Nov. 9, 1926. 1,606,121

J. B. GURY, JR

ELECTRIC SWITCH

Filed Oct. 27, 1924

Fig. 1.

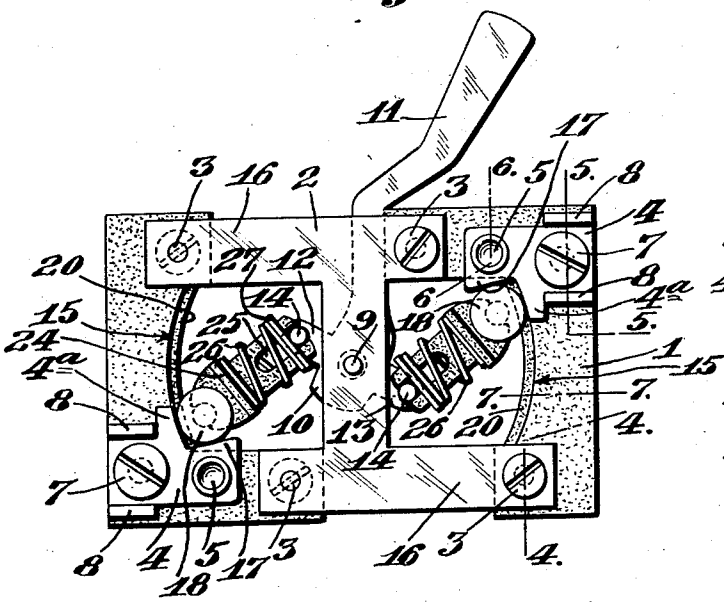


Fig. 2.

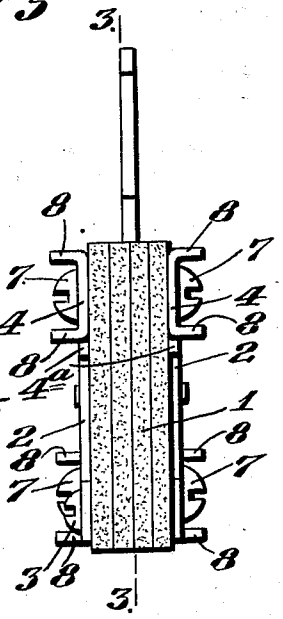


Fig. 3.

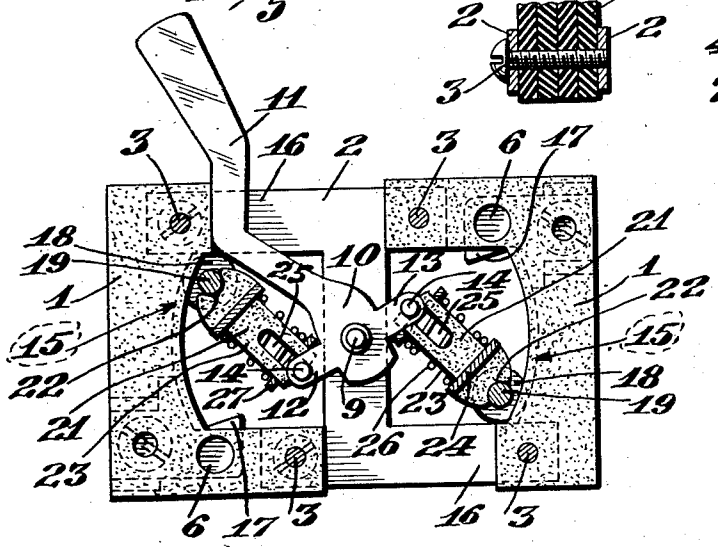


Fig. 4.

Fig. 5.

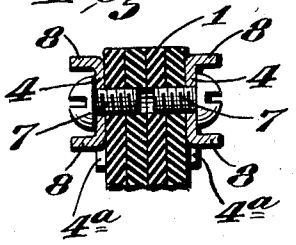


Fig. 6.

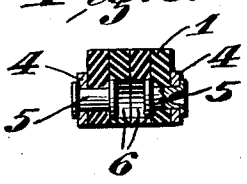
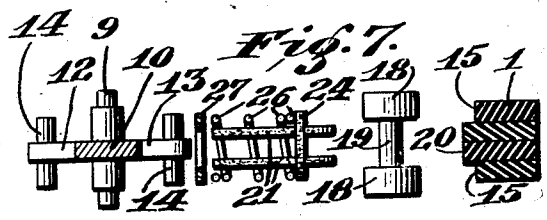


Fig. 7.



Inventor:
John B. Gury, Jr.,
By George A. Pennington
his Atty.

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UNITED STATES PATENT OFFICE.

JOHN B. GURY, JR., OF ST. LOUIS, MISSOURI.

ELECTRIC SWITCH.

Application filed October 27, 1924. Serial No. 746,062.

This invention relates to electric switches and more particularly to a switch for multiple circuits and whose switching elements are operated simultaneously from a single operating element. It has for its objects to produce a simple, compact and durable structure which is highly efficient and will meet the regulations and requirements as to safety, etc. Other objects and advantages to be attained will hereinafter more fully appear in the following specification.

The invention consists in the parts and combinations and arrangements of parts hereinafter described and afterwards pointed out with particularity in the appended claims.

In the accompanying drawings forming part of this specification and illustrating a practical adaptation of the invention,—

Figure 1 is a side elevation of the switch structure complete, the switching elements being shown in contact with the circuit terminal elements;

Figure 2 is an end elevation;

Figure 3 is a longitudinal section taken substantially on the line 3—3 of Figure 2, the switching elements being shown in the off contact position;

Figure 4 is a fragmentary section on the line 4—4 of Figure 1;

Figure 5 is a fragmentary section on the line 5—5 of Figure 1;

Figure 6 is a fragmentary section on the line 6—6 of Figure 1; and

Figure 7 is a view showing details of the several parts of the switching and actuating elements detached, and a fragmentary section of the insulator body on the line 7—7 of Figure 1.

Referring now to the drawings, the numeral 1 designates the end members of the supporting body of the switch, the same being substantially L-shape and preferably built of layers or laminations of sheets of pressed fiber or other suitable insulation material. These end members are attached to intermediate frame members 2 of substantially H-shape and made of metal or any material possessing the required rigidity. There are two of the frame members 2, one being placed on each side of the members 1, and each has two diagonally opposite legs shorter than the other two, by which shape and arrangement the necessity for making the parts in rights and lefts is obviated.

The members 1 and 2 are clamped securely together by screw-bolts 3. Terminal plates 4 are secured on opposite sides of the members 1, as by rivets 5 which secure said plates to the outer layers only (see Figure 6), there being openings 6 in the two intermediate layers to prevent contact of the two opposed rivets and afford ample air gap between them. The plates 4 are further secured to the members 1 by the screws 7 which serve as binding screws for the terminals of the circuit wires, and said plates preferably have retaining or guard flanges 8 on opposite sides of said screws 7. Of course, the inner ends of the screws 7 have an ample gap between them (see Figure 5).

Hinged, as at 9, between the members 2, is an actuator member 10 having an operating handle 11. This member 10 has a cross head affording two oppositely disposed arms 12 and 13, each of which latter having a cross pin 14 protruding on opposite sides thereof. The relative arrangement of the handle portion 11 and arms 12, 13, is such that when the handle is at the extreme limit of its stroke in either direction (see Figures 1 and 3) the arms 12, 13, are diagonally disposed and at substantially the same angularity in both of said positions.

The end members 1 of the supporting body of the switch have arcuate portions 15 constituting trackways for the switching elements, said trackways extending from the longer leg members 16 of the intermediate frame members 2 of the body to the terminal plates 4, the portions 4^a of which latter are substantially flush with or tangential to the trackways, while the portions 17 overhang the trackways and afford stops for the switching elements in electrical contact therewith as will presently appear.

The switching elements each comprise a roller of brass or other metal of electrical conductivity, said roller being annularly grooved between its ends affording a pair of heads 18 constituting the roller proper and a connecting neck or shank 19. The portions 18 ride on the arcuate trackways 15 of the members 1, and straddle a bead or rib 20 extending longitudinally of said trackways at the middle thereof (see Figures 1 and 7), ample clearance being provided between said bead or rib and the neck portion 19 of the roller.

The switching elements each further comprise two parallel like members 21 of compressed fiber or other suitable non-conduct-

ing material. These members 21 have tapered or rounded end portions with notches 22 to engage and afford bearings for the neck portion 19 of the roller. Adjacent to the above noted end portions the members 21 have shoulders afforded by reducing their width for the remainder of their length, as at 23, and said reduced portions are projected through slots provided therefor in a disk 24 which bears against said shoulders and serves to tie said members 21 together but in spaced relation to each other. The spaced members 21 receive the arms 12, 13, between them and they are bifurcated, as at 25, to receive the cross pins 14 which work in the slots with just an easy sliding fit. Coiled loosely about the members 21 is a spring 26 which is always under compression between the disk 24 and a washer 27 slidably fitted on the reduced portions of the members 21 and abutting the cross pins 14.

By having the trackways 15 curved on a radius from the axis of the pivot of the actuator 10 and owing to the arrangement of the spring-pressed switching elements between said trackways and the cross pins 14 of the arms 12, 13, the rollers 18 are held to the trackways both during the actuation of the arms 12, 13, and when said arms reach the limits of their strokes in either direction and in which positions of said arms the rollers are either in contact with the terminal plates 4 or the frame members 2, as the case may be.

When the head portions 18 of the roller of the switching element engage the portions 4^a and 17 of the terminal plates 4 an electrical cross connection is effected between the correlated pair of said plates, thereby closing the circuit. When the roller is moved out of contact with said plates the circuit is, of course, broken.

The novel construction and arrangement of the switch is such that both switching elements are shifted from one extreme position to the other at the same time by the operation of the single lever handle 11. So, too, by having the switching elements arranged in tandem instead of side by side, a relatively narrow body is produced without materially increasing the length thereof. That is, a double-throw switch structure is produced which takes up no more room than the usual single-throw switch of the same type. Furthermore, the structure is such that economy of manufacture is attained and assembly greatly facilitated.

Obviously, the structure admits of considerable modification without departing from the spirit of the invention. It is, therefore, not limited to the specific form shown.

What is claimed is:

1. An electric switch comprising a body frame comprising end members of insulation material at its opposite ends having opposed arcuate trackways thereon, terminal contact members arranged in pairs at one end of each of said trackways, each correlated pair of said terminal contact members being normally void of electrical connection with each other, switching elements each comprising a spring-pressed roller of electrical conductivity operable on the respective trackways, the end portions of said rollers being adapted to bridge a pair of said terminal contact members, and a single operating lever arranged and adapted to effect the actuation of said switching elements simultaneously in either direction on their respective trackways.

2. In an electric switch, a body frame having two opposed, arcuate, trackways of insulation material, a pair of like, spring-pressed, switching elements, each comprising a roller of electrical conductivity and operable on one of said trackways, a correlated pair of normally disconnected terminal contact members at one end of each of said trackways, portions of said terminal contact members affording contiguous extensions of said trackways and stops for said rollers of said switching elements whereby to be engaged and bridged by the respective rollers, and a single operating lever hingedly mounted midway between said trackways and having oppositely disposed arms in engagement with said switching elements whereby to actuate said elements simultaneously in either direction on said trackways.

3. In an electrical switch of the character described, a pair of oppositely-disposed trackways and a single operating lever midway between them in tandem relation, a correlated pair of terminal contact members at one end of each of said trackways, said contact members being normally void of electrical connection with each other, the correlated pair of said contact members on the one trackway being diagonally opposed to the pair on the other trackway, and a pair of diagonally opposed, like, spring-pressed, switching elements interposed between said trackways and said single operating lever, whereby to be actuated by said lever simultaneously in either direction but in opposite directions relative to each other, said switching elements each comprising a roller operable on its adjacent trackway, said rollers being of electrical conductivity and capable of bridging and electrically connecting the respective correlated pairs of terminal contact members on the respective trackways.

4. In an electrical switch of the character described, a rectangular body frame comprising a pair of spaced, parallel, substantially H-shape, intermediate members, two diagonally-opposite legs of each of which are shortened, two opposed, reversely-ar-

ranged, substantially L-shape end members of material of electrical non-conductivity, said end members being clamped between the end portions of said intermediate frame members, said end members having arcuate trackways in longitudinally-opposed relation with respect to the frame, a correlated pair of normally disconnected terminal contact members on said end members at one end of each of said trackways in diagonally-opposed relation, a diagonally disposed operating lever pivotally mounted between said intermediate frame members and centrally of the cross-bars thereof, said lever having oppositely-disposed cross-arms assuming an angularity of the same degree diagonally with respect to said body frame in the extreme reversely operated positions of said lever, spring-pressed switching elements interposed between said lever cross-arms and said trackways, said switching elements normally extending diagonally from said cross-arms to the ends of the respective trackways and having rollers at their ends operable on said trackways under the spring pressure of said switching elements and being shiftable from one end to the other of the respective trackways by the shifting of said lever cross-arms from one extreme operated position to the other.

5. In an electrical switch of the character described, a body frame comprising opposed end members of material of electrical non-conductivity, said end members having longitudinally opposed trackways on their inner portions, diagonally opposed terminal contact members on said end members at the ends of said trackways, reversely acting, diagonally opposed switching elements operable on said trackways, and a single operating device arranged in tandem relation with said trackways and said switching elements and being capable of simultaneously actuating said switching elements in opposite directions.

JOHN B. GURY, JR.