

No. 656,384.

Patented Aug. 21, 1900.

M. I. BAIRD.

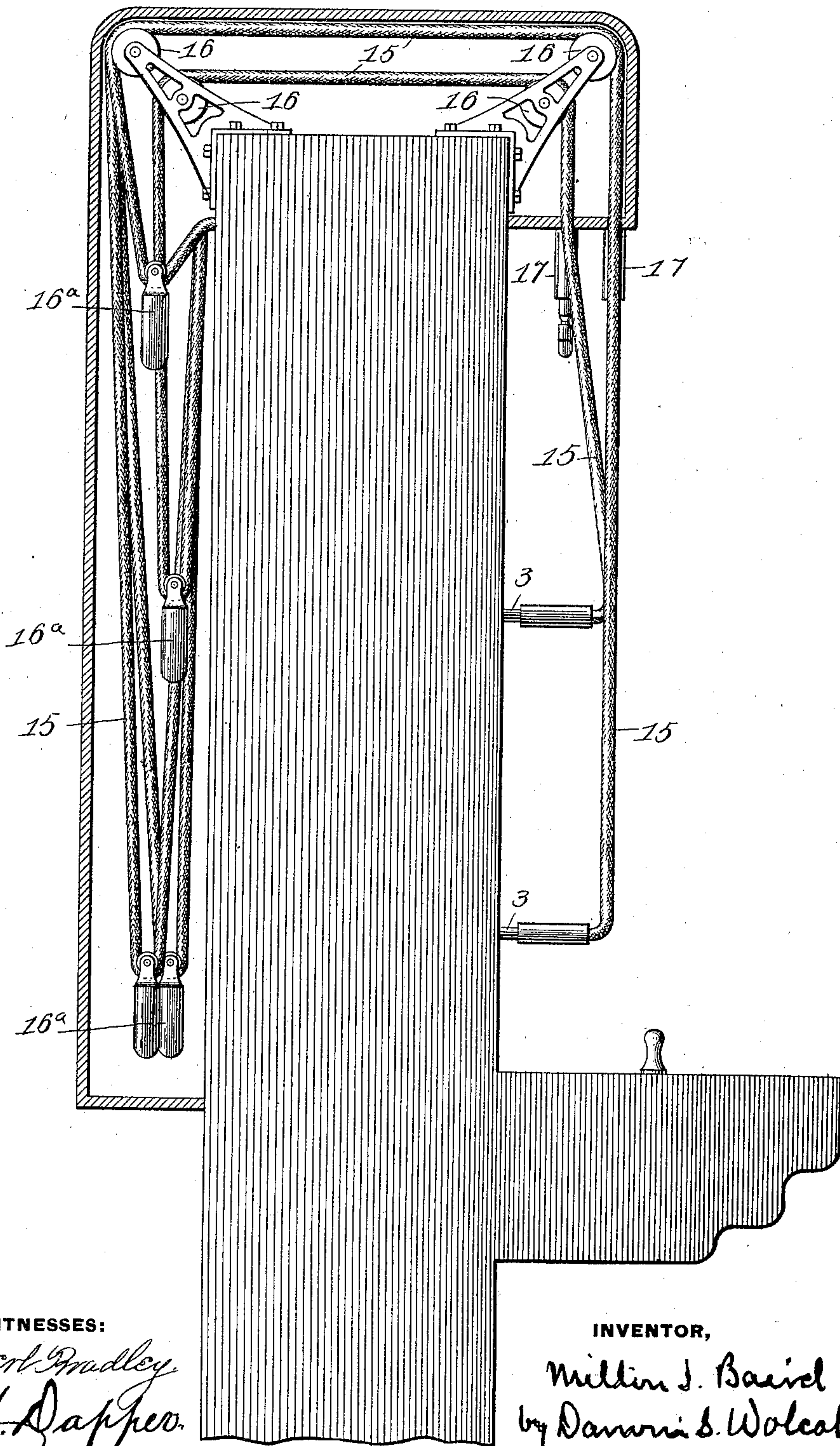
SWITCHBOARD FOR TELEPHONES.

(Application filed Dec. 1, 1899.)

(No Model.)

3 Sheets—Sheet 1.

FIG. 1.



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3 Sheets—Sheet 2.

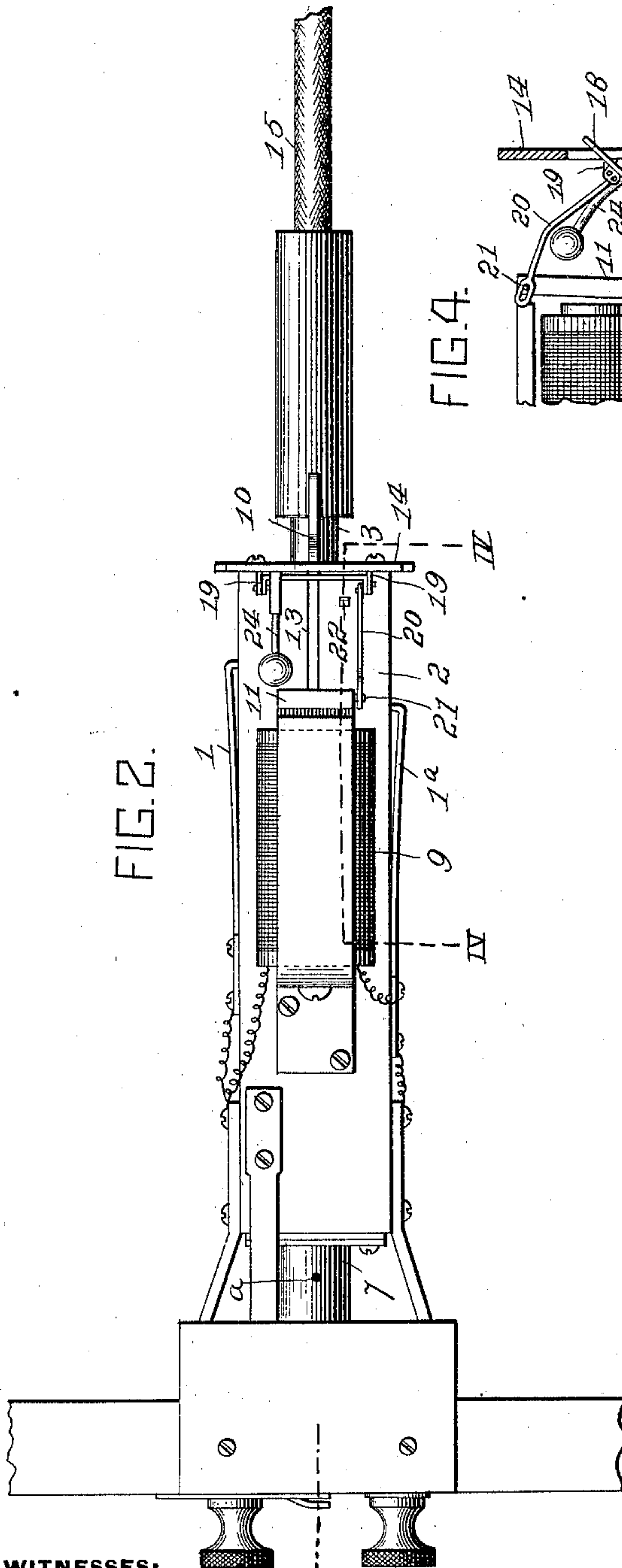


FIG. 2.

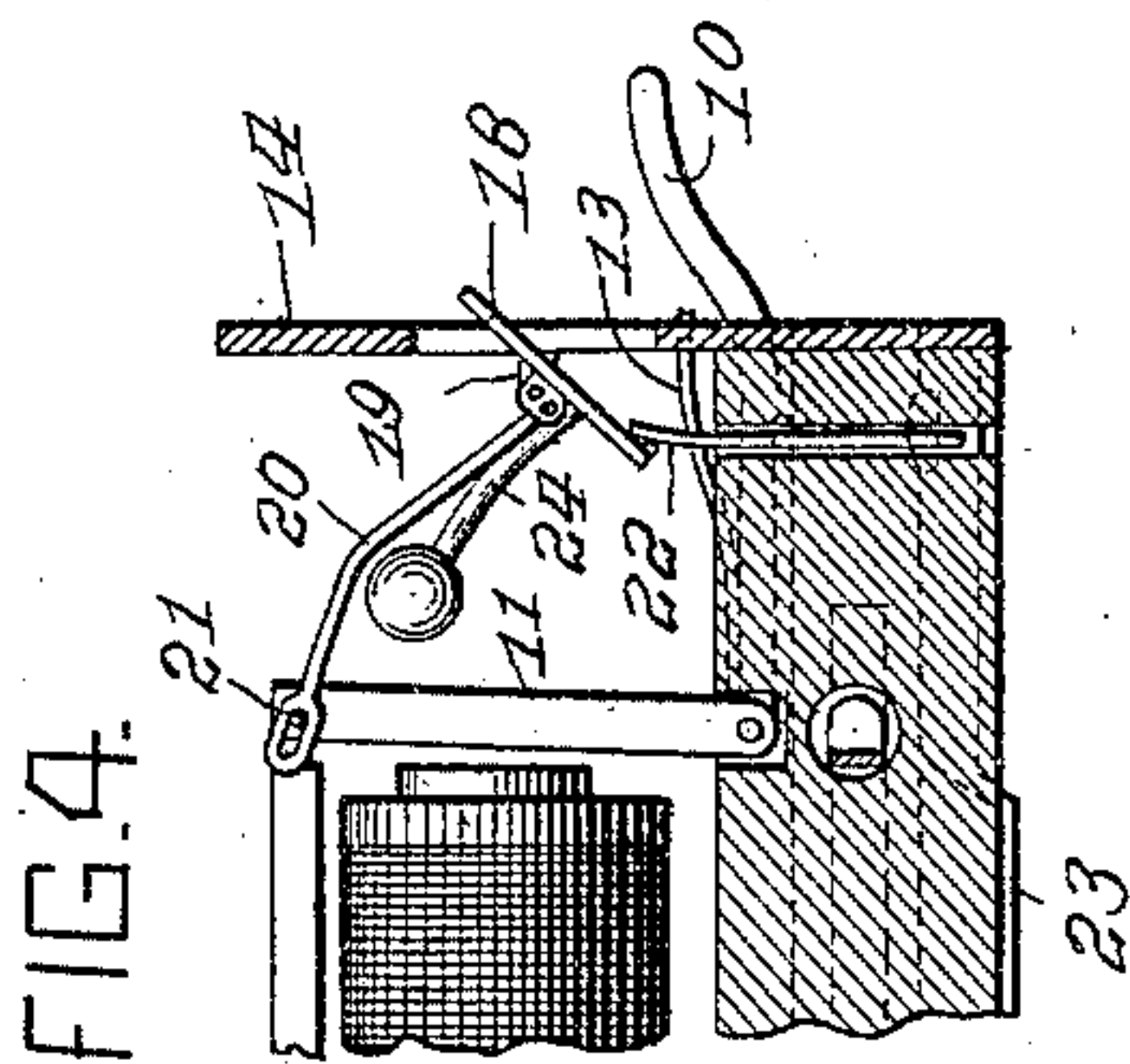


FIG. 4.

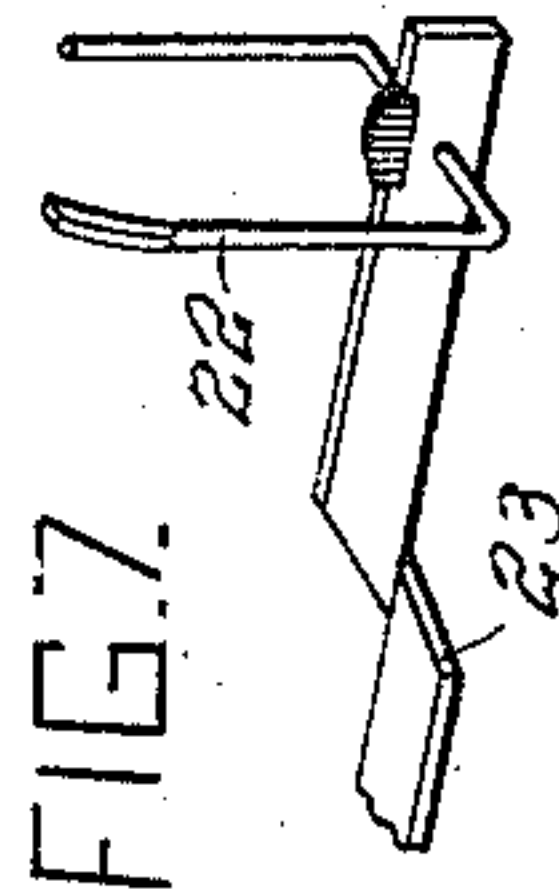


FIG. 7.

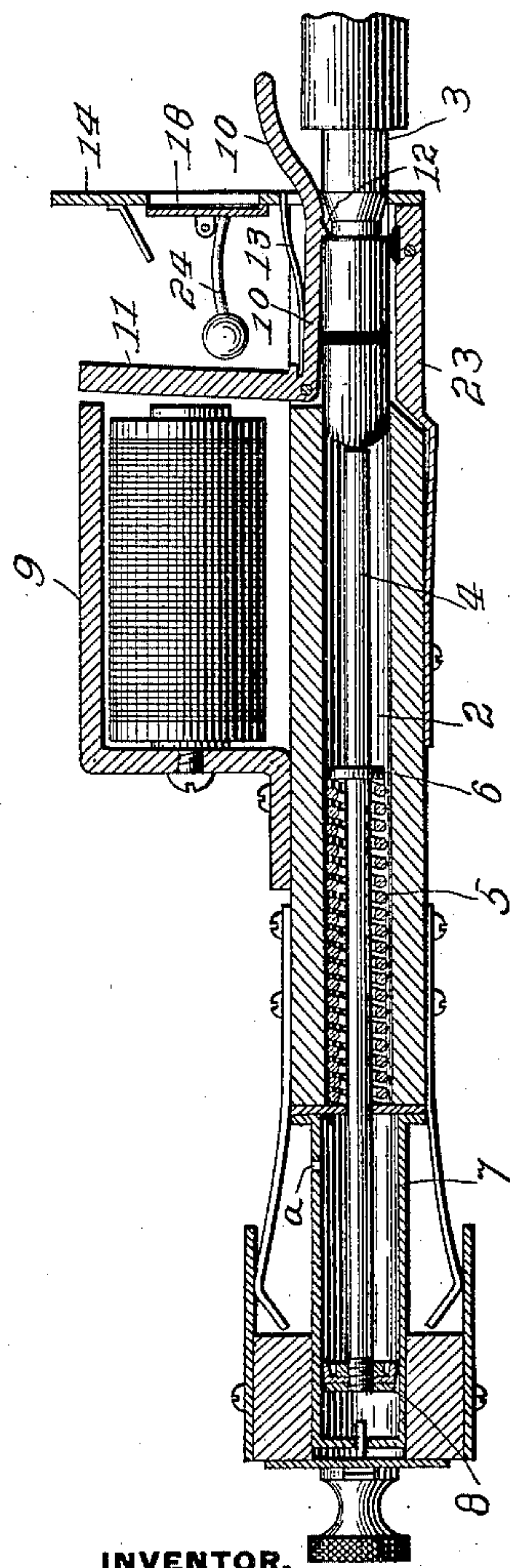


FIG. 3.

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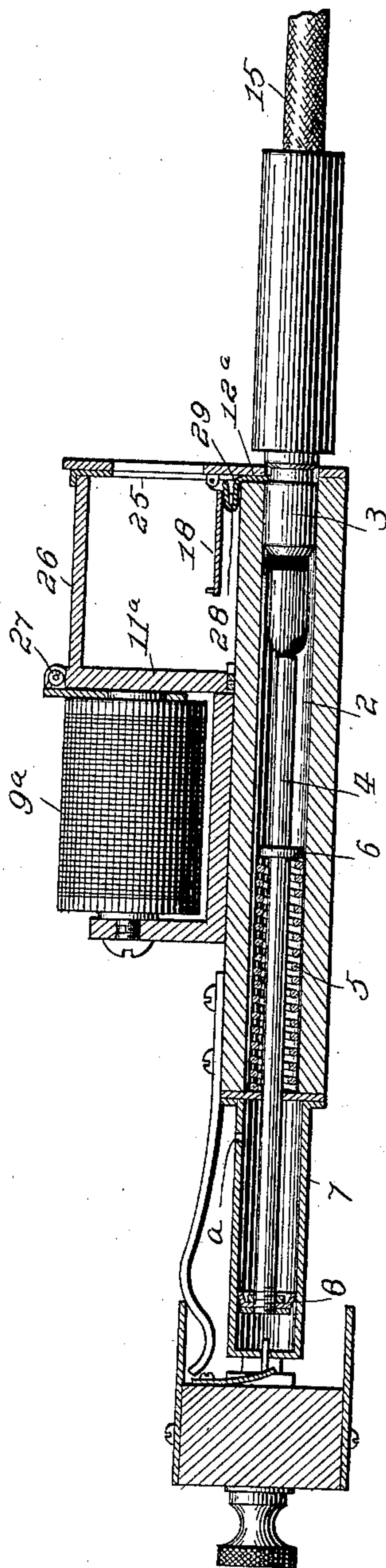
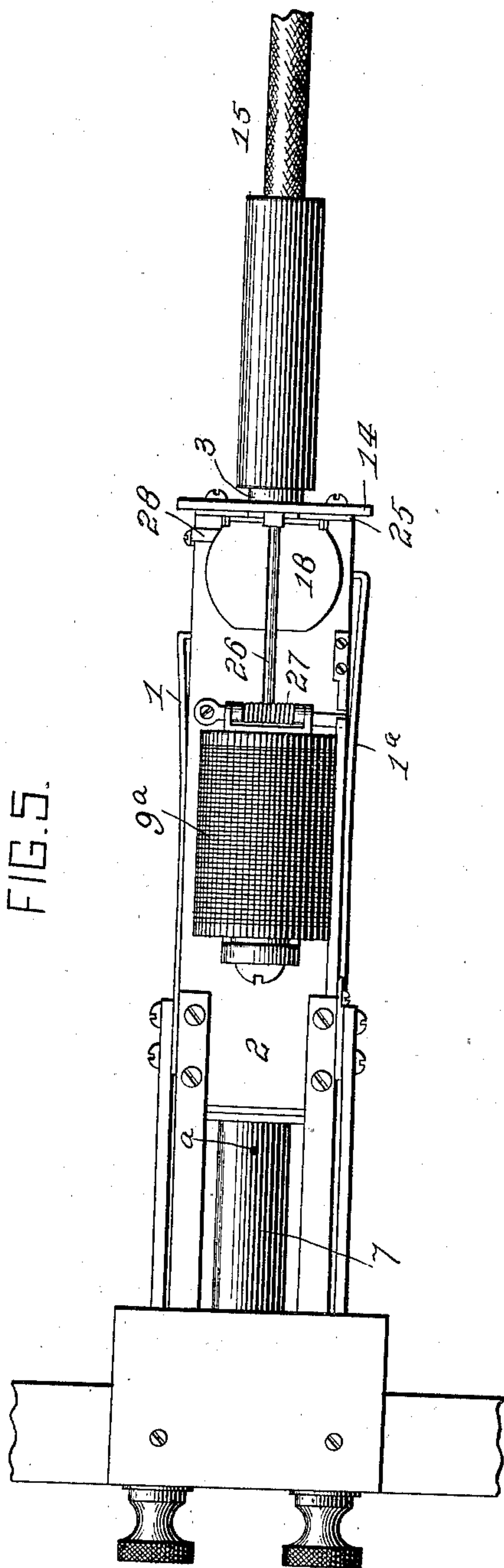
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

MILTON I. BAIRD, OF GLENFIELD, PENNSYLVANIA.

SWITCHBOARD FOR TELEPHONES.

SPECIFICATION forming part of Letters Patent No. 656,384, dated August 21, 1900.

Application filed December 1, 1899. Serial No. 738,836. (No model.)

To all whom it may concern:

Be it known that I, MILTON I. BAIRD, a citizen of the United States, residing at Glenfield, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Switchboards for Telephones, of which improvements the following is a specification.

The invention described herein relates to certain improvements in switchboards for telephone-stations. Under the usual practice the plug employed for connecting one subscriber with another remains in the switchboard until removed by the operator, although means have been suggested for snapping the plug out of its socket in the switchboard as soon as its detaining-catch is shifted. In some cases indicating devices are employed to show the operator that the connected lines are out of use; but it is still necessary for the operator to remove the plug.

The object of the present invention is to provide for the automatic removal of the plug from the switchboard and its removal out of the way of the operator on the hanging up of the receiver or the ringing of either of the connected subscribers.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view in side elevation of a telephone-switchboard. Fig. 2 is a plan of a plug, socket, and connections for one of the circuits. Figs. 3 and 4 are sectional elevations, the planes of section being indicated by the lines III III and IV IV, Fig. 2. Fig. 5 is a plan view of a modification of my improvement. Fig. 6 is a sectional elevation of the same, and Fig. 7 is a detail view.

In the practice of my invention the switchboard is formed of a series of sections dependent upon the number of circuits connected to the board. Each of these sections is constructed in the usual or any suitable manner, except as regards the particular features hereinafter described.

As is customary, each circuit is provided with two terminals, which are formed by spring-fingers 1 and 1^a, having their free ends bent so as to project through the walls of the socket 2 into the path of movement of the

plug 3 and make electrical contact with the sections thereof. Within the socket is placed the ejector-rod 4, which is shifted to force the plug out by a spring 5, bearing at its ends against a collar 6 on the rod and an abutment or shoulder on the socket. As the plug is pushed into the socket the rod 4 is forced back, compressing the spring, which will therefore operate to shoot the plug out as soon as the latter is released from its detaining-catch. In order to control this outward movement of the plug under the action of the spring, the rod 4 is extended into a cylinder 7 at the inner end of the socket and is provided with a piston 8, connected to the rod 4. The cylinder is provided with a port *a* near its end for the escape and inflow of air. The piston 8 is constructed, as shown, to permit displaced air to escape freely by it when forced back by the plug, but to permit a comparatively-slow flow of air past it when actuated by the spring. By this construction the plug will be ejected by a slow continuous movement until nearly free from its socket, when the piston will move past the port *a*, allowing a free inflow of air, so that the action of the spring will be unrestrained, and it can impart a "kick" or quick impulse to the plug, thus insuring its entire removal from the socket.

The plug is held within the socket by means of a catch controlled by the magnet 9. A convenient form of catch consists in attaching an arm 10 to the armature 11 of the magnet in such manner that the arm will be shifted by the armature. A shoulder or projection 12 is so formed on the arm 10 as to project into the path of movement of the plug and engage a shoulder on the latter when it has been pushed to operative position within the socket. The armature is yieldingly held normally away from the magnet and the projection 12 in operative position by a spring, which may be made in the form of a strip of spring metal secured at one end to the arm 10, while its opposite end engages a shoulder on the front plate 14 of the switchboard. If desired, the arm 10 may be extended through the front plate, thereby permitting of the manual lifting of the arm and consequent release of the plug.

As is customary, the plugs form the terminals of circuits, which are formed in part by

flexible conductors 15, having one end connected to suitable contacts at the back of the switchboard, while their opposite ends are connected to the insulated sections of the plugs. These cords or conductors are arranged over suitable guide-pulleys 16 and have weights 16^a movably hung thereon, so as to draw the plugs when removed from the sockets into suitable pockets 17, which may be arranged above, below, or at either end of the switchboard.

In the construction shown in Figs. 2, 3, and 4 the magnet is arranged to be excited only when the subscriber calls or rings off. When the subscriber calls, the movement of the armature 11 to the magnet shifts the indicating-disk 18 from normal position to show "central" the number calling. This disk 18 is pivotally mounted between ears 19, formed on the front plate 14, and has an arm 20 connected to it below its pivotal point. The opposite end of this arm is slotted for the reception of a pin or projection 21 on the armature. This construction permits the armature to drop away from its magnet without moving the disk from its indicating position. The disk is held in indicating position until the plug is inserted in the socket by a spring-finger 22, whose upper end projects into the path of movement of the lower edge of the disk. This finger is formed on or connected to a spring 23, which is so arranged that a shoulder thereon projects into the socket, so that when the plug is pushed into the socket the spring 23 will be shifted to withdraw the finger 22 from engagement with the disk, thereby permitting the latter to be returned to normal position by a weighted arm 24, secured to the disk.

In the construction shown in Figs. 2, 3, and 4 the magnet is excited only when a subscriber calls central or rings off. In some systems the electromagnet is included in a circuit which is closed from the time a subscriber takes down the receiver until it is hung up again. The modifications whereby my improvements can be employed in such a system are shown in Figs. 5 and 6. The catch for holding the plug within the socket is formed by a projection 12^a on the lower edge of the sliding plate 25, mounted in suitable guides on the rear side of the front plate 14. This slide is held in raised position by an arm 26 on the armature 11^a of the magnet 9^a, the armature being normally held away from the magnet by a spring 27. When the armature is drawn to the magnet, the slide is caused to move down, so that the projection 12^a will lie in the path of the plug, by a spring 28, secured to the socket and bearing at its free end on a lug 29 on the slide 25. As will be seen by reference to Fig. 6, the slide can move

up without affecting the arm 26 to permit of the passage of the plug past the projection on the slide. The lug 29 is so arranged on the slide as to bear against the lower edge of the indicating-disk 18, which is so pivoted to the front plate 14 that when the slide is raised the disk will be turned up to position behind its opening in the front plate.

It will be readily understood from the foregoing that the operator can devote her entire time to placing the plugs in position, as the latter will be released as soon as the subscriber rings off or hangs up the receiver. Immediately on the withdrawal of the retaining-catch the plug will be forced out of the socket by the spring 5, and as soon as the plug is free from the socket it will be drawn to one side of the switchboard to its receiving-pocket. By the employment of suitable means for controlling the action of the spring 5 there is no danger of the plug being pushed out into the face of the operator.

I claim herein as my invention—

1. In a telephone-switchboard, the combination of a socket, a plug, mechanism for forcing the plug out of the socket, and means for regulating the outward movement of the plug-ejector, substantially as set forth.

2. In a telephone-switchboard, the combination of a socket, a plug, mechanism for forcing the plug out of the socket, means for controlling the action of the ejector, and a catch controlled by the subscriber for holding the plug in the socket, substantially as set forth.

3. In a telephone-switchboard, the combination of a socket, a mechanism for forcing the plug out of the socket, means for regulating the outward movement of the plug-ejector and automatic means for shifting the released plug to one side of the switchboard, substantially as set forth.

4. In a telephone-switchboard, the combination of a plug-receiving socket, a spring-actuated rod arranged in the socket, a cylinder provided with ports, and having its piston connected to the push-rod, and a catch controlled by the subscriber for holding the plug in the socket, substantially as set forth.

5. In a telephone-switchboard, the combination of contacts forming terminals of circuits, a plug for connecting said contacts with another circuit, means for changing the position of the plug with relation to said contacts, and means for regulating such movement.

In testimony whereof I have hereunto set my hand.

MILTON I. BAIRD.

Witnesses:

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