S. D. BLACK & A. G. DECKER.

ELECTRICALLY DRIVEN TOOL.

APPLICATION FILED DEC. 4, 1914.

1,245,860. Patented Nov. 6, 1917.

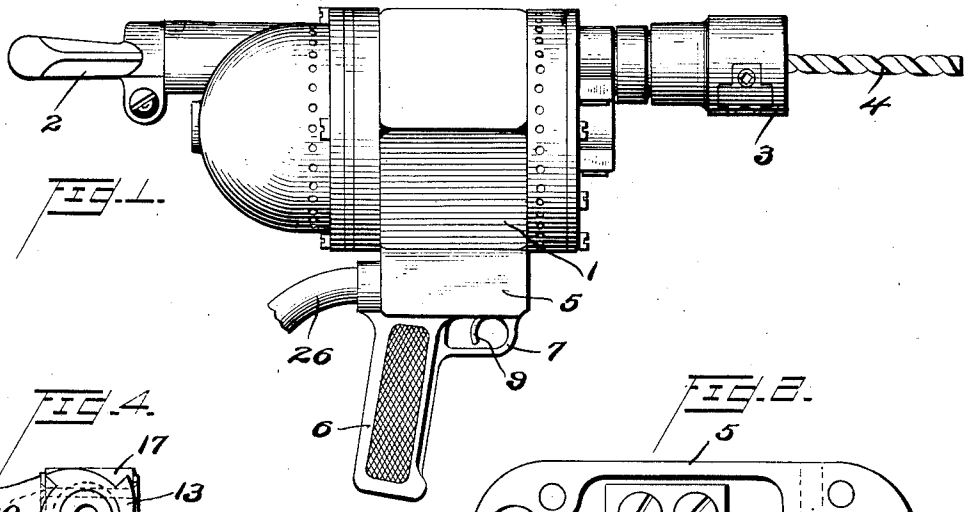


FIG. 1.

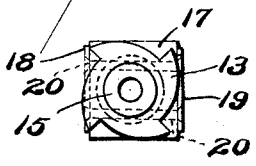


FIG. 4.

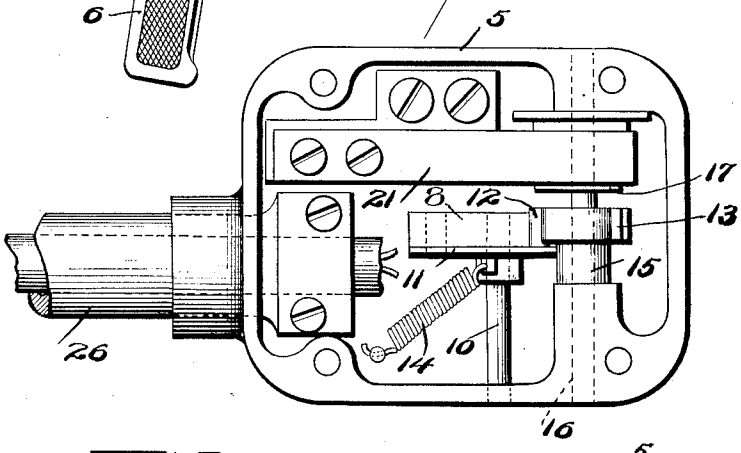


FIG. 2.

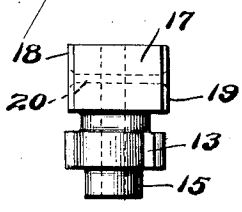


FIG. 5.

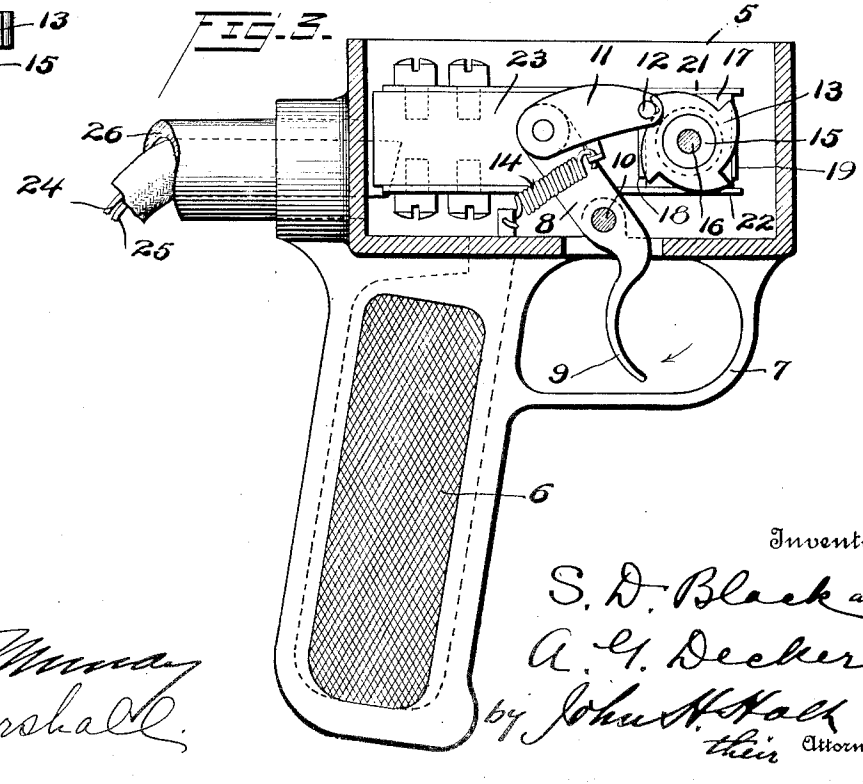


FIG. 3.

Witnesses

Kelly Murray

E. G. Marshall.

Inventors

S. D. Black and

A. G. Decker

by John H. Hall

their Attorney

UNITED STATES PATENT OFFICE.

SAMUEL DUNCAN BLACK AND ALONZO GALLOWAY DECKER, OF BALTIMORE, MARYLAND, ASSIGNORS TO THE BLACK & DECKER MANUFACTURING COMPANY, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND.

ELECTRICALLY-DRIVEN TOOL.

1,245,860. Specification of Letters Patent. Patented Nov. 6, 1917.

Application filed December 4, 1914. Serial No. 875,439.

To all whom it may concern:

Be it known that we, SAMUEL DUNCAN BLACK and ALONZO GALLOWAY DECKER, citizens of the United States, residing at Baltimore city and State of Maryland, have invented certain new and useful Improvements in Electrically-Driven Tools, of which the following is a specification.

The primary object of this invention is to overcome certain disadvantages inherent in most hand supported portable electrically driven tools, particularly electric drills.

With practically all portable electrically driven and hand supported drills, in use prior to our invention, it is necessary to release the grip of at least one hand to some extent in order to operate the switch which controls the current to the tool motor. This necessarily interferes with the steadiness with which the tool is held, and in the case of portable electric drills which should be supported under the center of gravity, this results very often in allowing the weight of the motor and other parts of the tool to hang for an instant on the drill bit which not infrequently breaks under the undue strain thus imposed upon it. Our improved switch may be operated without in the least releasing the grip or support of either hand of the operator.

Another advantage that this invention possesses is that there can be no confusion arising as to which button to push, or as to which way to turn a knob, or as to whether to pull a handle in or out, as in other switches employed in this class of tools. With our invention, there is nothing more to do than merely pull a trigger after the fashion of firing a revolver or gun.

Our improved switch further differs from those hitherto employed in that it has a rotatable switch member which moves always in the same direction. Further differences between our improved switch and those hitherto employed will hereinafter appear.

In order to more fully describe our said invention, reference will be had to the accompanying drawings wherein,

Figure 1, is a side elevation of an electric drill equipped with one form of our invention;

Fig. 2, a detail top plan view of the switch box removed from the drill;

Fig. 3, a detail vertical sectional elevation of the switch and grip removed from the drill;

Fig. 4, a detail end elevation of the rotatable member of the switch, and

Fig. 5, a top plan view of the parts shown in Fig. 4.

Referring to the accompanying drawings, 1 represents the motor casing; 2, one of the hand grips; 3, the drill chuck, and 4, the drill bit of a portable electric drill of known construction.

In carrying out our invention in the form shown, we cast integral with a switch box 5, for attachment to the motor casing as shown, a pistol grip support 6, adjacent which is formed a trigger guard 7. Within this switch box, which has a surface arranged to form a support for the tool on the hand of the operator, we pivot a lever 8 having a downward extension 9 which forms a trigger movable within the trigger guard 7. Lever 8 turns upon a spindle 10 fast to the casing of the switch box.

Pivotally connected to trigger lever 8 adjacent its upper end is a pawl 11 which is provided with a right angle pin 12, which rests upon the periphery of a four-toothed ratchet 13, and is held thereagainst under the tension of a coil spring 14.

Ratchet 13 is fast upon a sleeve 15 which is rotatably mounted upon a shaft or spindle 16 supported in the switch box casing and extending transversely thereacross as shown. Also fast on said sleeve is a four-sided insulating block 17 on two opposite faces of which are made fast two metal contact plates 18 and 19, respectively, electrically connected together as by rivets 20. This contact block is rotatable between two contact springs 21 and 22 which bear upon opposite sides thereof, and which are made fast to an insulating support 23.

Contact springs 21 and 22 form terminals respectively for two conductors 24 and

25 which extend into the switch box through the usual conduit 26, after the common practice in this class of devices.

The construction is such that each time trigger 9 is pulled in the direction indicated by the arrow, Fig. 3, block 17 will rotate one quarter of a revolution. Therefore, on one pull of the trigger the contact plates 18 and 19 will be brought into engagement with contact springs 21 and 22, and on the next pull of the trigger, said plates will be removed from contact with said springs and the insulating faces of block 17 brought into engagement therewith. Therefore to either close or open the switch, it is merely necessary to pull the trigger 9 with the finger after the usual practice of operating a pistol or gun trigger.

It will be readily seen that with our invention it is unnecessary to relax the grip of the hand upon support 6 in the slightest degree to operate the switch, and that since there is but one switch member to be operated, and this each time in the same way, the likelihood of confusion in its operation is eliminated.

While we have herein shown and described one specific embodiment of our said invention, modifications thereof may be made within the scope of our claims.

What we claim is:

1. Mechanism of the class described, comprising in combination with a portable electrically driven tool, a pistol grip support secured thereto, a pivoted trigger adjacent said support and adapted to be pulled by a finger of the operator's hand grasping said support without releasing said support, an electric switch, and means operable by said trigger to close and open said switch successively by successive pulls on said trigger in the same direction.

2. Mechanism of the class described, comprising in combination with a portable electric tool and an electric switch box secured thereto, an electric switch located in said box and comprising a pair of contacts, and a contact member associated therewith and rotatable in the same direction to successively connect and disconnect said contacts to and from each other, a pivoted trigger operatively connected to said contact member to rotate it in the same direction on each operation of the trigger, and a supporting member fast to said switch box and so located with relation to said trigger that the latter may be operated by a finger of the hand grasping said member without relaxing said grasp.

3. Mechanism of the class described, comprising in combination with a portable electrically driven tool, a support secured thereto, a pivoted trigger adjacent said support and adapted to be pulled by a finger of the operator's hand grasping said support without relaxing his grasp, an electric switch having a rotary contact member, and a ratchet and pawl operable by said trigger to operate said rotary contact member.

4. Mechanism of the class described, comprising in combination with a portable rotary electrically driven tool, manual supporting means located underneath the tool and comprising a switch box having a surface arranged to form a support for the tool on the hand of the operator, a hand grip projecting from said surface, a pivoted trigger also projecting from said surface and located adjacent said hand grip, and an electric switch in said box and operable by said trigger for controlling the operation of the electrically driven tool.

5. Mechanism of the class described, comprising in combination with a portable electrically driven tool, a switch box attached thereto and having a surface arranged to rest upon the hand of the operator as a support, a hand grip projecting from said supporting surface, a pivoted trigger also projecting from said supporting surface and located adjacent said hand grip, and an electric switch operable by said trigger for controlling the operation of the electrically driven tool.

6. Mechanism of the class described, comprising in combination with a portable electrically driven tool, a switch box attached thereto approximately under the center of gravity of the tool, said switch box having a surface arranged to rest upon the hand of the operator as a support, a hand grip projecting from said supporting surface, a pivoted trigger also projecting from said supporting surface and located adjacent said hand grip, and an electric switch operable by said trigger for controlling the operation of the electrically driven tool.

7. Mechanism of the class described, comprising in combination, a portable electrically driven tool, a switch box attached thereto, the bottom of said switch box forming a substantially flat surface adapted to rest upon the hand of the operator as a support, a hand grip extending downwardly from the bottom of said switch box, a switch within said box having a member for operating the same terminating in a trigger extending downwardly from said switch box forward of and adjacent said hand grip, and movable in the direction of said hand grip to operate said switch.

8. In mechanism of the class described, the combination with a portable electrically driven tool, of a unitary supporting and controlling structure therefor comprising a switch box having a surface arranged to form a support for the tool on the hand of the operator, a hand grip projecting from

said surface, a pivoted trigger also projecting from said surface and located adjacent said hand grip, and an electric switch located within said switch box and operable by said trigger for controlling the operation of the electrically driven tool, said supporting and controlling structure being removable as a unit from said tool.

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

SAMUEL DUNCAN BLACK.
ALONZO GALLOWAY DECKER.

Witnesses:
JERE J. SANTRY,
GEO. M. KIMBERLY.