No. 738,594. PATENTED SEPT. 8, 1903.

J. I. AYER.

AUTOMATIC SWITCH HANDLE FOR ELECTRICAL TOOLS.

APPLICATION FILED APR. 14, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

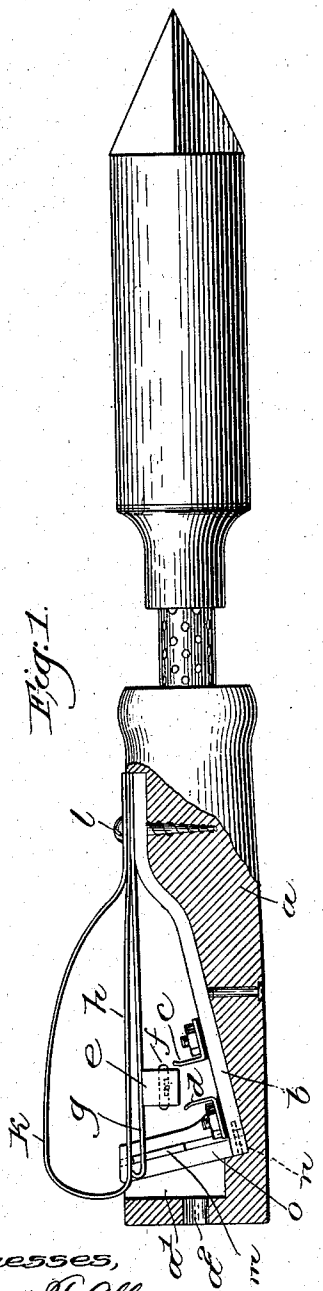


Fig. 2.

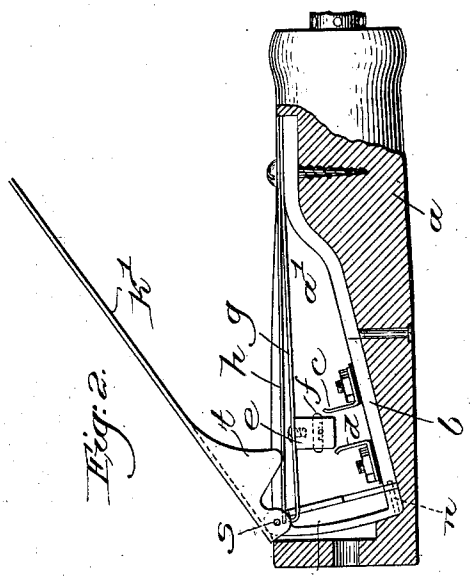


Fig. 3.

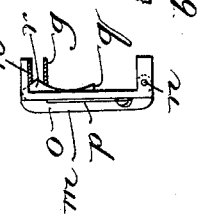


Fig. 4.

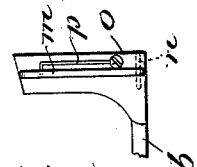
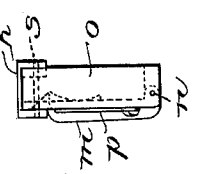


Fig. 5.



Witnesses,
Edward G. Allen.
L. Wm. Lutton.

Inventor:
James I. Ayer;
by Crosby Gregory,
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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AUTOMATIC SWITCH HANDLE FOR ELECTRICAL TOOLS.

APPLICATION FILED APR. 14, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 7.

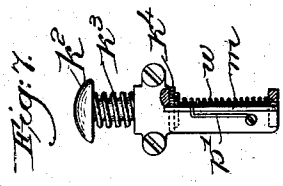


Fig. 10.

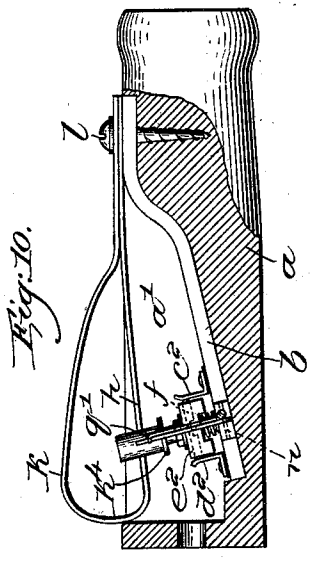


Fig. 6.

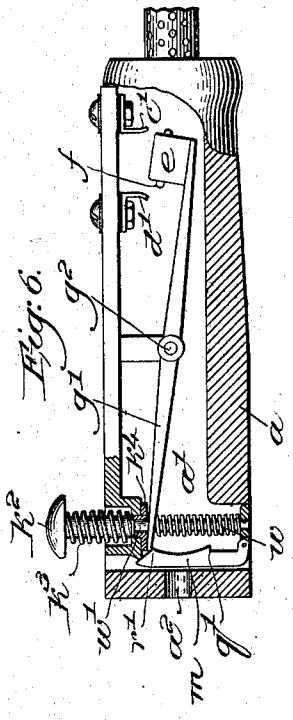


Fig. 9.

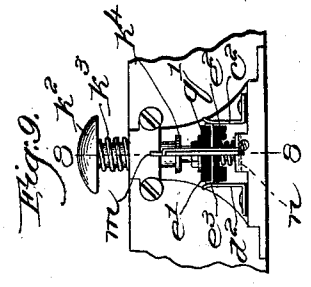
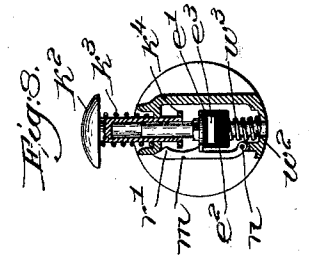


Fig. 8.



Witnesses,
Edward G. Allen,
L. Wm. Lutton.

Inventor:
James I. Ayer:
By Munn & Gregory.
Att'ys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 738,594. Patented September 8, 1903.

UNITED STATES PATENT OFFICE.

JAMES I. AYER, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO SIMPLEX ELECTRIC HEATING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

AUTOMATIC SWITCH-HANDLE FOR ELECTRICAL TOOLS.

SPECIFICATION forming part of Letters Patent No. 738,594, dated September 8, 1903.

Application filed April 14, 1903. Serial No. 152,589. (No model.)

To all whom it may concern:

Be it known that I, JAMES I. AYER, of Cambridge, county of Middlesex, State of Massachusetts, have invented an Improvement in Automatic Switch-Handles for Electrical Tools, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is a tool-handle for an electric device, and has for its object the provision of an inexpensive quick-acting switch-lever automatically operated by the hand of the user of the tool, and comprises a locking and releasing device preferably so constructed that the switch will remain closed during all ordinary handling of the instrument and the current will only be cut off when the operator actually releases the handle.

The invention is intended for use with all kinds of small tools, such as flat-irons, soldering-irons, and with various hand-tools electrically operated and common upon the market.

The constructional details and further advantages of my invention will be more fully pointed out in the course of the following description, reference being had to the accompanying drawings, in which I have illustrated certain embodiments of my invention.

In the drawings, Figure 1 represents in side elevation, parts being broken away, one form of my invention applied to the handle of a soldering-iron. Fig. 2 is a similar view showing a modification thereof. Figs. 3 to 5 are details of the catch device, showing the same in side and edge elevation, respectively. Fig. 6 is a view similar to Figs. 1 and 2 of a further modification. Fig. 7 is a detail thereof in rear elevation. Figs. 8 and 9 are transverse sectional and side elevations, respectively, of a further modification. Fig. 10 is a view similar to Fig. 1 of a further modification.

Referring more particularly to Fig. 1, it will be seen that the usual handle a is provided with a cavity a', in which is secured a frame b in the form of a plate carrying suitable contacts c d, to which circuit-wires may be connected and passed out through an aperture a^2. Above the contacts is a contact-maker, shown as an insulating-block e, carrying a loose pin f, said block being secured to a spring-plate g, above which is a second spring-plate h, bent around at k to constitute a handle, said springs g h k being secured at l to the frame b. At the outer end of the frame b is mounted a detent m, pivoted thereto at n and guided in a bracket o, being held inwardly by a spring p and provided with an engaging notch q at its lower portion and an inclined releasing projection r in its upper portion.

In Fig. 2, instead of bending the handle k around, as shown, I have provided a separate handle k', pivoted at s and provided with a depending lug t.

In the foregoing description it will be seen that when the handle is grasped the spring k or lever k' will be depressed against the handle a, thereby moving the springs g h downwardly until the former is automatically engaged by the notch q, at which time the contact-maker f completes the circuit between the contacts c d. As the hand is shifted and tightened or released, according to the convenience of the operator, it does not affect in any way the circuit, because the circuit-closer is held in a fixed position by the contact of the notch q with the contact-maker spring or carrier g. The actuating-lever or operating members k k' cannot release the contact-maker until said lever rises nearly to its inoperative position, as shown in Figs. 1 and 2, at which time the releasing device h moves upwardly on the locking device along the releasing projection r until it moves the notch q out of engagement with the spring g, permitting the latter to fly instantly upward and break contact with the utmost quickness and certainty. I regard this feature as of great advantage, as it is an important convenience to the operator to have a construction which will permit comparative freedom of grasp, so that the switch-controlling member can play up and down nearly through its maximum range without opening its switch after the latter has once been closed, but when released entirely from the grasp of the hand it will permit the switch to be automatically opened instantly without danger of sparking.

In Figs. 6 and 7 I have shown a further modification of the invention, in which, instead of employing an actuator extending lengthwise of the handle, I have simply employed a plunger k^2, actuated by spring k^3, the lower end k^4 performing the same office as the spring h of Figs. 1 and 3 in engaging the releasing projection r' of the locking device, and a lever g', pivoted at g^2, carries the contact-maker e, said lever being given an upward tendency by a spring w, mounted on a rod w', guided in the hollow stem of the plunger k^2; and in Figs. 8 and 9 I have shown a further modification still more compact in construction. The contact-maker comprises two blocks e' e^2 of insulating material, between which is clamped a strip e^3 of conductive material bent up at its ends to form a contact-maker, the same being mounted to slide on a rod w^2 and actuated by a spring w^3. The operation of these modifications is substantially the same as already described, downward movement of the plunger k^2 automatically locking the contact-maker in circuit-closing position by means of the detent q', and a limited movement of the plunger up and down as the operator changes his grasp not influencing the same, but said circuit being suddenly broken when the operator releases the plunger k^2, so that its head k^4 is permitted to slide up on the releasing projection r' of the locking device. The same operation takes place in the construction shown in Fig. 10, in which I have mounted the parts in a frame b and operate them by a handle k and leaf-spring h, the same as shown in Fig. 1, said leaf-spring being attached to a hollow plunger, the same as in Fig. 8, whose lower end k^4 operates the detent to release the contact-maker and permit the same to spring up, as already described.

The advantages of the quick opening and closing of the circuit are well recognized in the art, and a further advantage will be apparent by having a construction which does not hamper the operator in handling his tools, but permits him great freedom instead of compelling him to retain a tight grip thereon for preventing the switch from being released and opened. This also permits the tool to be placed with more or less carelessness upon a convenient stand or receptacle therefor while yet maintaining the switch closed.

The switch is self-contained in the sense of being supported in a rigid frame carrying all the working parts and adapted to be housed conveniently in any usual handle. This permits it to be made in a simple way and conveniently tested and inspected and readily secured or removed. If the tool should be dropped or if the operator takes his hand entirely therefrom, the current is automatically cut out at once, this being desirable in using small hand-tools so as to prevent the accident of fire, which might occur if they were left with the current on in contact with inflammable substances.

While I have herein shown the preferred embodiments of my invention, I do not intend to restrict the latter thereto, as many changes in detail of construction and arrangement of parts may be resorted to without departing from the spirit and scope of my invention, which, stated in general terms, may be said, broadly, to consist in providing a coöperating circuit closing and opening device in connection with a locking and releasing mechanism for normally holding the parts in circuit-closing position and a releasing device automatically unlocking said parts upon outward movement toward releasing position, nor do I intend to restrict myself in all respects to the use of my invention in a handle.

Other aspects and different limitations of my invention will be pointed out in the following claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A device of the kind described, comprising a handle having a circuit-closing device, a spring normally tending to open said device, a locking device having a detent for normally engaging said circuit-closing device, said locking device having a separate releasing projection, and means movable toward and from said handle for engaging said projection and releasing said locking device.

2. A device of the kind described, comprising a handle, a contact, a contact-maker, a leaf-spring extending lengthwise of the handle and carrying said contact-maker, an actuating leaf-spring also extending lengthwise of the handle and adapted to engage said first-mentioned spring but moving independently thereof, a locking mechanism for engaging said first-mentioned spring and retaining the parts in circuit-closing position, and a trip operated by said second spring for releasing said locking device.

3. A device of the kind described, comprising a handle provided with a pair of separate contact-springs, a leaf-spring, a contact-maker mounted thereon, and including a loosely-sliding pin adapted to contact with, and adjust itself to, said contact-springs, a locking device for retaining said parts in circuit-closing position, and automatic means for releasing said locking device when the operator lets go of the handle.

4. A device of the kind described, comprising a handle, provided with a longitudinal cavity extending in from the side, and a frame secured in said cavity and carrying a spring bent around in an elongated loop to constitute a yielding operating-handle, a movable detent also carried by said frame, contacts on said frame, a movable contact-maker provided with means for engaging said detent for holding the said circuit-maker in circuit-closing position and means operated by said yielding loop for moving said detent out of holding engagement with said contact-maker.

5. A device of the kind described, compris-

ing a handle, a cavity extending longitudinally thereof from one side, and a triangular frame, an operating-handle mounted at one end of said frame to swing toward and from said cavity, contacts and a contact-maker, said contact-maker being mounted to swing in said frame, a detent for holding said contact-maker in circuit-closing position and means operated by said operating-handle for automatically releasing said contact-maker when said operating-handle is released.

6. A device of the kind described, comprising an elongated handle adapted to carry a tool at one end, a cavity in the side of said handle, contacts secured at the rear part and bottom of said cavity, a contact-maker suspended over said contacts and movable toward and from the same, and a handle in the form of a spring-loop secured to the forward end of said handle and extending toward the rear end in position to engage and automatically operate said contact-maker.

7. A device of the kind described, comprising a handle having a recess containing a plate extending lengthwise of the handle, contacts, a contact-maker, a movable member extending longitudinally of said plate and carrying said contact-maker, and a yielding operating-handle projecting from one side of said first-mentioned handle, said operating-handle, movable member, and contacts, all being carried by and depending from said plate.

8. A device of the kind described, comprising a handle, a cavity in one side thereof, a frame in the form of a plate extending obliquely in said cavity, being nearer the surface of said handle at the forward end thereof, contacts, a yielding contact-maker, an operating-handle, a detent for engaging and automatically holding said contact-maker and contacts in circuit-closing position when the operating-handle is depressed, and means for automatically disengaging said detent upon the releasing of said operating-handle.

9. A device of the kind described, comprising a handle, a cavity in one side thereof, a frame in the form of a plate extending obliquely downward in said cavity, contacts, a contact-maker, and a spring-handle in the form of a loop secured to the outer end of said frame and extending rearwardly over said cavity and frame for operating said contact-maker.

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

JAS. I. AYER.

Witnesses:
ELIZABETH M. CONLIN,
DORA A. PROCTOR.