

(No Model.)

G. DOYLE.
ELECTRIC SWITCH.

No. 599,692.

Patented Mar. 1, 1898.

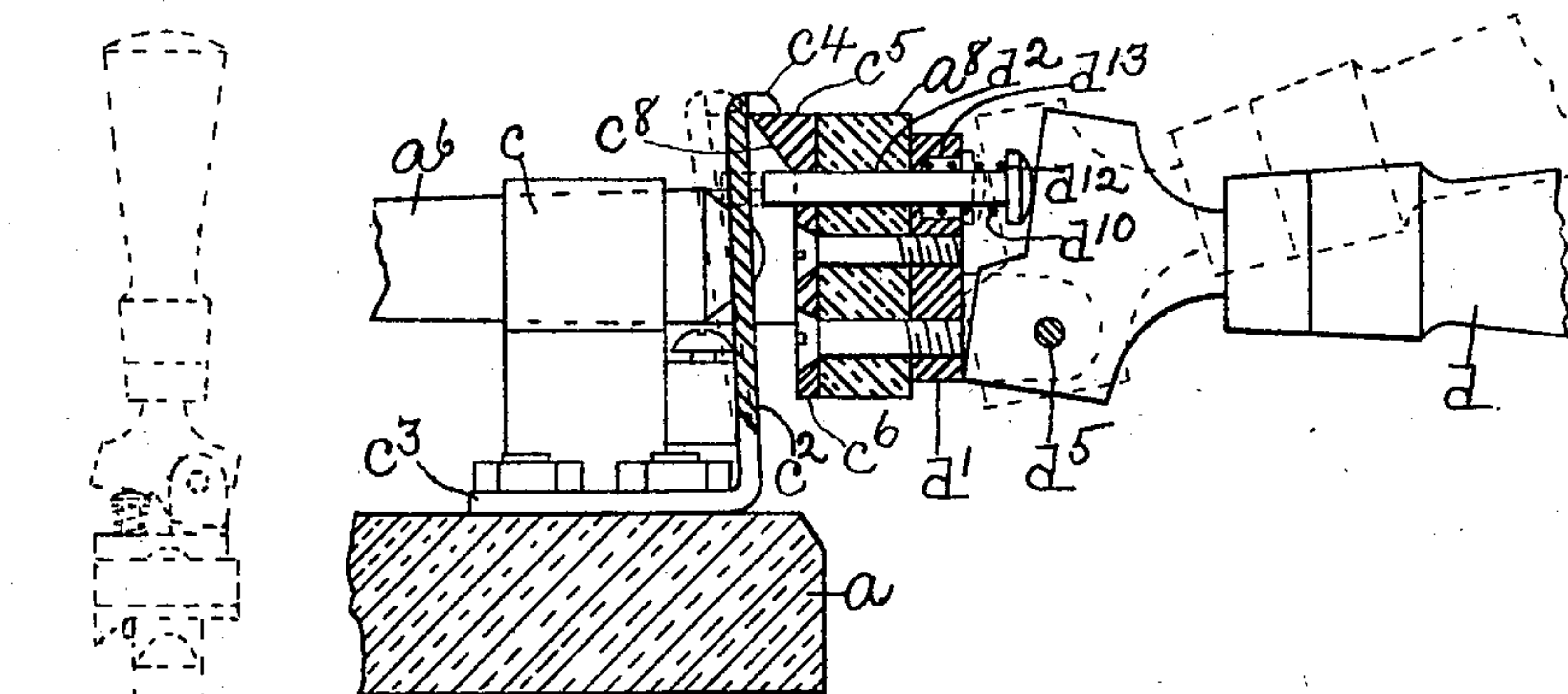


Fig. 3.

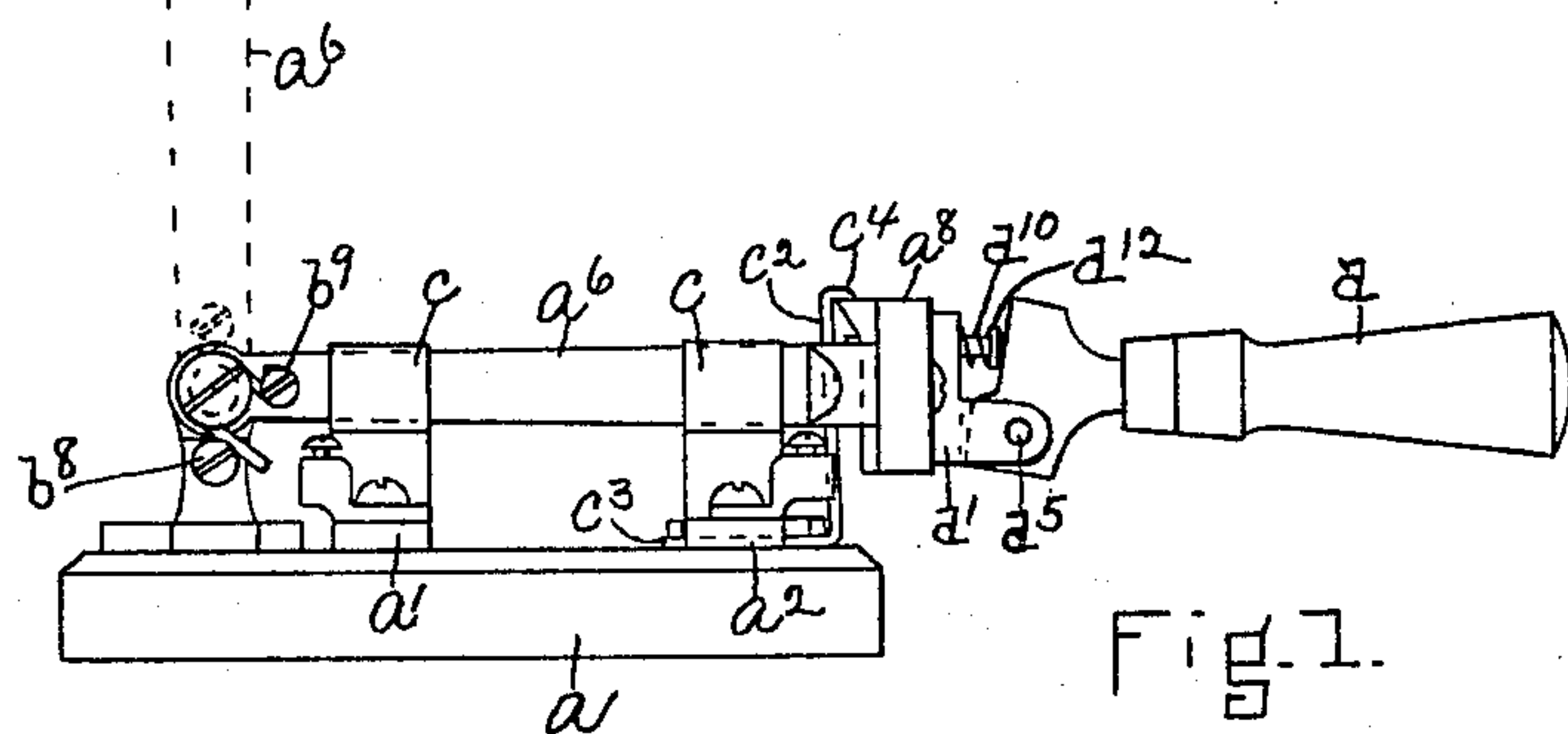


Fig. 1.

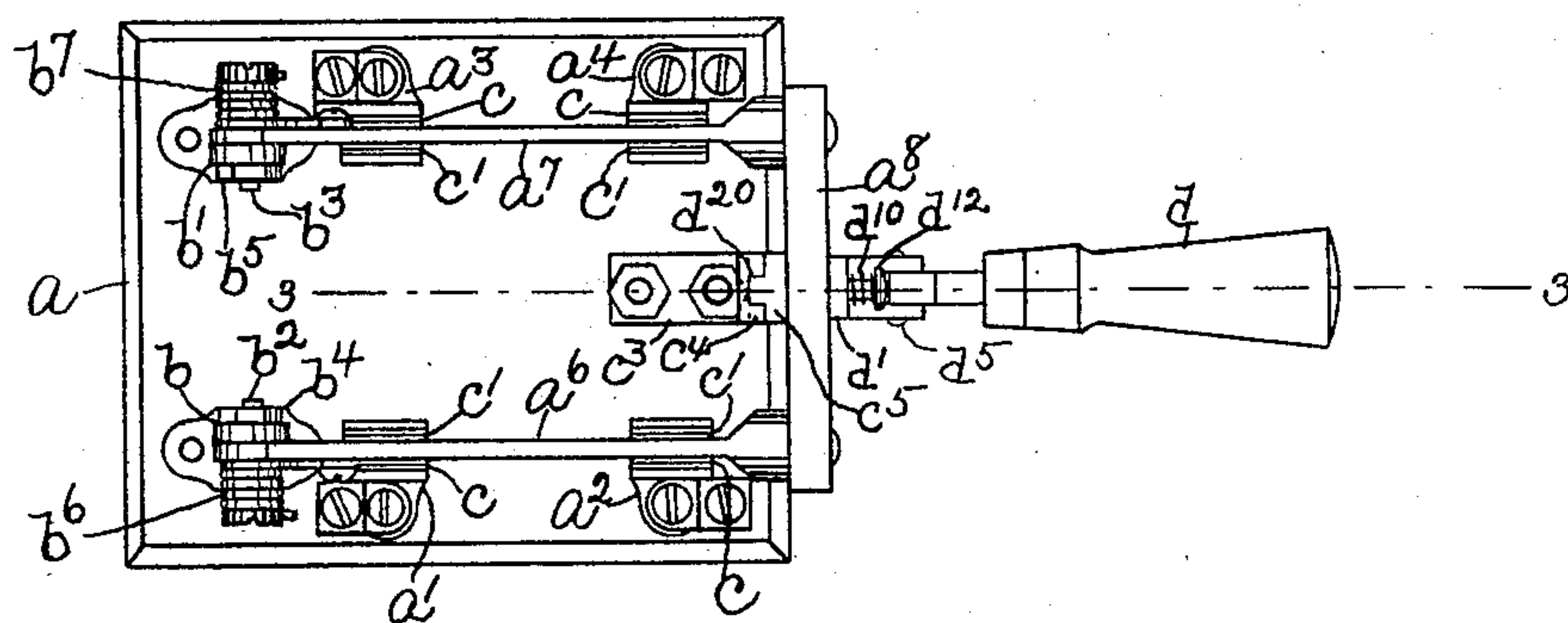


Fig. 2.

WITNESSES.

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GEORGE DOYLE, OF BROOKLINE, MASSACHUSETTS.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 599,692, dated March 1, 1898.

Application filed August 14, 1896. Serial No. 602,763. (No model.)

To all whom it may concern:

Be it known that I, GEORGE DOYLE, residing in Brookline, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Electric Switches, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates to electric switches of that class known as "quick-acting," and is herein shown as embodied in a double-pole switch of the class referred to. In switches of this class as now commonly constructed and known to me the movable member or knife-blade is inserted between metallic contact arms or pieces, which are usually of spring-metal, so as to create sufficient friction to hold the blade when the latter is inserted between the said contact-arms. This construction of switch is defective in that it frequently happens that the blade is not fully inserted between the spring-contact arms by the operator when closing the switch, thereby obtaining an imperfect or insufficient contact of the blade with the contact-arms to carry the current, which imperfect or insufficient contact creates resistance and heats the blade to such extent as to be liable to melt the blade and contact-arms and form an arc, which is liable to start a fire in a building or other structure.

This invention has for its object to overcome the defect referred to, and I accomplish this result by providing the switch with a lock for the movable member in its closed position and by providing the switch with a spring of sufficient tension or strength as will overcome any frictional contact between the movable member or blade and the contact-arms and thereby positively open the switch if the movable member should be brought into its closed position and not locked, consequently avoiding the defects referred to, as the switch is required to be locked in its closed position, which insures the proper amount of contact to be made between the movable member or blade and the contact-arms as will carry the current without danger of heating or forming arcs. The lock for the movable member of the switch may and preferably will be

operated by the handle of the switch, as will be described. The spring employed to open the switch when unlocked may and preferably will be adjustable as to tension, for a purpose as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of an electric switch embodying this invention, the closed position being indicated by full lines and the open position by dotted lines; Fig. 2, a top or plan view of the switch shown in Fig. 1; and Fig. 3, a sectional detail, on an enlarged scale, on the line 3 3, Fig. 2, showing by full lines the locked condition of the switch and by dotted lines the unlocked condition.

In the present instance the invention is shown as embodied in a double-pole switch comprising a base *a*, preferably of porcelain or other suitable insulating material, two sets of line-terminals *a'* *a*² *a*³ *a*⁴, fastened to said base, and a movable member, consisting, as shown, of two metallic or conducting blades *a*⁶ *a*⁷, joined together at one end by a tie-bar *a*⁸, which may be of insulating material or which may be of metal, to which the blades *a*⁶ *a*⁷ may be fastened, but insulated therefrom in any suitable or usual manner.

The blades *a*⁶ *a*⁷ are pivoted at their opposite ends to uprights or standards *b* *b'*, suitably fastened to the base *a*, the said blades being mounted, in the present instance, on pivot-pins *b*² *b*³, extended through suitable holes in the blades and in the uprights and provided at their ends with screw-threads to receive nuts *b*⁴ *b*⁵, the said pivot-pins being encircled outside of the blades *a*⁶ *a*⁷ by coiled springs *b*⁶ *b*⁷, which act to throw or move the blades from their full-line closed position into their dotted-line open position, (shown in Fig. 1,) when the said blades are unlocked and released by the operator. In the present instance each coiled spring has one end in engagement with a pin or projection *b*⁸ on the upright, to which the blade acted upon by it is pivoted, and the other end bears against the under side of a pin, screw, or projection *b*⁹, fastened to the blade.

The springs *b*⁶ *b*⁷ are of sufficient strength to turn the blades from their closed position (shown by full lines, Fig. 1) into their open

position, (shown by dotted lines,) when the said blades are placed under control of the said springs.

The line-terminals a' a^2 a^3 a^4 are provided with spring-contact arms or jaws c c' , which coöperate the blades a^6 a^7 , which, in their fully-closed position, (represented by full lines, Fig. 1,) make contact the entire width of the blade with the said spring-jaws or contact-arms, and in order to insure a maximum contact of the blades or movable member of the switch when the switch is closed I have provided the switch with a locking device for the movable member, which is brought into operation when the movable member is in its proper or fully-closed position.

The locking device may and preferably will be made as herein shown, and consists of an upright bar c^2 , of spring metal, suitably fastened to the base a , it being shown as provided with a foot or arm c^3 at its lower end, which is bolted to the base. The arm c^2 is provided at its upper end with a projecting finger c^4 , which is adapted to engage a lug or projection c^5 on a bar or plate c^6 , secured to or forming part of the tie-bar a^8 , the said lug being beveled on its under side, as at c^8 , (see Fig. 3,) to engage the finger c^4 and force the spring-arm c^2 backward, when the movable member of the switch is moved into its closed position a sufficient distance to permit the said movable member to be moved into its full-line position, (shown in Fig. 1,) and after the lug or projection c^5 has passed by the finger c^4 the latter is thrown forward over the said lug by the spring-arm c^2 , and the movable member of the switch is thereby locked in its fully-closed position until positively released, as will now be described.

I prefer to release the movable member of the switch with the handle d of the switch, and this result may be accomplished, as herein shown, by pivoting the said handle to a bracket d' , secured to or forming part of the tie-bar a^8 and providing a releasing bolt or pin d^2 , which is loosely extended through the said bracket, tie-bar, and bar or plate c^6 , as herein shown, in line with the handle, so that by turning the handle on its pivot d^5 from the full-line into the dotted-line position in Fig. 3 the bolt or pin d^2 will be engaged with the locking-arm c^2 and force the same backward a sufficient distance to remove the finger c^4 from engagement with the lug c^5 , and thereby unlock the movable member of the switch and place it under control of the springs b^6 b^7 , which are sufficiently strong to throw the said movable member into its dotted-line position as soon as the operator lets go of the handle.

As soon as the operator lets go of the handle the releasing bolt or pin d^2 is returned to its normal or full-line position by a spring d^{10} , which encircles the said pin or bolt between its head d^{12} and the end of a socket d^{13} in the bracket d' . In Fig. 1 the open position of the switch is indicated by dotted lines, and

to close the switch the operator moves the handle and the blades down into their full-line position until the tie-bar is engaged by the locking-finger, thereby insuring sufficient contact of the blades with the contact-arms to carry the current without heating or without danger of arcing, for, if the handle is lowered by the operator only sufficient to make contact with the upper ends of the contact-arms and then released by the operator, the switch will be immediately opened wide by the springs b^6 b^7 , returning the movable member back into its dotted-line position.

In the present instance I have shown my invention as embodied in a double-pole double-break switch; but I do not desire to limit my invention in this respect, as the same may be embodied in a single or other pole single or double break switch.

When embodied in a double-pole single-break switch, the line-terminals a' a^3 may be dispensed with and the standards b b' used as line-terminals, and in this case the construction of pivots for the blades is especially useful, as they can be adjusted to compress or regulate the tension of the springs b^6 b^7 , so as to cause the said springs to force the blades into good electrical contact with the standards.

In the present instance the finger c^4 is shown as substantially the same width as the lug c^5 , and in order to permit the releasing bolt or pin d^2 to pass by or clear the said finger when the tie-bar is moved by the operator and the springs b^6 b^7 the said finger is provided with a slot d^{20} in line with the bolt or pin d^2 .

I claim—

1. In an electric switch, the combination with a movable member comprising conducting pivoted blades, and a tie-bar connecting said blades together, of a handle attached to said tie-bar to move therewith, a locking device to engage said tie-bar and secure said movable member in its closed position, a releasing device operated by movement of the said handle, and means to move said movable member into its open position when unlocked, substantially as described.

2. In an electric switch, the combination with a movable member comprising conducting-blades pivoted at one end and having their opposite ends connected by a tie-bar, a locking device to engage said tie-bar and secure the said blades in their closed position, a releasing device carried by said tie-bar to disengage said locking device from said tie-bar, and springs to move said blades into their open position when unlocked, substantially as described.

3. In an electric switch, the combination with a movable member comprising conducting-blades pivoted at one end and having their opposite ends connected by a tie-bar, a handle secured to said tie-bar to move therewith, a locking device to engage said tie-bar and secure the said blades in their closed position, a releasing device operated by the handle to

disengage said locking device from said tie-bar, springs mounted upon the pivots for said blades, and means to compress said springs, substantially as described.

- 5 4. In an electric switch, the combination with a movable member comprising conducting-blades pivoted at one end and having their opposite ends connected by a tie-bar, a locking device to engage said tie-bar and secure
10 the said blades in their closed position, a releasing device carried by said tie-bar and normally removed from said locking device but adapted to be engaged therewith, to disengage said locking device from said tie-bar, a

pivoted handle carried by said tie-bar and co- 15
operating with said releasing device to move the same into engagement with the locking device to disengage it from the said tie-bar, and means to throw the movable member into its open position, substantially as described. 20

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE DOYLE.

Witnesses:

JAS. H. CHURCHILL,
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