D. F. Hartford,

Screw Driver.

No. 47,102. Patented Apr. 4, 1865.

Fig. 1.

Fig. 2

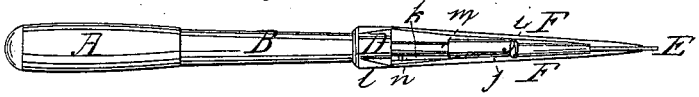
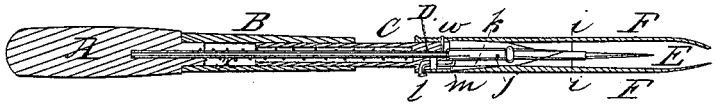


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

D. FRANK HARTFORD, OF BOSTON, MASSACHUSETTS.

SCREW-DRIVER AND TWEEZERS.

Specification forming part of Letters Patent No. 47,102, dated April 4, 1865.

To all whom it may concern:

Be it known that I, D. FRANK HARTFORD, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Combined Screw-Driver and Tweezers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side view of the instrument, representing the tweezers open and ready for use. Fig. 2 is a similar view, representing the tweezers closed down upon the screw-driver, and the latter ready for use; and Fig. 3 is a longitudinal central section of Fig. 1.

Like parts are indicated by the same letters in all the drawings, which are intended to be full-sized.

My instrument is intended chiefly for the use of watch-makers and jewelers; and the nature of my improvement consists in combining, in a convenient form, a screw-driver and a pair of tweezers or pinchers, so that the workman can use, at pleasure, either the one or the other, thereby saving a great amount of time now lost in picking up, laying down, and looking after the separate instruments, as hitherto constructed.

To enable others skilled in the art to make and use my invention, I will now proceed to describe the construction and operation of the same.

A is a round handle, of bone, ivory, or other suitable material, the length of which is shown in Fig. 3.

B is a metallic pipe or thimble, one end of which is fast upon the handle A.

C is a smaller pipe, the diameter of which is the same is that of the bore in the pipe A, so that the one may slide into the other, like the sections of a telescope, as represented in Fig. 3.

D is a larger cylinder or block, fast to one end of the cylinder C, as shown in the drawings. To the opposite sides of this cylinder D are attached, by means of screws or otherwise, the two prongs F F of a pair of watch-maker's tweezers, shaped in all respects like those in general use. The tweezers are prevented from turning on the screw-driver by means of a small pin, *w*, which is fast in the thimble D, and plays in a longitudinal slot in the screw-driver E, which consists of a single rod of steel, fast in the handle A, and shaped as clearly shown in the drawings. The tweezers are thrown forward, so that their points shall project beyond the point of the screw-driver, by means of the spiral spring *x*, which encircles the screw-driver shank, as represented in Fig. 3.

l is a lever, shaped as shown in Fig. 3, and vibrating freely in a slot in the block D, the inner end of this lever being forced down upon the screw-driver shank by means of the flat spring *k*, one end of which is fast to one of the prongs of the tweezers.

n is an indentation in the screw-driver shank, and *m* is a shoulder on the same. The design of the shoulder is to prevent the tweezers from moving too far from the handle A, which is effected by the end of the lever *l* bearing against it, as represented in Figs. 1 and 3. The design of the indentation *n* is to receive the end of the lever *l*, which is forced into it by means of the spring *k*, thereby holding the tweezers in the position shown in Fig. 2.

i i are steel wires fast one to each prong of the tweezers, being shaped and placed as clearly shown in Fig. 1.

j is a small pin projecting each side of the screw-driver shank about one-eighth of an inch. When the tweezers are drawn back, as shown in Fig. 2, the wires *i i*, bearing on the pin *j*, force the points of the prongs F F down upon the screw-driver E, so as to be entirely out of the way when it is required to use the instrument as a screw-driver.

When the parts of the instrument are in the relative position represented in Fig. 2, it is as convenient for a screw-driver as any single tool in general use for a similar purpose; and if now the operator wishes to use the instrument as a pair of tweezers, he simply presses with his thumb or finger on the outer end of the lever *l*, which lifts the lower end thereof out of the indentation *n*, when the spring *x* will instantly force the arms F F into the position shown in Fig. 1.

To bring the tweezers from the position shown in Fig. 1 to that of Fig. 2, the operator, grasping the block D with his thumb and second finger, instantly draws it back by pressing upon the end of the handle A with his forefinger; or he can simply press the end of

the handle A on the bench or table before him, which will accomplish the same purpose equally well.

As screw-driver and tweezers are the two instruments which are in constant requisition by watch-makers and jewelers to perform consecutive operations, the utility of combining the two instruments in one, as I have described, is very great, saving no small amount of time now lost in picking up, laying down, and looking after the two separate instruments, as hitherto constructed.

Having thus described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The wires *k k* and pin *j*, or their equivalents, in combination with the tweezers and screw-driver, substantially as and for the purpose described.

2. Throwing the points of the tweezers beyond the point of the screw-driver by means of the spring *x*, substantially as set forth, and for the purpose described.

3. The spring-lever *l*, to operate substantially as described, in combination with the tweezers, the indentation *n*, and shoulder *m*, for the purpose described.

D. F. HARTFORD.

Witnesses:
N. AMES,
N. E. WALLACE.