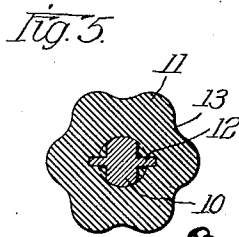
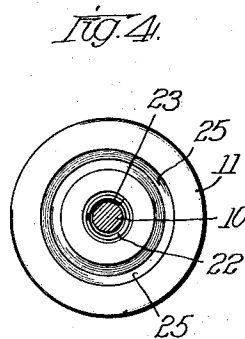
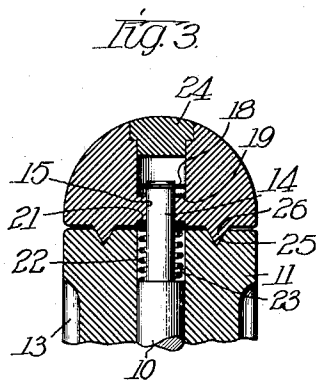
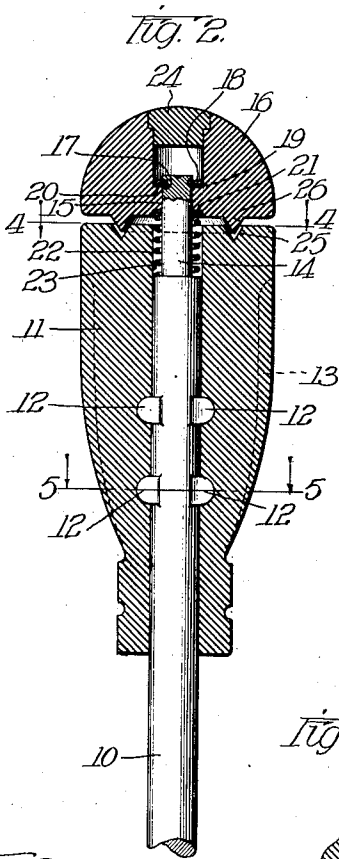
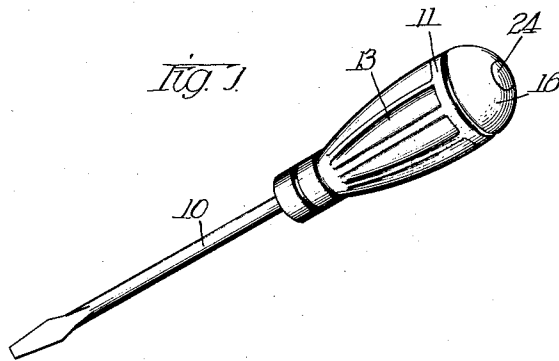


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SCREW DRIVER.
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1,049,650.

Patented Jan. 7, 1913.



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SCREW-DRIVER.

1,049,650.

Specification of Letters Patent.

Patented Jan. 7, 1913.

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To all whom it may concern:

Be it known that I, REUBEN B. BENJAMIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Screw-Drivers, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to tools such as are, in use, grasped and turned by hand; and of which the screw-driver is a convenient instance.

It is the object of my invention to provide a tool of the above character which will be convenient and comfortable in use; while, at the same time, being of an economical and durable construction.

One embodiment of my invention is shown, by way of example, in the accompanying drawings, in which:

Figure 1 is a perspective view of a screw-driver constructed in accordance with my invention; Fig. 2 is a sectional elevation, showing the parts of the screw-driver in the position which they assume when endwise pressure is not being exerted on the handle; Fig. 3 is a fragmentary view, in section, showing the position assumed by the parts of the screw-driver when pressure is exerted endwise on the handle; and Figs. 4 and 5 are sectional plans, the sections being taken on the lines 4-4 and 5-5, respectively, of Fig. 2, looking in the directions of the arrows.

By the aid of my invention, I obviate several disadvantages usually noticeable in tools which have to be rotated by hand; one of such disadvantages being that the handle of the tool is liable to irritate the palm of the person using it, and another disadvantage being, in the case of screw-drivers, that it is difficult to keep the blade in the slot of the screw head when the screw is being driven rapidly. This I effect by making the handle in two relatively movable parts, one part carrying the blade and being adapted to be grasped by the fingers and the other part being disposed so that it will naturally rest in the palm of the person using the tool. The last-named part is rotatable on the first-named part and movable longitudinally relatively thereto. The effect of this construction is that the advantage of the use of the whole handle is ob-

tained during the time when the hand is turning with the tool; while the rotatable member remains stationary in the hand, and turns therewith, during the time when the hand is turning relatively to the tool, thereby preventing friction between the hand and the handle of the tool at that time.

Referring now to the drawings: 10 designates the blade of the screw-driver, to which is secured the handle portion 11, which latter is disposed so that it may conveniently be grasped by the fingers. The handle portion 11 will hereinafter be termed the "finger-piece." In the construction shown, the finger-piece is formed of hard rubber, molded upon the shank of the blade 10, the shank being formed with outwardly-extending ears 12, for preventing relative movement, longitudinal or otherwise, between the finger-piece and the blade. The ears 12 may conveniently be stamped up from the metal of the shank. In order to enable a better hold to be obtained upon the finger-piece, the latter is formed with a plurality of longitudinal depressions or flutings 13. This method of forming the handle, and securing it to the blade, results in a very firm and durable construction.

The upper end of the shank of the blade 10 is reduced, somewhat beneath the upper end of the finger-piece 11, to form a stem 14, which enters an aperture 15, formed centrally in the other portion 16 of the handle. The portion 16 is so disposed that it will naturally be located in the palm of the person using the tool, and will hereinafter be termed the "palm-piece." The topmost end of the stem 14 is formed with a shoulder 17, on which is placed a washer 18, the washer being secured in position by spinning over the end of the stem 14. Surrounding the stem 14, and placed beneath the washer 18, is a second washer 19, which rests upon a shoulder 20, formed by enlarging the upper portion of the aperture 15 of the palm-piece. The dimensions of the parts are such as to allow a slight longitudinal play between the palm-piece 16 and the finger-piece 11, while the palm-piece is free to rotate relatively to the finger-piece, except under the conditions pointed out below. In order that the device may have a neat appearance, and that the palm-piece may be comfortable in the hand, the upper end of the aperture 15 is filled by a plug 24, the upper face of which conforms with the remainder of the surface of

the palm-piece. Surrounding the stem 14, and located in a suitable recess in the palm-piece, are two washers 21, against the lower of which abuts the upper end of a coil spring 22, which also abuts against the shoulder formed at the junction of the stem 14 and the shank of the blade 10. The finger-piece is formed with a suitable recess to provide room for this spring.

10 The upper end of the finger-piece 11 is made flat, and is formed with an annular V-shaped recess 25, which is concentric with the stem 14. The lower surface of the palm-piece 16 is also made flat, and is formed with an annular V-shaped rib or projection 26 opposite to the recess 25 of the finger-piece. When the palm-piece 16 is moved inward against the action of the spring 22, the rib 26 will engage in the recess 25, and a firm frictional connection will thus be made between the palm-piece and the finger-piece.

The operation of the device is as follows: It is to be observed that, in turning a screw in the proper direction for inserting the same, it is natural to exert an end-thrust upon the handle of the screw-driver, the thrust being more or less powerful proportionally to the resistance of the screw to insertion. Such thrust will result in the palm-piece 16 being forced toward the finger-piece 11, so that the rib 26 will engage in the recess 25, and the palm-piece 16 will therefore bind frictionally with the finger-piece, the efficiency of this frictional engagement being proportional to the end-thrust employed; and, therefore, naturally, proportional to the particular requirements for the screw being inserted. The screw-driver becomes, therefore, during this portion of the operation of inserting the screw, as though its handle were formed in but one part, and the user thus has the advantage of the whole handle. In turning the hand back, however, preparatory to another turn in the direction for inserting the screw, the hand necessarily relaxes its end pressure, and must turn relatively to the blade. This relaxing of the end pressure enables the spring 22 to force the palm-piece 16 out of engagement with the finger-piece 11, so that the palm-piece can remain stationary relatively to the palm and rotate relatively to the finger-piece, during the backward movement of the hand. Upon making another forward turn of the tool, the natural end pressure of the hand again causes the palm-piece to bind frictionally with the finger-piece.

60 In inserting machine screws, or wood screws into old screw-holes, it usually is not necessary to exert much force until the conclusion of the operation; this is true also of the withdrawing of screws. Under such circumstances, it is not necessary to exert

any end pressure upon the tool, and the finger-piece, therefore, may be turned by the fingers while the wrist remains still; the palm-piece resting stationary in the palm, and serving to maintain the end of the blade in the notch of the screw. Immediately, however, that it becomes difficult to use the screw-driver in this manner, an end pressure may be exerted, and the screw-driver operated as described in the preceding paragraph.

It will be noted that the device has all the advantages, but none of the disadvantages, of an ordinary solid handle. When the palm-piece is caused to bind with the finger-piece, the effect of a solid handle is obtained, since the turning effort of the palm of the hand, as well as of the fingers, is utilized in turning the screw; while, during that portion of the operation in which it is not necessary to exert force upon the handle, the palm-piece rests stationary in the palm of the hand, so that there is no tendency to cause soreness of the palm, and the maintaining of the blade in the slot of the screw is aided by the spring between the palm-piece and the finger-piece. It may, in fact, be said that the portion of the palm-piece which engages the finger-piece performs mechanically the same functions (but in a more convenient and comfortable manner) as are performed naturally by the portion of the palm against which the butt of the handle of an ordinary screw-driver rests in use. It is to be noted, moreover, that the embodiment of my invention herein shown has the above advantages, not only in inserting a screw, but in withdrawing one, and regardless of whether the screw has a right-hand or left-hand thread. Also, the longitudinal movement, required to free the friction surfaces from engagement with one another, is exceedingly small—so small, in fact, that a conscious rearward movement of the hand to free the friction surfaces is not necessary, the natural relaxation of the hand during its backward movement being quite sufficient.

I claim—

1. A hand tool comprising a blade and a handle adapted to be grasped by the hand to apply power for turning the tool, said handle consisting of a finger member rigid with the blade, and a palm member normally out of engagement with the finger member but adapted to frictionally connect therewith for either direction of rotation of the tool when pressure is applied thereto and to rotate freely in either direction when the pressure is removed.

2. A tool having a handle adapted to be grasped and operated by one hand, said handle comprising a finger member adapted to be gripped by the fingers in the driving operation of the tool, and a palm member

adapted to lie in the palm of the hand, said two handle members having opposed frictional engaging surfaces adapted to grip each other when a turning pressure in either direction is applied to the handle and to be disengaged and the palm member to rotate freely in either direction when the pressure is relieved.

3. A hand tool consisting of a blade and a handle, said handle comprising a member rigidly secured to said blade and disposed so that it may be conveniently grasped by the fingers, a second member disposed so as to lie in the palm of the hand, said second named member being rotatably mounted on said first named member so as to be capable of longitudinal movement into and out of engagement therewith, said first and second members being provided with oppositely disposed friction surfaces arranged to engage and grip each other when a turning pressure is applied to the handle in either direction, and resilient means for normally holding said second named member out of engagement with said first named member, whereby when pressure is relieved from the handle the second member is free to rotate in either direction.

4. A hand tool consisting of a blade and a handle, said handle comprising a member rigidly secured to said blade and disposed so that it may be conveniently grasped by the fingers, a second member disposed adjacent said first named member in such a position as to lie in the palm of the hand, one of said members being provided with an annular V-shaped projection and the other member being provided with an annular groove complementary to said projection, and means for rotatably connecting said second named to said first named member so as to be movable longitudinally thereof, whereby when pressure is applied to said second member and a turning effort is exerted on the handle in either direction the annular projection of one member will frictionally engage and grip the walls of the recess of the other member and when pressure is relieved the said two members disengage and the said second member is free to rotate in either direction.

5. A hand tool comprising a blade, a handle section rigidly connected therewith, said handle section being adapted to be grasped by the fingers and having an end face adapted to be frictionally engaged to turn the tool, a palm member adapted to lie in the palm of the hand and rotatably connected to the rear end of said handle section so as to be capable of longitudinal movement with respect thereto and having a friction surface to engage the said end face of said handle

section, and a spring tending to hold said rotatable palm member in its rearward position whereby said rotatable palm member can transmit a light end pressure to said handle section through the intermediary of said spring and can be moved inward against the action of said spring when a heavier end pressure is applied to cause a frictional turning engagement in either direction with the end face of said handle section.

6. A rotatable hand tool comprising a blade and a handle longitudinally disposed on the shank of the blade; said handle comprising an elongated member rigidly attached to the blade and forming the main gripping member for the fingers of the hand in the use of the tool, and an end member adapted to lie in the palm of the hand when the hand is grasping the handle, said end member being mounted to rotate in either direction with respect to said rigid member and to move longitudinally toward and away from the end of said rigid member; and means for operatively connecting said two members together when a turning pressure is applied to the handle in either direction so that the whole turning effort of both the fingers and the palm of the hand is exerted on the blade and for disengaging said two members and permitting the said end piece to rotate freely in either direction when such pressure is removed.

7. A hand tool comprising a blade and a handle adapted to be grasped by the hand to apply power for turning the tool in either direction, said handle consisting of a finger member rigidly attached to the shank of the blade and arranged to be conveniently grasped and gripped by the fingers of the hand in the natural use of the tool, and a palm member adapted to lie in the palm of the hand, said palm member being mounted for rotation in either direction on the shank of the blade and immediately at the end of the said finger member, a resilient member surrounding said shank between the said two members and tending to separate them, the adjacent opposed faces of said two members being adapted to frictionally engage and bind each other together when a turning pressure is applied to the handle in either direction and said palm member rotating freely in either direction when such pressure is removed.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

REUBEN B. BENJAMIN.

Witnesses:

E. R. KING,
CHARLES G. COPE.