

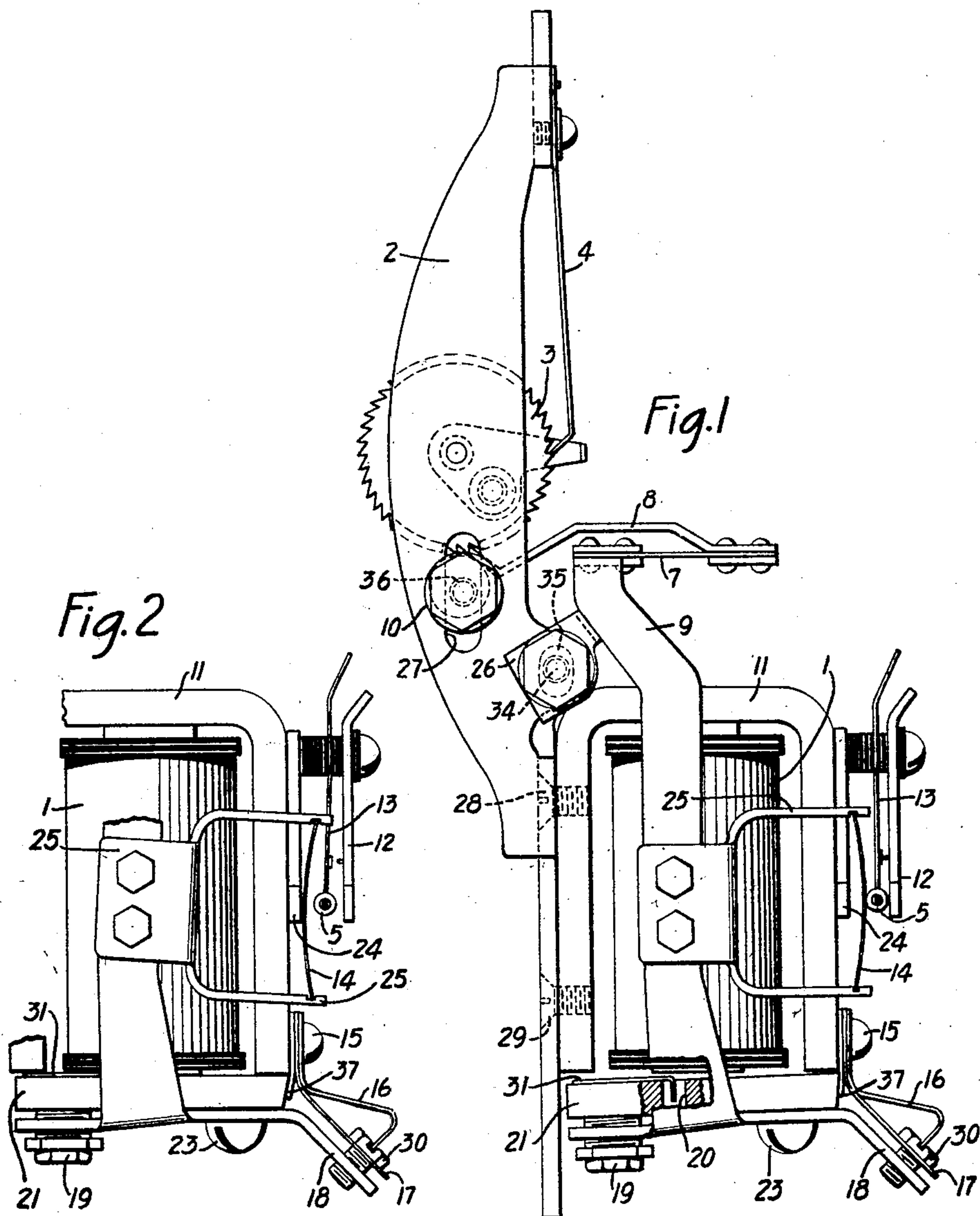
Jan. 3, 1928.

1,655,059

G. K. HESS

SELECTOR SWITCH

Filed March 31, 1926



Inventor:
George K. Hess
by J. G. Robertson Att'y

UNITED STATES PATENT OFFICE.

GEORGE K. HESS, OF NEWARK, NEW JERSEY, ASSIGNOR TO BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SELECTOR SWITCH.

Application filed March 31, 1926. Serial No. 98,716.

This invention relates to selector switches and particularly to switches of the step-by-step type using a motor magnet operating a ratchet and pawl.

5 The object of the invention is to improve the construction, operation, and dependability of switches of the foregoing character, and also to increase the power and facilitate manufacture and adjustment.

10 It has heretofore been the practice to interrupt the operating circuit of such switches by means of a set of springs which were opened directly by the movement of the driving arm of the switch. In this type of
15 switch it is desirable to delay the closing of the operating circuit until the driving arm has reached the end of its driving stroke and then to close this circuit quickly. The same is true with the back stroke in order
20 that the switch may be correctly positioned and the opening of the operating circuit not be delayed.

Accordingly a feature of the invention relates to the provision of a switch equipped
25 with a quick acting spring element arranged to operate at the end of the backward stroke of the driving arm to open the energizing circuit of the operating magnet, thus allowing said arm to step the switch forward one
30 step under the power of a suitable driving spring. As the driving arm nearly reaches the end of its driving stroke the quick acting spring element again operates to close the circuit of the magnet and the operation
35 is repeated.

Another feature of the invention relates to a construction wherein the armature is attached to the magnet yoke by a motor spring in such a manner that the air-gap
40 may be adjusted without altering the relationship of the driving arm to the ratchet wheel of the switch.

Other objects and features of the invention will appear in the detailed description.

45 Fig. 1 shows a side view of the switch in its normal position.

Fig. 2 shows a side view of the driving magnet and the armature in their operated position.

50 The switch is composed of a main frame 2 on which is mounted a U shaped yoke 11 by means of screws 28 and 29, to which motor magnet 1 is attached. The armature for magnet 1 is shown at 21 and is connected
55 to the yoke by means of a hinged joint

formed by springs 17 and 37 and metal strip 18. Strip 18 is attached to the armature by means of screw 23 and spring 17 is attached to the yoke by means of screw 15. The strip 18 and spring 17 are joined together by means of screw 30. This screw is used to vary the tension of spring 17 in relation to strip 18 and a small nickel-silver strip 16 is provided to hold screw 30 in position. The armature is held in position by
60 motor spring 17 and pivots against spring 37. The relationship between the armature and strip 18 may be varied by means of screw 19.

The arm 9 is the motor arm of the switch
70 and is a continuation of strip 18. Mounted on arm 9 is a U shaped piece 25 which carries a bow spring 14 and forms a delayed contact mechanism with contact springs 12 and 13. When the switch is normal spring
75 14 is in the position shown in Fig. 1. As the armature 21 is attracted by the motor magnet 1, arm 9 starts on its back stroke. When this stroke is almost finished, the bow spring is snapped into the position shown
80 in Fig. 2 by means of the hard rubber roller 5 against which it was forced by the movement of arm 9. This action allows springs 12 and 13 to open and break the operating circuit of motor magnet 1 which thereby
85 releases armature 21. Armature 21 is protected from possible freezing to the pole pieces by means of a non-magnetic strip of metal 31 which is held in place on the armature by means of lugs which fall into hole
90 drilled in the armature. This freezing would have a tendency to slow up the operation of the switch. The springs 12 and 13 remain open until the driving pawl has nearly reached the end of its driving stroke
95 at which time the lug 24 causes the spring 14 to snap back to its normal position thereby closing contacts 12 and 13 and preparing the switch for its next cycle.

The arm 9 has a spring 7 riveted to its
100 top to which is riveted a pawl 8. As the armature 21 is attracted by magnet 1, the arm 9 causes pawl 8 to draw away from ratchet 3. Spring 7 causes the pawl to snap up to the next tooth of ratchet 3 and when
105 the armature is released the arm 9 causes the pawl to step the ratchet one step. The arm 9 is kept from moving too far on its driving stroke by means of back stop 26 which is mounted on frame 2 and may be
110

adjusted with relation to arm 9 by means of slot 35 and screw 34. Bushing 10 is also mounted on frame 2 by means of screw 36 and slot 27 in which it may be adjusted thereby limiting the action of pawl 8 and keeping it in engagement with ratchet 3 at all times.

What is claimed is:

1. In a selector switch, a motor magnet, an armature to which is connected a driving arm, a yoke or said magnet, a lug on said driving arm, a spring connected to said yoke, and adjustable means for interconnecting said lug and said spring.

2. In a selector switch, a motor magnet, an armature to which is connected a driving arm, a yoke for said armature, a lug on said driving arm, a spring connected to said yoke, and adjustable means for interconnecting said arm and said spring and for varying the relationship between said yoke and said armature.

3. In a selector switch, a driving arm, a set of contact springs, a delayed contact con-

trolling device mounted on said driving arm, and means to actuate said delayed device to force said contact springs closed until the driving arm is near the end of its back stroke.

4. In a selector switch, a driving arm, a set of contact springs, a delayed contact controlling mechanism comprising a bowed spring mounted on said driving arm, and being actuated by the movement of said driving arm to close said contact springs when said arm is near the end of its driving stroke.

5. In a selector switch, a driving arm, a set of contact springs, a delayed contact actuating mechanism comprising a bowed spring mounted on said driving arm being actuated in the direction of the springs by the movement of said driving arm to open said contact springs when said arm is near the end of its back stroke.

In witness whereof, I hereunto subscribe my name this 29th day of March A. D., 1926.

GEORGE K. HESS.