

No. 836,794.

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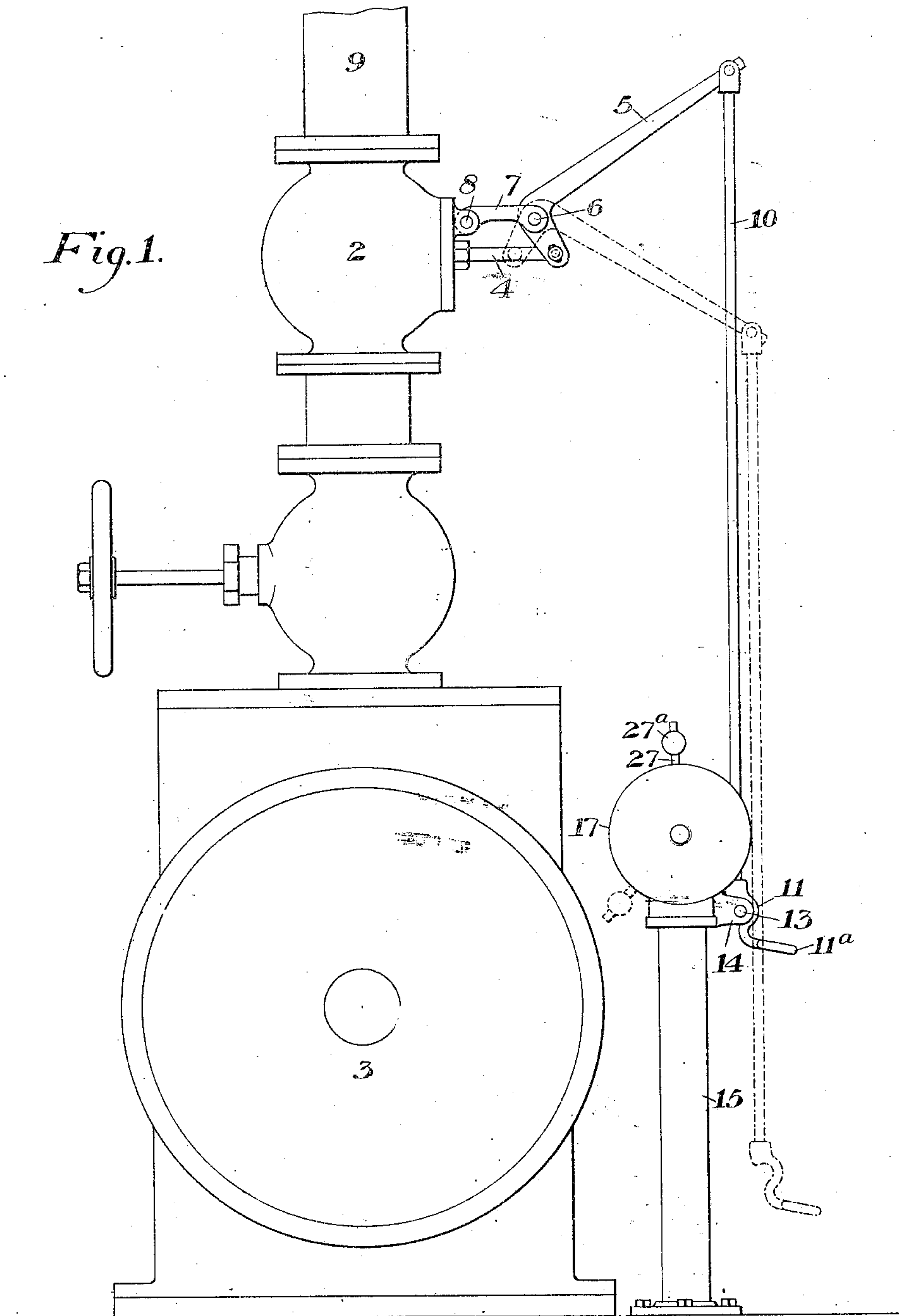
O. WINTER & F. W. WATERMAN.

AUTOMATIC DEVICE FOR OPERATING VALVES AND OTHER MECHANISMS.

APPLICATION FILED FEB. 17, 1906.

3 SHEETS—SHEET 1.

*Fig. 1.*



WITNESSES

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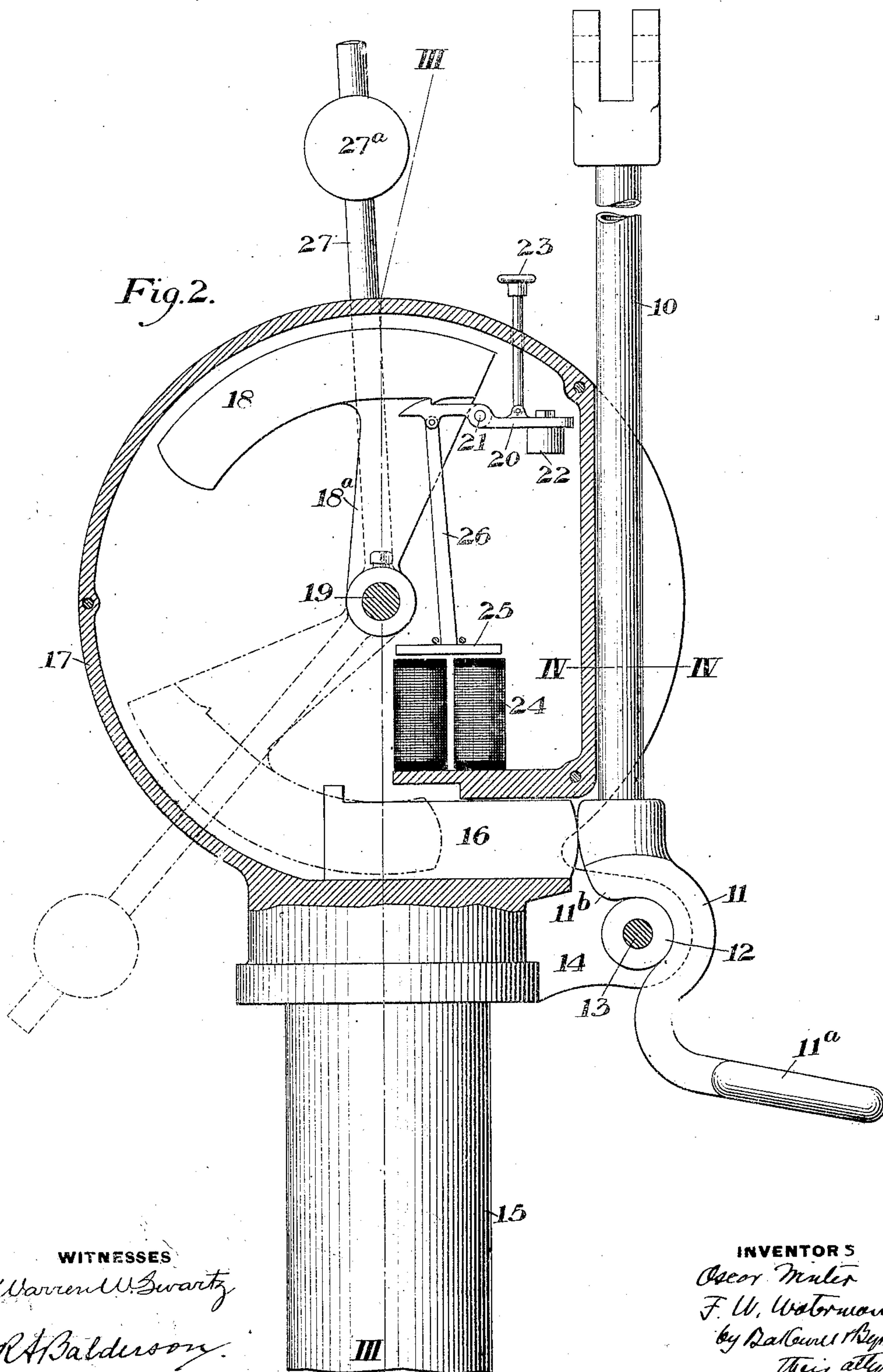
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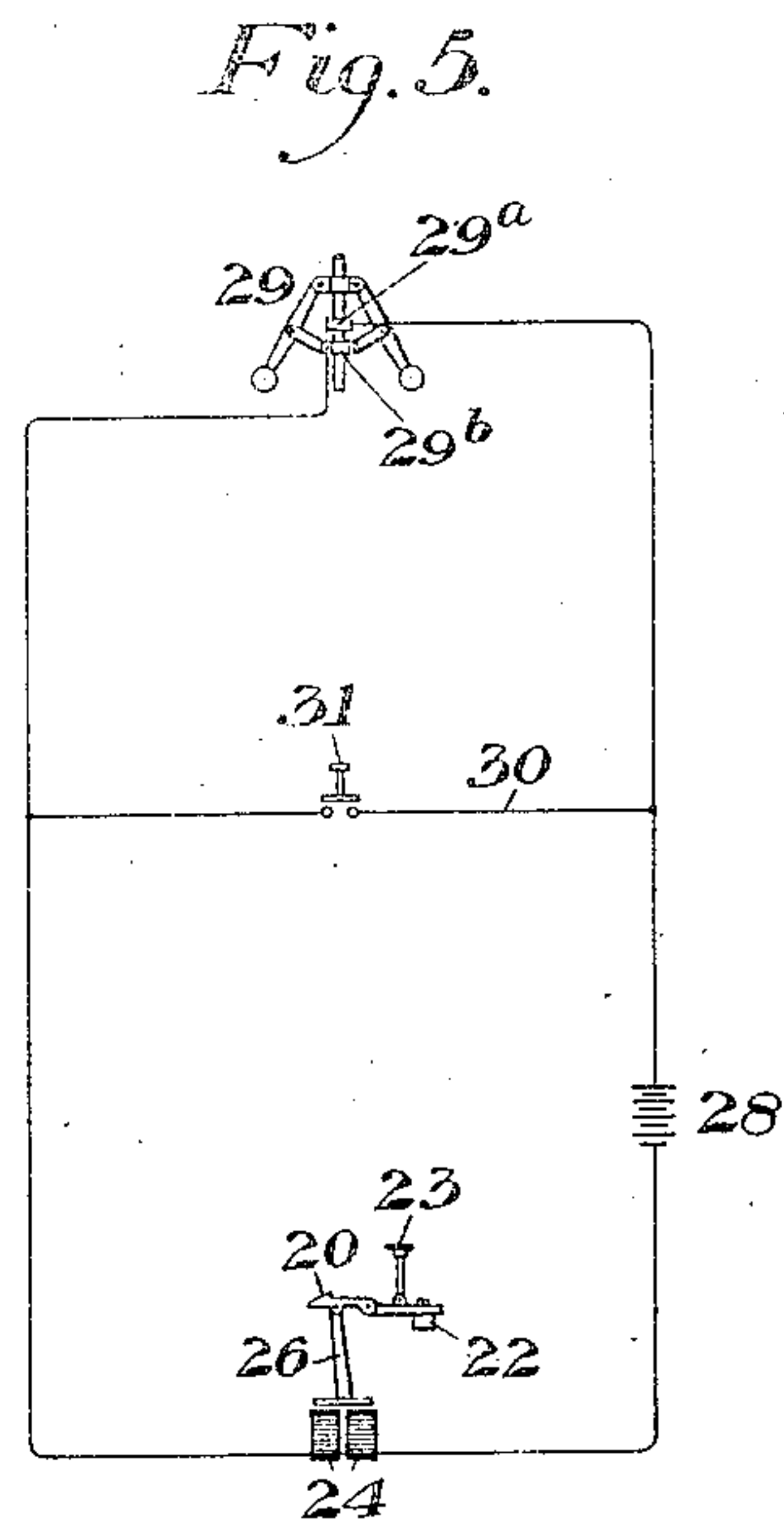
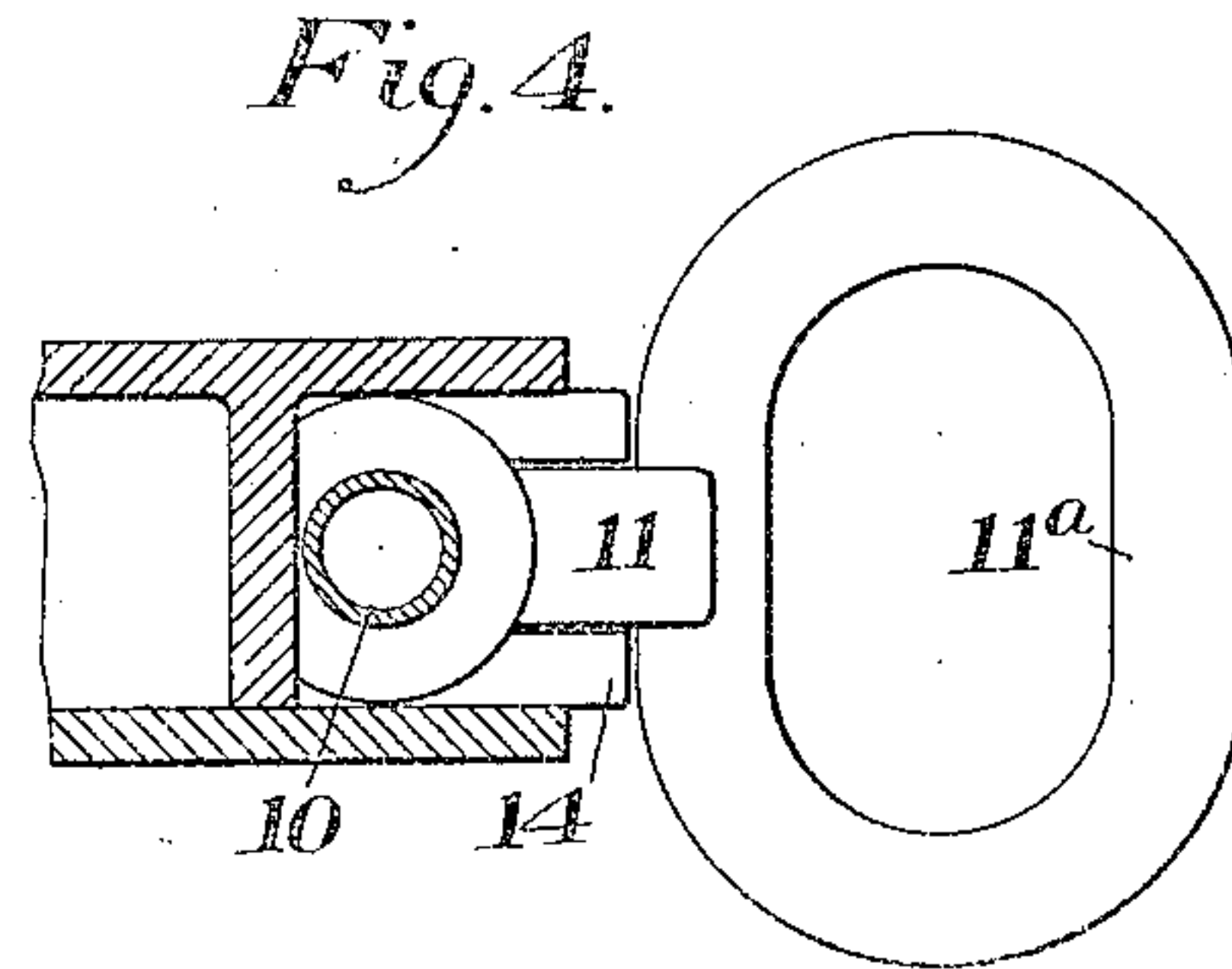
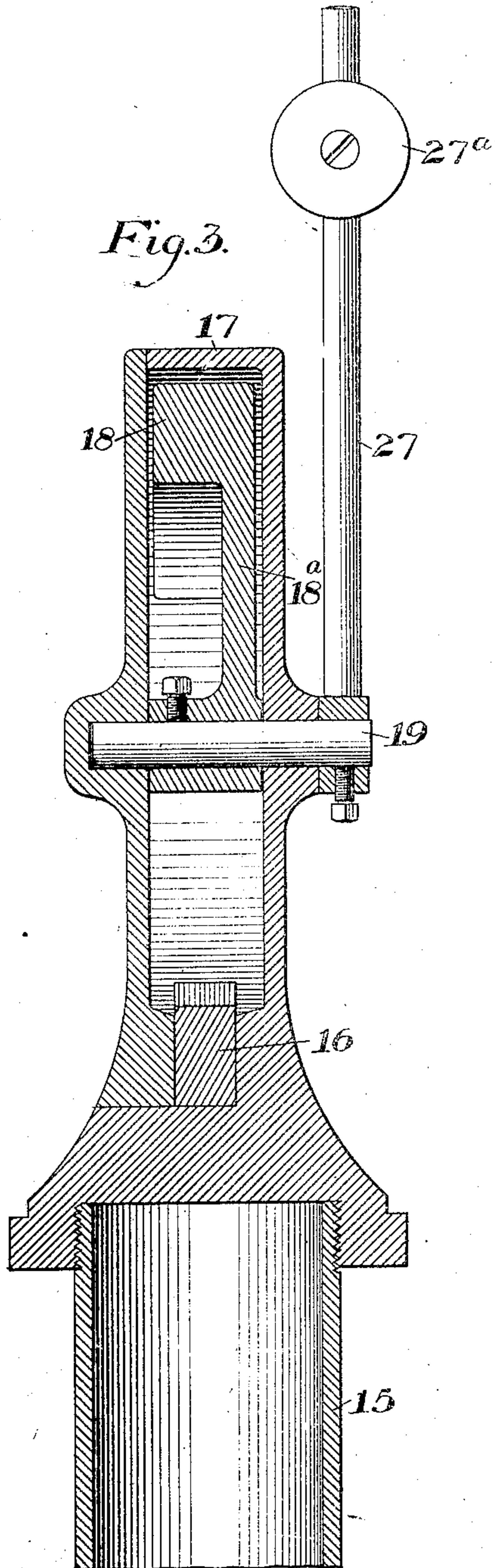
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

OSCAR WINTER AND FRED WALTER WATERMAN, OF ELYRIA, OHIO.

AUTOMATIC DEVICE FOR OPERATING VALVES AND OTHER MECHANISMS.

No. 836,794.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed February 17, 1906. Serial No. 301,590.

*To all whom it may concern:*

Be it known that we, OSCAR WINTER and FRED WALTER WATERMAN, of Elyria, Lorain county, Ohio, have invented a new and useful Automatic Safety Device for Operating Valves and other Mechanisms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation illustrating the application of our invention. Fig. 2 is a sectional elevation of the trip mechanism detached from the valve. Fig. 3 is a section on the line III III of Fig. 2. Fig. 4 is a section on the line IV IV of Fig. 2, and Fig. 5 is a diagram showing the electrical connections.

The object of our invention is to provide means of simple and efficient character for automatically controlling the operation of engine-valves or other mechanism to prevent an excessive speed of the parts controlled by such valve or mechanism; also, to provide a device of this kind which can also be readily operated by hand whenever desired, which can be quickly reset, which can be readily tested at any time, and which is free from complicated mechanism or delicate parts of a character likely to become injured or deranged; also, to provide means of this character which will not be affected by the vibration of the engine or other machinery and which is certain and reliable in its action.

Other objects and advantages of our invention will hereinafter appear.

With these objects in view our invention consists in the novel construction, arrangement, and combination of parts, all substantially as hereinafter described, and pointed out in the appended claims.

In the drawings we have shown our invention as applied to the throttle or admission valve of a steam-engine; but it will be readily understood that it is equally applicable to other forms of valves, to electrical switches, and to various other mechanisms where an automatic speed-limiting device is desirable.

In the drawings the numeral 2 indicates the admission or throttle valve of a steam-engine 3, and 4 indicates the stem of such valve.

5 is a bent lever whose shorter arm is loosely connected to the stem 4 and which is pivoted at 6 to a link 7, which is pivotally connected to the valve-casing at 8.

9 is the steam-supply pipe controlled by the valve 2.

Connected to the longer arm of the lever 5 is a vertical rod 10, whose lower end portion is provided with a latch 11, which is arranged to be engaged with a detent or locking device 12 for the purpose of normally holding the valve 2 in its open position. The detent 12 preferably consists of a roller loosely mounted on a pin 13, carried by a bracket or lug 14 of the stand or support 15 for the trip mechanism presently to be described; but any other suitable form of detent or locking device may be used. The latch 11 is also shown as provided with a projecting handle portion or ring 11<sup>a</sup>, which provides means for the manual disengagement of said latch from the detent 12.

The lever 5, rod 10, and latch 11 are made of sufficient weight so that when the latch is disengaged from the detent they will operate automatically upon the valve-stem 4 to close the valve 2.

The latch 11 normally rests against a sliding bolt 16, which is arranged in the lower part of an inclosing casing 17, which is supported by the stand 15, before referred to.

18 is a hammer which is carried by an arm 18<sup>a</sup>, pivoted to the central shaft or pin 19, and which is normally held in the raised position shown in full lines in Fig. 2 by means of the pawl or detent 20. This pawl or detent is formed by one arm of a lever which is pivoted at 21, and its opposite arm is counterweighted, as shown at 22.

23 is a pull-button which projects through the casing in position to be operated from the outside and which is connected to the counterweighted arm of the lever 20. This button provides additional means for the manual operation of the device.

24 is an electromagnet whose armature 25 is connected to the detent by means of the rod or bar 26.

27 is a counterweighted arm which is secured to the shaft 19 externally of the casing, the counterweight 27<sup>a</sup> of said arm being adjustable thereon to any desirable position.

The electromagnets 24 are connected in a circuit with a battery 28 or other source of electric energy, as shown in Fig. 5, the circuit through the battery and magnets being made through a centrifugal governor-actuated switch 29. This governor is attached to a moving part of the engine or other mech-



anism to be controlled, and when a predetermined speed has been reached the outward movement of the governor-arms automatically closes the circuit by means of the engagement of the two contacts 29<sup>a</sup> and 29<sup>b</sup>, and thereby energizes the magnets 24. This attracts the armature 25, which releases the pawl or detent 20 from the hammer 17. The hammer now falls and strikes the bolt 16 with a sharp sudden blow, which disengages the latch 11 from the detent 12. The weight of the lever connections causes them to resume the position shown in dotted lines in Fig. 1, and thereby closes the valve 2.

In order to permit the magnets to be energized in case of necessity from any point in the building, the circuit before described may be provided with any desired number of branch circuits 30, one of which is shown in Fig. 5 and in which are placed push-buttons 31 or other manually-operated circuit-closing devices.

In order to prevent the latch 11 being disengaged from the detent 12 by reason of the vibration, the corner portion 11<sup>b</sup> of said latch is carried downwardly a sufficient distance to give it a secure hold on the detent-roller 12.

The trip device is reset by raising the counterweighted lever 27 and by engaging the latch 11 with a detent 12.

The advantages of our invention consist in the arrangement of the lever connections to the valve or other part to be operated, so that they act as a counterweight, no further weights or springs being required, together with the latch arrangement whereby the lever connections are normally prevented from operating the valve. All the parts are of simple construction, and the tripping mechanism can be placed on a solid foundation or located on a part of the engine which is free from vibration. The casing or closure for the trip mechanism is preferably dust-proof, while permitting access to all parts of the device for examination and testing, which may be done at any time without shutting down the engine. The trip mechanism can be located at such points that there is no necessity for exposed wiring, and the provision of the trip-hammer for releasing the latch insures a certain and reliable operation of the device. A further advantage consists in the readiness with which the device may be operated by hand to open the valve in case of necessity.

It will be seen that our arrangement consists, essentially, in the use of a normally open valve arranged to close by gravity in connection with means for normally preventing the valve from closing and which when released permits it to close by gravity alone, no motive device of any kind for this purpose being required or used.

Various changes may be made in details of

construction and arrangement without departing from our invention, since

What we claim is—

1. In mechanism of the character described, the combination with a normally open controlling member arranged to move from one position to another by gravity, means for normally holding the member against such movement, and electromagnetic holding means for controlling the release of the latch means to permit such movement under predetermined conditions; substantially as described.

2. In mechanism of the character described, the combination with a valve, lever connections arranged to operate said valve by their weight, a latch device for preventing such operation, a trip-hammer arranged, when released, to fall and release said latch device by a hammer-blow, and electromagnetic means whose circuit is arranged to be closed under predetermined conditions for controlling the release of the hammer; substantially as described.

3. In mechanism of the character described, the combination with a latch device, of a sliding bolt engaging said device, and a pivoted drop-hammer arranged to actuate said bolt by a direct hammer-blow thereon; substantially as described.

4. In a device of the character described, the combination with the valve or other part to be controlled, of a depending lever attachment, a latch for said attachment; a trip-hammer for releasing the latch, a locking device for the trip-hammer, and means for releasing the locking device including a normally open electric circuit, with means for closing said circuit; substantially as described.

5. Mechanism of the character described, having a normally open valve arranged to close by gravity, means for normally holding the gravity device against such movement, and means for releasing the holding means comprising mechanism which is not directly connected to any other engine-operating part; substantially as described.

6. In a device of the character described, the combination with a valve or other part to be controlled, of a lever connected thereto, a rod connected to said lever, a latch device for said rod, a trip-hammer for releasing the latch device, a locking device for the hammer, an electromagnet for releasing the locking device, and means for energizing said magnet upon predetermined conditions; substantially as described.

7. In the safety device for engines and the like, the combination with a valve, of a weighted lever connected to said valve, a latch device for normally holding the valve in open position, a trip-hammer for releasing the latch device, and means for controlling



the operation of the trip-hammer; substantially as described.

8. In a device of the character described, a latch, a pivoted counterweighted trip-hammer arranged to release said latch, means for normally retaining the trip-hammer, and electromagnetic means for releasing the trip-hammer; substantially as described.

9. In a device of the character described, the combination of a latch, a bolt arranged to release the latch, a trip-hammer arranged to actuate the bolt by a direct hammer-blow thereon, means for holding said hammer, means for releasing the hammer, and means for resetting the hammer; substantially as described.

10. In a device of the character described, a normally open valve, a lever-arm connected thereto, a rod hung from said lever-arm and having a hook portion, a roller engaged by the hook portion, and a trip-hammer arranged to disengage the hook portion from the roller; substantially as described.

11. In mechanism of the class described, a

normally open valve, connections arranged to close said valve by their weight, and a latch device normally preventing the movement of said connections, together with electromagnetic and manual means for releasing the latch device under predetermined conditions; substantially as described.

12. In mechanism of the character described, a normally open valve, connections arranged to close said valve by their weight, and having a hook member, means with which said hook member is arranged to engage, a sliding bolt arranged to contact with the hook member, and a trip-hammer device for actuating the bolt; substantially as described.

In testimony whereof we have hereunto set our hands.

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FRED WALTER WATERMAN.

Witnesses:

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