

Nov. 17, 1931.

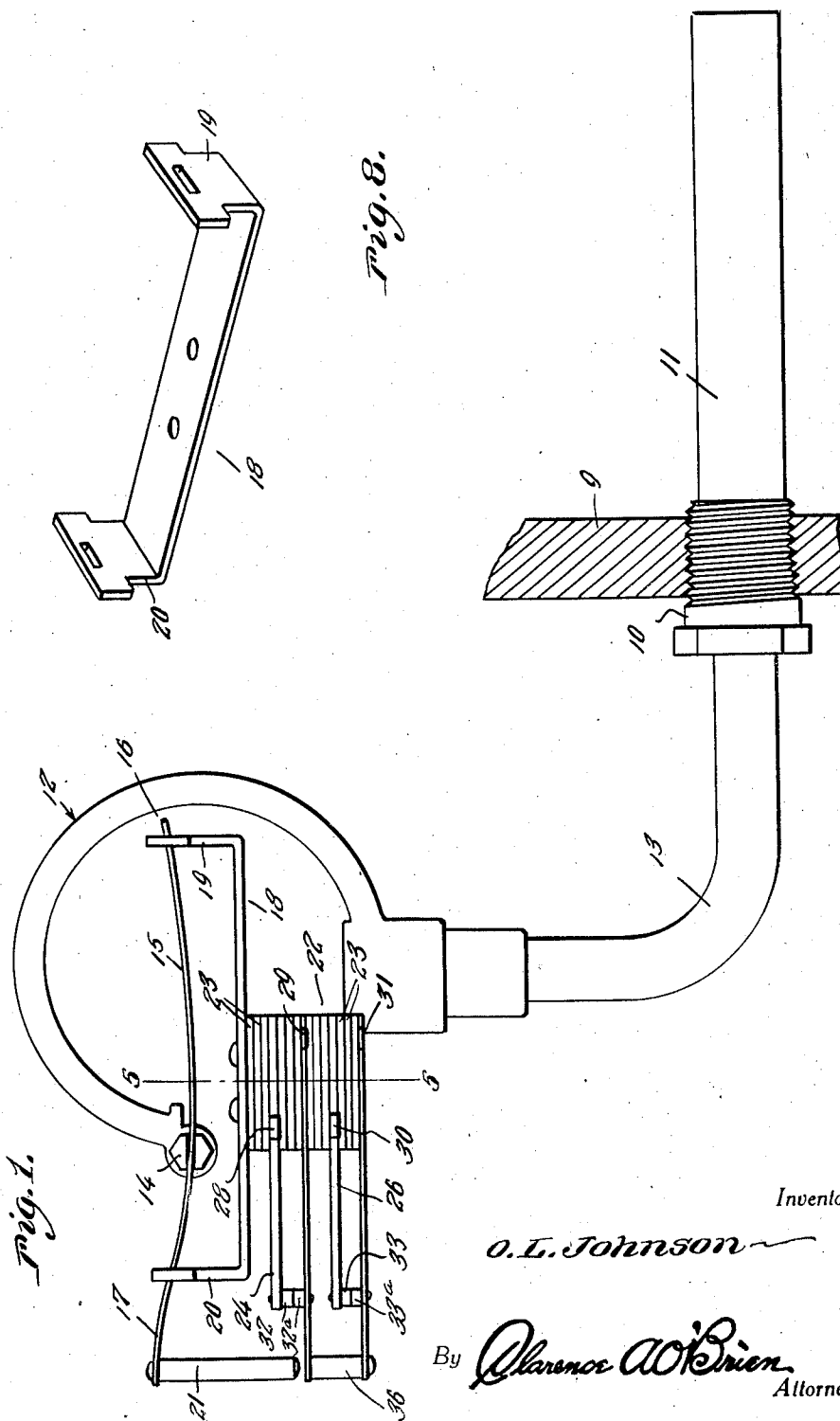
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1,832,779

ELECTRIC SWITCH

Filed June 18, 1930

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

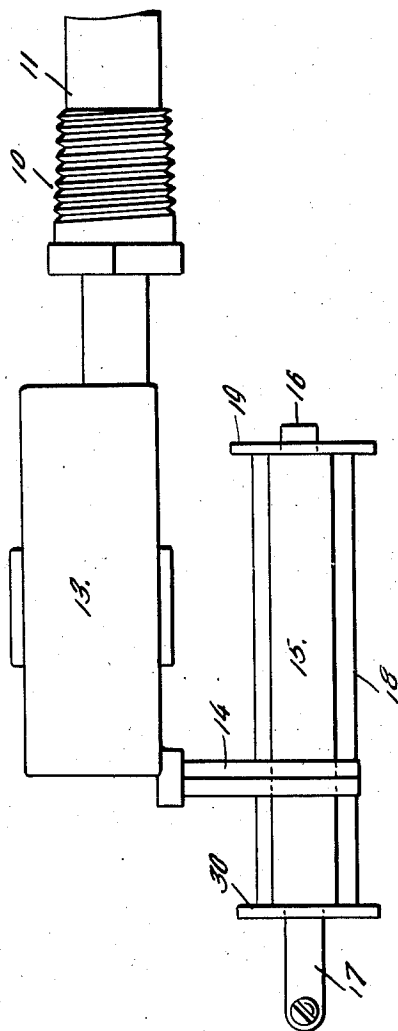


Fig. 2.

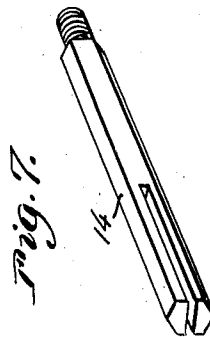


Fig. 7.

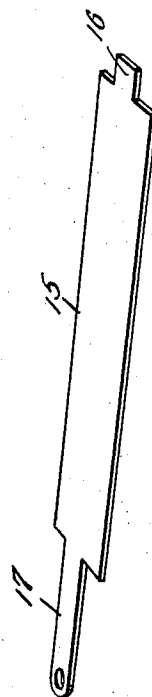


Fig. 6.

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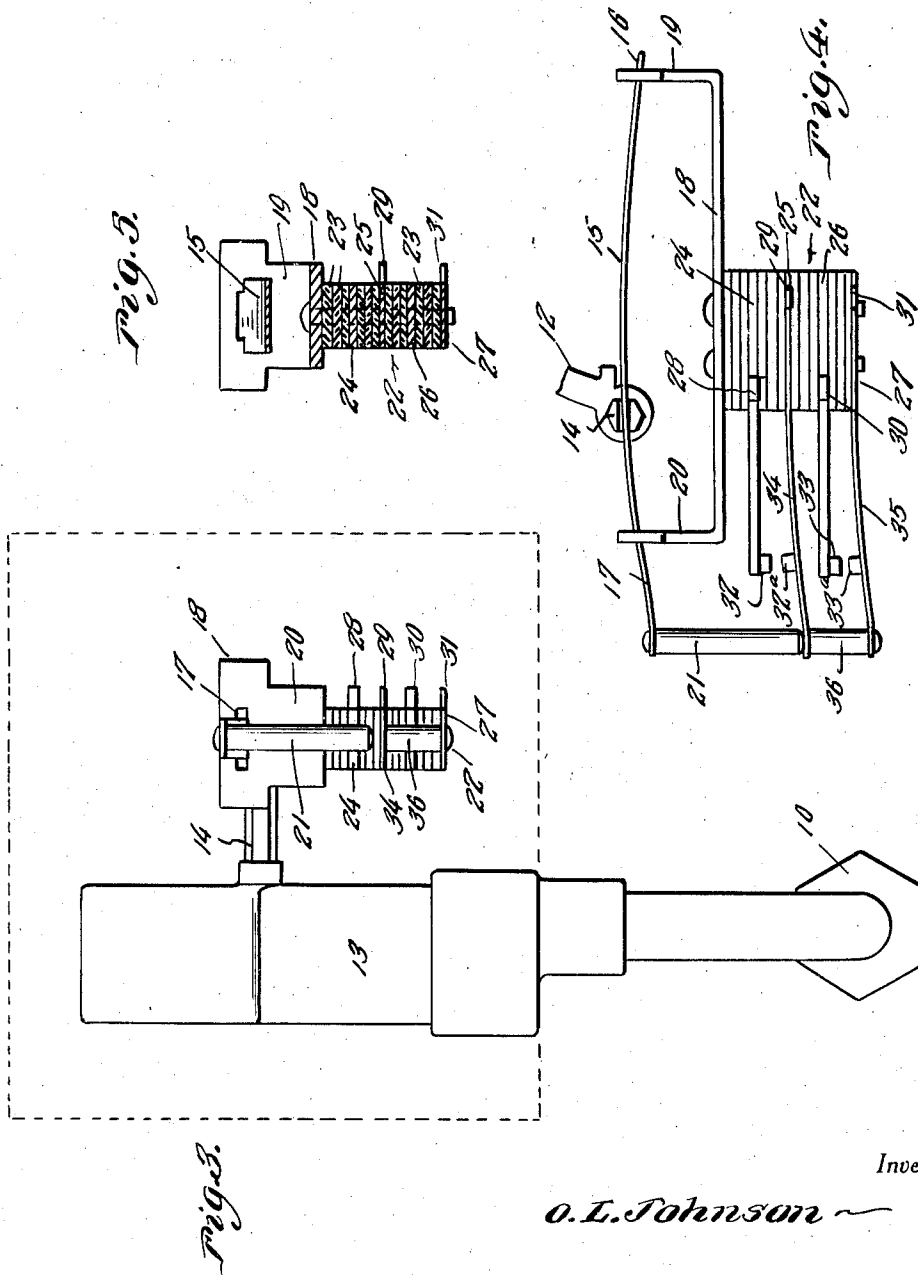
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ELECTRIC SWITCH

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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ELECTRIC SWITCH

Application filed June 18, 1930. Serial No. 462,035.

This invention relates to an electrical appliance which may be generally referred to as a switch and it has more particular reference to a duplex circuit make and break device embodying a plurality of sets of cooperable contacts and quick acting operating means therefor.

The primary purpose of the invention is to provide a simple, economical, and dependable structure which will either close or open an electric circuit with a sudden snap thus avoiding the objectionable arcs now prevalent in devices of this class.

Considered in the singular, and broadly comprehended, structural merit is founded on a novel circuit make and break device characterized by companion contacts, a quick acting snap spring, and an operating connection between the spring and one of the contacts, whereby to permit the circuit to be opened and closed in an expeditious and speedy manner to prevent the development of a flashy arc such as is produced under the ordinary sluggish acting operating means for switch contacts.

Other features and advantages will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is an elevational view of a switch constructed in accordance with the present invention showing its association with a Bourdon tube and thermostatic control element therefor.

Figure 2 is a top plan view of the structure illustrated in Figure 1.

Figure 3 is a front end elevation of the structure seen in Figure 1, observing it in a direction from left to right.

Figure 4 is a detail side elevational view of the switch showing it opened.

Figure 5 is a cross section on the line 5—5 of Figure 1.

Figure 6 is a perspective view of the snap leaf spring.

Figure 7 is a prespective view of a bifurcated connector.

Figure 8 is a perspective view of the spring supporting bracket or yoke.

The general assembly may well be seen in

Figure 1 wherein it will be observed that the switch is closed. The numeral 9 designates a casing such as a furnace, boiler, ice box or the like. Attached thereto is a fitting 10 which serves to mount the thermostatic element or pressure bulb 11. The numeral 12 designates a conventional Bourdon tube which is connected by way of the pipes 13 to the coupling 10.

The Bourdon tube is provided with a bifurcated connector which is generally represented by the numeral 14 and extends horizontally and laterally to the terminal ends thereof. The furcations of this part 14 straddle the intermediate portion of the snap spring 15. This is the form of a leaf spring and as shown in Figure 6 has a short reduced extension 16 at one end and a relatively long apertured extension 17 at the opposite end which functions as a fulcrum lever.

This spring 15 is supported through the medium of a bracket in the nature of a yoke and generally represented by the numeral 18. The upstanding apertured end 19 accommodates the extension 16 and serves as a mounting therefor. The upstanding end 20 is apertured to permit passage therethrough of the fulcrum lever 17.

This lever carries a depending actuating finger 21. The expansion and contraction of the Bourdon tube 12 produces the desired bow or flexing of the intermediate part of the spring 15 to produce the snap fulcruming action of the lever extension 17 as is obvious.

The numeral 22 designates generally a block-like body composed of a plurality of laminations of material bolted or secured together and fastened to the intermediate or bight portion of the yoke. The numerals 23 of this block designate plies of insulation. The numerals 24, 25, 26, and 27 designates metal strips located at predetermined points in this laminated block construction. These are provided with current wire terminals 28, 29, 30 and 31 respectively. The projecting end portions of the metal strips 24 and 26 are formed with relatively stationary contact buttons 32 and 33 respectively.

The projecting end portions 34 and 35 of the relatively resilient strips 25 and 27 pro-

ject beyond the terminal ends of the contacting strips 24 and 26 as shown in Figure 4. These are formed intermediate their ends with relatively movable contact buttons 32a and 33a which co-operate with the companion buttons as is obvious.

The terminal ends of these extensions 34 and 35 are fastened together through the medium of a tie element 36 so that they are operated in unison. This forms a double-acting or duplex type of switch. The aforesaid end or finger 21 engages with the adjacent end of the extension 34.

Under this arrangement, it is obvious, that when the switch is closed as indicated in Figure 1, the spring 15 is bowed downwardly, thus lifting the finger 21 and permitting the contacts to come into electrical engagement with each other. When however the spring 15 is flexed to the position shown in Figure 4 through the medium of the Bourdon tube 12, the snap action of the lever 17 pushes the pin 21 against the spring strips 34 and 35, thus disengaging the contact elements to open the circuit. This quick snap action produced under this speedy acting spring 15 minimizes, if not entirely eliminates, the development of a flashing, sputtering arc.

Incidentally the principle of construction may involve either a single switch or a double acting duplex type of a switch as illustrated.

It is understood that the principal novelty is predicated upon the construction of the switch per se and that the Bourdon tube and thermostatic arrangement is merely illustrated as one means of operating the spring 15. The device can be operated with pressure or temperature.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary. Minor changes in shape, size, and rearrangement of details coming within the field of invention claimed may be resorted to in actual practice if desired.

I claim:

1. In a circuit make and break device of the class described, a yoke, a relatively stationary contact equipped strip associated therewith, a flexible contact strip, a contact carried thereby and co-operable with the first named contact, a flexible snap spring carried by said yoke and including a projecting end portion constituting an actuating lever, a push pin carried by the free end of the lever and co-operable with the second-named flexible contact strip.

2. In a switch of the class described, a mounting, a yoke fastened on said mounting and having upstanding apertured end portions, a quick acting snap spring having its end portion associated with the apertured

end portions of the yoke, one end portion of the spring being extended to form a quick acting flip lever, a relatively rigid strip carried by said mounting and including a stationary contact, a relatively flexible strip on the mounting including a relatively movable contact co-operable with said stationary contact, and a push pin carried by the free end of the lever and co-operable with the free end portion of the movable contact strip, and operating means for said spring.

3. In a duplex switch construction of the class described, a laminated body including upper and lower pairs of contact equipped strips, the lower contact strip of each pair being relatively flexible and said lower contact strips being secured together at their free end portions for operation in unison, a yoke fastened to said body, a snap spring mounted in said yoke, operating means therefor, one end portion of the spring being extended beyond the yoke to form a quick acting lever, and a push pin carried by the free end portions of said lever and co-operable with the adjacent free end portion of the relatively flexible contact strip.

In testimony whereof I affix my signature.
OSCAR LEONARD JOHNSON.

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