No. 690,787. Patented Jan. 7, 1902.

J. H. SPANGLER.

INDEPENDENT OPERATING MEANS FOR ELECTRIC SWITCHES.

(Application filed Apr. 17, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

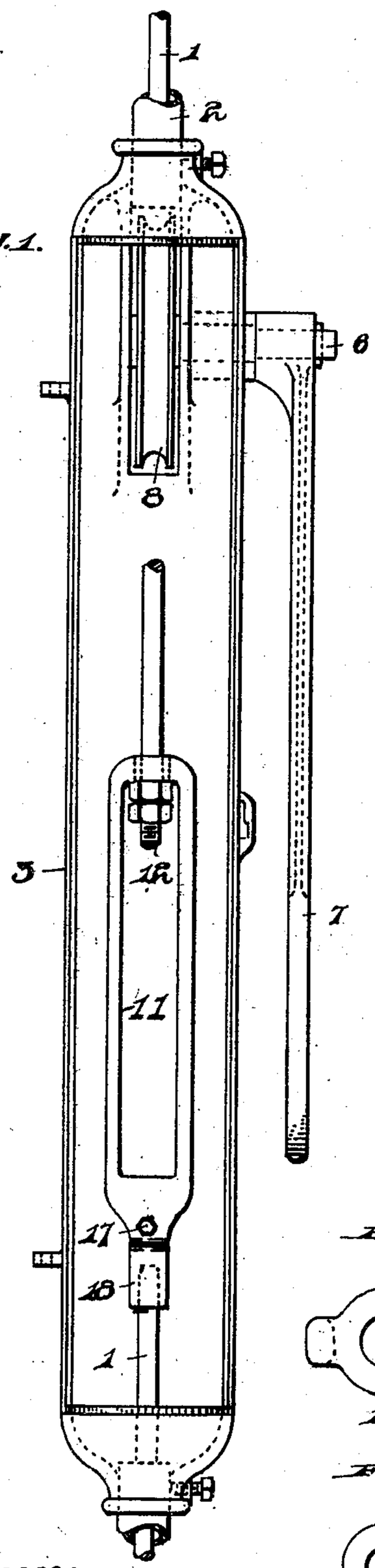


Fig. 2.

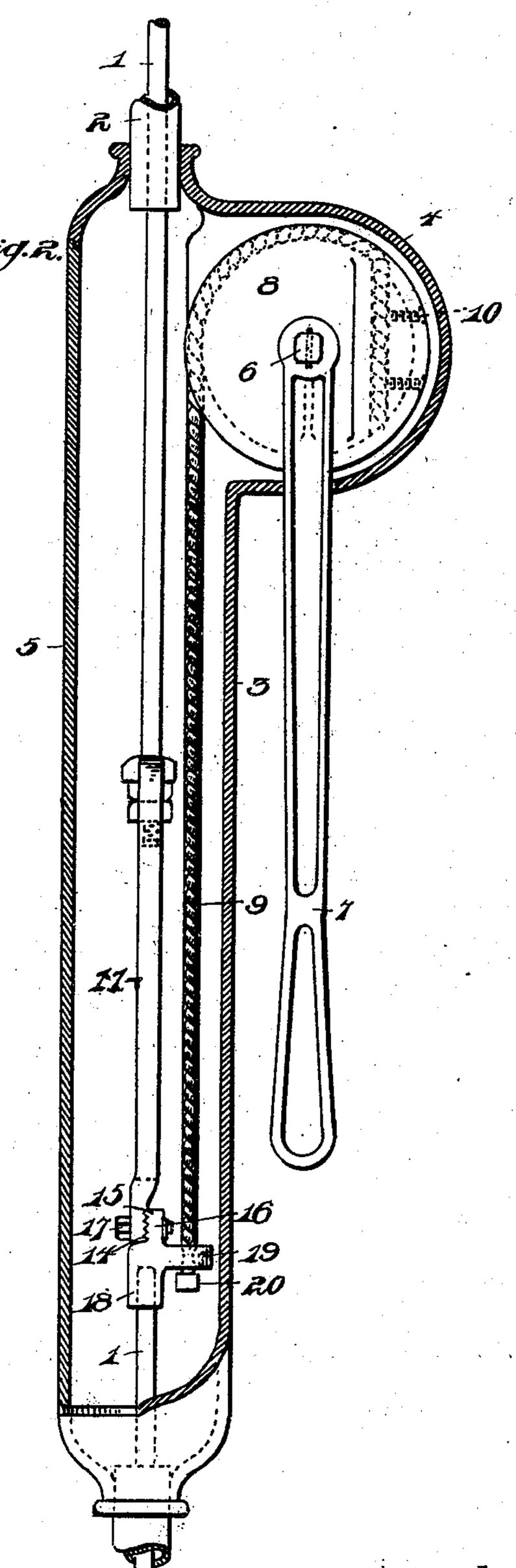


Fig. 3.

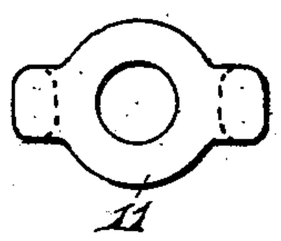
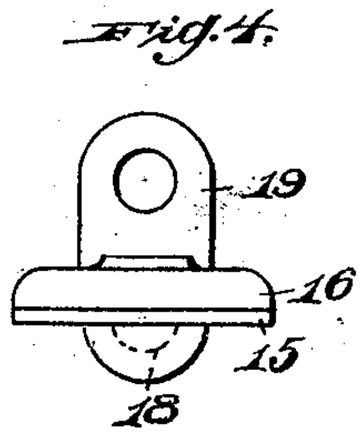


Fig. 4.



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INDEPENDENT OPERATING MEANS FOR ELECTRIC SWITCHES.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 6.

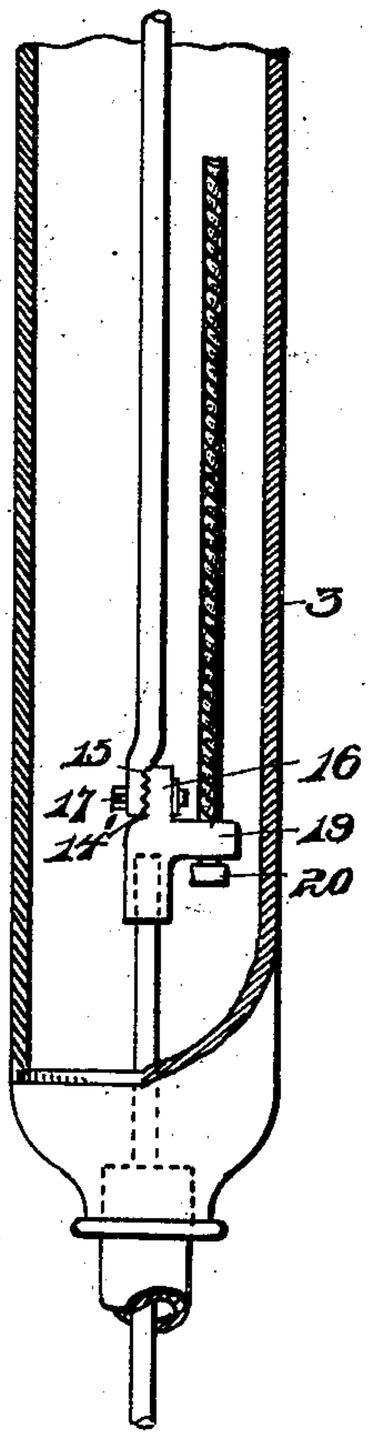
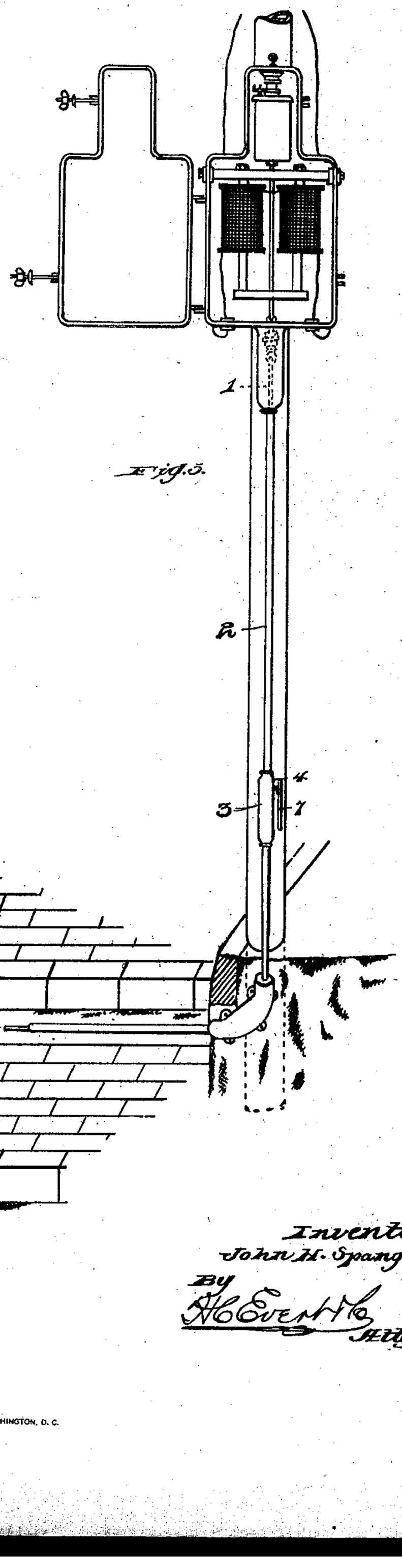


Fig. 5.



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JOHN H. SPANGLER, OF CRAFTON, PENNSYLVANIA.

INDEPENDENT OPERATING MEANS FOR ELECTRIC SWITCHES.

SPECIFICATION forming part of Letters Patent No. 690,787, dated January 7, 1902.

Application filed April 17, 1901. Serial No. 56,250. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. SPANGLER, a citizen of the United States of America, residing at Crafton, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Independent Operating Means for Electric Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in hand-operated devices for electrically-operated switches, the object being to provide in connection with an electric switch an independent device by means of which the switch-tongue may be moved independently of the electrically-operated means for actuating the switch-tongue.

In the use of automatic electric switches employed in connection with street-railways it is sometimes desirable to provide means whereby the switch-tongue can be thrown by manual means or by means independent of the switch-throwing circuit and mechanism operated thereby. Such a means is desirable in case the switch-throwing mechanism that is operated by the switch-throwing circuit should be out of order, also at times when repairs are being made to the track at the point where the switch is located.

This invention is designed to be used in connection with an electric switch of the character described and claimed in my Patent No. 668,662, issued February 26, 1901; and it consists of manually-operated means which is interposed in the rod that connects the solenoid to the switch-tongue, and by its aid I am enabled in case it is inconvenient or undesirable to at any particular time throw the switch-tongue by the electrical means to operate the same independently of the electric means, the manually-operated means not, however, interfering in any manner with the electrically-operated means; and to this end the invention consists in the novel construction, combination, and arrangement of parts, as will be hereinafter more specifically described and then particularly pointed out in the claims.

In describing the invention in detail reference will be had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference will be employed for designating like parts throughout the different views of the drawings, in which—

Figure 1 is a front elevation of the device interposed in the connecting-rod between the switch-tongue and the solenoid, the casing having its door removed. Fig. 2 is a side view with the door of the casing closed and the latter in vertical section. Fig. 3 is a top plan view of the link that is interposed in the connecting-rod. Fig. 4 is a top plan view of the adjustable member which connects the lower end of the link to the connecting-rod and to which the operating-cable of the manual means is connected. Fig. 5 is a detail perspective view of an electrically-operated switch, showing the independent means for actuating the switch in position. Fig. 6 is a vertical sectional view of a part of the casing, showing a modified form of construction of the connecting-rod.

In my electric switch shown and described in Patent No. 668,662 I support the solenoid from a post at the side of the track, connecting the solenoid by a cord, cable, or chain to mechanism located in the road-bed and connected to the switch-tongue. I may, however, employ a rod for connecting the solenoid to the switch mechanism, and in such case the rod 1 is passed through a tubular casing 2, and in this tubular casing 2 I interpose a box or casing 3, provided near its upper end, at one side thereof, with an enlargement 4. This casing 3 is provided with a suitable door 5, which is hinged thereto, and suitable means is provided for locking the same. In the enlarged portion 4 of the box or casing 3 is journaled a shaft 6, upon which is mounted a pulley-wheel 8, suitably grooved to receive the flexible connection 9. This connection 9 may be a rope, cable, chain, or the like and may be securely fastened to the wheel 8 by boring the same and inserting the end of the connection into said bore, where it is secured by screws 10 or other like means. The shaft 6 extends outwardly at one side of the box or casing and has secured thereto a hand-lever 7.

The connecting-rod 1 instead of being continuous from the lower end of the supporting-post to the solenoid is separated or divided, and its one end is passed into the upper end

of a link 11, in which it is free to work, being held against removal, however, by nuts 12, threaded onto the end of the rod. The lower end of this link 11 is provided with teeth 14, which interlock with teeth 15, formed on an upwardly-extending lug 16, carried by a connecting member attached to the other part of the rod. These teeth are held in engagement by a bolt passed through the link at its lower end and through the lug 16, as shown at 17. This connecting member has a socket 18, into which the upper end of the lower part or member of the connecting-rod is secured, and it also carries a lug or ear 19, extending outwardly at right angles thereto and provided with an aperture to receive the flexible connection 9, the latter being passed through said aperture and having a nut 20 secured on its lower end.

In case it is desired to operate the switch independently of the electric means the hand-lever 7 is pulled outwardly from the supporting-post of the solenoids, which will cause the nut 20 on the end of the flexible connection to be drawn into engagement with the lower face of the lug or ear 19 of the connecting member, and thus move vertically that portion of the rod 1 that is below the link 11 and actuate the switch-tongue, the link 11 sliding upward on the upper portion of the rod 1 and imparting no motion thereto. When, however, the switch is operated electrically, it will be observed that the movement of the upper part of the rod 1, caused by the energizing of the magnets, will also move the link and the lower portion of the rod 1 vertically to actuate the switch-tongue, the lug or ear 19 during such operation sliding upward on the flexible connection 9. It will thus be seen that the interposing of the manual means in the connecting-rod in no manner interferes with the operation of the switch electrically and that the manual means when operated imparts no movement to the core of the solenoid to which the connecting-rod is attached.

In Fig. 6 I have shown a modified form of construction in which the link 11 is dispensed with, and I provide the lower end of the upper member of the rod with teeth 14′ to mesh with the teeth 15 of the lug 16 of the connecting member. The cord, cable, or chain 9 is attached to this connecting member in the same manner as when the link is employed. With this rigid connection the operating of the lever 7 will raise the entire portion of the connecting-rod 1 instead of only the lower member thereof, as in the aforesaid described construction. This will of course necessitate the lifting of the solenoid instead of allowing the same to remain stationary, as in the case where the link is employed.

It will be observed that in the practice of the invention various changes could be made in the details of construction from that shown herein and specifically described without departing from the general spirit of my invention.

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

1. In a device of the character described, the combination, with a connecting-rod between the switch-operating mechanism and the solenoid whereby the switch may be operated electrically, of manual means for operating the switch including a flexible connection, means for operating said flexible connection, a connecting member carried by the connecting-rod and slidably engaging the flexible connection so as to move independently of the flexible connection when the switch is operated electrically, and means whereby the flexible connection when actuated engages with the connecting member to operate the connecting-rod, substantially as described.

2. Manual means for independently operating electric switches, comprising, in combination, a connecting-rod between the switch-operating mechanism and the solenoid, a pulley, a lever for operating said pulley, a flexible connection having its one end secured to said pulley, and a connecting member attached to the connecting-rod and provided with an apertured lug to receive the flexible connection, the said flexible connection remaining inactive when the switch is operated electrically, substantially as described.

3. In a device of the character described, the combination with a divided connecting-rod between the switch-operating mechanism and the solenoid, of a connecting member carried by one of the members of the connecting-rod, a pulley, a lever for operating said pulley, and a flexible connection between the connecting member and the pulley, substantially as described.

4. In a device of the character described, the combination with a connecting-rod between the switch-operating mechanism and the solenoid whereby the switch may be operated electrically, of manual means for actuating the switch including a flexible connection, and means for operating said flexible connection, a connecting member carried by the connecting-rod and through which the flexible connection is passed, the said flexible connection remaining stationary when the switch is operated electrically, and means carried by the flexible connection for engagement with the connecting-rod when the flexible connection is actuated, substantially as described.

5. In a device of the character described, the combination with a connecting-rod between the switch-operating mechanism and the solenoid whereby the switch may be operated electrically, of manual means for actuating said rod to operate the switch, said means including a flexible connection, means connected thereto for operating the same, a connecting member carried by the connecting-rod and provided with an apertured lug through which the flexible connection is

passed, said connecting member adapted to slide on the flexible connection when the switch is operated electrically, and means carried on the free end of the flexible connection for engagement with the connecting member to permit the manual operation of the connecting-rod and the switch, substantially as described.

6. Manual means for independently operating electric switches, comprising in combination with a divided connecting-rod between the switch-operating mechanism and the solenoid, a link connected to one end of said rod and slidable on the other end, a flexible connection with said link, a pulley-wheel to which said flexible connection is secured, and a hand-lever for actuating the pulley-wheel to operate the switch-throwing mechanism, substantially as described.

7. In a device of the character described, the combination with the divided connecting-rod, of a casing into which said rod extends, a link connected to one end of said rod and slidable on the other end thereof within the casing, a pulley mounted within the casing, a hand-lever for operating said pulley, and flexible connections between the link and the pulley, as and for the purpose described.

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

JOHN H. SPANGLER.

Witnesses:
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A. M. WILSON.