

(No Model.)

G. W. HAEL.

SCREW DRIVER.

No. 303,003.

Patented Aug. 5, 1884.

Fig. 1

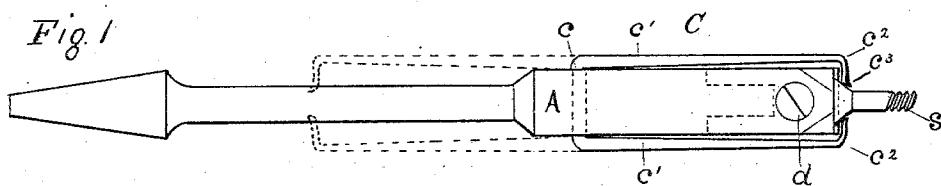


Fig. 2

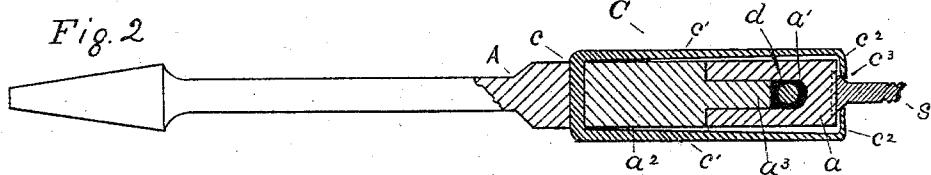


Fig. 3

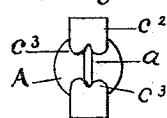
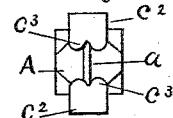


Fig. 4



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE W. HAEL, OF MINNEAPOLIS, MINNESOTA.

## SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 303,003, dated August 5, 1884.

Application filed April 23, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. HAEL, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State 5 of Minnesota, have invented certain new and useful Improvements in Screw-Drivers, of which the following is a specification.

My invention relates to screw-drivers in which clamping devices are used for holding 10 the screw.

My invention consists in attaching a spring-clamp to the bit-shank, so that the clamp can be adjusted over the screw-head to hold it firmly to the bit, and released at pleasure.

15 Figure 1 represents a bit provided with the clamping device. Fig. 2 is a longitudinal section of Fig. 1. Figs. 3 and 4 show end views of a round and square form of bit-shank with the clamp.

20 A is a bit-shank, which may be either round or angular, and used either with a handle or in a brace. In Fig. 3 is shown the round form of shank with a flat end or face, and Fig. 4 shows the square form with the corners at the 25 end beveled. Any shape desired may be given the head of the shank; but it is preferable to have it flat for the head of the screw to bear against. In the head of the bit-shank is provided a central slot extending longitudinally 30 an inch or more for the reception of a thin plate of steel, *a*, to form the edge or bit proper. This plate should have a central slot, as *a'*, extending from its inner end about half its length, and it may then be secured within the 35 shank by means of a screw, *d*, or a rivet through the shank. When the bit becomes dull and requires sharpening, or if it projects too far or not far enough, the screw may be loosened and the plate adjusted or removed for sharpening. The plate *a* should be somewhat thicker than is desirable, for the bit edge and 40 its end should be slightly beveled, so that it will be free from contact with the face of the shank-head. This will render the edge less liable to be broken off when in use than if it was firmly held by the extreme end of the shank; and it is preferable to have the bit edge project beyond the head of the shank only far enough to insure a firm turning hold in the 45 screw-head slit without extending to the bottom of the slit, thus allowing the screw-head to rest on the end or face of the shank.

C is a spring clamping device, composed of a round middle portion, *c*, and the two flattened ends or arms *c' c'*, bent at right angles to the part *c*, so as to fit close to the bit-shank, and the arms *c' c'* are bent at right angles inwardly near their ends, forming the clamps *c'' c''*. These clamps, in order that they may hold screws of the smaller sizes, should almost meet, 60 and should be located very close to the bit edge. They should be notched centrally, and their corners rounded and under edges beveled, and all made smooth, so as to permit them to be easily pressed over a screw-head 65 and give a firm clamping hold. By having the lip or lips *c''* (which are the lips on the side in the direction in which the clamps revolve in entering a screw) slightly turned up at the end, the clamp will be released automatically from the screw-head when, in inserting the screw, the part *c''* comes in contact with the wood or other material into which the screw is being inserted.

In Figs. 1 and 2 is illustrated a mode of securing a clamping device such as described which has been constructed before being inserted in the bit-shank. The slot in the shank, heretofore mentioned, is extended back to the point at which the part *c* is to be placed, and 75 there terminates in a rounded end. The part *c* is then inserted and held in place by a plate, *a'*, inserted in the slot in the rear of the plate *a*, and may have a tongue, *a''*, fitting into the slot *a'*, and extending to the screw *d*; or a screw 80 or rivet may be passed through the bit-shank and plate *a'*, to keep the plate in place, and thus secure the part *c* of the spring in its place. Another mode of inserting and securing the clamping device is by making a hole through 85 the bit-shank a proper distance from the end, and inserting in it a piece of round spring-wire, which can be afterward flattened and suitably formed into the spring-clamp described. In such construction the slot in the shank 90 should not extend as far back as shown in the drawings, and only the plate *a* need be used in the slot. In any mode of securing the clamping device to the bit the arms *c'* must be permitted free rotary movement on the axis *c*, in 95 rec

order that they can be turned back out of the way when not in use. By making the bit-shank thinner at the point reached by the clamps when turned back, they can be made to 5 clamp around the shank.

In operating the tool the slit of a screw-head is adjusted to the bit, and the operator presses the clamps  $c^2$   $c^2$  over the beveled side of the head, which is thus clamped firmly 10 against the face of the shank-head. The screw can then be entered into wood without being first started by boring or driving. As the screw-head nears the wood, the clamp may be 15 disengaged from it by the pressure of the thumb or finger of the operator on the edge of the arm  $c'$ , and the clamp may be turned to any desired angle. The necessity for thus manipulating the clamp to get it out of the way can be avoided by having a lip, as  $c^3$ , of one of the 20 clamps  $c^2$  turned out, as heretofore described, by which means the clamps will be released from engagement and thrown out of the way automatically by the spring when the lip  $c^3$  comes in contact with the wood in turning. 25 It is preferable to have the clamps arranged over the edges of the bit rather than at an angle to it, in order that the screw-head may be held centrally to the bit, and not slide on the bit. 30 I am aware that prior to my invention spring clamping devices for holding screws have been used in connection with screw-drivers, and that means were provided for causing the clamps to seize or be released from the screw at the 35 pleasure of the operator, and means also for withdrawing the clamp out of the way when the screw was nearly entered. I therefore do not claim such a combination, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a screw-driver bit, of a spring clamping device made of one piece of metal bent to form the arms  $c'$   $c'$  at right angles to its round middle part,  $c$ , and its ends bent inwardly and suitably notched to form 45 the clamps  $c^2$   $c^2$ , the said middle part,  $c$ , being passed through a hole in the bit-shank, whereby the clamps may be allowed to swing over the end of the bit to engage a screw-head, all 50 constructed and arranged substantially as set forth.

2. The combination, in a screw-driver, with the bit-shank A, provided with the bit-plate  $a$ , secured by a rivet or screw,  $d$ , in a slot in the head of the bit-shank, of the spring clamping device C, made of one piece of metal, having a round middle portion,  $c$ , arms  $c'$   $c'$ , and clamps  $c^2$   $c^2$ , and hinged by inserting said middle part,  $c$ , in a hole or slot in the bit-shank, so as to allow the clamps to swing over the 60 edge of the bit to engage a screw-head and clamp it against the bit edge.

3. The bit-shank A, having a slot in its end, provided with plate  $a^2$  and bit-plate  $a$ , secured in said slot by a rivet or screw,  $d$ , in combination with the spring clamping device C, composed of the middle part,  $c$ , arms  $c'$   $c'$ , and clamps  $c^2$   $c^2$ , having bent lips  $c^3$ , the said clamp having its middle part secured in the head of said slot, so as to permit the clamps to swing over 70 the bit edge to engage a screw-head, substantially as and for the purpose set forth.

GEORGE W. HAEL.

Witnesses:

HOWE PAIGE,  
ROBT. C. KALKLUFF.