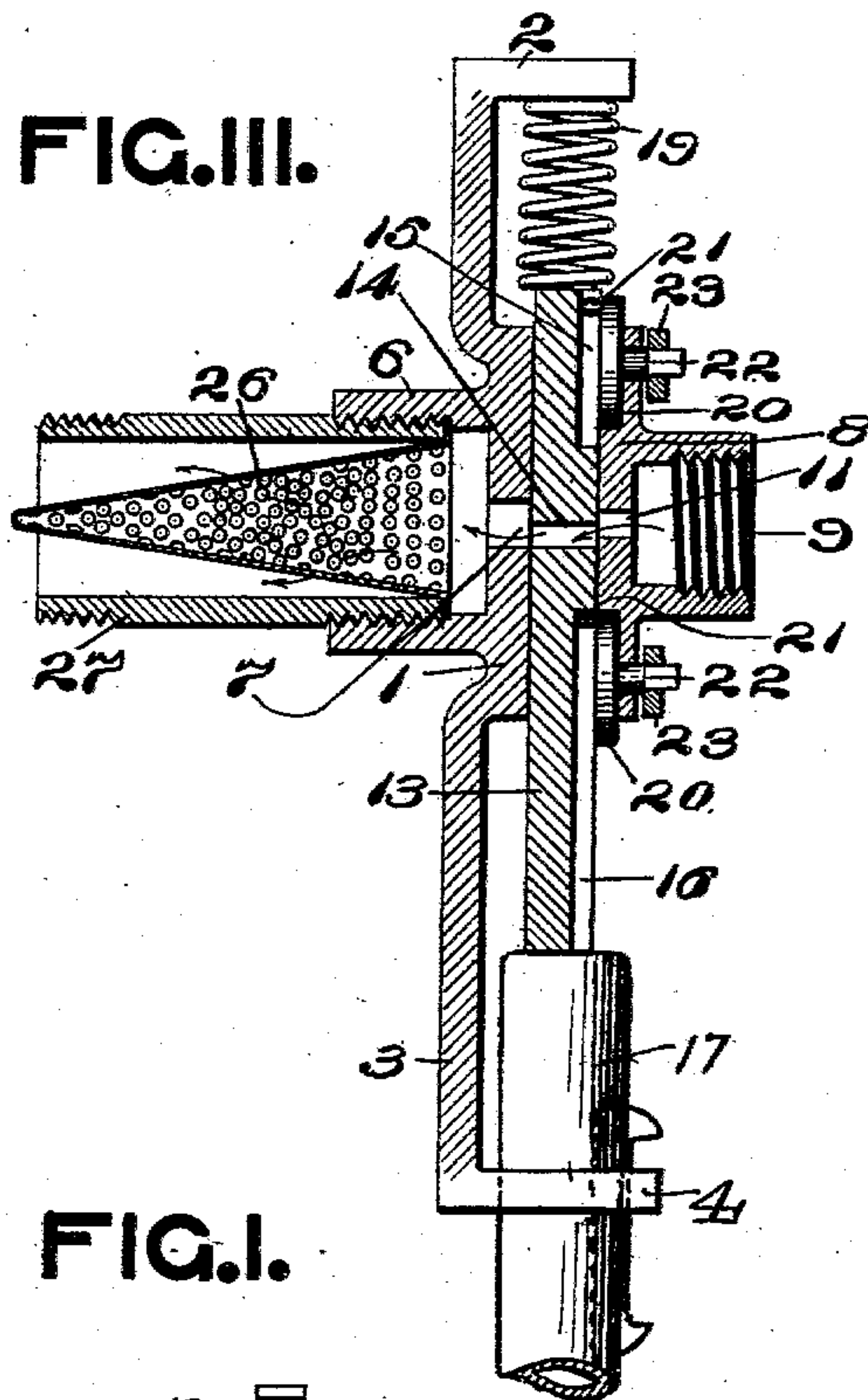
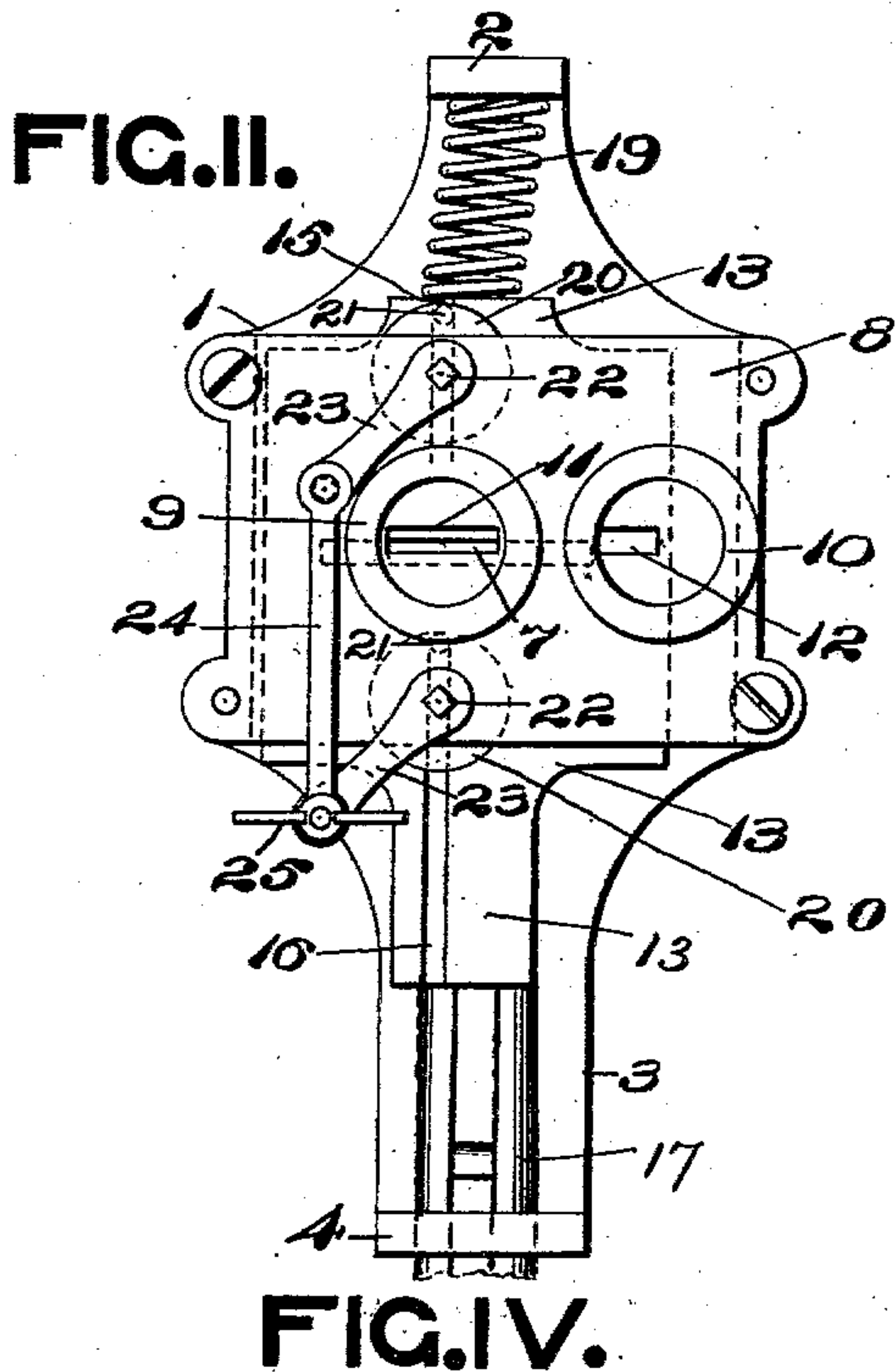
PATENTED NOV. 10, 1903.

J. ELLIS.

REGULATOR VALVE MECHANISM FOR EXPLOSION ENGINES.

APPLICATION FILED SEPT. 23, 1902.

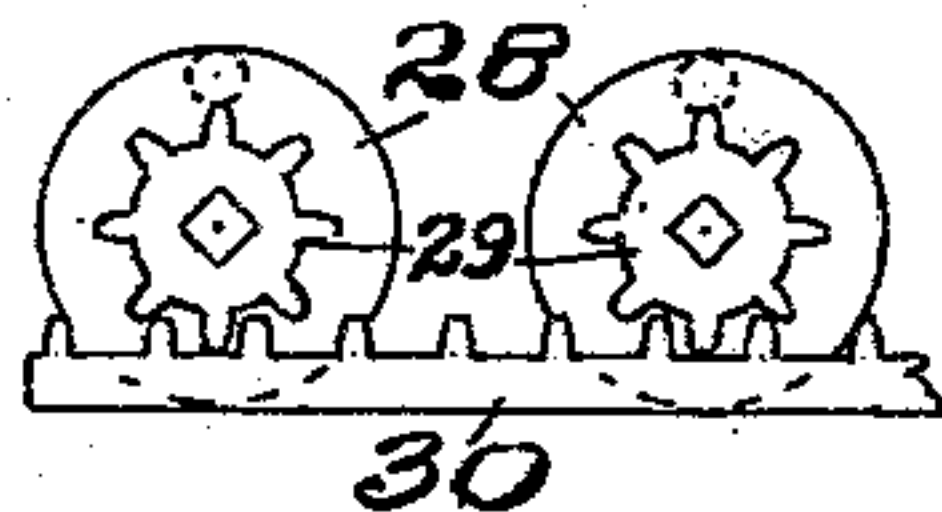
NO MODEL.



WITNESSES:

J. O. Krepps.
C. H. Adams

FIG.V.



INVENTOR

John Ellis,
BY his ATTORNEY
Richard D. Harrison.

UNITED STATES PATENT OFFICE.

JOHN ELLIS, OF ALLEGHENY, PENNSYLVANIA.

REGULATOR-VALVE MECHANISM FOR EXPLOSION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 743,845, dated November 10, 1903.

Application filed September 23, 1902. Serial No. 124,531. (No model.)

To all whom it may concern:

Be it known that I, JOHN ELLIS, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Regulator-Valve Mechanism for Explosive-Engines, of which improvement the following is a specification.

This invention relates to improvements in regulator-valves for explosive-engines, and particularly relates to that class of valves controlled by a governor to vary the charge of explosive mixture to the engine as distinguished from that class wherein the charges are relatively timed in accordance to the cycle of the engine to effect like results.

In the class of devices to which this invention relates it has heretofore been the custom generally to employ a governor-controlled ported piston or mixing-chamber arranged to be reciprocated or rotated within a cylindrical casing having ports therein through which the air and gas are received and discharged from said mixing-chamber to the engine and wherein the proportion of air or gas to form a given mixture may be varied. Such structures have their attending disadvantages inasmuch as they are necessarily of complex structure, liable to injury by back explosions being communicated to the interior thereof, and difficult of access when out of order, besides expensive to manufacture.

My object therefore is to provide a simple and practical valve device to obviate the above difficulties wherein the mixing is effected after passing through the valve proper and the proportion of gas in the mixture varied at will.

The best form in which I have contemplated embodying my invention I have by several views illustrated in the accompanying drawings, in which—

Figure I is a vertical front elevation of the valve device and governor. Fig. II is an enlarged front view of said valve device disconnected from the governor. Fig. III is a vertical sectional view through parts thereof. Fig. IV is a transverse sectional view through the same. Fig. V is a modified form of valve-adjusting mechanism therefor.

1 designates the frame of the device, which is provided upon its upper extended portion

with a lug 2 and upon its lower extended portion 3 with a lug 4, said frame being further provided with side strips 5, hollow boss 6 at its rear for connection with the pipe to convey the explosive mixture to the engine, and elongated horizontally-disposed port 7, communicating with the interior of said hollow boss. Secured upon the face of said frame to said side strips is a plate 8, having formed thereon the hollow bosses 9 and 10, to which the air and gas supply pipes are connected, said plate being provided with a horizontally-disposed elongated air-port 11, communicating with the interior of said hollow boss 9, and a similarly-formed but lesser port 12, communicating with the interior of the said hollow gas-pipe-connecting boss 10. Slidably fitted between said frame and plate is a plate-valve 13, having a horizontally-disposed port 14 of greater length than the previously-mentioned ports, and the vertically-disposed surface grooves 15 and 16, said valve-port being elongated to a greater extent than the others to permit lateral adjustment to vary the proportion of gas to pass therethrough without affecting the proportion of air. To adjust said valve laterally, a pair of disks 20 are fitted into recesses formed within the plate 8, which disks carry pins 21 to engage within the vertically-disposed grooves 15 and 16 of the valve. The stems 22, upon which said disks are to be rotated to laterally adjust the valve, pass through said plate and have connected thereto the crank-levers 23, which cranks are connected one to the other by a rod 24. Upon the pin connecting one end of one of said cranks with said rod is arranged a thumb-nut 25, which is adapted to maintain the valve in its laterally-adjusted position. To vertically adjust said valve, a suitable governor 18 is employed, the sleeve 17 of which is slidably fitted into the lug 4 of the frame and engages the lower end of the valve, and to assure the valve being held at all times in operative contact with said sleeve a spiral spring 19 is interposed between the upper end thereof and the lug 2 of the frame. The mixing of the air and gas is effected after the same passes through the valve by means of a perforated thimble or cone 26, fitted into the hollow boss 6, and is held in place by a

tubular extension 27, which is adapted to be connected to the explosive or compression chamber of the engine. In practice the supply of air and gas passing through the valve-port from their respective supply-pipes is under the control of the governor, the valve-port being caused to register more or less with those of said supply and discharge in accordance to the speed or power and as the same issues through the discharge-port becomes thoroughly mixed in passing through the perforations of the cone or thimble to the engine. By laterally adjusting the valve the proportion of gas may be varied without affecting the proportion of air. Therefore it is plain that a mixture of any proportions can be made.

At Fig. V a modified form of valve-adjusting means is shown, in which the crank-disks are designated as 28 and have gear-pinions 29 fitted upon the stems thereof, said pinions meshing with a rack 30, which is adapted to be adjusted longitudinally to effect a rotary motion of the crank-disks, and thereby transmit a lateral motion to the valve, as in the manner previously set forth.

Other variations of the detail parts of the device may be made, such as multiplying the ports—that is, forming two or more instead of one at each passage—without affecting the spirit of my invention.

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

1. In a supply-controlling mechanism for explosive-engines, the combination of a frame provided at one side with separate air and gas ports and at the other side with a port for both air and gas, and an air and gas mixer at the outlet side of the latter port, of a plate-valve located in said frame and having an opening through which said inlet-ports communicate with the port for both air and gas, said valve being mounted to be adjustable laterally to vary the proportion of air and gas admitted therethrough to the mixer and longitudinally to control the quantity of air and gas admitted to said mixer, and a governor for controlling the longitudinal movement of said plate-valve automatically.

2. In a supply-controlling mechanism for explosive-engines, the combination of a frame provided at one side with separate air and

gas inlet ports, a valve for controlling the admission of air and gas from said ports, said valve being so constructed that the admixture of air and gas will be effected exteriorly thereof, and having an elongated opening through which the air and gas flow from said inlet-ports, an air and gas mixer located exteriorly of said valve, means for sliding said valve automatically to control the admission of air and gas to said mixer and means for fixing the valve adjustably in such relation to the gas and air inlet ports as to control the proportions of air and gas and render the same variable.

3. In a supply-controlling mechanism for explosive-engines, the combination of a frame provided at one side with separate air and gas inlet ports, a valve for controlling the admission of air and gas, said valve being so constructed that the admixture of air and gas will be effected exteriorly thereof and having an elongated opening through which the air and gas flow from said inlet-ports, and being so mounted as to be adjustable laterally to vary the proportions of air and gas and longitudinally to control the quantity of air and gas admitted therethrough, an air and gas mixer located outside of said valve, a governor connected with said valve for adjusting the same longitudinally, a spring connected with said valve and acting thereon in opposition to said governor, and means for fixing said valve in its laterally-adjusted position.

4. The combination with gas and air inlet-ports, a laterally-adjustable ported valve for controlling the supply of gas and air admitted through said ports and means for conveying the gas and air to the engine, of means connected with said valve for varying the proportions of gas and air, comprising disks connected with said valve, means for rotating said disks to adjust the valve laterally, and means adjustable to fix the valve in its laterally-adjusted position.

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

JOHN ELLIS.

In presence of—

J. E. KREPPS,
RICHARD S. HARRISON.