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H. H. RUGG

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SWITCH MECHANISM

Filed May 14, 1927

Fig. 1.

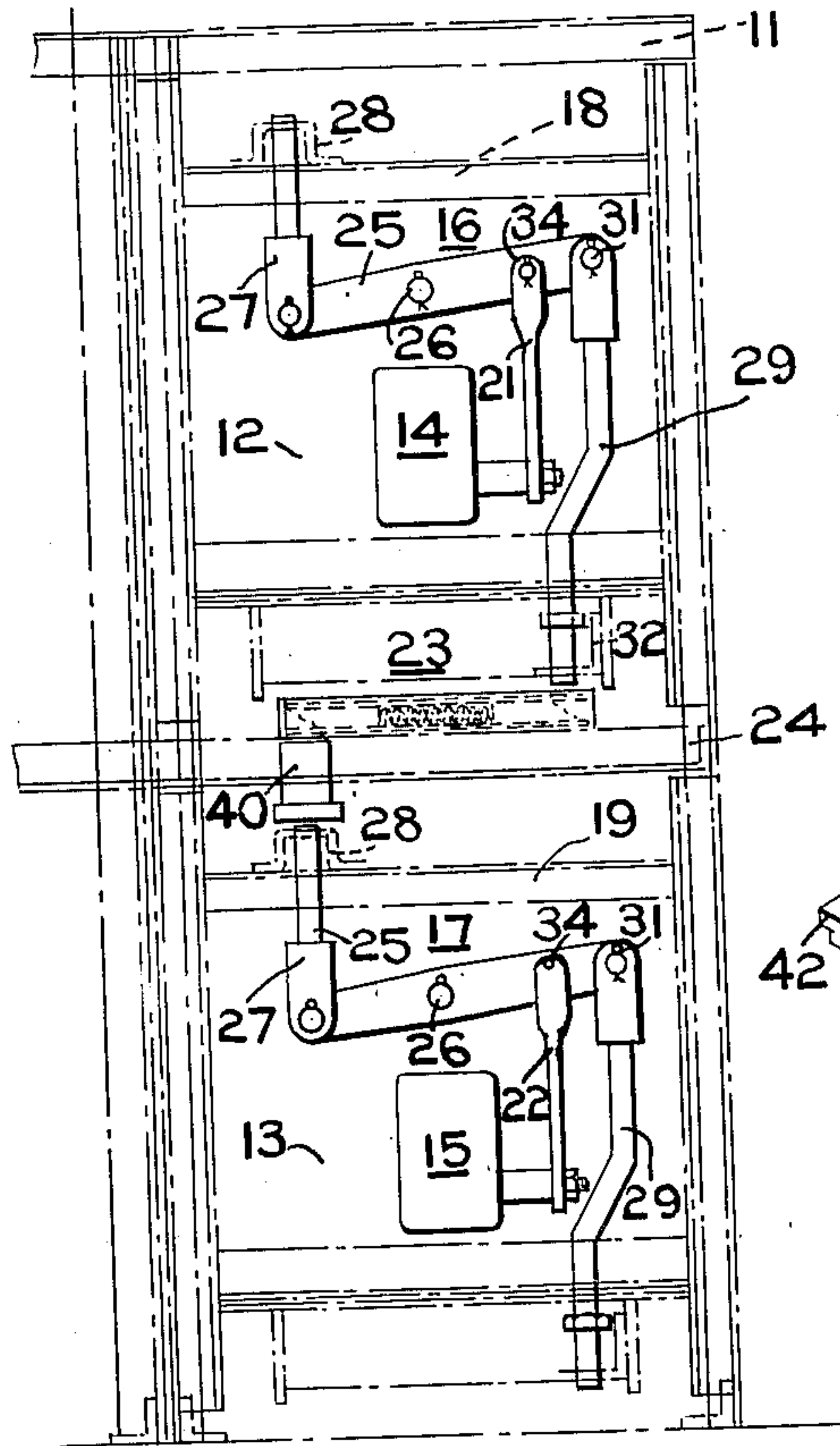


Fig. 4.

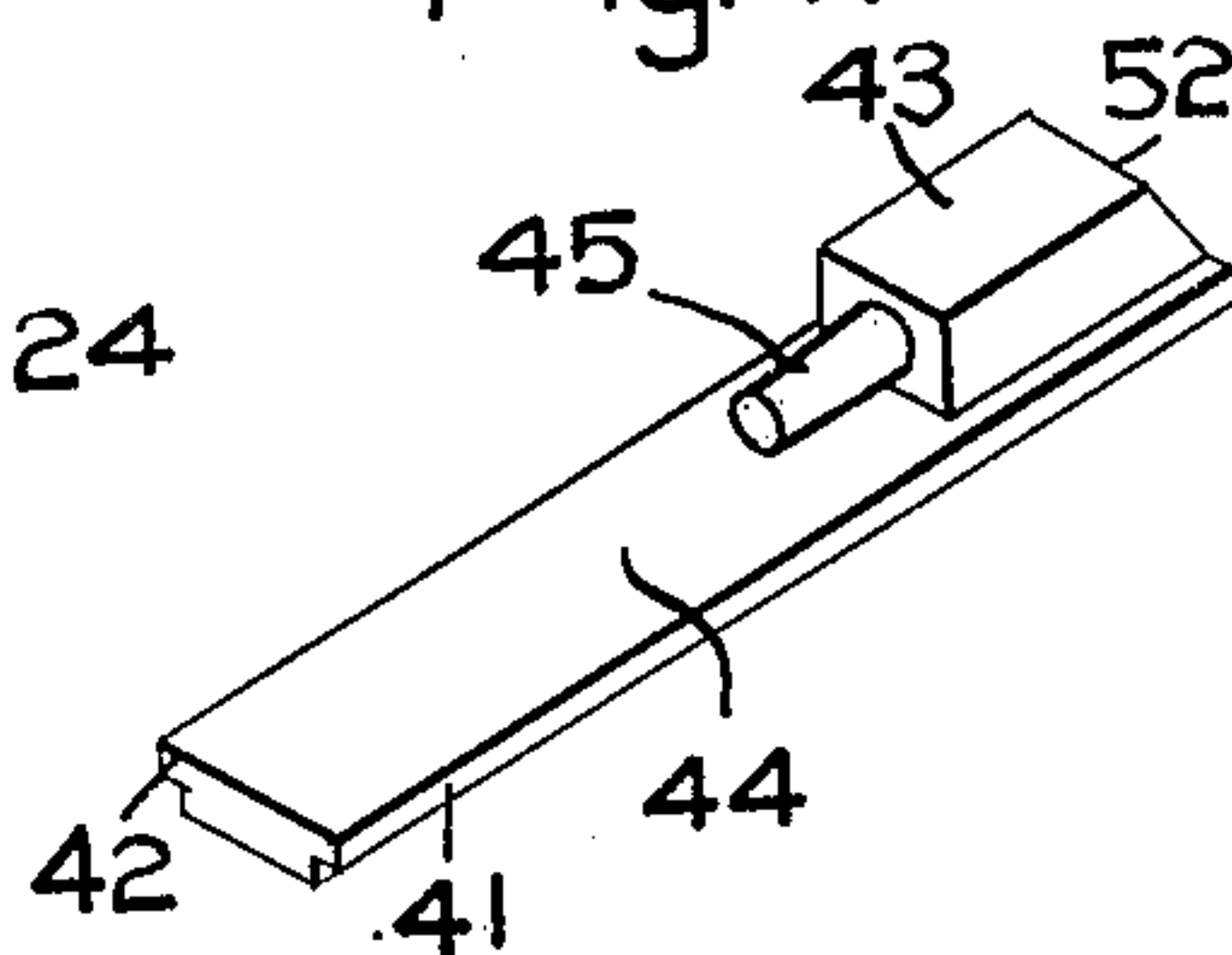


Fig. 2.

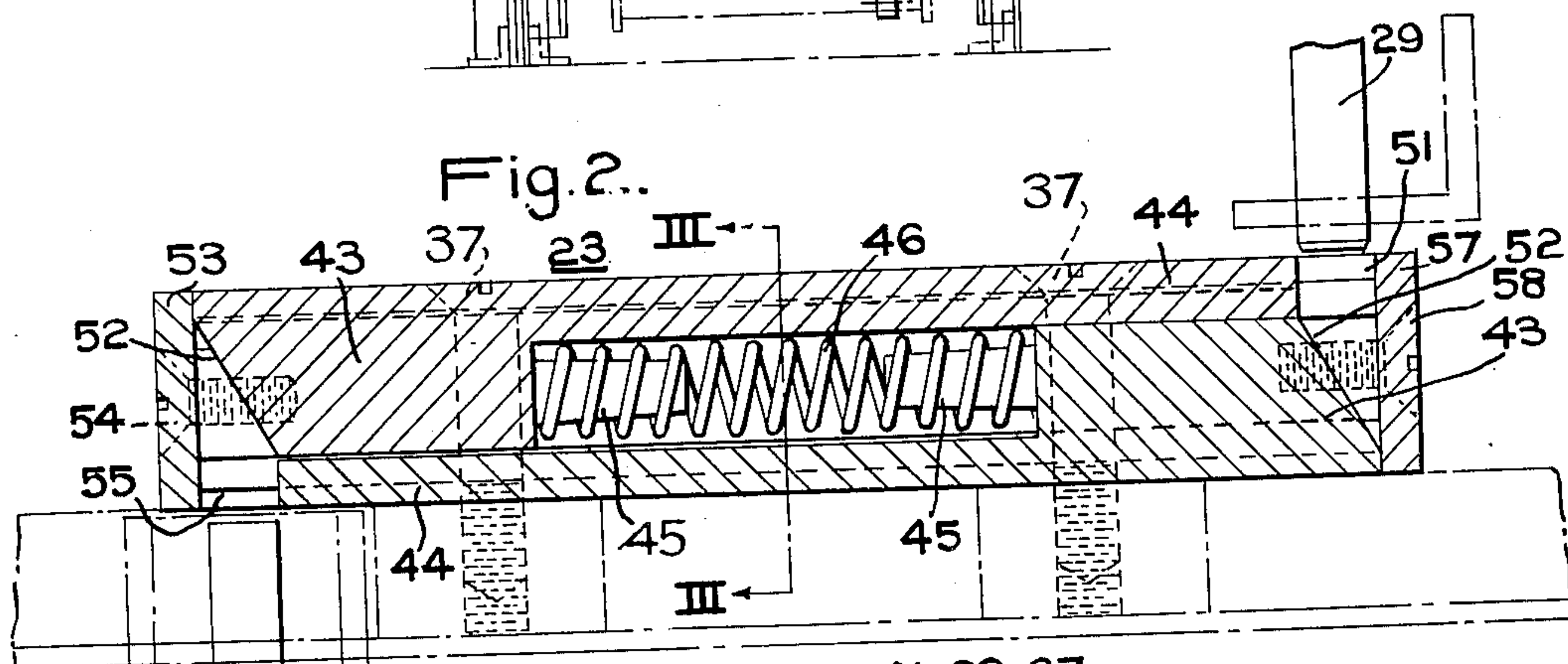
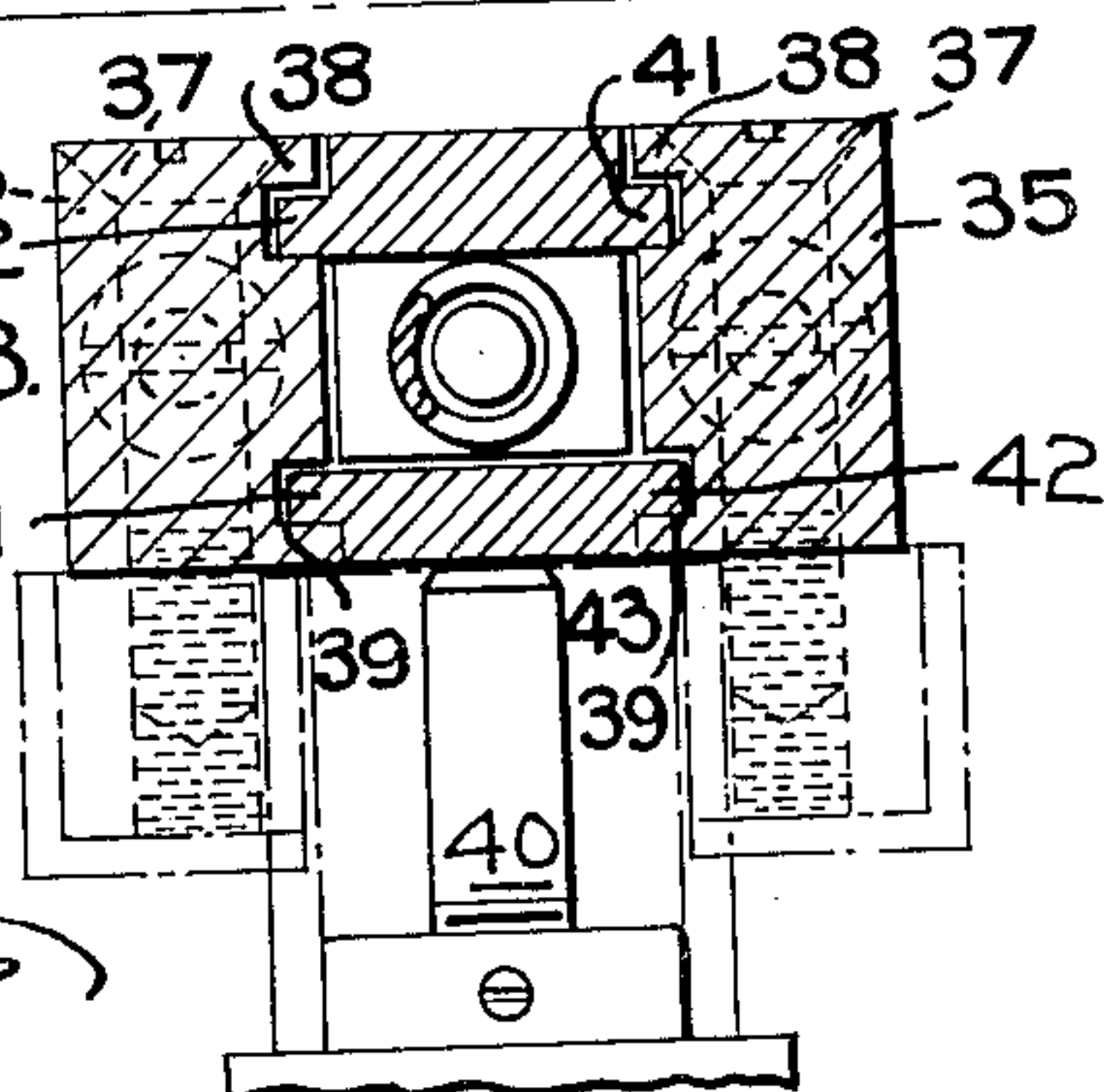


Fig. 3.



WITNESSES:

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SWITCH MECHANISM

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My invention relates to switch mechanisms, and particularly to switch mechanisms of the cell type.

One object of my invention is to provide a switch mechanism comprising a structure having a pair of compartments, circuit breakers disposed in each compartment, and means associated with the circuit breakers that shall positively prevent the circuit breakers from being closed at the same time.

Another object of my invention is to provide a switch mechanism comprising a structure having a pair of compartments therein, a circuit breaker disposed in each compartment, and a mechanical connection for each circuit breaker for predetermining the closing movement of the circuit breaker.

Another object of my invention is to provide a switch mechanism comprising a structure having a pair of compartments therein, a circuit breaker disposed in each compartment, each circuit breaker being provided with a mechanical connection for cooperating with the stationary structure that shall predetermine the opening or closing movement of the circuit breakers.

Another object of my invention is to provide a switch mechanism of the above type wherein the circuit breakers and the mechanical connection therefor are interchangeable.

It is a further object of my invention to provide a switch mechanism comprising a pair of structures, a circuit breaker disposed in each structure, and a mechanical connection for cooperating with the circuit breakers that shall positively prevent simultaneous closing of the circuit breakers.

These and other objects that may be made apparent throughout the further description of my invention are attained by the apparatus hereinafter described and illustrated in the accompanying drawing, wherein,

Figure 1 is a front elevational view of a switch mechanism comprising my invention,

Fig. 2 is an enlarged sectional detail view of a portion of the structure embodying my invention,

Fig. 3 is a sectional view taken along the line III—III of Fig. 2, and

Fig. 4 is perspective view of an element comprised in my invention.

My invention comprises, in general, a stationary structure having an upper and lower compartment, a circuit breaker disposed in each compartment, and a mechanical connection disposed on each circuit breaker and adapted to cooperate with a member disposed on a partition in the stationary structure which separates the two compartments, to prevent the closing movement of either circuit breaker so long as the other circuit breaker is closed.

Referring to the drawing, I provide a stationary structure 11, having upper and lower compartments 12 and 13, circuit breakers 14 and 15 disposed in the compartments 12 and 13, respectively, and mechanical connections 16 and 17 disposed on the circuit breaker supporting struts 18 and 19, respectively, and adapted to cooperate with the circuit breaker handles 21 and 22 as will be hereinafter described.

A lock mechanism 23 is provided on the partition 24 of the stationary structure for cooperating with the mechanical connections 16 and 17 for preventing the circuit breakers 14 and 15 from being closed at the same time.

The mechanical connections 16 and 17 are identical, each comprising a center member 25, pivotally mounted on the circuit breaker frames 18 and 19 by any suitable means, such as pivots 26, and having an arm 27 pivotally connected to its left end, the arm 27 being guided at its upper end by any suitable means, such as 28, on the circuit breaker supporting frames 18 and 19. The member 25 is also provided with an arm 29 pivotally connected to its right end by any suitable means, such as pivot 31, the arm 29 extending downwardly and through guides, such as 32 disposed on the circuit breaker frames 18 and 19. The circuit breaker handles 21 and 22 are pivotally connected to the member 25 adjacent the pivots 31 by any suitable means, such as pivots 34. It can be seen from the drawing that as the circuit breaker handles 21 or 22 are raised or lowered, the corresponding member 25 is

turned about its pivot 26; and as the arms 29 are fastened to the members 25 at their right ends, they are moved up and down simultaneously with the circuit breaker handles 21 and 22.

The lock mechanism 23 is best understood by referring to Figs. 2, 3 and 4. I provide side members 35 and 36 that are fixed to the partition 24 by means of screws 37. The side members 35 and 36 are provided with grooves 38 and 39 that are adapted to receive the tongue portions 41 and 42 of a bolt member 43.

The bolt member 43 is provided with a tail piece 44 having tongue portions 41 and 42. The bolt member 43 is also provided with a lug 45 for cooperating with a spring 46, the purpose of which will be hereinafter described.

As stated above, a pair of bolt members 43 form the top and bottom sides of mechanism 23 and have their respective tongue portions 41 and 42 arranged to slide within the grooves 38 and 39 of the side pieces 35 and 36.

In the operation of my invention, upon moving the circuit breaker 14 to its closed position, the handle 21 is moved downward, thereby carrying the arm 29 in a downward direction. The lower end of the arm 29 is adapted to enter the opening 51 of the lock mechanism 23, and to strike the bevelled face 52 of the bolt member 43, thereby sliding the member 43 to the left in the grooves 39 until the left end of the tail piece 44 of the cam member 43 is pressed against an end piece 53 that is fastened to the side members 35 and 36 by means of screws 54. This closes the opening 55 of the lock mechanism 23, and thereby prevents the upward movement of the arm 27 of the mechanical connection 17 which is adapted to cooperate with the circuit breaker 15 in the same way as the mechanical connection 16 cooperates with the circuit breaker 14 above described. This prevents the closing of the circuit breaker 15 so long as the circuit breaker 14 is in its closed position.

Upon moving the circuit breaker 14 to its open position, the arm 29 is moved upward and the bolt member 43 disposed in the grooves 39 of the side members 35 and 36 is moved to the right by means of the spring 46 thereby moving out of the opening 55. Thereupon the arm 27 of the mechanical connection 17 is free to be moved upward carrying bar 40, which is disposed on the partition 24 into the opening 55 of the lock mechanism 23 whenever the circuit breaker 15 is closed. If the upper end of the arm 27 of the mechanical connection 17 is moved upward by closing the circuit breaker 15, it engages the member 40 which presses against the cam face 52 of the bolt member 43 disposed in the slots 38 of the

side members 35 and 36, and moves it to the right until the right end of the tail piece 44 presses against an end piece 57 that is fastened to the right end of the side members 35 and 36 by means of screws 58. This positively prevents the closing of circuit breaker 14 by preventing the downward movement of member 29.

The spring 46, being disposed between the oppositely disposed bolt members 43 and held in place by lugs 45, is compressed as the arms 27 or 29 move their respective bolt members 43 to the right or left, as the case may be. It can be seen from the drawing that upon removing the member 40 or arm 29 from the respective openings 55 or 51 the associated bolt member 43 is moved back to the position shown in Fig. 2 of the drawing, by the spring 46, thus leaving the openings 55 and 51 open so long as both circuit breakers are in an open position.

Upon closing either circuit breaker, the associated bolt member 43 closes the opening associated with the mechanical connection of the other circuit breaker, positively preventing it from closing so long as the other circuit breaker is in a closed position.

Arms 27 and 29 are provided on both the mechanical connections 16 and 17 for rendering the circuit breakers and their structures interchangeable between the two compartments; that is to say, the arm 27 of the mechanical connection 16 serves to cooperate with the lock mechanism 23 when the circuit breaker 14 is inserted in the lower compartment, and likewise, the arm 29 of the mechanical connection 17 cooperates with the lock mechanism 23 when the circuit breaker 15 is disposed in the upper compartment.

It can be seen from the drawing that lock mechanism 23 is fixed to the stationary structure and that when the arm 29 of the mechanical connection 16 is in engagement with the lock mechanism, by closing the circuit breaker 14, that the circuit breaker is prevented from being separated from the stationary structure so long as the circuit breaker 14 is closed. Also, the arm 27 of the mechanical connection 17 serves to prevent the separation of the circuit breaker 15 from the stationary structure, so long as the circuit breaker 15 is in a closed position.

While I have illustrated and described but one embodiment of my invention, it will be apparent to those skilled in the art that the compartments may be placed in side-by-side relation and the mechanical connections re-arranged to serve the purpose of my invention without departing from the spirit and scope of the appended claims.

I claim as my invention:

1. In combination with a pair of members to be actuated each having a stop thereon, an interlock mechanism disposed therebetween having slidable means for closing an open-

ing adjacent each stop, a spring adapted to retain the slidable means in disengaged position and means for moving one of the slidable means to close the opening of the stop of one of the members when the stop of the other member has been actuated into its said opening.

2. The combination with a pair of circuit interrupters having stop members on the operating mechanism thereof, of an interlock mechanism comprising a pair of slidable members one of which is adapted to be moved into the path of one of the said stop members and actuated by the movement of the other stop member during the movement of its operating mechanism.

3. The combination with two cells for receiving containers for electrical equipment, of a pair of containers including circuit interrupters, interlocking means associated with said cells and means on the containers so associated with the said interlocking means that the one container is locked in position when its circuit interrupter is actuated to closed position and the other circuit interrupter is prevented from being actuated thereafter.

4. The combination with two cells for receiving containers for electrical equipment, of a pair of containers including circuit interrupters, interlocking means associated with said cells and means on the containers so associated with the said interlocking means that one container of a pair is locked in position when its circuit interrupter is actuated to closed position and the other circuit interrupter of the pair is prevented from being actuated thereafter and its container prevented from being latched in its cell.

In testimony whereof, I have hereunto subscribed my name this 5th day of May 1927.

HAROLD H. RUGG.

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