

W. KAISLING.  
 SWITCH MOVEMENT.  
 APPLICATION FILED MAR. 22, 1909.

959,944.

Patented May 31, 1910.

FIG. 1.

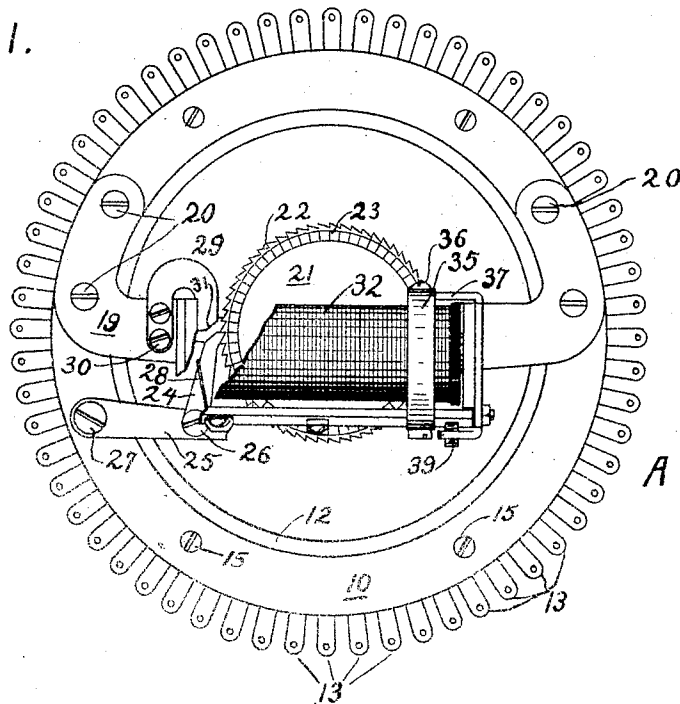
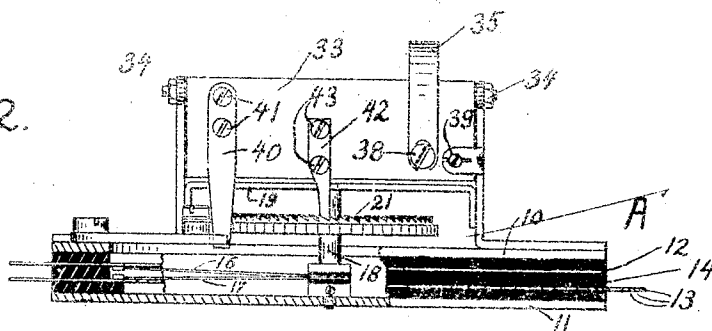


FIG. 2.



WITNESSES  
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INVENTOR  
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*By Thomas H. Ferguson*  
*Att.*

# UNITED STATES PATENT OFFICE.

WILLIAM KAISLING, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO  
KELLOGG SWITCHBOARD & SUPPLY COMPANY, A CORPORATION OF ILLINOIS.

## SWITCH-MOVEMENT.

959,944.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed March 22, 1909. Serial No. 484,991.

*To all whom it may concern:*

Be it known that I, WILLIAM KAISLING, a citizen of the United States, residing in Chicago, county of Cook, State of Illinois, have invented new and useful Improvements in Switch-Movements, of which the following is a specification.

The present invention consists of a novel combination of mechanical elements by which a driven member is advanced by a driving member only when the latter reaches a definite point in its driving movement.

It is especially applicable to electric switches of the type employed in telephone systems where the movable switch contacts are advanced step by step. In such devices, it is desirable to advance the contacts either a whole step, or not at all. In my invention, I provide means for accomplishing this. By its use, the driven member is locked against movement until the driving member has practically reached the end of its driving movement, whereupon the driven member is freed and allowed to advance one step.

The nature of the invention will be more fully understood upon reference to the following detailed description taken in connection with the accompanying drawing, and the scope of the invention will be particularly pointed out in the appended claims.

In the drawing, Figure 1 illustrates in plan a rotary switch of the type above referred to, constructed in accordance with my invention; Fig. 2 is a side elevation of the same with parts shown in central section.

Referring to the drawing in detail, A designates the switch-bank which is made up of a top ring 10, a bottom plate 11, a common contact 12, and a plurality of individual contacts 13 with suitable intervening insulation 14, the whole being secured together by any suitable means such as the screws 15. The movable contacts 16, 17 engage the adjacent sides of the contacts 12 and 13 so as to electrically unite the same. These movable contacts are suitably secured to the shaft 18 and are insulated therefrom. This shaft is journaled in the bottom plate 11 and in a yoke 19 which is secured to the top plate of the switch structure by any suitable means such as the screws 20. Upon this shaft, is mounted a driven member 21 which is provided with two sets of ratchet teeth 22 and 23. The former set is adapted to be engaged by a driving pawl 24 which is se-

cured to an arm 25 by a pivot 26, the arm 25 being in turn pivoted to the switch structure by a pivot 27. A spring 28, wrapped about the pivot 26 and bearing against the rear of the pawl 24, presses the latter into engagement with the teeth 22. A member 29, secured to the yoke 19 by screws 30, has an inclined face 31 against which the end of the pawl 28 is adapted to strike upon reaching the limit of its advance movement. A driving magnet 32 is secured to the upper side of the yoke 19. The armature 33 of this magnet extends lengthwise of the magnet and parallel to the driven member 21 and is secured at its upper edge by pivots 34 to the supporting structure. A semi-circular spring 35 is fixed by screws 36 to one end of the U-shaped member 37 and engages the armature 33 near its lower edge with a pin and slot connection 38. An adjustable stop 39, threaded through the U-shaped member 37, limits the return movement of the armature. A yielding connection is provided between the armature 33 and the driving pawl 24 by means of a leaf-spring 40 which is secured at its upper end to the armature by means of screws 41 and passes through a slot in the end of the arm 25 at its lower end, thereby providing a sliding connection with said arm. The armature 33 is also provided with a projecting member 42 which is secured to the armature by screws 43 and is shaped at its lower end so as to engage the ratchet teeth 23.

In operation, the energization of the magnet 32 attracts its armature and as the armature moves forward, it carries the projection 42 forward and at the same time places the leaf-spring 40 under tension. When the armature has reached a definite point in its forward movement, the stop 42 disengages the particular tooth 23 which it has previously been in engagement with and thereby frees the driven member 21 and allows it to advance under the pressure of the driving pawl 24, the latter being pressed by the actuated leaf-spring 40. When the member 21 has moved one step, the driving pawl 24 will come into engagement with the stop 29 and prevent further movement of the member 21. In this switch structure, one advance step of the member 21 will be sufficient to move the wiping contacts 16, 17 of the switch from engagement with one

set of bank contacts into engagement with the next adjacent set. Upon the return of the armature, the projection 42 engages the next tooth 23 of the driven member 21.

5 Although I have shown my invention in connection with an electric switch and in a structure in which the driving member is the armature of an electromagnet, it will be apparent that the same will be useful in  
10 other relations and in other devices. It will also be apparent that certain alterations and modifications may be made in the cooperating elements and their arrangements without departing from the spirit and scope of  
15 my invention. I therefore do not wish to be limited to the specific matter herein disclosed, but aim to cover by the terms of the appended claims all such alterations and modifications.

20 What I claim as new and desire to secure by Letters Patent of the United States is:—

1. In an electric switch, the combination  
25 of a movable member provided with a set of ratchet teeth, a driving pawl for engaging said teeth, a driving magnet, an armature for said magnet, a yielding connection between said armature and pawl, and means for locking said member against  
30 movement until said armature reaches a definite point in its movement.

2. In an electric switch, the combination  
35 of a movable member provided with a set of ratchet teeth, a driving pawl for engaging said teeth, an actuating member, a yielding connection between said actuating member and said pawl, and means for locking  
40 said movable member against movement until said actuating member reaches a definite point in its movement.

3. In an electric switch, the combination  
45 of a movable member provided with a set of ratchet teeth, a driving pawl for engaging said teeth, an actuating member, a yielding connection between said actuating member and said pawl, cooperating projections

on said movable member and said actuating member adapted to lock the former against movement until the latter reaches a definite point in its movement.

4. In an electric switch, the combination  
50 of a movable member provided with two sets of teeth, an actuating member, a driving pawl for the former yieldingly mounted on the latter, and operative to engage the  
55 teeth of one of said sets, and a projection on said actuating member operative to engage the teeth of said second set until said actuating member reaches a definite point in its movement.

5. In an electric switch, the combination  
60 of a movable member provided with two sets of teeth, a driving magnet, an armature for said magnet, a driving pawl for engaging the teeth of one of said sets, a spring connection between said armature and pawl,  
65 and a projection on said armature for engaging the teeth of said second set during a definite range of movement of said armature.

6. In an electric switch, the combination  
70 of a supporting frame, a movable member mounted in said frame and provided with two sets of teeth, a driving magnet mounted on said frame, an armature for said magnet,  
75 a driving pawl for engaging the teeth of one of said sets, a leaf-spring fixed to said armature and operatively engaging said driving pawl, and a projection on said armature  
80 for engaging the teeth of said second set during a definite range of movement of said armature, whereby said movable member is only actuated by the driving pawl when said armature reaches a definite point in its driving movement.

In witness whereof I hereunto sign my name this 17th day of March, 1909.

WILLIAM KAISLING.

Witnesses:

CAROLYN WEBER,  
LEROY D. KELLOGG.