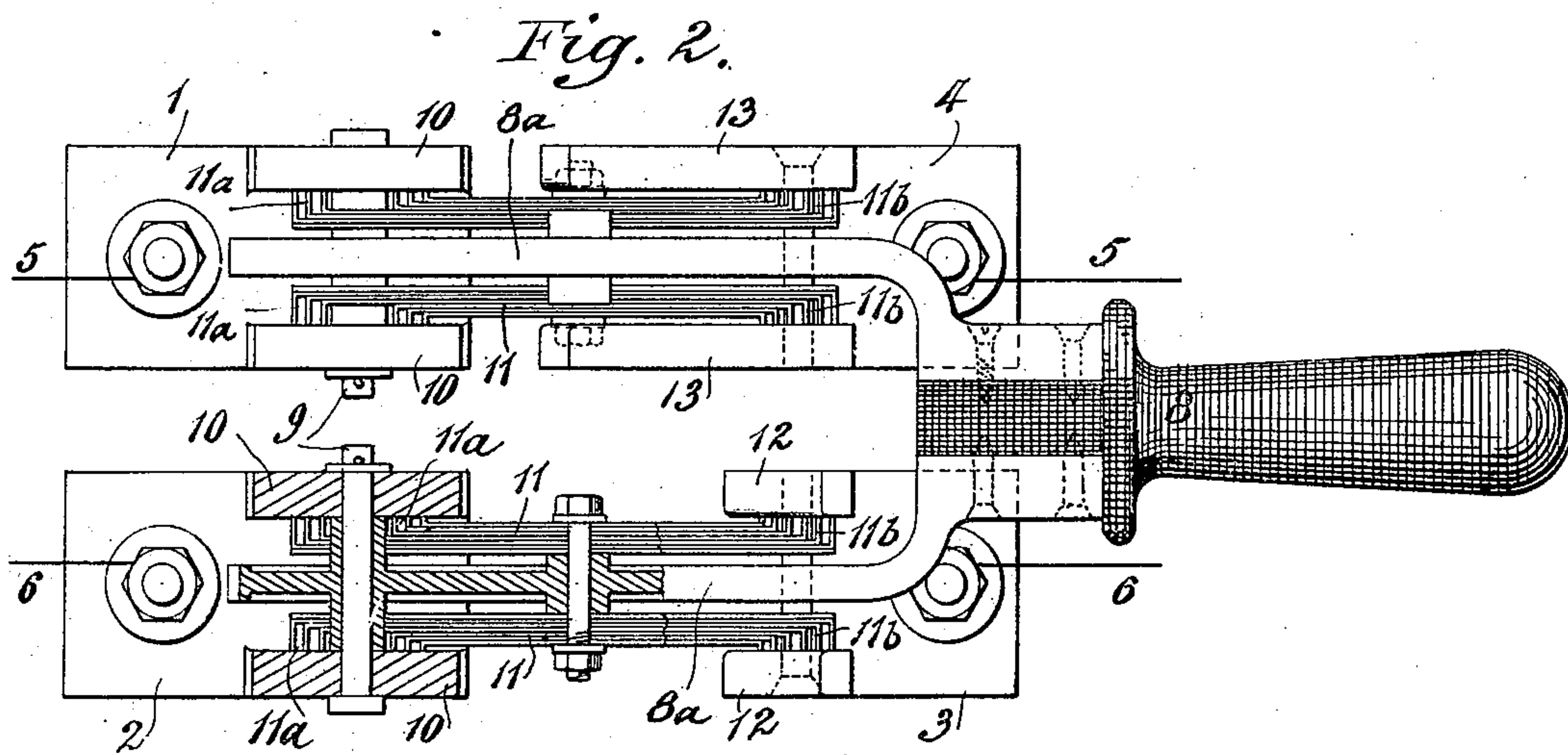
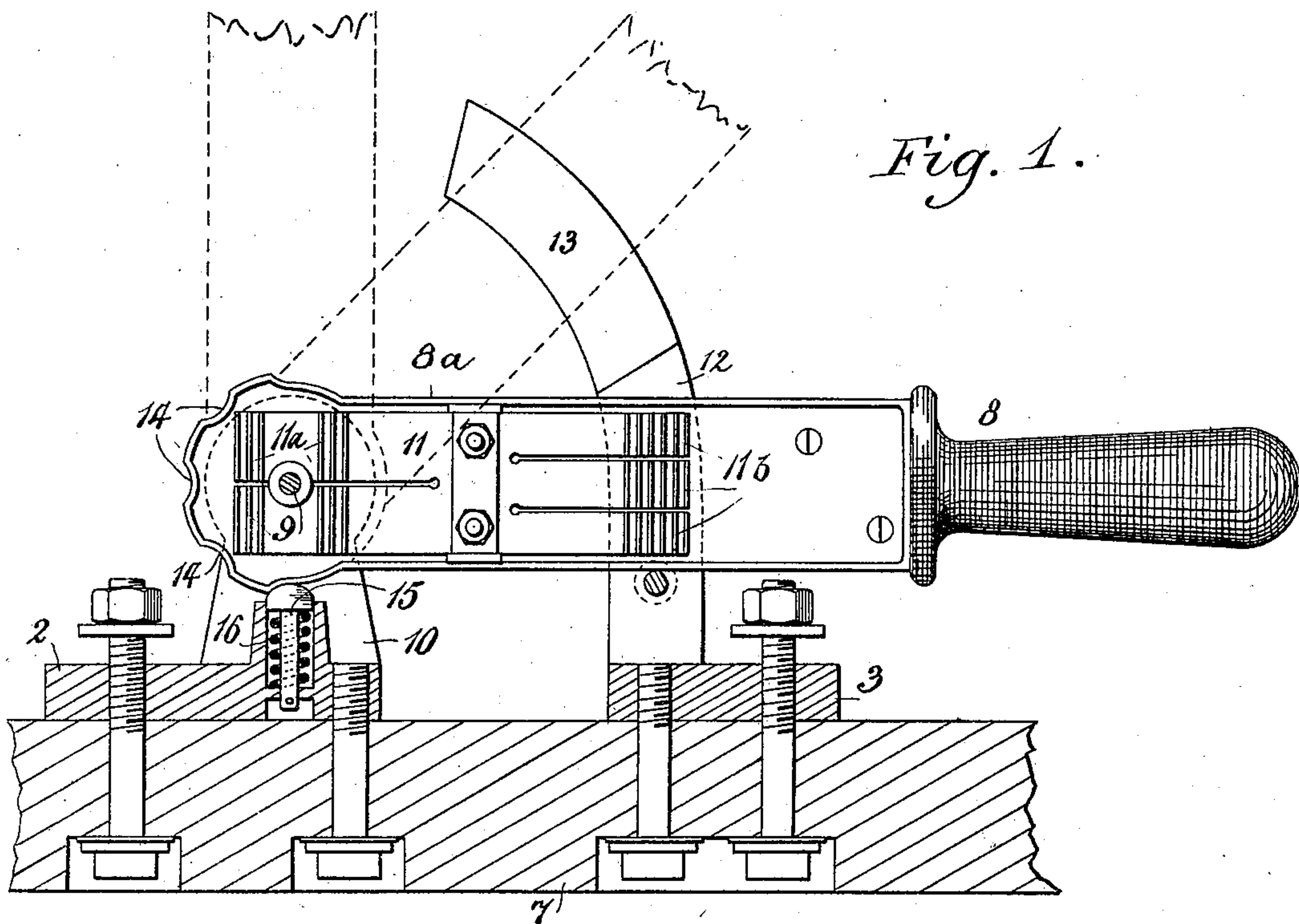


(No Model.)

C. HOFFMANN.
TWO POLE SWITCH.

No. 502,519.

Patented Aug. 1, 1893.



WITNESSES:
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CARL HOFFMANN, OF BERLIN, GERMANY, ASSIGNOR TO SIEMENS & HALSKE,
OF SAME PLACE.

TWO-POLE SWITCH.

SPECIFICATION forming part of Letters Patent No. 502,519, dated August 1, 1893.

Application filed April 11, 1893. Serial No. 469,890. (No model.)

To all whom it may concern:

Be it known that I, CARL HOFFMANN, a subject of the Emperor of Germany, residing at the city of Berlin, in the Empire of Germany, have invented new and useful Improvements in Two-Pole Switches, of which the following is a specification.

This invention relates to two-pole switches of that class adapted to successively engage two separate sets of contacts for opening and closing two independent electric line circuits at the will of the operator. In prior devices of this class and especially after they have been used awhile, an electric arc is formed at the pivotal connections of the switch lever, due to wear of the lever journal and bearings, and whereby the durability and efficiency of the device are impaired.

My invention has for its object to obviate the above named difficulty, and at the same time provide for maintaining most effective electrical conductivity between the line contacts of the switch lever, and to this end my invention in its preferred form comprises a switch lever having two electrically insulated arms fulcrumed to plates or lugs on line wire contacts and carrying contact plates engaging said fulcrum plates and also adapted to engage other longer and shorter contact plates or lugs preferably having segmental form and removed from the contacts next the lever fulcrum. The different lengths of the outer contact plates or lugs allow the lever contacts to be set by a greater or lesser movement of the lever so as to engage the longer or shorter outer contacts or to be set clear of them and thus make or break independent electric circuits at the will of the operator.

Reference is to be had to the accompanying drawings, forming a part of this specification, and in which like reference numerals indicate similar parts in both the views.

Figure 1 is a vertical sectional side view of the improved two-pole switch; and Fig. 2 is a plan view thereof, partly broken away and in section.

The opposing pairs 1, 2 and 3, 4 of the contacts, to which the ends of the line wires 5 and 6 are connected, are sustained on any suitable insulating support 7.

The switch lever shown has a forked con-

struction comprising a handle 8, made of wood or other non-conducting material, and two arms 8^a, 8^b, screwed or otherwise fixed to the handle so as to be insulated from each other. This lever is pivoted by pins 9, 9, passed through the lever arms into lugs or plates 10, 10, rising from the bases of the contacts 1, 2; said parts 10 being those on or against which bear at all times the outbent portions 11^a of the elastic or leaf spring contacts 11, 11 next the fulcrum of the switch lever. The other pair of contacts 3, 4 have upwardly projecting segmental pairs of plates 12, 12 and 13, 13, respectively, the former being shorter than the latter, to allow the other outbent end portions 11^b of the elastic switch lever contacts 11, 11 to be adjusted independently to the contacts 12, 13, or to both series of contacts at once or to be set clear of them.

As shown in the drawings, the oppositely arranged contacts 11 are made of a series of elastic plates having the aforesaid outbent end portions 11^a, 11^b, and one pair of contacts is rigidly held or clamped at its central parts to and at opposite sides or faces of each of the two arms 8^a, 8^b of the switch lever. The series of plates forming each contact is preferably split or divided longitudinally for some distance from opposite ends, as shown in Fig. 1, in order to assure most effective engagement of its parts 11^a, 11^b with the plates or parts 10, 12, 13 of the contacts.

The ends of the switch lever, next its fulcrums 9, 9, are provided with series of indentations or recesses 14 adapted for engagement by the rounded heads of detents 15 fitted in pockets on the contacts 1, 2. A spring 16 surrounding the stem portion of each detent 15 forces the latter upward into the lever recess 14, which may be presented to it as the lever is swung over on its fulcrums to make or break the electric circuits.

The operation of the device is very simple and effective. When the switch lever has the position shown by full lines in the drawings, the contacts 11 will engage the contacts 10, 12 and 13, and electric circuits through both wire lines 5 and 6 will be established. Should the lever be swung upward forty-five degrees to the first dotted position shown in Fig. 1 of the drawings, the contacts 11, 11 on one arm

8^a of the lever will leave the shorter segments 12, 12 of the contact 3, while the other pair of contacts 11, 11 will remain engaged with the longer segments 13, 13 of the contact 4, and the circuit through the wire 6 will then be broken, while the circuit through the wire 5 will be maintained. Should the switch lever be moved still farther over to the vertical dotted position shown in Fig. 1, the contacts 11, 11 will then be removed also from the segment plates 13, 13 and the electric circuit through the wire 5 will then also be broken. The detents 15, by entering the recesses 14, will hold the lever at any position to which it may be adjusted to cut into or out of circuit either or both line wires 5, 6, at the will of the operator.

Some features of my invention are applicable to switches adapted to control only one line wire circuit, as will readily be understood.

Having thus described my invention, I claim—

1. In an electrical switch, the switch lever fulcrumed to lugs forming conductive contact faces, said lever carrying independent conductive contacts which bear constantly upon opposing contact faces of the fulcrum lugs, substantially as described.

2. In an electrical switch, the switch lever fulcrumed to lugs forming conductive contact faces, said lever carrying independent conductive contacts made of elastic material and bearing constantly upon opposing contact faces of the fulcrum lugs, substantially as described.

3. In an electrical switch, the switch lever fulcrumed to lugs forming conductive contact faces, said lever carrying side conductive contacts made of elastic material and having out-bent ends which bear constantly upon opposing contact faces of the fulcrum lugs, substantially as described.

4. In an electrical switch, the switch lever fulcrumed to lugs forming conductive contact faces, said lever carrying side conductive contacts made of elastic material longitudinally split and having out-bent ends which bear constantly upon opposing contact faces of the fulcrum lugs, substantially as described.

5. The combination in an electrical switch, of a binding post or plate having lugs forming opposing contact faces, a switch lever fulcrumed to and between said lugs, independent conductive contacts held at the sides of the lever and bearing constantly upon opposing faces of the fulcrum lugs of the lever, and independent outer binding post or plate contact lugs or faces beyond said fulcrum lugs and to which also the lever contacts are adapted, substantially as described.

6. An electrical switch, comprising four line wire terminal contacts opposed in pairs, a bifurcated switch lever fulcrumed to one pair of contacts, the other pair of contacts having longer and shorter contact segments or faces; and contact plates held to both lever arms

and engaging contact faces next the lever fulcrum and adapted to either or both long or short contact faces beyond said fulcrum, substantially as described.

7. An electrical switch, comprising four line wire terminal contacts opposed in pairs, a bifurcated switch lever fulcrumed to one pair of contacts, the other pair of contacts having longer and shorter contact segments or faces; and elastic contact plates held to both lever arms and engaging contact faces next the lever fulcrum and adapted to either or both long or short contact faces beyond said fulcrum, substantially as described.

8. An electrical switch, comprising four line wire terminal contacts opposed in pairs, a bifurcated switch lever fulcrumed to one pair of contacts, the other pair of contacts having longer and shorter contact segments or faces; and elastic contact plates having outbent ends and held to both lever arms and engaging contact faces next the lever fulcrum and adapted to either or both long or short contact faces beyond said fulcrum, substantially as described.

9. An electrical switch, comprising four line wire terminal contacts opposed in pairs and each having an opposing pair of contact faces, a bifurcated switch lever fulcrumed to one pair of contacts and between their pairs of contact faces, the opposing pairs of contact faces of the opposite contacts removed from the lever fulcrum being longer and shorter, and contacts on opposite faces of each arm of the switch lever constantly engaging the four contact faces next the lever fulcrum, and adapted also for successive engagement with the longer and shorter pairs of contact faces removed from the lever fulcrum, substantially as described.

10. An electrical switch, comprising four line wire terminal contacts opposed in pairs and each having an opposing pair of contact faces, a bifurcated switch lever fulcrumed to one pair of contacts and between their pairs of contact faces, the opposing pairs of contact faces of the opposite contacts removed from the lever fulcrum being longer and shorter, and elastic contacts on opposite faces of each arm of the switch lever constantly engaging the four contact faces next the lever fulcrum and adapted also for successive engagement with the longer and shorter pairs of contact faces removed from the lever fulcrum, substantially as described.

11. An electrical switch, comprising four line wire terminal contacts opposed in pairs and each having an opposing pair of contact faces, a bifurcated switch lever fulcrumed to one pair of contacts and between their pairs of contact faces, the opposing pairs of contact faces of the opposite contacts removed from the lever fulcrum being longer and shorter, and elastic contacts on opposite faces of the two arms of the switch lever and having outbent ends constantly engaging the four contact faces next the lever fulcrum and adapted

also for successive engagement with the longer and shorter pairs of contact faces removed from the lever fulcrum, substantially as described.

5 12. In an electrical switch, the switch lever fulcrumed to and between lugs having opposing contact faces, said lever carrying at its opposite sides independent conductive contacts which bear constantly upon the opposing con-
10 tact faces of the fulcrum lugs, and a spring actuated detent located between said lugs and adapted to engage the lever and hold it at varying adjustments, substantially as de-
scribed.

15 13. In an electrical two-pole switch, the combination with a base 7, of contacts 1, 2, 3, 4, a bifurcated switch lever 8, pivoted to parts 10 of the contacts 1, 2, said contacts 3, 4 having parts 12, 12, 13, 13; and contact

plates 11, 11 held to each arm 8^a of the lever 20 and adapted to the contacts 10, 12, 13, substantially as described.

14. In an electrical switch, the combination with the base 7, of contacts 1, 2, 3, 4, a bifurcated switch lever 8 pivoted to parts 10 25 of the contacts 1, 2, and having recesses 14; said contacts 3, 4, having parts 12, 12, 13, 13; contact plates 11 held to each arm 8^a of the lever and adapted to the contacts 10, 12, 13, and spring actuated detent 15 on the base, 30 adapted to the lever recesses 14, substantially as described for the purposes set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

CARL HOFFMANN.

Witnesses:

TIMOTHY F. DILLON,
GEO. H. BENJAMIN.