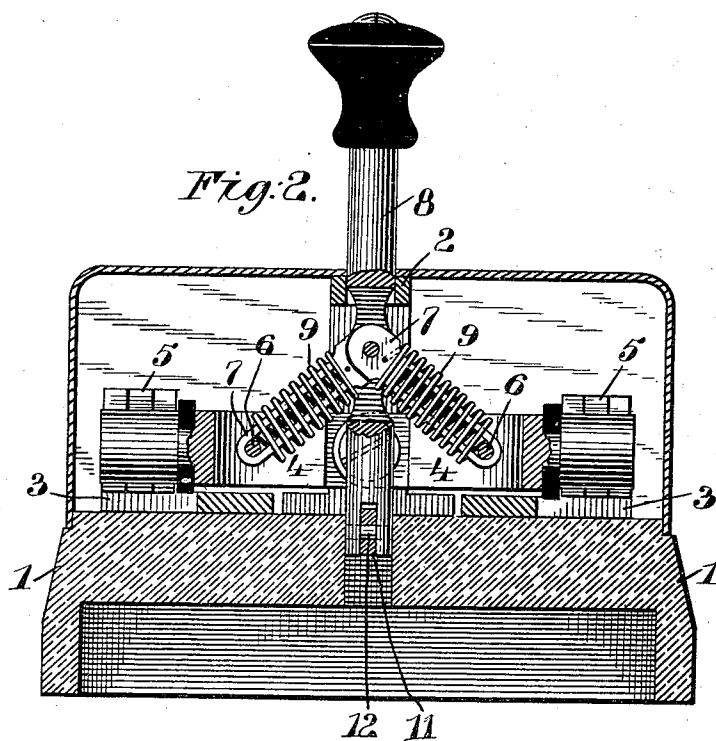
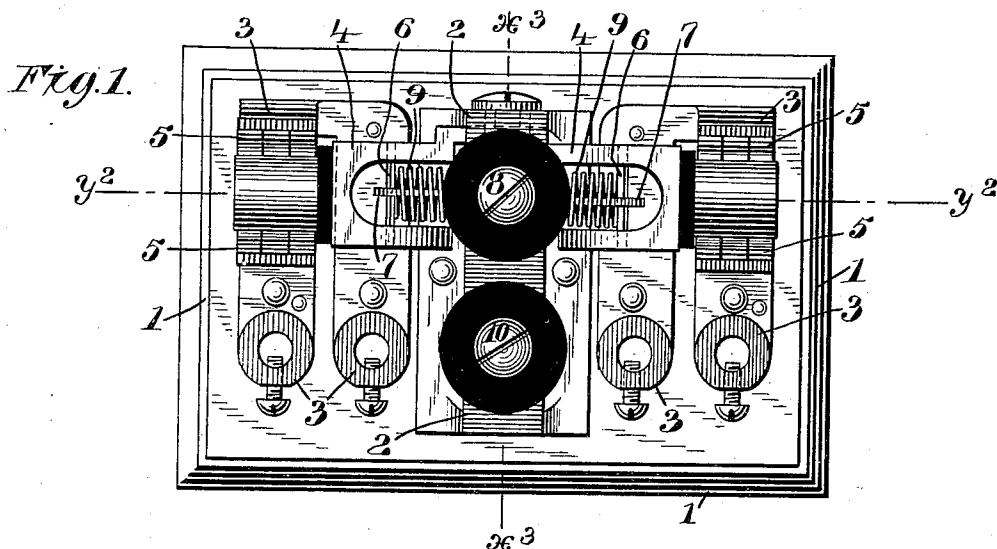


J. M. ORFORD & J. C. ENGLISH.  
ELECTRIC SWITCH.

No. 447,788.

Patented Mar. 10, 1891.



WITNESSES  
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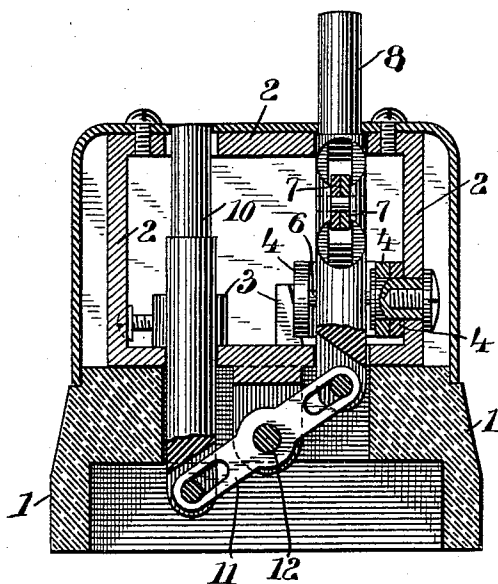
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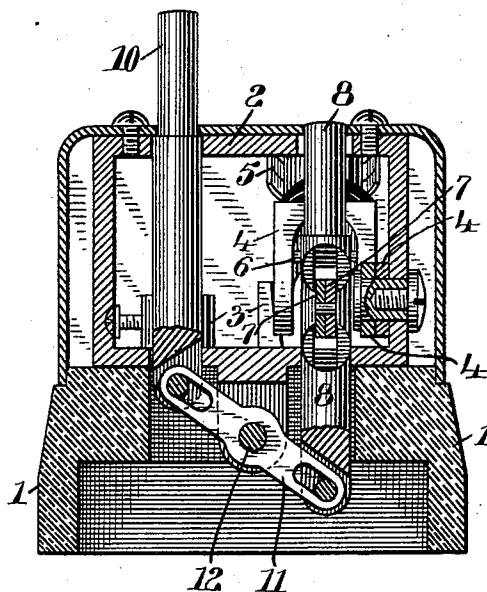
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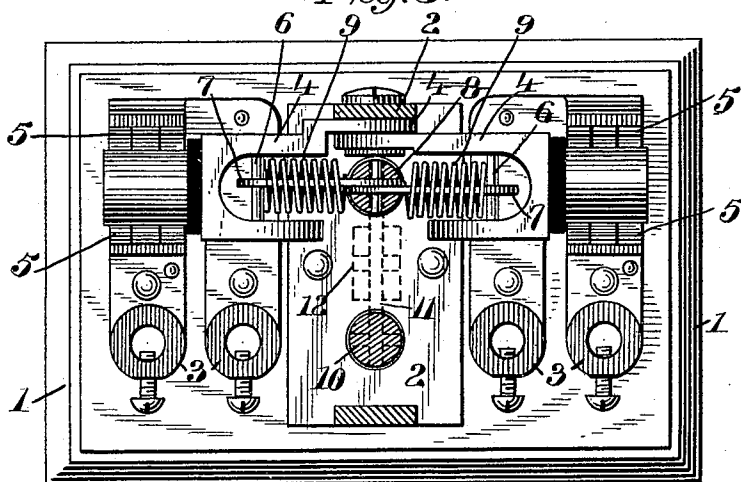
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN M. ORFORD, OF BRIDGEPORT, AND JOHN C. ENGLISH, OF NEW HAVEN,  
CONNECTICUT.

## ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 447,788, dated March 10, 1891.

Application filed December 19, 1890. Serial No. 375,219. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN M. ORFORD, of Bridgeport, in the county of Fairfield, and JOHN C. ENGLISH, of New Haven, in the county of New Haven, State of Connecticut, citizens of the United States, have invented certain new and useful Improvements in Electric Switches; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in electric switches, but is more particularly intended to apply to switches of the double-pole variety.

It is the object of our invention to provide a construction which shall be operated either to make or break contact by a pushing movement, and in which no other method of operation will produce the desired result.

Our invention in some parts embodies and is an improvement upon the construction shown and described in Letters Patent to William B. Cleveland, No. 391,512, dated October 23, 1888.

In order that those skilled in the art to which our invention appertains may fully understand its construction and method of operation, we will describe the same in detail, reference being had to the accompanying drawings and the reference-numerals marked thereon, which form a part of this specification.

Figure 1 is a plan view of a double-pole switch with the cover removed. Fig. 2 is a section on the line  $y^2$  of Fig. 1; Figs. 3 and 4, sectional views on the line  $x^3$  of Fig. 1, the former showing the circuit as closed, and the latter showing it as open. Fig. 5 is a plan view similar to Fig. 1, but with the plungers transversely sectioned.

In Figs. 1 and 2 the plungers are shown as bearing knobs projecting above the case, and they may be so provided, if desired, but by preference the ends of the plungers are left as shown at Figs. 3 and 4, so that when depressed their upper ends will be substantially flush with the top of the case.

All the parts of our improved switch are

mounted upon a base 1, of wood, porcelain, or other convenient substance.

2 is an open housing centrally secured upon the block, and upon either side of this housing is mounted a pair of terminals 3, adapted for the attachment of the line-wires.

To the inner wall of the housing, as seen at Figs. 3, 4, and 5, are pivoted two circuit-breaking levers 4, each bearing upon its end, but insulated therefrom, contacts 5, which by preference consist of broadly U-shaped copper plates or brushes. Each of the levers 4 just referred to is substantially U-shaped in interior contour, and pins 6 pass from side to side therein. Slotted links 7 connect these pins with a plunger 8, which is adapted to move vertically in guideways formed, respectively, in the top and bottom of the housing 2, and interposed between said plunger and the respective pins 6 springs 9 are coiled about the links in such manner as to exert a pushing movement longitudinally of said links.

10 is a plunger substantially like the plunger 8 and similarly guided, and 11 is a lever whose extremities are pivotally attached to the lower ends of the plungers and which at its center has a rocking bearing about a pin 12.

In the operation of our invention, as shown at Figs. 3 and 4, one plunger is always projecting above the inclosing case, the other being flush with the top thereof, and the condition of the circuit may be reversed by depressing this projecting plunger. Suppose, for instance, the parts are in the position shown at Figs. 2 and 3—that is, with the circuit closed. Then by depressing the plunger 8 the springs 9 will be compressed between the pins 6 and the pivotal points of the links, until the latter have passed the longitudinal center of the circuit-closing levers as they lie in their closed position, when the springs will expand and raise said levers upon their pivotal points, so that the contacts clear the terminals. This operation of the springs is in substantial accordance with that shown and described in the Letters Patent to Cleveland, heretofore recited. The depression of the plunger 8 not only changes the direction in which the springs act, but also through the

lever 11 raises the plunger 10 in such manner as to project its end out of the case. Thus it will be readily understood that the same movement—that is, the depression of that  
5 plunger which is in sight—reverses the position of the contacts. If desired, the tops of the plungers may be lettered or otherwise distinguished for the purpose of showing by a glance at the switch the condition of the circuit.  
10

We claim—

1. The combination, in an electric switch, with the terminals, of a pair of pivoted circuit-breaking levers, a pair of guided plungers  
15 connected together for purposes of mutual operation, slotted links interposed one between one of said plungers and each of the circuit-closing levers, and springs surrounding said links, substantially as described.

2. The combination, with the terminals, of 20 a pivoted circuit-closing bar or lever, a plunger, a spring interposed between said plunger and said circuit-closing lever, and a second plunger parallel with the first and connected thereto, whereby the fulcrum against which 25 the spring acts may be changed by pressure upon either plunger, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN M. ORFORD.  
JOHN C. ENGLISH.

Witnesses:

SHERMAN HARTWELL HUBBARD,  
M. C. HINCHCLIFFE.