Nov. 1, 1955 T. M. WOYTON 2,722,148

FASTENING HOLDER AND STARTER WITH RESILIENT ARMS

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Fig. 1.

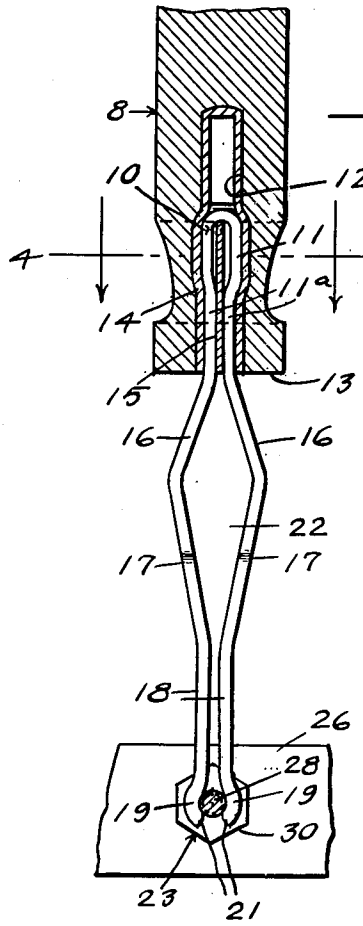
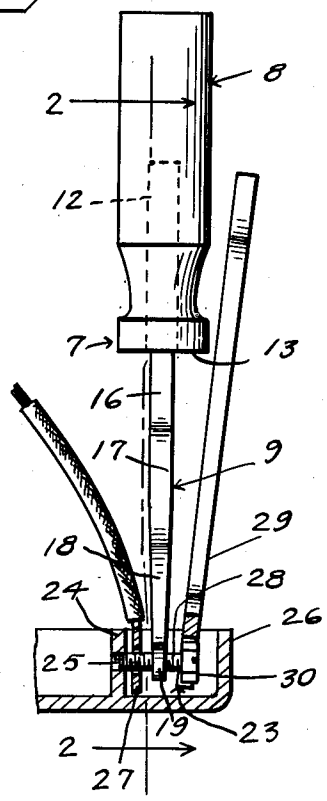


Fig. 2.



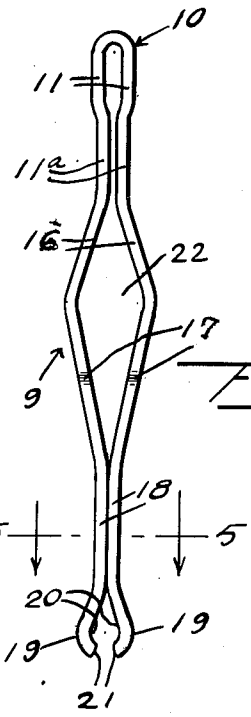


Fig. 3.

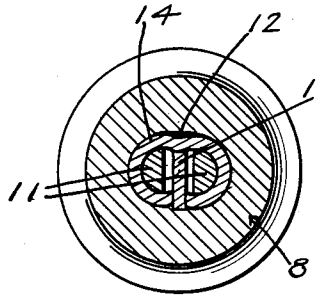


Fig. 4.

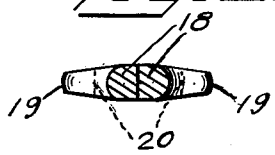


Fig. 5.

INVENTOR

T. M. Woyton

BY John N. Randolph

ATTORNEY

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FASTENING HOLDER AND STARTER WITH RESILIENT ARMS

Thomas M. Woyton, Elmont, N. Y.

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4 Claims. (Cl. 81—43)

This invention relates to a tool of extremely simple construction adapted to be used for holding fastenings such as small machine screws and bolts in inaccessible locations and while the fastening is started into a threaded bore or other part to which it is to be connected.

Considerable difficulty is encountered and much time is lost in starting small screw fastenings into fastening receiving parts located in inaccessible spaces where insufficient space is available to hold the fastening while it is being initially applied by means of a tool such as a small wrench or offset screw driver, as for example in working on automobile distributors, switches and under dashboard connections and also in connection with work on televisions, radios, general electrical repairs and various mechanical assembly work.

Accordingly, it is a primary object of the present invention to provide a holder for a screw fastening in which the screw fastening can be readily supported with the axis of the fastening disposed substantially transverse to the longitudinal axis of the tool or holder, and so that the fastening can be readily turned while thus held for starting the fastening into a part to which it is to be connected or for holding the fastening while it is being removed to prevent the fastening dropping into an inaccessible location in which it could cause damage.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a side elevational view of the tool or holder shown in an operative position;

Figure 2 is an enlarged fragmentary vertical sectional view taken substantially along a plane as indicated by the line 2—2 of Figure 1;

Figure 3 is a side elevational view of the tool shank, shown detached from the tool handle;

Figure 4 is an enlarged cross sectional view through the tool handle, taken substantially along a plane as indicated by the line 4—4 of Figure 2, and

Figure 5 is an enlarged cross sectional view through the tool shank, taken substantially along a plane as indicated by the line 5—5 of Figure 3.

Referring more specifically to the drawing, the fastening holding tool in its entirety and comprising the invention is designated generally 7 and includes an elongated handle 8 which may be of any desired external shape in cross section, similar to the handle of a small screw driver, and a shank, designated generally 9.

The shank 9, in the presently preferred embodiment of the invention, as herein disclosed, is formed from a strip of spring steel which is relatively resilient and which is folded back upon itself intermediate of its ends to provide an inner end portion 10 including spaced apart arm portions 11. The arm portions 11 have complementary extensions 11*a*, as best seen in Figure 3, which are spaced apart a lesser distance than the arm portions 11. The handle 8, in the embodiment of the tool 7 as disclosed, has a longitudinally extending bore 12 opening outwardly

of an inner end 13 thereof and which may contain a sleeve or liner 14. The inner end portion 10 including the arm portions 11 and 11*a* are disposed within the lining 14 of the bore 12 and are suitably anchored therein in any desired manner, as by means of a wedging strip 15, as illustrated, which may be wedged tightly between the arm portions 11*a*, for securing the shank 9 immovably to the handle 8 and so that the remainder of the shank, hereinafter to be described, will project from the handle end 13 and will be disposed with its longitudinal axis in substantially axial alignment with the handle axis. However, as the description proceeds it will become apparent that the inner end portion 10 including the parts 11 and 11*a* may be secured in any desired manner longitudinally in a handle and may, for example, be molded therein.

The shank part protruding from the inner handle end 13 includes substantially straight outwardly diverging arm portions 16 which terminate at their outer ends in longer substantially straight converging arm portions 17. The arm portions 17 have substantially straight extensions 18 forming continuations of their outer ends which are normally disposed in abutting engagement with one another, as illustrated in Figure 3, and which terminate in outwardly bowed portions 19, forming the terminals of the spring steel strand of which the shank 9 is formed and which constitute the jaws of the tool 7. Said jaws 19 are outwardly bowed relative to one another and include longitudinally curved concave inner surfaces which are disposed in opposed relation to one another and which form the faces 20 of the jaws 19. Said jaw faces 20 are substantially flat in a direction transverse of the shank 9, as illustrated in dotted lines in Figure 5. The jaws 19 have downwardly and outwardly diverging distal ends 21, the inner parts of which merge with the outer ends of the jaw faces 20 and are disposed at an angle thereto, as seen in Figure 3. The arm portions 16 and 17 cooperate to form an elongated opening 22 in the tool shank 9, between the handle end 13 and the arm portions 18. However, the shape of the arm portions 16 and 17 and accordingly the shape of the opening 22 may be varied without materially affecting the function of the tool, as will hereinafter be described.

The strand of which the shank 9 is formed is preferably of substantially semicircular shape in cross section so that the arm portions and jaws formed thereby have substantially flat inner sides and convexly rounded outer sides, as best illustrated in Figures 4 and 5.

The tool 7 has been shown on an enlarged scale in the drawing for the purpose of clarity. The two arms of the shank 9 taper in width from midway of the arm portions 17 to their distal ends 21, as seen in Figure 1, so that the jaw faces 20 are relatively narrow and will engage only a very small longitudinal portion of the threaded shank of a fastening such as the bolt or machine screw 23, as seen in Figures 1 and 2. Referring to Figure 1, for the purpose of illustrating one example of the use of the tool 7, a wall or partition 24 is shown having a threaded fastening receiving opening 25. The wall 24 is located in close proximity to another wall 26 so that considerable difficulty would normally be encountered in attempting to hold the screw or bolt 23 between the walls 24 and 26 and perpendicular thereto while the threaded shank of the screw was started into the threaded opening 25. If the screw or bolt 23 is utilized to fasten an electrical conductor eye 27 to the part 24, even less space is left available to hold the screw while it is started into the threaded bore 25. However, with the tool 7 the operation of applying the fastening 23 can be rendered extremely simple. The spaced jaw ends 21 are pressed transversely against the threaded screw shank 28 and form cams for spreading the jaws 19

so that said jaws will snap over the screw shank **28** a portion of which will then be loosely gripped between the jaw faces **20** and with the jaws **19** spaced apart a distance somewhat greater than their normal spacing, as illustrated in Figure 2, and as evidenced by the spacing of the arm portions **18** relative to one another. With the jaws **19** thus engaging the fastening shank **28** at a point spaced from its ends, the conductor eye **27** may be applied over the outer end of the screw shank after which the screw or fastening **23** is placed in a position for the end of the screw shank to be started into the threaded opening **25**. A conventional turning tool, such as a small wrench **29**, as seen in Figure 1, may engage the wrench lands of the screw head **30** or an offset screw driver, not shown, may engage the kerf of the screw head for turning the screw while thus held by the tool **7** for advancing the screw into the threaded opening **25**. The jaw faces **20** will have a sufficiently loose engagement with the fastening shank **28** so that the fastening can be readily turned by the turning tool while supported by the tool **7**. If necessary, a finger of the hand holding the handle **8** may be inserted in the opening **22** for additionally spreading the jaws **19** where the tool is used on screw shanks of larger diameter than as shown in Figures 1 and 2 in relation to the size of the jaws **19**. The tool **7** may be similarly engaged with the threaded shank **28** after partial removal of the fastening **23** by the tool **29** to prevent the fastening being dropped when completely removed from the opening **25**, under conditions where the fastening could fall into an inaccessible space where it could cause damage. The tool **7** may also be employed for starting the fastening **23** into the opening **25** by swinging the tool **7** in an arc in a proper direction for advancing the fastening into the opening **25** and in then placing pressure against the outer end of the fastening head **30** with a screw driver blade or with a flat surface of the tool **29** while the tool is swung in the opposite direction with the jaw faces **20** sliding relatively to the fastening shank **28**, so that a ratchet action may thus be accomplished for starting and/or advancing the fastening **28** into the opening **25**.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. A tool of the character described comprising a handle, a pair of resilient arms anchored in and projecting from a portion of said handle, said arms being spring biased toward one another and having free end portions outwardly bowed relative to one another and forming gripping jaws having opposed jaw faces between which a screw fastening shank is adapted to be loosely gripped for supporting the screw fastening while being turned for threadedly attaching said fastening to another part or for detaching the fastening therefrom, said jaws having substantially opposed spaced apart distal ends defining faces disposed in outwardly diverging relation to one another and which are spaced apart a distance less than the spacing between adjacent portions of the jaw faces, said jaw end faces forming cam means adapted to engage the fastening shank for camming the jaws apart for advancing the jaws into engagement with the fastening shank, said arms having elongated portions extending inwardly from the jaws and terminating in spaced apart relation to the handle, said elongated arm portions being normally disposed in abutting engagement for maintaining said jaws in laterally spaced apart relation to one another.

2. A tool as in claim 1, said arms including complementary outwardly bowed portions disposed between the handle and said normally abutting arm portions and defining a finger receiving opening into which a finger is adapted to be inserted for spreading the jaws or which outwardly bowed arm portions are adapted to be gripped for resisting spreading of the jaws.

3. A tool as in claim 1, said arms being partially semicircular and partially semielliptical in cross section and including substantially flat surfaces disposed in opposed relation to one another.

4. A tool as in claim 3, said arms tapering in width, as measured across said flat surfaces thereof, from adjacent the inner ends of said elongated arm portions to said distal ends.

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