No. 686,349. Patented Nov. 12, 1901.

G. J. SCOTT.

ELECTRIC CONTROLLER.

(Application filed Jan. 22, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

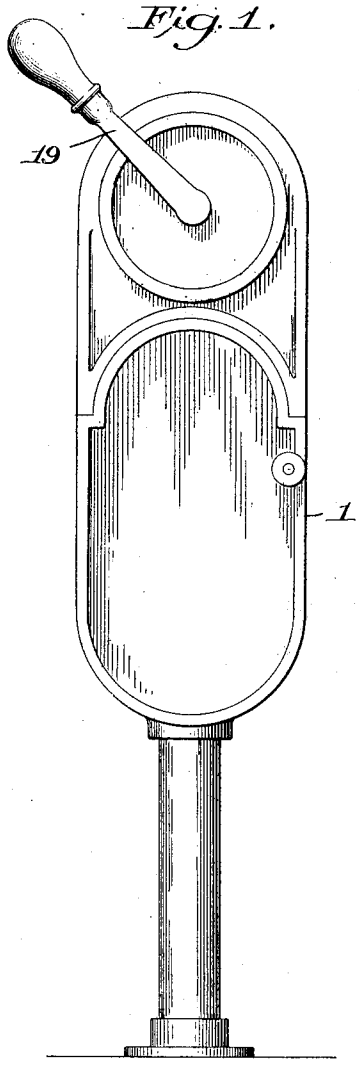


Fig. 4.

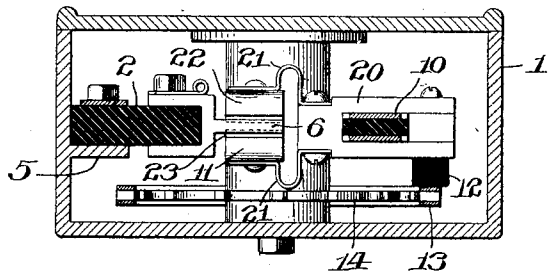


Fig. 5.

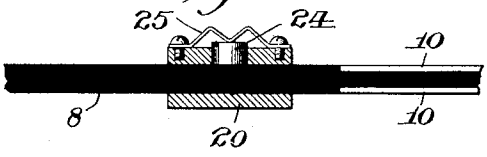


Fig. 6.

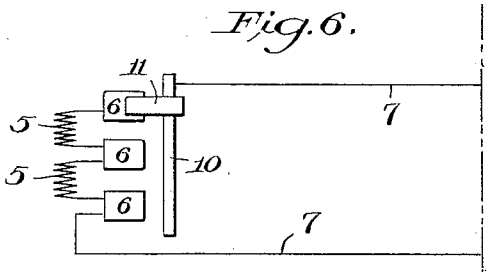
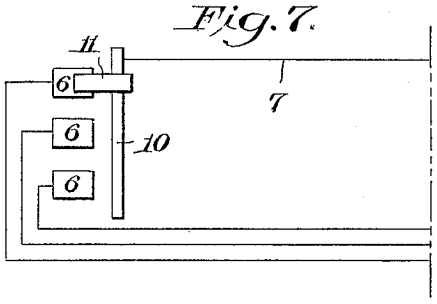


Fig. 7.



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Fig. 2.

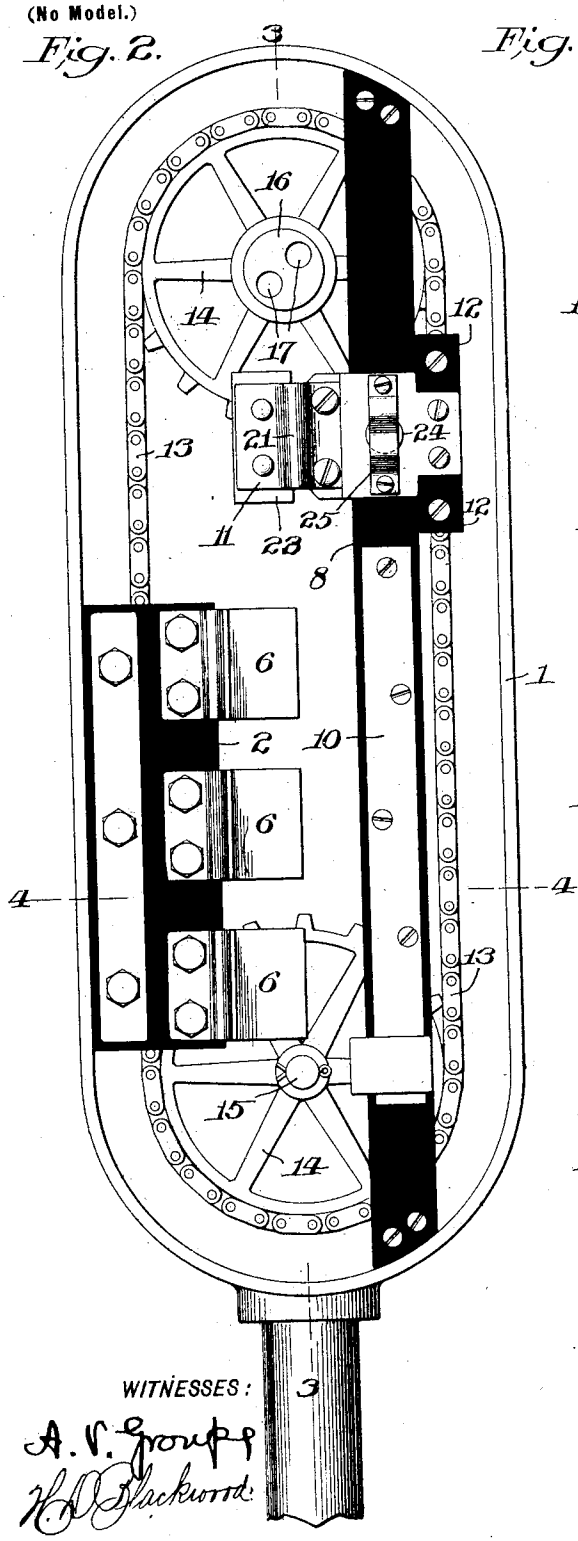
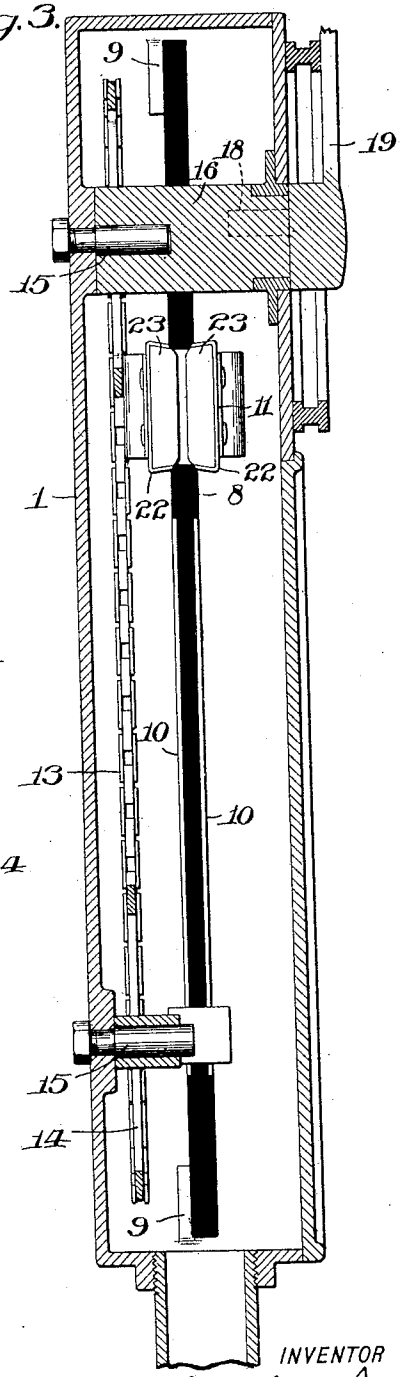


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ELECTRIC CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 686,349, dated November 12, 1901.

Application filed January 22, 1901. Serial No. 44,265. (No model.)

To all whom it may concern:

Be it known that I, GORDON JOHN SCOTT, a citizen of the United States, residing at the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Controllers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to controllers or switches for electrical circuits, my object being to provide a structure combining simplicity and durability of construction with ease and efficiency of operation. According to my invention the number of contacts employed is reduced to a minimum and the construction and operation of the mechanism are such that upon the breaking of the contacts or connections all liability of arcs with the attendant burning out and pitting of the contacts is obviated.

In the present embodiment of my invention a series of contact-clips are affixed to a stationary insulating-support on one side of the supporting box or frame and a stationary contact-strip is arranged on the opposite side of the latter. Between the row of clips and the contact-strip is mounted a movable contact or brush which is designed to coact therewith to make the requisite connection or connections and establish the circuit or circuits. This movable contact or brush is constructed and arranged to make contact with each succeeding contact-clip before breaking contact with the preceding contact-clip, and at the same time to remain in continuous contact with the stationary contact-strip. Hence its connection with both the contact-strip and the contact-clips is continuous after the first connection has been established, although each contact-clip may have a different function to perform. Such functions may be both dependent and independent, as the moving contact may play on any two or only upon one of the contact-clips. Thus it is possible to pass from one condition to another without any very sudden changes.

In the drawings, Figure 1 is a front elevation of a controller embodying my invention. Fig. 2 is a similar view enlarged, the front of the box or casing having been removed to expose the internal mechanism. Fig. 3 is a vertical section as on the line 3 3 of Fig. 2. Fig. 4 is a transverse section as on the line 4 4 of Fig. 2. Fig. 5 is a sectional detail of the movable contact or brush, showing a portion of the stationary contact-strip on which it slides. Figs. 6 and 7 are diagrams illustrating the contact devices with electrical connections therefor.

1 designates a box or casing of suitable shape and size for its intended purpose. Within this box, at one side thereof, is disposed a strip 2, of insulating material, the same being bolted to a rib 5 on the side of the box. To this strip are bolted or otherwise fixedly secured at intervals apart a series of contact-clips 6—in the present instance three—between which are or may be disposed suitable resistances, as indicated at 5 in Fig. 6. One or more of said clips are electrically connected directly or indirectly with an electric circuit 7 under the control of the apparatus. At the opposite side of the box is supported in parallelism with the strip 2 a bar 8, of insulating material, the ends of which may be secured to lugs 9 at the top and bottom, respectively, of the box. Upon each side of this strip and flush therewith is affixed an elongated contact-strip 10, that extends above and below the series of contact-clips referred to and is electrically connected with the said circuit, to the end that if electric contact be made and broken between the strip and the respective contact-clips the circuit will be correspondingly controlled thereby, the force of the current being influenced by the particular clip with which contact may be made.

A movable contact or brush, as 11, is adapted to be moved in respect to the strips 10 and the row of clips 6 in a manner to establish or break the circuit or circuits, as desired. This movable contact is constructed and arranged to make contact with each succeeding contact-clip 6 before it breaks contact with the preceding contact on one side and at the same time to remain in continuous contact with the strips 10. Hence it is possi-

ble to pass from one condition to another without sudden change, thereby obviating all liability of arcs with the attendant burning out and pitting of the contacts. Moreover, the number of contacts required is reduced to a minimum, in that the resistance to the current may be nicely regulated by engaging the movable contact or brush with a greater or less portion of the surface of each of two adjoining contacts.

Instead of the contact-clips being connected by resistants, as indicated in Fig. 6, each of such clips may be electrically connected with separate and independent circuits, as indicated in Fig. 7, having arranged therein and influenced thereby translating devices operative dependently upon or independently of each other.

In the present construction the movable contact or brush is attached, through an insulating-piece 12, to an endless carrier, as the sprocket-chain 13, passing around appropriate wheels 14, mounted on stud-shafts 15 at the respective ends of the casing. The hub 16 of the upper wheel extends through an aperture in the front of the casing and is provided in its outer end with suitably-arranged sockets 17 for the reception of laterally-projecting studs 18 on a handle 19. It will be seen that by properly turning this handle the upper sprocket-wheel will be correspondingly rotated in a manner to impel the chain and the contact-brush thereon, the degree of rotation determining the position of said brush in respect to the several contacts.

The particular movable contact or brush herein shown comprises a block 20, embracing snugly the strips 10, so as to be movable vertically in sliding contact therewith, two spring-arms 21 on said block carrying opposing jaws 22, in which carbon blocks 23 are held in position to yieldingly receive and embrace the contact-clips 6 in their path. Preferably there is fitted to an aperture in one side of the block 20 a cylindrical piece of carbon 24 or the like, which is held yieldingly in contact with the opposing strip 10 by the pressure of a suitable spring, such as the M-spring 25, secured to said block, whereby wear of the opposing surfaces is compensated for and proper electrical contact between the brush and the strip constantly insured.

The above-described controller has been especially though not exclusively designed for use in connection with a system of electric propulsion for railway and other cars.

I claim—

1. In an electric controller, the combination with a support, of a series of contacts thereon, an elongated contact-strip parallel therewith, a movable brush adapted to coact with the said strip and contacts, an endless carrier on which said brush is mounted, supporting-wheels for said carrier, and means for actuating the same, substantially as described.

2. In an electric controller, the combination with a support, of a series of contacts thereon, an elongated contact-strip parallel therewith, a movable brush adapted to coact with the said strip and contacts, a sprocket-chain on which said brush is mounted, supporting-wheels for said chain, and means for actuating the same, substantially as described.

3. In an electric controller, the combination with a support, of a series of contacts thereon, an elongated contact-strip parallel therewith, a movable brush adapted to coact with said strip and contacts, said brush comprising a block movable along said strip, and spring-arms extending from said block provided with jaws containing carbon or the like adapted to receive and embrace said contacts, and means for supporting and operating said brush, substantially as described.

4. In an electric controller, the combination with a support, of a series of contacts thereon, an elongated contact-strip parallel therewith, a movable brush adapted to coact with said strip and contacts, said brush comprising a block movable along said strip, a spring-pressed contact-piece arranged in said block and adapted to yieldingly engage said strip, and spring-arms extending from said block and provided with jaws containing carbon or the like adapted to receive and embrace said contacts, and means for supporting and operating said brush, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

GORDON JOHN SCOTT.

Witnesses:
ANDREW V. GROUPE,
JOHN R. NOLAN.