

UNITED STATES PATENT OFFICE.

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DUPLEX SCREW DRIVER.

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The object of this invention is to provide an improved screw gripping screw driver.

A further object is to provide a duplex screw driver adapted for use on screws of a wide range of size.

A further feature consists in a novel form of sleeve for the bar on which the screw driver bits are formed, said sleeve having on opposite ends thereof sets of screw gripping fingers that are adapted to be disposed into coacting or retracted relation with the respective bit adjacent such fingers.

A further object is to provide means whereby said sleeve can be manually shifted on the bit bar to bring about a coactive or retractive relation of the fingers with their respective bits.

A further object is to pivotally mount the bit bar in a holding shank in a manner to permit the sleeve to be freely shifted to various positions.

A further object is to provide means for structurally and frictionally locking the sleeve and bar to the shank in the various adjusted positions so that the tool will be free from "slop."

My invention also resides in the sleeve, as a new and useful article of manufacture.

The invention has many other features and objects that will be more fully described in connection with the accompanying drawing and which will be more particularly pointed out in and by the appended claims.

In the drawing;

Fig. 1, is a plan view of the preferred form of the invention showing the screw holding fingers in retracted relation with their respective bit.

Fig. 2, is a view in side elevation with the parts in the same adjustment.

Fig. 3, is a view of a portion of the tool shown in Fig. 1, in plan, with the fingers adjusted into coactive relation with the operative bit.

Fig. 4, is a side view thereof, with the parts in the same adjustment as shown in Fig. 3.

Fig. 5, is a sectional view on line 5—5 of Fig. 2, showing the parts on an enlarged scale.

Fig. 6, is a sectional view on line 6—6 of Fig. 5, looking toward the left thereof.

Fig. 7, is a view in side elevation of the

shank with the bit bar and sleeve being partially adjusted to bring one of the ends into an operative position.

Fig. 8, is a developed plan view of the blank from which the sleeve is formed, showing the same on a small scale.

Fig. 9, is an end view of the screw holding fingers.

Fig. 10, is a side elevation of the bit bar.

Like characters of reference designate similar parts throughout the different figures of the drawing.

As shown, a handle is indicated at 1, the same having a thimble 2, preferably of metal and the end 3, of which is adapted to form a shoulder stop. Attached to and projecting from said thimble 2, is a shank 4, which, in the present construction, is bifurcated from a bight 5, outwardly, the limbs being indicated at 6. In cross section, the shank 4 is circular, and as will be seen in Fig. 5, the limbs 6, are generally cylindrical except for the interruption caused by the bifurcation thereof. The inner faces 7, of said limbs 6, are preferably flat and from a point 8, inwardly to bight 5, said limbs are slightly cut-away, as indicated at 9, for a purpose which will presently appear.

I will next describe my improved bit bar which is more particularly shown in Fig. 10, on a reduced scale.

Said bar is designated at 10 and in side elevation, it is of the contour shown, the same being shown in cross section in Fig. 5. The ends of said bar 10, as indicated at 11, are reduced from the greatest width as shown at 12, and said ends are shaped to form screwdriver bits 13 and 14, the former being for a relatively large range or size of screws and the latter for the smaller sizes. Mid-way between the ends thereof, said bar is provided with an aperture 15.

I will next refer to my improved sleeve means which is coactively associated with said bit bar.

There is shown a bit bar enclosing or enveloping sleeve having identical side walls 16, an edge wall 17 and a split edge wall composed of identical flanges 18, all as shown more clearly in Fig. 5. As shown in Fig. 1, the edge walls terminate at 19 and 20 from which points, outwardly, the sleeve is forked to form at each end of the sleeve,

a set of screw holding fingers. Adjacent the larger bit 13, the fingers are indicated at 21, and the ends 22 thereof are bent inwardly thereby tensioning the fingers 21 when the latter are in the retracted position shown in Fig. 1. The bent ends 22 are shown provided with notches 23, as illustrated in Fig. 9, and the walls of said notches are adapted for engagement with the shank of the screw just behind the head, as shown in Fig. 3. When the sleeve is in the position shown in Figs. 1 and 2, the bit 13 is adapted to be used in the usual capacity. At the opposite end, and disposed within the forked shank limbs 6, the sleeve is likewise bifurcated from point 20, to form fingers 24 having inwardly bent ends 25, identical with ends 22. In the walls 16, of said sleeve, I provide slots 26 for a purpose which I am now about to describe.

Reference will next be made to the manner and means for mounting the bit bar and its sleeve onto the shank.

In cases where the shank is a forked shank, as shown, I employ means such as a pivot 27, extending through limbs 6, and through slots 26 and through opening 15, the heads of the pivot being suitably set in rigid relation to the limbs, which heads are shown at 28. Thus, the bar 10, with its slidable sleeve, is pivotally mounted in the shank so that the bar 10 can be turned end for end to dispose either bit 13 or 14 in an operative position with respect to the shank. The elongated slots 26, afford movement for the sleeve such as will dispose the fingers in the desired position with respect to the bits. Movement of the sleeve, longitudinally of the bit bar 10, is effected by manually grasping the sleeve with the hand. In order to prevent binding, and afford free longitudinal shifting movement of the sleeve on the bit bar 10, I provide means which is preferably in the form of spacing washers 29, which are preferably square, and which are disposed over the pivot 27, between the bar 10 and the limbs 6 and within the slots 26. These washers 29, are slightly thicker than the walls 16, of the sleeve, so that when the heads 28 are riveted or swaged in place, there will be a working clearance between the flat faces 7, of limbs 6, and the walls 16 of the sleeve. In fact, it is desirable to use washers 29 of a sufficient thickness so that the inner walls 7 will actually diverge to a very slight extent, from the bight 5, outwardly.

I have purposely shown the sleeve in Fig. 1, in an adjustment that will illustrate the reason for slightly recessing the walls 9, so that the latter will accommodate the fingers when the latter are in a normal position and not under tension.

I will next describe the means for holding the bit bar 10, and its sleeve in rigid rela-

tion to the shank and in a manner to prevent "slop."

A ferrule 30, is slidably mounted on the holding shank in a manner to be adjusted from the full to the dotted line positions shown in Figs. 1 and 2. Said ferrule slides easily on the shank from shoulder 3, to a point near the end 8 of the reduction of walls 9, and from that point, the diversion of the limbs 6, affords friction to the ferrule 30, and to slide the same any further, tends to bend the limbs 6, between the pivot 27, and the bight 5, and thereby compress said limbs against the sleeve. As an alternative of the foregoing, or supplemental thereof, and preferably the latter, I proportion the sleeve in such a manner or on such dimensions that the edge walls thereof project slightly above a line marking the total diameter of the limbs and near the ends of the sleeve, I reduce the same as shown at 31, as regards the left hand end in Figs. 2, and 4, and at 32, as regards the right hand end, as shown in Fig. 2. Thus, when the ferrule 30 is shifted far enough to ride up on the central extended portion of the sleeve and over the reduced portions 31 or 32, the ferrule will not only structurally lock the bar 10, in its adjusted position, but it will so rigidly and frictionally secure the sleeve that both the bar and sleeve will be held firmly in position against "slop". This is an important feature in an adjustable screw driver, as a wobbly action would render the driver very inefficient, especially an adjustable driver.

I consider it a novel feature to make a sleeve, as shown and described, from a blank as illustrated in Fig. 8, on a reduced scale. Said blank is made with the stock cut-away so as to form projections 33, on one end, to constitute one set of fingers, and projections 34, on the other end, to constitute the remaining set of fingers. These projections are formed in a manner to leave enough stock for one complete edge wall, as shown at 35, and to leave edge portions 36, for the walls 18. The slots 26, are formed in the blank as shown at 37. Thus when the blank is folded on a general medial line A, about the bar 10, or about any suitable former, and the portions 36 are bent in place, the sleeve will be complete as shown.

While the device of my invention may be clear as regards operation, from the foregoing description, it may be briefly recapitulated as follows:

In the adjustments shown in Figs. 1 and 2, the bit 13, can be used in the usual capacity, for a screw driver. If it is desired to start a screw, either a wood or a machine screw, in a place that is inaccessible to the hands, then, the ferrule 30 is shifted back to the dotted line position thereby leaving the sleeve free to be manually adjusted so that

the fingers will be in a screw holding position, as shown in Figs. 3 and 4. When the ferrule is again advanced to the locking position as shown in full lines, the screw will be firmly held and can be started. After the screw has been started, the ferrule can be shifted back to the dotted line position to free the sleeve for retraction of the latter to the Figure 1, position. Then, the ferrule can be again advanced to lock the bar and sleeve in a fixed position against "slop".

It will be seen that the coaction between the ferrule 30 and the reduced portions 31 and 32 of the sleeve is of a very flexible nature that compensates for a wide variety of adjustments of the sleeve with respect to the bit bar 10. For instance, when the sleeve is in the retracted adjustment shown in Fig. 1, the reduced portions 32 would be nearer the bight 5, than when the sleeve was forced outwardly into the Fig. 3 adjustment, and yet, the ferrule is movable to whatever position is necessary in order to effect engagement with the sleeve and frictionally lock and hold the latter and its bar against "slop". Whatever bend takes place, with respect to the limbs 6, will accommodate for this wide range of adjustment afforded so that in any event, the ferrule 30 can always be moved into tight locking engagement with the sleeve.

It is believed that the invention will be fully understood from the foregoing description, and while I have herein shown and described one specific form of my invention, I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:

1. In a duplex screw driver, a bit bar having a bit on each end thereof, a sleeve enclosing said bar and having a set of screw holding fingers on each end thereof and being slidable on said bar to dispose either set of fingers in coacting or retracted relation with the respective bit thereof, a forked holding shank, means pivoting said bar in the fork of said shank for end for end adjustment of said bar with respect to said shank to dispose either bit in projecting relation from said shank, and a ferrule slidable on said shank for locking said bar in its adjusted position.

2. In a duplex screw driver, a bit bar having a bit on each end thereof, a sleeve enclosing said bar and edge portions of said sleeve being cut away and the resultant free ends being bent inwardly to form a set of screw holding fingers on each end of said sleeve and said sleeve being slidable longitudinally along said bar to dispose either set of fingers in coacting or retracted relation with respect to its respective bit, and a handle shank in which said parts are mounted.

3. In a duplex screw driver, a bit bar having a bit on each end thereof, a sleeve enclosing said bar and having a set of resilient screw holding fingers on each end thereof and said sleeve being slidable on said bar to dispose either set of fingers in coacting or retracted relation with respect to the adjacent bit, said sleeve having pivot slots in opposite walls thereof, a forked holding shank, a pivot extending through the fork ends of said shank and through said slots and through an intermediate portion of said bar to pivotally mount the latter in said shank, spacing washers disposed on said pivot and located in said slots between said forked ends and said bar and being of a thickness to slightly space said forked ends in working clearance relation to said sleeve to permit free movement of the latter, and a locking ferrule slidable on said shank toward said pivot to enclose and lock said sleeve and bar and compress the intermediate forked portions of said shank against said sleeve to rigidly hold said bar in its adjusted position against "slop."

4. In a duplex screw driver, a bit bar having a bit on each end thereof, a sleeve enclosing said bar and having a set of screw holding fingers on each end thereof and said sleeve being slidable on said bar to dispose either set of fingers in coacting or retracted relation with respect to the adjacent bit, a forked shank having its limbs reduced from its bight toward its ends to render said limbs inwardly bendable, a pivot extending through the forked ends of said shank and through an intermediate portion of said bar to pivotally mount the latter, and a locking ferrule slidable on said shank toward said pivot to enclose and structurally lock said sleeve and bar and compress intermediate portions of said limbs against said sleeve to rigidly hold said bar in adjusted positions against "slop."

5. In a duplex screw driver, a bit bar having a bit on each end thereof, a sleeve on said bar having a set of screw holding fingers on each end thereof and being slidable on said bar to dispose either set of fingers in coacting or retracted relation to the respective and nearest bit, a holding shank pivotally united with said bar for end for end adjustment of said bar, and means for locking or holding said bar in its adjusted position with respect to said shank.

6. In a duplex screw holding screw driver, a forked shank, a bit bar having a bit on each end thereof and pivoted between its ends in the forked ends of said shank, a sleeve on said bar having a set of screw holding fingers, one set for each bit, and said sleeve being slidably adjustable on said bar to dispose a set of fingers in coactive or retracted relation to the active bit, and a ferrule slidable on said shank for holding

said bar in position by engaging said sleeve irrespective of the longitudinal position of said sleeve on said bar.

7. In a duplex screw holding screw driver,
5 a shank forked to form limbs, a bit bar having a bit at each end thereof, a sleeve longitudinally slidable on said bar and having sets of screw holding fingers at each end thereof and the walls of said sleeve being
10 slotted, a pivot extending through the ends of said limbs and through the slots of said

sleeve and through said bar, spacing washers on said pivot between said limbs and bit bar for spacing the ends of said limbs in clearance relation to said sleeve to slightly diverge said limbs, and a ferrule movable on said limbs to contract the latter against and lock said sleeve and bar. 15

In witness whereof, I hereby affix my signature.

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