

No. 736,897.

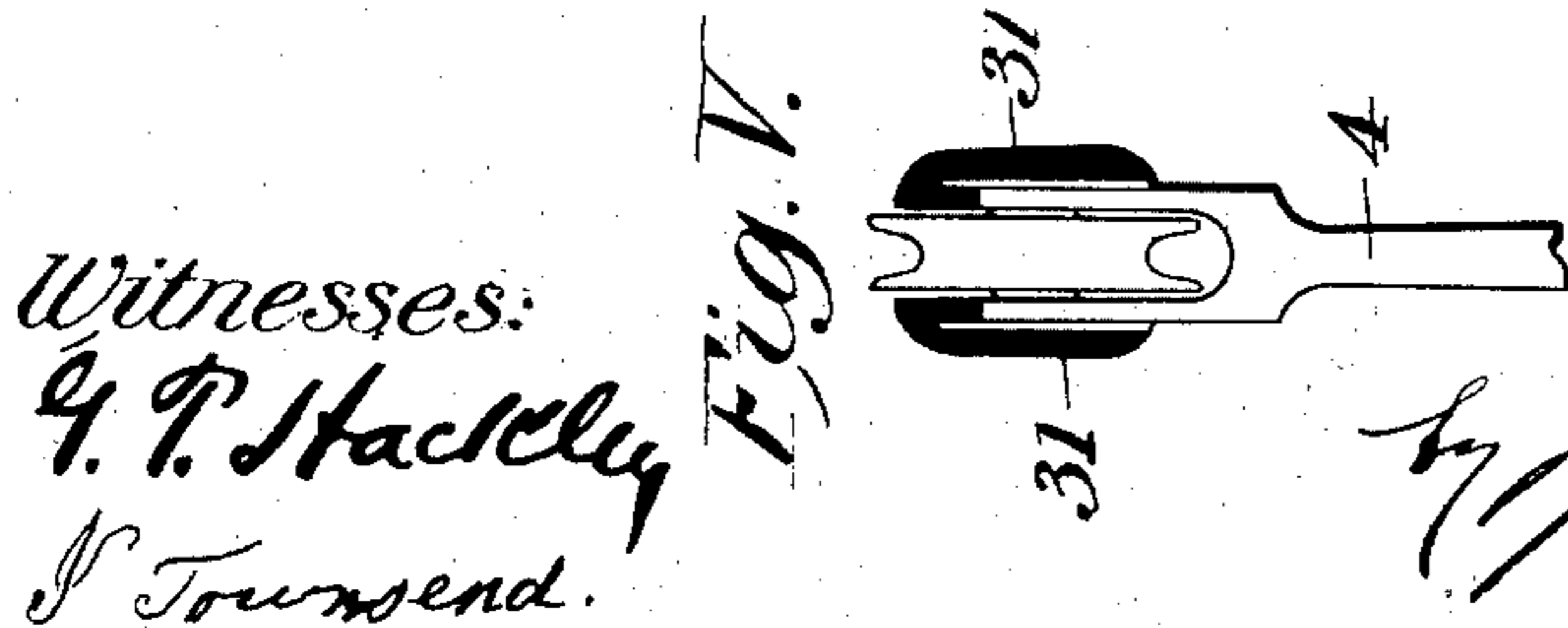
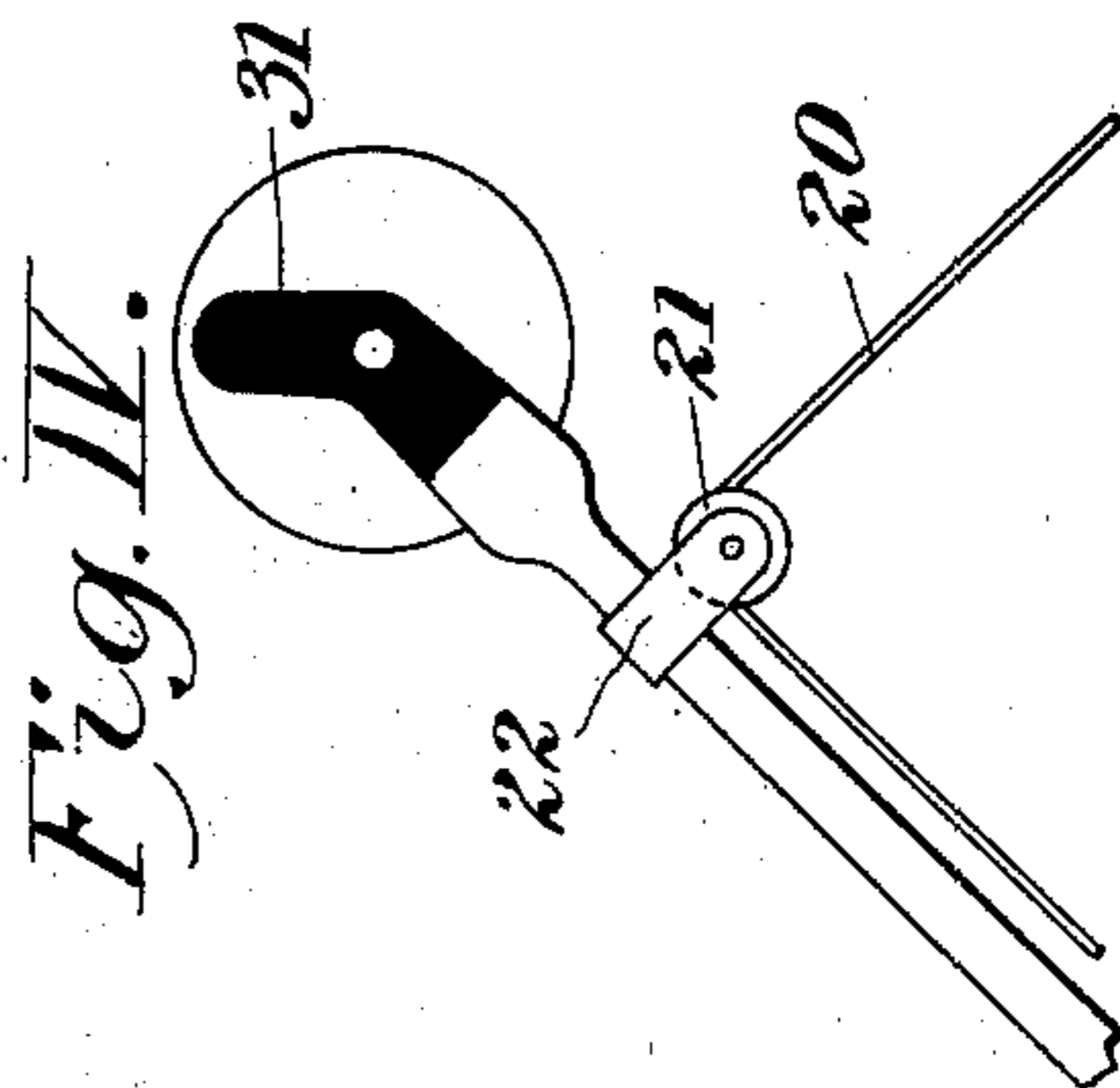
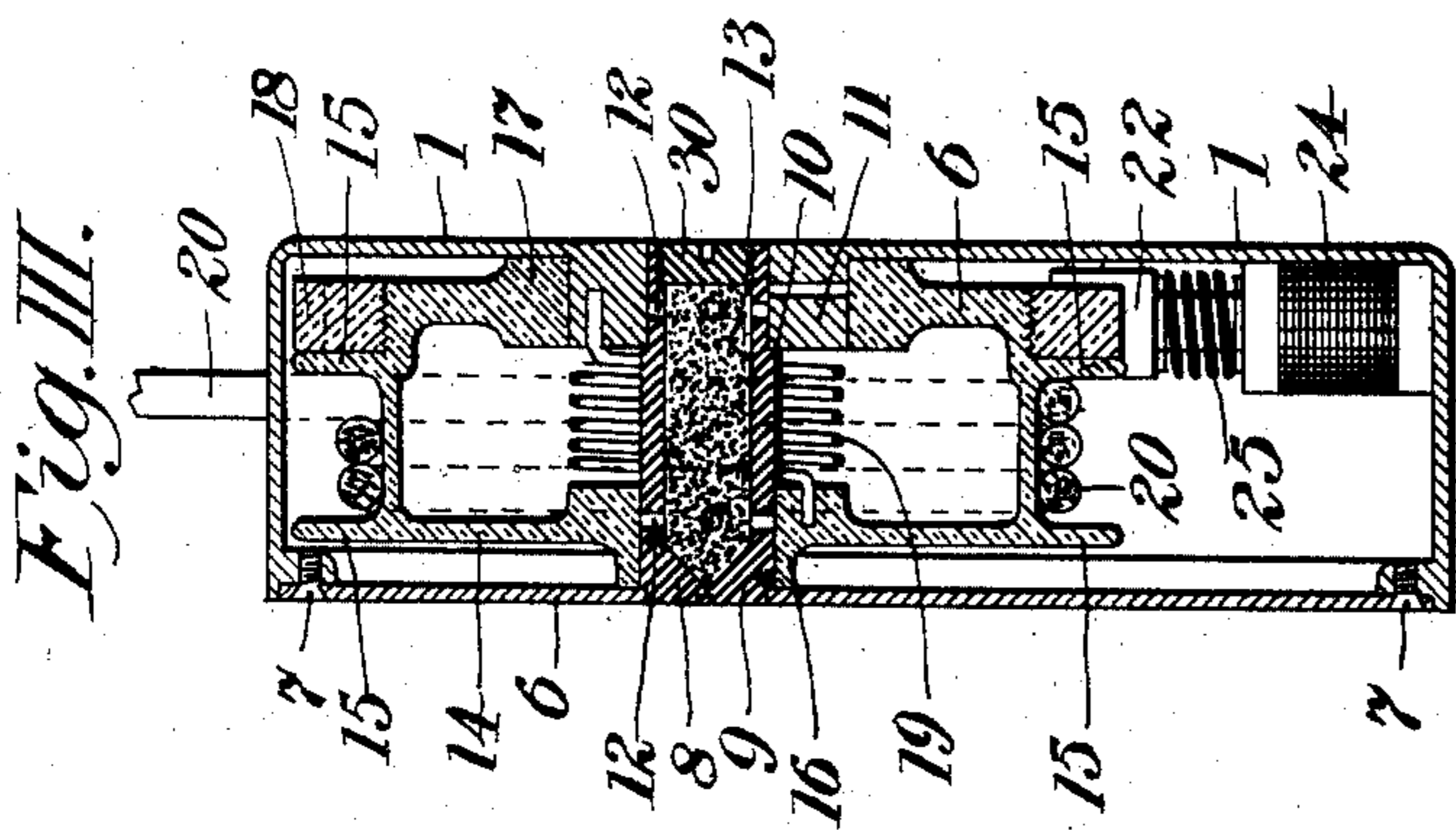
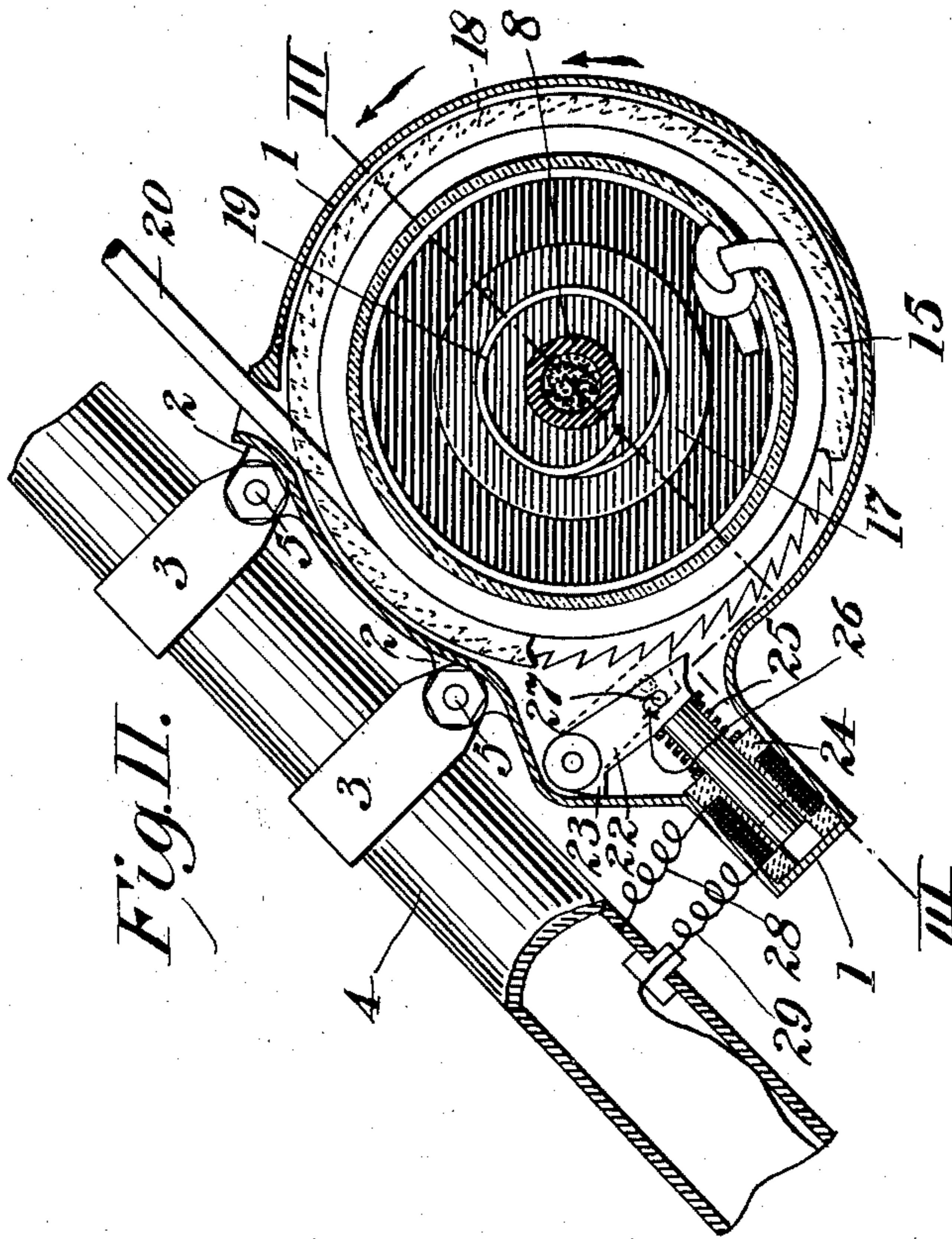
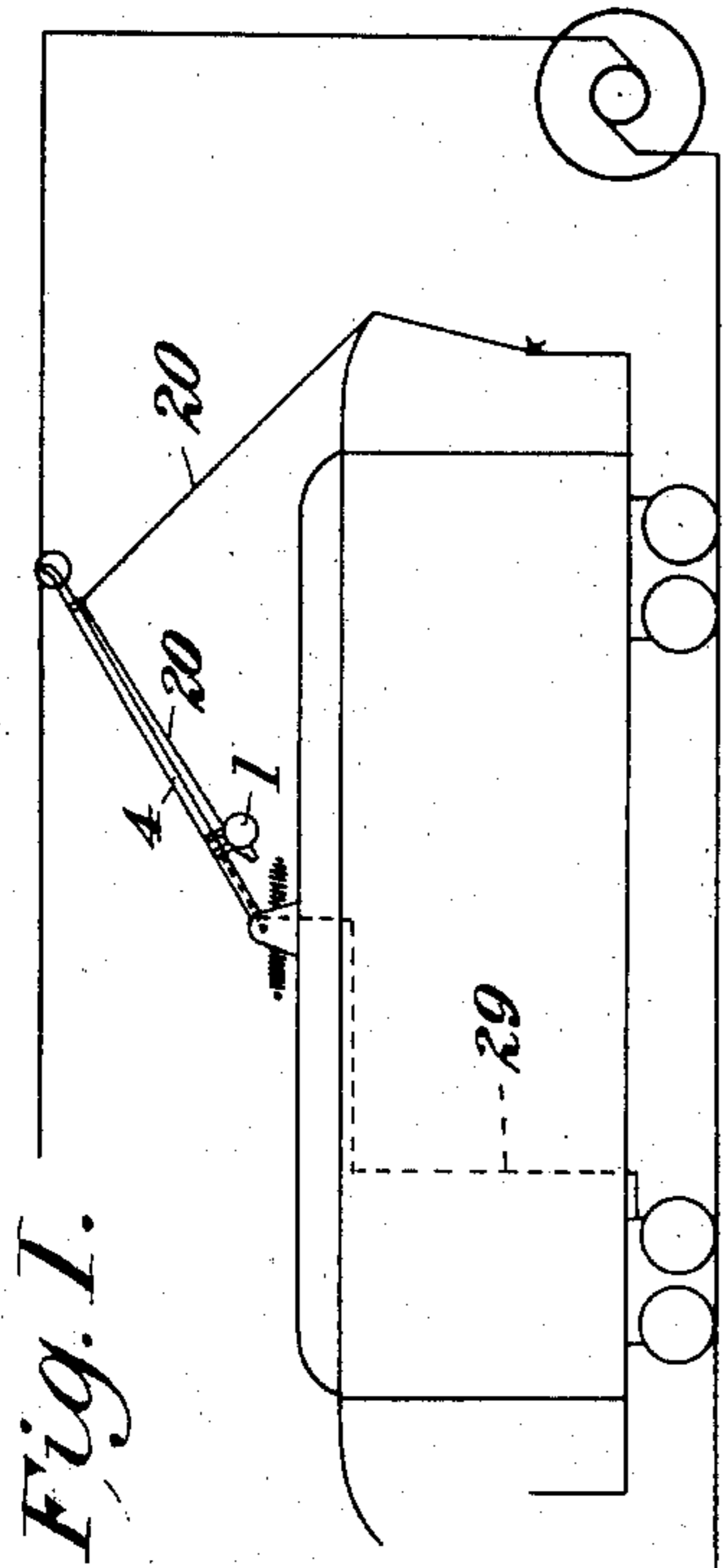
PATENTED AUG. 18, 1903.

M. C. WHITE & O. C. DURYEA.

TROLLEY CATCH.

APPLICATION FILED JULY 5, 1902.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

MORRIS C. WHITE AND OTHO C. DURYEA, OF LOS ANGELES, CALIFORNIA.

TROLLEY-CATCH.

SPECIFICATION forming part of Letters Patent No. 736,897, dated August 18, 1903.

Application filed July 5, 1902. Serial No. 114,456. (No model.)

To all whom it may concern:

Be it known that we, MORRIS C. WHITE and OTHO C. DURYEA, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Trolley-Catch, of which the following is a specification.

Our invention relates to a device which will automatically operate, when the trolley of an electric car slips off the wire, to check the upward movement of the trolley and prevent the damage caused by the trolley or trolley-pole striking against the span-wires, guy-wires, or arms which support the trolley-wire.

One object is to provide a device which will operate only when the trolley jumps from the wire, thus allowing the device to be used without disadvantage on lines which pass through tunnels or under bridges, &c., and which require a rapid change in the elevation of the trolley owing to the depression of the trolley-wire at such places.

Another object of our invention is to provide a device of the character described which will be automatic in action, positive in operation, of simple construction, and adapted to be placed upon the ordinary trolley-pole.

Other objects and advantages of the device will be brought out in the following description.

Referring to the drawings, Figure I is a view showing an electric car of the overhead-trolley type equipped with our device. Fig. II is an enlarged detail view of the device, partially in section. Fig. III is a section taken on the line III-III of Fig. II. Fig. IV is a view of a portion of a trolley-pole, showing certain details which cooperate with the device. Fig. V is a rear elevation of what is shown in Fig. IV with certain parts removed.

1 is a casing provided with lugs 2. Collars 3 are mounted upon the trolley-pole 4 and connected to the lugs 2 by means of bolts 5. The bolts 5 while serving to attach the casing also pinch the collars 3 rightly against the pole 4, and by loosening the bolts 5 the casing may be adjusted along the pole. The casing 1 is provided with a cover 6, which may be removably attached to the casing by means of screws 7. 8 is a hollow shaft mounted in the casing 1 and is provided with shoulders 9 and 10. The shoulder 9 bears against the cover

6, while the shoulder 10 bears against the boss 11, which is formed on the inside of the casing 1. We prefer to mount the shaft 8 loosely in the casing, although, if desired, it may be rigidly held therein by forcing the cover 6 tightly against the shoulder 9. The interior of the shaft may preferably be filled with waste or other packing material saturated with a lubricant, and the shaft 8 may be provided with a series of oil-holes 12, so that the lubricant may pass therethrough to the bearing-surface of the shaft. The end of the shaft may be closed by means of a screw-plug 30. Loosely mounted within the casing is a drum 14, provided with opposite flanges 15 and hubs 16 and 17. The hub 16 is rotatably mounted upon the shaft 8, while the hub 17 is mounted upon the boss 11. The hub 16 also bears against the inside of the cover 6, while the hub 17 bears against the wall of the casing 1, and the drum is thereby prevented from longitudinal play.

18 is an annular ratchet, which is attached to the drum 14 and lies against one of the flanges 15. The ratchet 18 may be fastened to the drum 14 by any suitable means; but we prefer to provide the ratchet with female threads and screw the same onto the drum. The teeth of the ratchet 18 are preferably undercut, as shown in Fig. II, for a purpose hereinafter described.

19 is a coiled spring, one end of which is secured to the hub 16 of the drum 14 and the other end is secured to the boss 11 of the casing 1. The spring 19 tends to rotate the drum in the direction of the arrow, Fig. III. A flexible connection, as a rope 20, is wound with a few turns around the drum between the flanges, and one end of the rope may pass through a hole in the drum and may be knotted, as shown in Fig. II, to secure the rope to the drum. A sufficient length of rope is wound upon the drum to allow for the vertical movement of the trolley-pole caused by the varying elevation of the wire above the car.

21 is a pulley connected to the upper end of the trolley-pole by means of a collar 22. The rope 20 passes from the drum over the pulley 21 and may be attached to the dashboard or other portion of the car in any convenient manner.

Pivotally mounted in the casing 1 adjacent to the ratchet is a pawl 22. The pawl 22 is provided with a shoulder 23, which may strike against the casing, and thus limit the movement of the pawl. The pawl is normally held out of engagement with the teeth of the ratchet by means of a solenoid 24.

25 is a coiled spring preferably interposed between the solenoid and pawl for throwing the pawl into engagement with the ratchet when the solenoid is deenergized. The pawl 22 is provided with an elongated slot 26, through which a pin 27 passes, which pin is carried by the armature of the solenoid. One pole of the solenoid is connected by a wire 28 to the trolley-pole, while the other pole of the solenoid is connected by an insulated wire 29, which may preferably pass into the interior of the pole and thence be carried, as shown by dotted line in Fig. I, into the car and be grounded on the frame or any other convenient portion of the car.

When the trolley slips off the wire, it has been found desirable to prevent sparking caused by the side of the trolley striking against the wire, and to this end we insulate each side of the trolley, as at 31. The insulation 31 may be preferably of porcelain, and the upper end of the insulation may be rounded and extend nearly to the edge of the trolley, a sufficient space being allowed between the end of the insulation and the edge of the trolley to permit the trolley to easily pass through the trolley-wire switches.

The operation of the device is as follows: When the trolley is in contact with the wire, the solenoid 24 is energized and its armature holds the pawl 22 out of engagement with the teeth of the ratchet. As the trolley-pole oscillates the slack in the rope 20 is taken up by means of the drum 14, the drum being revolved in the direction of the arrow by the spring 19. The tension of the spring 19 is sufficient to take up the slack in the rope, but it is not strong enough to affect to any appreciable extent the action of the springs which support the trolley-pole. When the trolley slips off the wire, the solenoid is deenergized and the spring 25 quickly throws the pawl 22 into engagement with the ratchet, thereby preventing any movement of the ratchet in the direction which allows the rope to be unreel, and the trolley is thereby held from upward movement. The insulation 31 on each side of the trolley-pole serves to break the current and prevent arcing between the pole or trolley and the wire when the trolley is off the wire and allowing the deenergizing of the solenoid, so that the pawl may engage the ratchet. When the trolley is out of electrical contact with the wire, the stiff springs which support the trolley cause a strong tension to be given to the rope 20, which acts to force a tooth of the ratchet firmly against the pawl, and the undercut shape of the tooth, together with the pressure exerted tending to hold the pawl

under the tooth, prevents the pawl from being retracted in the event of an imperfect electrical contact being made between either the trolley or the pole and the wire. When, however, the trolley has been placed in proper position on the wire, the wire holds the trolley from upward movement and relieves the strain on the rope, so that the tension on the rope tending to hold the tooth of the ratchet over the pawl is relatively low, being supplied by the spring 19, and in consequence of this reduced tension against the pawl and the perfect contact of the trolley with the wire the solenoid retracts the pawl and frees the ratchet. When reversing the position of the pole, it will simply require the change of the rope from one dashboard to the other and not require the device to be bodily carried from one end of the car to the other.

The device may be clamped to the trolley-pole in a position adjacent the pivotal support of the trolley-pole, so that the weight of the device does not appreciably affect the action of the springs which support the trolley against the wire.

It is obvious that various changes may be made in the herein-described embodiment without departing from the spirit of our invention.

What we claim is—

1. An electric circuit, a car, a trolley carried by said car, a drum rotatably mounted and connected to said car, a connection from said drum to said trolley, an annular ratchet having female threads screwed to said drum, a pawl adjacent said ratchet, and means controlled by said circuit for controlling said pawl.

2. In a device of the character described, a casing, a removable cover for said casing, a shaft, shoulders on said shaft, one end of said shaft being mounted in said casing, and one of its shoulders bearing against said casing, the other end of said shaft being mounted in said cover, and the other shoulder of said shaft bearing against said cover, a drum, said drum having oppositely-arranged hubs, one hub of the drum being mounted upon said shaft, and bearing against said cover, the other hub of said drum being mounted upon a boss projecting from the interior of said casing, a spring inside said drum, one end of said spring being attached to said drum, the other end of said spring being attached to said casing, a ratchet carried by said drum, a pawl pivoted in said casing adjacent said ratchet, and means in said casing for automatically moving said pawl into engagement with said ratchet.

3. A device of the character described embracing a casing, a drum rotatably mounted in said casing, a ratchet with undercut teeth carried by the drum, a pawl pivoted to the casing, said pawl being formed and arranged to fit under a tooth of the ratchet, a magnet normally holding the pawl free from the ratchet while the magnet is energized, and a

5 spring engaging the pawl for throwing the pawl into the ratchet when the magnet is de-energized, the undercut teeth serving to retain the pawl during momentary excited conditions of the magnet for the purpose specified.

In witness whereof we have signed our names to this specification, in the presence

of two subscribing witnesses, at Los Angeles, in the county of Los Angeles and State of California, this 28th day of June, 1902.

MORRIS C. WHITE.
OTHO C. DURYEA.

Witnesses:

GEORGE T. HACKLEY,
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