

No. 670,202.

Patented Mar. 19, 1901.

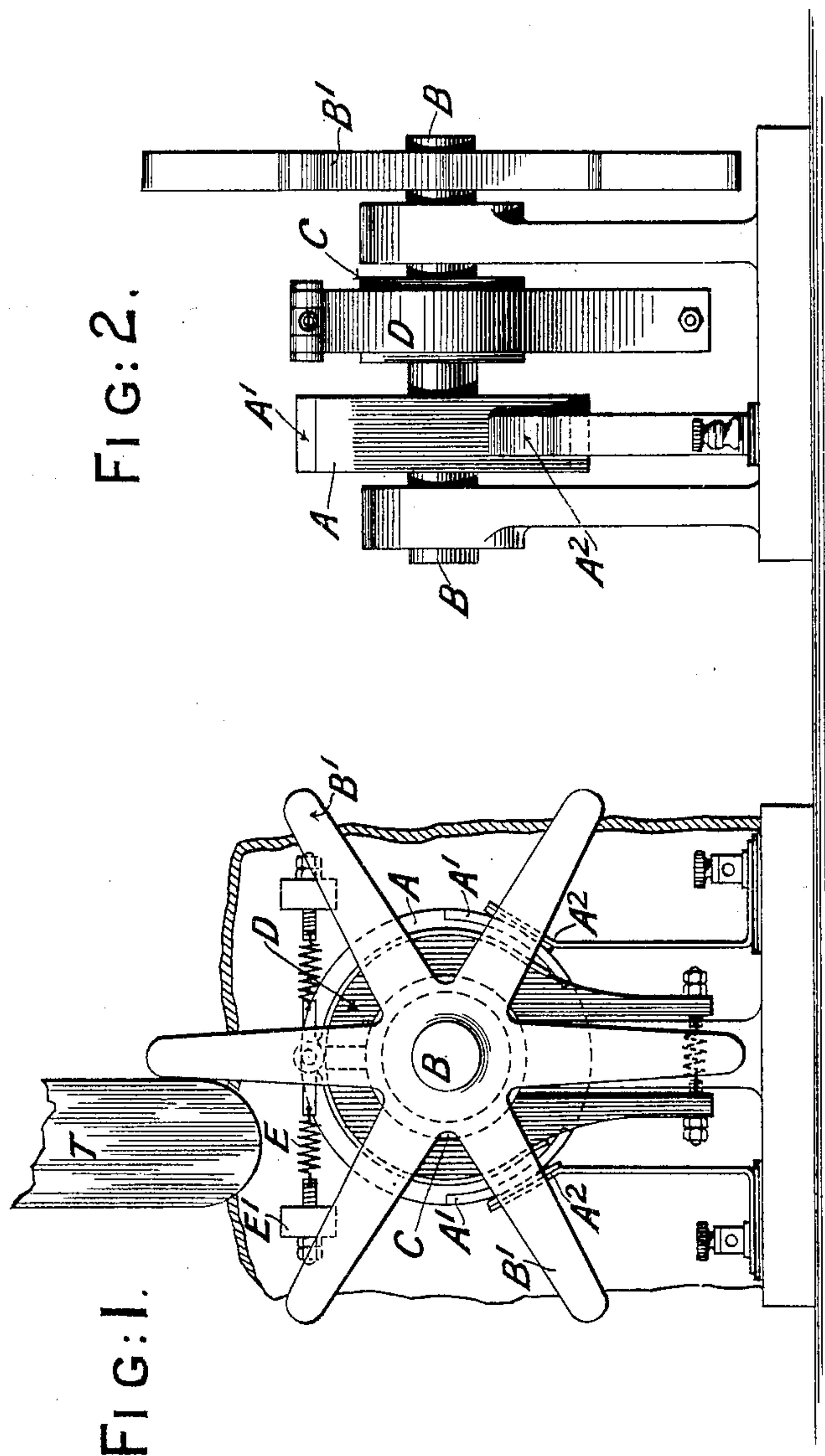
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APPARATUS FOR CONTROLLING THE MOTION OF ELECTRIC SWITCHES.

(Application filed Aug. 9, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
Chas. H. Smith  
J. Staib

Inventor  
William Kingsland  
per L. W. Terrell & Son  
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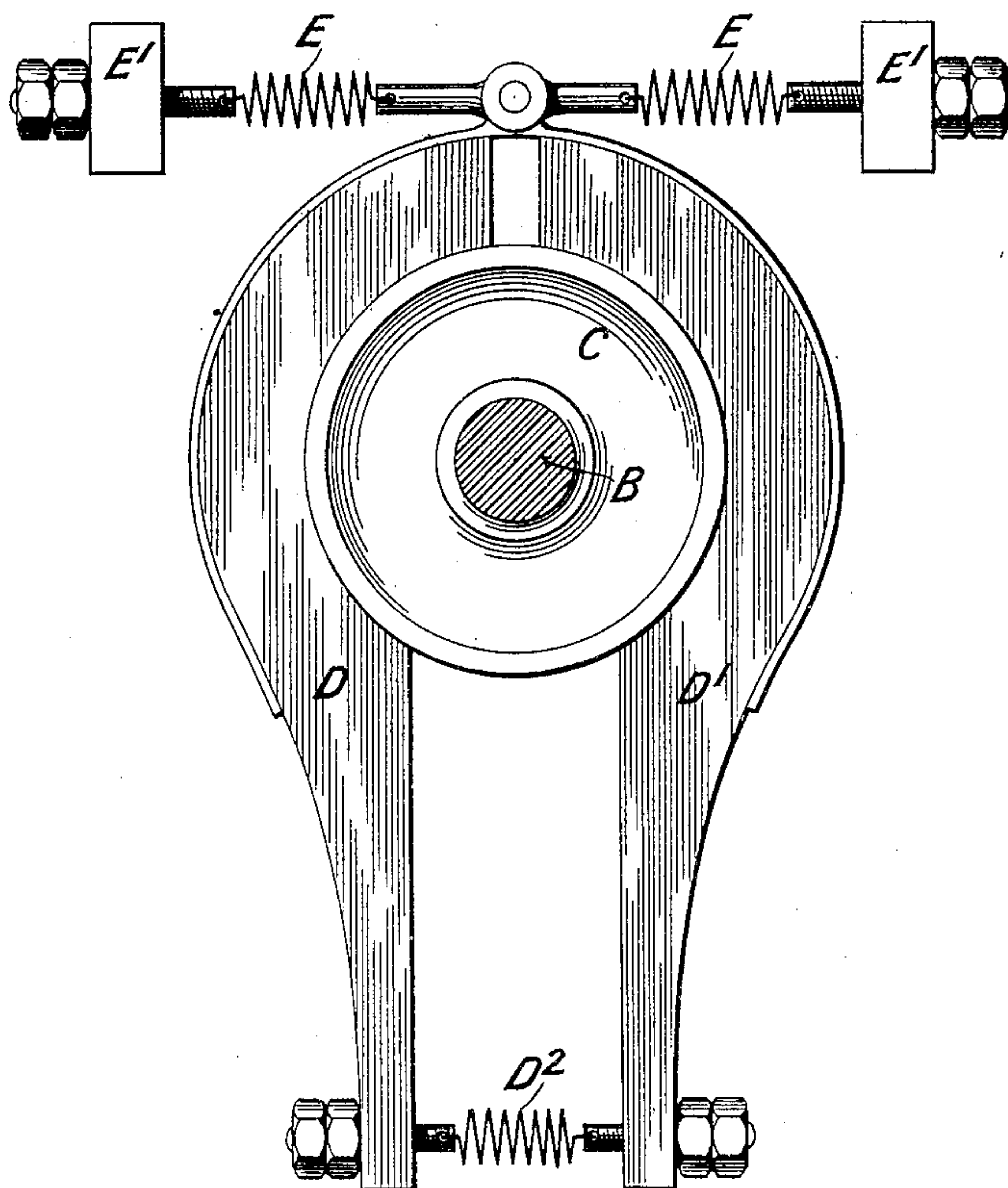
APPARATUS FOR CONTROLLING THE MOTION OF ELECTRIC SWITCHES.

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2 Sheets—Sheet 2.

FIG. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM KINGSLAND, OF LONDON, ENGLAND.

APPARATUS FOR CONTROLLING THE MOTION OF ELECTRIC SWITCHES.

SPECIFICATION forming part of Letters Patent No. 670,202, dated March 19, 1901.

Application filed August 9, 1900. Serial No. 26,318. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM KINGSLAND, electrical engineer, of 8 Breems Buildings, Chancery Lane, in the city of London, Eng-  
land, have invented a certain new and use-  
ful Apparatus for Controlling and Regulat-  
ing the Motion of Electric Switches which are  
Operated by Tappet Action, (for which I have  
made application for a patent in Great Britain  
under No. 1,618, dated January 25, 1900,) of  
which the following is a specification.

In electrical switches which are employed  
to connect and disconnect an electrical cir-  
cuit and are operated by means of a tappet  
action it may and frequently does happen  
that the moving part or parts of the switch  
acquire (as the result of such tappet action)  
greater momentum than is necessary to carry  
out the required amount of movement of the  
switch, and that amount of the momentum  
which is unrequired to effect the requisite  
change in position of the switch is detrimental  
in that it may carry the moving part of the  
switch beyond the position which it is desired  
it should assume or cause injury to the switch  
mechanism; and the object of my present in-  
vention is to provide means to overcome  
these disadvantages. With this object in  
view I provide mechanism, as hereinafter de-  
scribed, to regulate and control the motion of  
the rotative shaft by which the switch is op-  
erated, the rotative shaft receiving its motion  
by the impact of a moving tappet bar or bars.  
Such regulating and controlling mechanism  
I so arrange that the switch-shaft during its  
motion is subjected to a frictional braking  
action, and the braking mechanism produc-  
ing this action is so fitted that the impact of  
the tappet is taken up by springs or equiva-  
lent devices, which latter are also arranged  
to effect the return of the moving parts to the  
position they should be caused to assume in  
cases where the said parts are carried by the  
impact beyond such required positions, such  
return or adjustment being effected by the  
resilient or other accumulated power.

My invention, as aforesaid, is applicable to  
any switch which is operated by a tappet ac-  
tion, and particularly to switches employed  
in electrical traction, where the said switches  
are to be operated mechanically by a tappet-  
arm carried by or connected to a motor-vehi-

cle moving at various speeds along a line of  
rails.

I will describe my invention by way of ex-  
ample in its application to a rotative form of  
switch actuated by a tappet action, such as  
is in part illustrated with reference to Figures  
1, 2, and 3 of the accompanying drawings,  
Fig. 1 being an end view, Fig. 2 a side eleva-  
tion of same, and Fig. 3 an enlarged view of  
the brake device.

This example of switch is composed of a  
cylinder A, of some insulating material, fixed  
upon a rotative shaft B and having upon a  
portion of its circumference a conducting  
plate or plates A', there being contact springs  
or brushes A<sup>2</sup> A<sup>2</sup>, pressing against the sur-  
face of the cylinder A and electrically con-  
nected, respectively, say, to a main conduc-  
tor and a sectional conductor in a sectional  
conductor system of electrical traction.  
Mounted upon the rotative shaft B of the  
switch is a tappet-wheel B', having several  
arms, which latter are successively operated  
by tappets, such as T, carried by the vehicle  
as the latter passes along the track in such  
manner as to give the tappet-wheel B' a par-  
tial turn or partial turns every time a vehicle  
passes. In such a form of switch mechanism  
I apply my automatic controlling and regu-  
lating device to the shaft B or to a drum C  
thereon, the device itself (marked D in Figs.  
1 and 2) being shown in end elevation at Fig.  
3 drawn to a larger scale than the previous  
figures. The brake device, as shown at Fig.  
3, is composed of two levers D D', hinged to-  
gether at one end and embracing the drum  
C, which is fixed on the tappet-wheel shaft B,  
the inner sides of the levers D D' forming  
brake-blocks to act upon the said drum C,  
while the otherwise free ends of the levers  
are drawn together by a spring D<sup>2</sup>, the ten-  
sion of which can be adjusted. Such a brake  
device is maintained in its normal position  
by being balanced by means of springs or a  
counterbalance-weight, so that the whole  
brake device may have a small partial ro-  
tative movement and be returned to its nor-  
mal position by the accumulated power, as  
will be readily understood. In the construc-  
tion shown I connect the hinged end of the  
brake-lever arms D D' to two oppositely-act-  
ing balancing-springs E E, supported between



stationary supports E' E', whereby the said  
balancing-springs E E allow for the impact  
of the tappet and return the brake device  
back to its normal position, the latter device  
5 carrying with it the tappet-shaft B, and con-  
sequently the switch only receives as a re-  
sult of each tappet operation a certain and  
defined degree of rotative movement.

What I claim as my invention, and desire  
10 to secure by Letters Patent, is—

1. In an electrical switch for connecting  
and disconnecting an electrical circuit, and  
which is operated by a shaft, receiving step-  
by-step rotative motion by the impact of pass-  
15 ing tappets; the combination with the oper-  
ating-shaft; of a frictional brake, carried by  
and acting upon the shaft, and balancing de-  
vices to support the said frictional brake to  
prevent the latter completely rotating with  
20 the shaft, whereby the shock produced by  
the impact of the moving tappet is absorbed  
by the balancing devices, the latter after the  
tappet action returning the frictional brake  
to its normal position and the operating-shaft  
25 to the required position, by the power accumu-  
lated in the balancing devices, substantially  
as set forth.

2. In an electrical switch for connecting  
and disconnecting an electrical circuit, and  
30 which is operated by a shaft receiving step-  
by-step rotative motion by the impact of pass-  
ing tappets; the combination with the oper-  
ating-shaft, of brake-blocks held in frictional  
contact with the said shaft, means for adjust-  
35 ing the said brake-blocks to increase or de-  
crease the amount of frictional grip of the  
brake-blocks upon the shaft, and balancing  
devices to support the brake-blocks to pre-  
vent the latter completely rotating with the  
40 shaft, whereby the shock produced by the im-  
pact of the moving tappet is absorbed by the  
balancing devices, the latter after the tappet  
action returning the frictional brake to its  
normal position and the operating-shaft to  
45 the required position, by the power accumu-  
lated in the balancing devices, substantially  
as set forth.

3. In an electrical switch for connecting  
and disconnecting an electrical circuit, and  
which is operated by a shaft receiving step- 50  
by-step rotative motion by the impact of pass-  
ing tappets; the combination with the oper-  
ating-shaft, of brake-blocks held in frictional  
contact with the said shaft, means for adjust-  
55 ing the said brake-blocks to increase or de-  
crease the amount of frictional grip of the  
brake-blocks upon the shaft, and springs con-  
necting the brake-blocks to a stationary frame  
to prevent the brake-blocks completely ro- 60  
tating with the shaft, and whereby the shock  
produced by the impact of the moving tappet  
is absorbed, the springs after the tappet ac-  
tion returning the frictional brake to its nor-  
mal position, and the operating-shaft to the  
65 required position, by the power accumulated  
in the springs, substantially as set forth.

4. In an electrical switch for connecting  
and disconnecting an electrical circuit, and  
which is operated by a shaft receiving step- 70  
by-step rotative motion by the impact of pass-  
ing tappets; the combination with the oper-  
ating-shaft, of two brake-blocks upon oppo-  
site sides of the shaft and partly embracing  
same, a hinged connection coupling the brake-  
75 blocks together at one end thereof, and an  
adjustable connection coupling the brake-  
blocks at the other end thereof, and adapted  
by its adjustment to regulate the friction of  
the blocks upon the shaft; and balancing de-  
80 vices to support the said frictional brake to  
prevent the latter completely rotating with  
the shaft, and whereby the shock produced  
by the impact of the moving tappet is ab-  
sorbed by the balancing devices, the latter  
85 after the tappet action returning the fric-  
tional brake to its normal position and the  
operating-shaft to the required position, by  
the power accumulated in the balancing de-  
vices, substantially as set forth.

WILLIAM KINGSLAND.

Witnesses:

GRIFFITH BREWER,  
THOMAS WILLIAM ROGERS.