Oct. 7, 1947. W. G. HOLLWARTH 2,428,458

BOLT ANCHOR APPLYING TOOL

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Fig. 1.

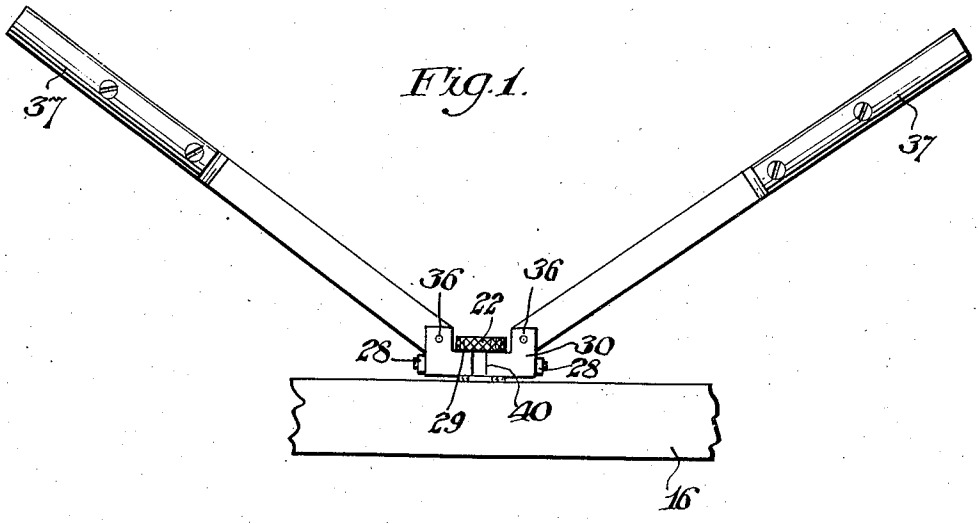


Fig. 2.

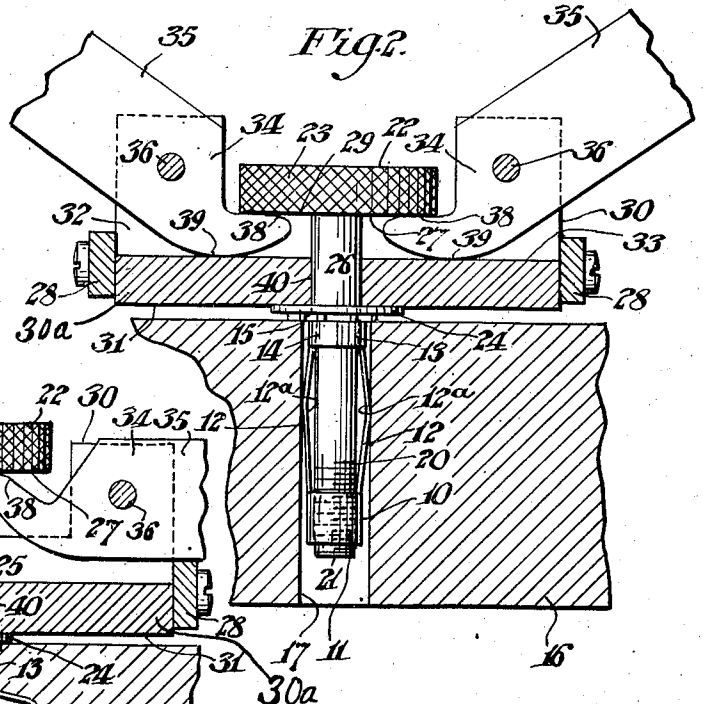
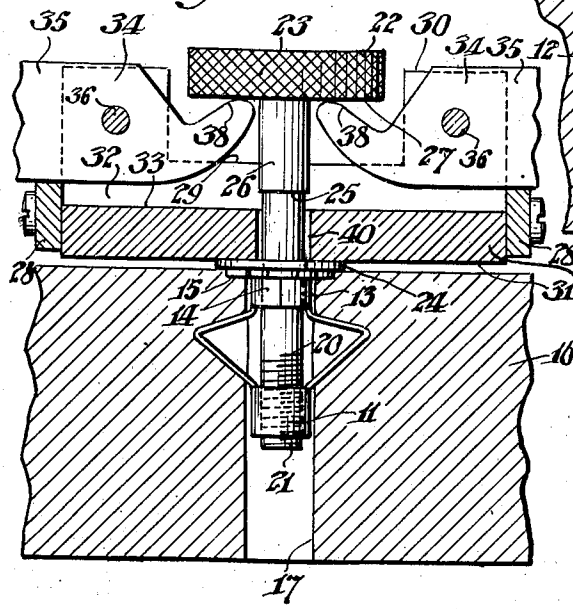


Fig. 3.



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BOLT ANCHOR APPLYING TOOL

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3 Claims. (Cl. 218—19)

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This invention relates to bolt anchor applying tools and more particularly to tools for applying bolt or screw anchors of the type which include an internally threaded sleeve, spreadable side portions and a crown head which are adapted to be inserted into a hole in a support and secured therein. The tool of the present invention is especially suited for use with bolt or screw anchors of the type known in the trade as "toggle screw anchors."

The apparatus heretofore available for applying bolt or screw anchors of the type heretofore referred to has not proven satisfactory in use because of the difficulty of manipulation thereof, and the lack of certainty of the operation thereof. With the prior applying apparatus, in some instances the fasteners do not have their side portions spread to proper gripping position, while in other instances the side portions are deformed to an extent to destroy their grip and injure the support in which they are mounted, so that the fasteners are not secure and pull out through the face of the support.

The apparatus heretofore available for applying these anchors was also exceedingly slow in its action thereby limiting greatly the number of anchors capable of being mounted.

In accordance with the present invention a bolt or screw anchor applying tool is provided which is simple and sturdy in construction, is quick in its action, and is positive in its mounting of the anchor. At the same time the anchor is mounted with its side portions spread to the desired extent for most effective gripping.

Other advantageous features will be apparent from the specification and claims.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming part hereof, in which:

Figure 1 is a view in side elevation of an anchor applying tool in accordance with the present invention;

Fig. 2 is a central sectional view showing the tool in one position and prior to the securing of the bolt anchor; and

Fig. 3 is a central sectional view similar to Fig. 2 showing the tool in another position and with the bolt anchor secured.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes may be made in the structure disclosed without departing from the spirit of the invention.

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Referring more particularly to the drawings a bolt or screw anchor 10 of the type for which the applying tool is particularly adapted is shown in detail in Fig. 2. The bolt anchor or fastener 10 preferably includes an internally threaded sleeve 11 from which expansible and deformable side strip portions 12 extend to a head 13. The side strip portions 12 preferably have bend lines or creases 12a, formed thereon to start the bending of the side strips 12 in the desired direction upon the application of a compressive force thereon. The head 13 preferably includes a collar 14 with outwardly or radially extending wings or lugs 15. The bolt anchor 10 is adapted to be inserted in any desired type of support 16, of wood, plaster, tile, masonry, sheet material, or the like, and in any desired direction, horizontally or vertically up or down, in a hole 17 drilled or bored in the support 16 for the purpose. In position for securing the bolt anchor 10 the lugs or wings 15 are disposed on the outer surface of the support 16 and with the outer ends of the lugs or wings 15 extending inwardly into the outer surface of the support 16 in gripping relationship to aid in preventing rotation of the anchor 10 after the securing thereof.

The anchor applying tool in accordance with the present invention and as illustrated in Figs. 1, 2, and 3 preferably includes an anchor compressing element comprising an actuating stem 20 externally threaded at its inner end 21 and secured at its outer end in an actuating head 22. The actuating head 22 is knurled or otherwise roughened on its peripheral edge 23 for aiding in turning the same with the fingers when desired. The end portion 21 is adapted to engage with the threads in the sleeve 11 upon turning of the head 22. Spaced from the head 22 a disc or washer 24 is provided, slidable on the stem 20 and stopped in one direction by a shoulder 25 formed on the stem 20 by enlarging the same, as at 26, at the end toward the actuating head 22, or in any other desired manner. The actuating head 22 has an inner face 27 for actuating engagement as hereinafter explained.

The anchor applying tool as illustrated in Figs. 1, 2 and 3, also includes an operating element for the anchor compressing element which operating element comprises a body portion 30. The body portion 30 preferably includes a plate portion 30a which has a flat external face portion 31 adapted to be disposed close to or in engagement with the exposed face of the support 16. The body portion 30 is provided with a central longitudinal slot 32 having a flat internal face portion 33, parallel to

the face portion 31 and forming a boundary of the slot 32. The block 30 is also provided with faces 29 spaced above the face portion 33 for the reception of the actuating head 22. Within the slot 32 inner end portions 34 of a pair of oppositely extending lever arms 35 are mounted on pivot pins 36 carried by the body portion 30. The lever arms 35 have outer end portions 37 for manual engagement for actuation. The inner end portions 34 have cam ends 38 for engagement with the inner face of the operating head 22 for forcing the same outwardly upon inward movement of the lever ends 37. The levers 35 are limited in their movement in one direction by the engagement thereof with stop plates 28 secured to the body portion 30 and are limited in their movement in the other direction by the engagement of the inner sides 39 of the cam ends 38 with the face portion 33.

Stop plates 28 of different sizes or adjustable on the body portion 30 may be provided for varying the stroke or permissible movement of the stem 20.

The face portions 31 and 33 are connected by a central slot 40 which extends in from one side edge of the plate portion 30a and which is adapted to receive the enlarged portion 26 of the stem 20 with the disc or washer 24 in engagement with the face portion 31 and with the inner face 27 of the actuating head 22 for contact by the cam ends 38 of the lever arms 35.

The stem 20 is preferably of such length and the shoulder 25 is preferably so located that the enlarged portion 26 of the stem 20 may be inserted in the slot 40 without binding of the disc or washer 24 on the face portion 31 or binding of the actuating head 22 on the cam ends 38 when in the position shown in Fig. 2, and further that the lugs or wings 15 will be in engagement with the disc or washer 24 when the threaded end portion 21 is in the desired engagement in the sleeve 11.

The mode of operation of the applying tool shown in the drawings will now be pointed out.

The support 16 is prepared by having a hole 17 drilled or bored therein at the location where it is desired to secure the bolt or screw anchor 10. The bolt or screw anchor or fastener 10 may then be mounted on the stem 20 with the enlarged portion 26 of the stem 20 extending through the collar 14, and with the threaded inner end 21 in engagement with the threads in the sleeve 11. The head 13 of the anchor 10 is preferably positioned with the wings or lugs 15 in engagement with the disc or washer 24. Turning of the head 22 to obtain the desired character of mounting is facilitated by the roughened surface of the peripheral edge 23.

If desired the bolt or screw anchor 10 may first be positioned in the hole 17 and the stem 20 inserted and positioned. The location of the disc or washer 24 with respect to the shoulder 25 will indicate whether the threaded end 21 is properly in engagement with the sleeve 11 thereby avoiding the possibility of injury to the threads on the end 21 or in the sleeve 11 during the securing of the bolt anchor or fastener 10.

The body portion 30 is then brought into position on the stem 20 with the face 31 adjacent the disc or washer 24 and with the cam ends 38 adjacent the face 27 of the head 22 by passing the slot 40 past the stem until the rear end of the slot contacts said stem.

The lever arms 35 are then manually moved from a position out of alinement with each other, indicated in Figs. 1 and 2, to a position in or substantially in alinement, as indicated in Fig. 3. Upon this movement of the lever arms 35 the cam ends 38 engage the face 27 of the actuating head 22, force the actuating head 22 and the actuating stem 20 carried thereby in an outward direction, and move the sleeve 11 outwardly. This applies a compressive force on the side strip portions 12, spreading the side strip portions 12 to the desired extent and into gripping engagement with the support 16 as shown in Fig. 3. The distance the sleeve portion 11 is moved determines the spreading of the strip portions 12 and this is regulated and controlled by limiting the movement of the levers 35. The levers 35 are stopped by their engagement with the plate portions 28. Deformation of the strip portions 12 beyond their most effective securing positions is thus obviated. The strip portions 12 are also not deformed to an extent to protrude beyond the exterior surface of the support 16 and thereby fail in their purpose. Upon the completion of the upsetting of the side strip portions 12, the levers 35 are moved to or substantially to their original positions and the body portion 30 is moved so that the slot 40 is moved away from the stem 20 and thus disassociated therefrom, after which the stem 20 is unscrewed from the sleeve 11.

The applying tool, because of its simplicity, may be readily employed by unskilled persons in a manner not heretofore possible.

I claim:

1. Apparatus for securing in a support a bolt anchor having a head adapted to be positioned at the surface of the support, an internally threaded sleeve adapted to be positioned inside the surface of the support and deformable connectors between said head and said sleeve for gripping engagement with said support upon the spreading thereof, a body member having a plate portion with parallel ends and with a forward substantially flat face adapted to be positioned adjacent the surface of the support, a pair of spaced projections at each end of said plate portion extending rearwardly therefrom, a pivot pin mounted in each pair of projections, said pivot pins being disposed in parallel relationship, said plate portion having a central slot extending therethrough from one side edge to the center thereof, an actuating member having a shank extending through the slot in said plate portion and enlarged at the rear end to provide an actuating head, said shank having the forward end thereof threaded for engagement with the sleeve, and manually operable levers pivotally mounted on said pins and each having a cam end for actuating engagement with said actuating head.

2. Apparatus for securing in a support a bolt anchor having a head adapted to be positioned at the surface of the support, an internally threaded sleeve adapted to be positioned inside the surface of the support and deformable connectors between said head and said sleeve for gripping engagement with said support upon the spreading thereof, a body member having a plate portion with parallel ends and with a forward substantially flat face adapted to be positioned adjacent the surface of the support, a pair of spaced projections at each end of said plate portion extending rearwardly therefrom, a pivot pin mounted in each pair of projections, said pivot pins being disposed in parallel relationship, said plate portion having a central slot extending therethrough from one side edge to the center thereof, an ac-

tuating member having a shank extending through the slot in said plate portion and enlarged at the rear end to provide an actuating head, said shank having the forward end thereof of reduced diameter to provide a shoulder and being threaded for engagement with the sleeve, a spacer member of substantially the same diameter as said head positioned between said forward face of said plate portion and said support and being adapted to be seated against said shoulder, and manually operable levers pivotally mounted on said pins and each having a cam end for actuating engagement with said actuating head.

3. Apparatus for securing in a support a bolt anchor having a head adapted to be positioned at the surface of the support, an internally threaded sleeve adapted to be positioned inside the surface of the support and deformable connectors between said head and said sleeve for gripping engagement with said support upon the spreading thereof, a body member having a plate portion with parallel ends and with a forward substantially flat face adapted to be positioned adjacent the surface of the support, a pair of spaced projections at each end of said plate portion extending rearwardly therefrom, a pivot pin mounted in each pair of projections, said pivot pins being disposed in parallel relationship, said plate portion having a central slot extending therethrough from one side edge to the center thereof, an actuating member having a shank extending through the slot in said plate portion and enlarged at the rear end to provide an actuating head, said shank having the forward end

thereof of reduced diameter to provide a shoulder and being threaded for engagement with the sleeve, a spacer member of substantially the same diameter as said head positioned between said forward face of said plate portion and said support and being adapted to be seated against said shoulder, manually operable levers pivotally mounted on said pins and each having a cam end for actuating engagement with said actuating head, and stop members on the ends of said plate portion for limiting the movement of said levers.

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