(No Model.)

H. S. BROWNSON.

SCREW DRIVER.

No. 344,160. Patented June 22, 1886.

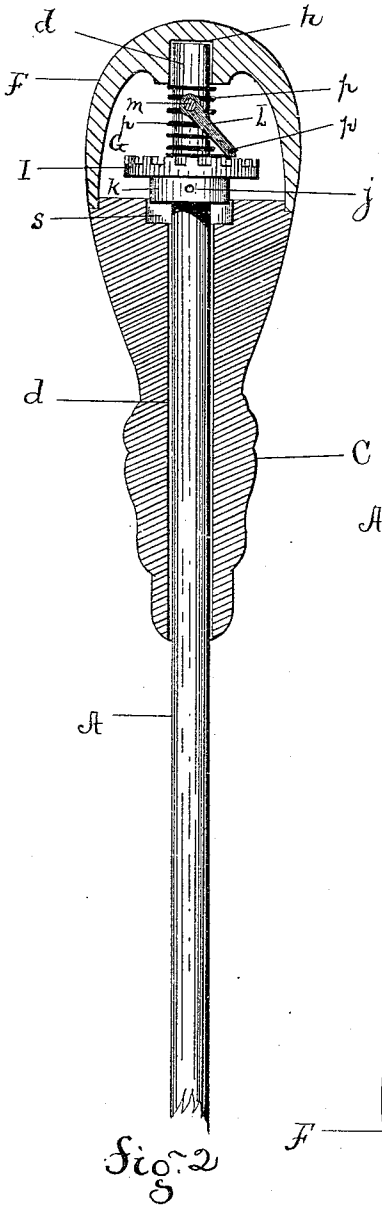


Fig. 2.

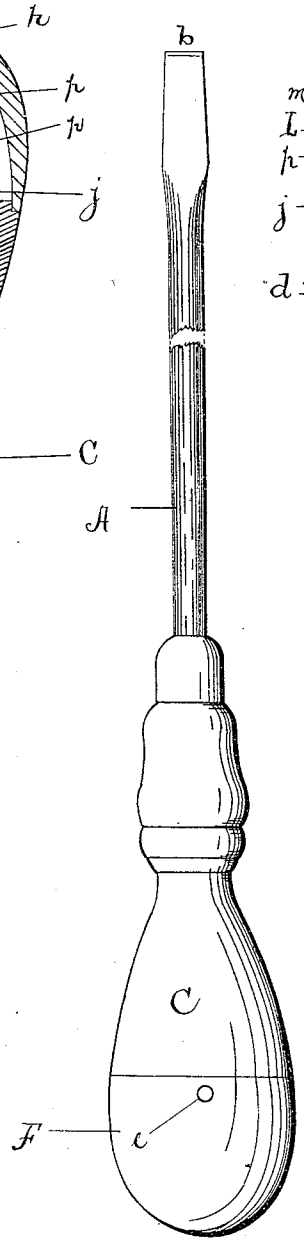


Fig. 1.

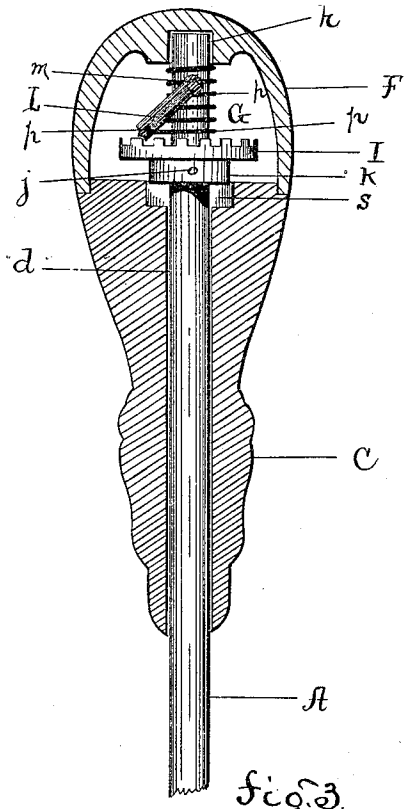


Fig. 3.

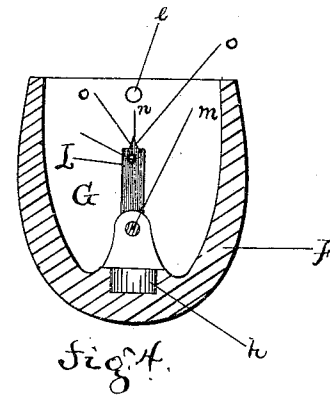


Fig. 4.

Witnesses:-
J. B. Bishop
John F. Barrett

Inventor:-
Herbert S. Brownson
By his atty
Herbert G. Briggs

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

HERBERT S. BROWNSON, OF PORTLAND, MAINE.

SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 344,160, dated June 22, 1886.

Application filed August 21, 1885. Serial No. 174,932. (No model.)

To all whom it may concern:

Be it known that I, HERBERT S. BROWNSON, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Screw-Drivers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a new and useful improvement in that class of wood-working tools commonly known as "screw-drivers," and whereby the general usefulness of the same is greatly increased by means of a reversible ratchet movement contained within the handle.

The invention consists in the use of a face-gear, a pawl, and a pawl-operating spring, so constructed, combined, and arranged that an operative rotary motion back and forth in opposite directions can be readily imparted to the screw-driver by rotating the handle in a forward direction.

In the accompanying drawings, Figure 1 is a front view or elevation. Fig. 2 represents a longitudinal section showing the parts in position for forcing a screw forward. Fig. 3 shows same view with parts reversed for extracting a screw. Fig. 4 is an enlarged detail of the pawl.

Similar letters of reference indicate corresponding parts.

A is a screw-driver, made of a length of round steel, and shaped at its extreme end *f* to engage with the slot of a screw-head.

C shows a handle, preferably of wood, provided with a bore, *d*, to receive the shank of the driver A. To the end of the handle I attach, by means of pins or screws *e e*, a cast-metal cap or head, F, which has a recess or chamber, G, for holding the mechanical parts composing my newly-organized reversible ratchet movement. At the bottom of the chamber G is a socket, *h*, which affords a convenient bearing-point for the shank end of the driver A to rotate upon.

I is a face-gear made fast to the shank *d* by means of a pin, *i*, passing through a collar, *k*, on the back of the gear.

L is a pawl swinging upon a pivot-pin, *m*, at its lower end. The free or top end of the pawl is provided with a projecting spur, *n*, having a shoulder or recess, *o*, on each side, to engage with the teeth on the gear I.

P is a spiral spring which encircles the screw-driver shank. One end of the spring rests upon the face or rim of the socket *h*. The other end is carried away from the shank and connected to the spur end of the pawl L.

In putting the parts together the shank *d* is passed through the bore of the handle C. The face-gear I is then slipped over the shank, and at the proper point is made secure by means of the pin *i*. The pawl L is put in its place in the chamber, and then rendered secure by the pivot-pin *k*. The spiral spring P is set upright over the socket *h*, throwing the pawl L into a vertical position. The end of the shank *d* is thrust through the center of the coil P and fitted into the bearing-socket *h*. The rim of the chambered cap F is presented to the end of the hollow handle and secured thereto by the pins *e e*.

In reversing the operations of the device it is necessary that the driver-shank *d* should be capable of a limited longitudinal movement through the handle. To permit said movement, care should be exercised in assembling the parts to leave a space between the face-gear I and the end of the handle C. Further, a countersink, S, is made in the end of the handle to receive the collar K.

That the uses of the device may be fully understood, I will describe the several operations necessary for driving and extracting a wood-screw. Assuming the pawl L to be in direct engagement with the gear I, as shown in Fig. 2, the operator grasps the handle G, inserts the point *b* in the screw-slot, and then rotates the device in a forward direction so far as his wrist can turn conveniently. This operation drives the screw to a greater or less degree. The direction of movement of the handle is then reversed, and as this disengages the pawl from the gear the driver A becomes inoperative. Immediately upon turning the handle forward the pawl engages with the face-gear and forces the screw further forward. Thus by alternately twisting his wrist from side to side backward and forward the operator drives the screw till it is firmly embedded in its place. Without disengaging the point *b* from the screw-slot, the driver can be rendered operative for extracting the same screw. Upon

relaxing the pressure necessary to keep the point *b* in firm union with the slot of the screw the spring P, which has been compressed between the face-gear L and socket *h*, elongates and forces the driver A longitudinally through the handle C. When the spring has been elongated, the pawl L will be in a vertical position. Then by turning the wrist backward and exerting direct pressure the pawl will fall to the opposite side and become engaged with the gear.

The handle is turned in a forward direction in extracting a screw, just as in the operation of driving; but the reversal of the pawl causes the driver to be operative for the purpose of reversing the operation first described.

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

1. In a reversible screw-driver, the driver A, having the face-gears I attached to its shank, combined with the pawl L, pivoted to the bit-shank and swinging on the pivot-pin *m*, and adapted to engage with the gear I, and the spring P, connected to the spur end of said pawl, all substantially as and for the purposes described.

2. The handle C and the hollow head or cap F, secured thereto, having at its bottom the socket *h*, combined with the shank of the driver, (the end of which fits into said socket,) and having the face-gear thereon, and the spring-pawl pivoted to the bit-shank and over said gear, and adapted to engage therewith, substantially as described.

In testimony that I claim the foregoing as my own I have affixed my signature in the presence of two witnesses.

HERBERT S. BROWNSON.

Witnesses:
WM. H. MOTLEY,
H. G. BRIGGS.