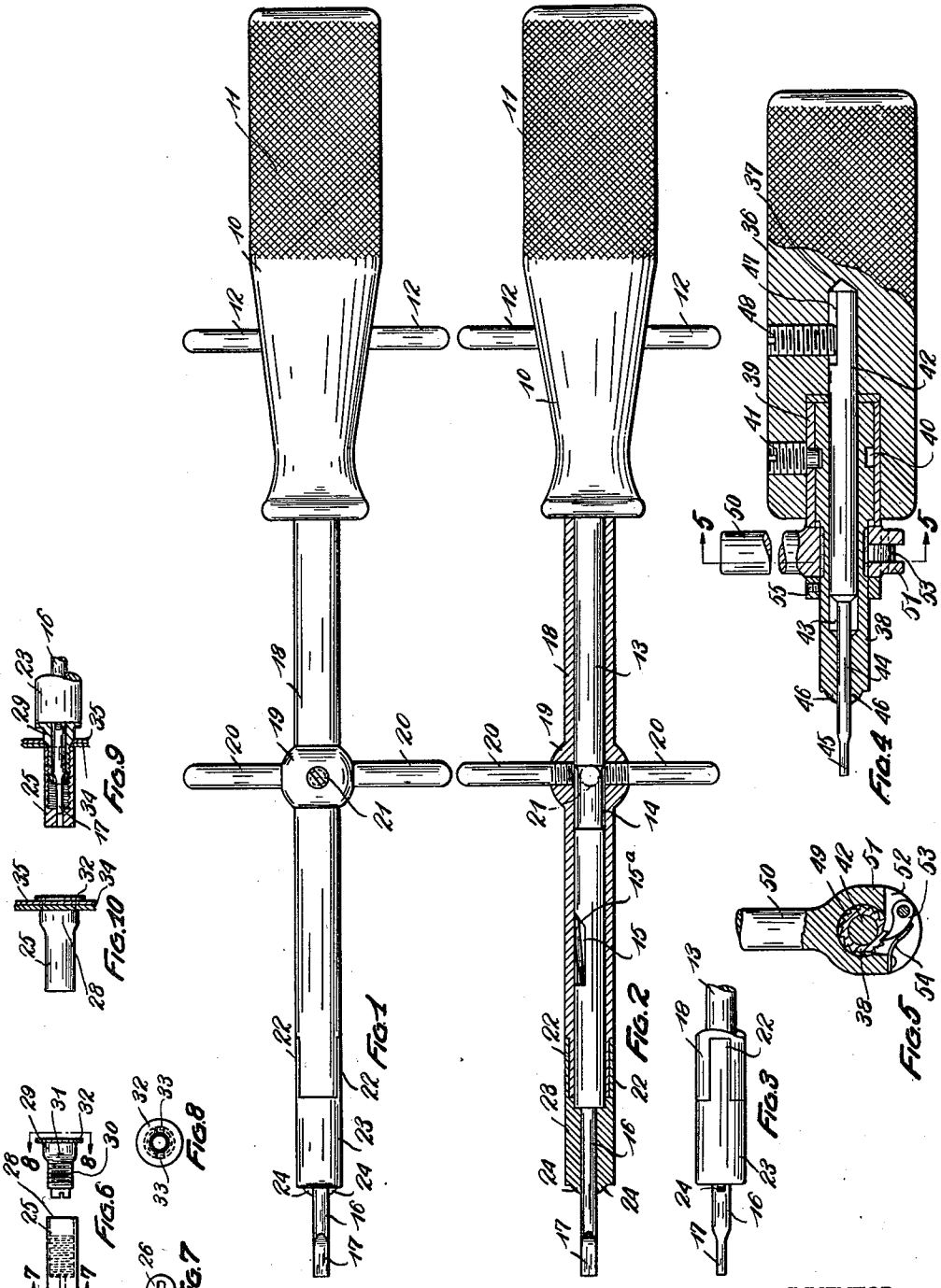
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TOOL OR WRENCH

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TOOL OR WRENCH

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1 Claim. (Cl. 81—55)

This invention relates to a tool or wrench which is particularly adapted to be used in the application of fastenings to openings in metal or other plates or the like, where access can only be had to one side of the plate. An illustration of the type of fastening with which the tool or wrench may be used is disclosed in my Patent No. 2,051,066, issued August 18, 1936. In this patent there is shown a fastening comprising two main parts, one of which is an outer sleeve that can be passed through an opening in the plate, and the other of which is an inner sleeve that can be screwed into the outer sleeve and acts to expand a portion thereof.

The object of the invention is to provide an improved and efficient tool or wrench especially adapted for applying fastenings of the type specified and wherein access can be had ordinarily to only one end of the fastening.

Another object is to provide an improved tool or wrench for applying fastenings of the type specified and which fastenings are formed of two interfitting relatively rotatable members, the application of the fastening being made by holding one member stationary and rotating the other member.

Further and additional objects and advantages not hereinbefore specified will become apparent hereinafter during the detailed description which is to follow of two embodiments of the invention. The embodiments of the invention are illustrated in the accompanying drawing, wherein:

Fig. 1 is an elevational view of one form of the tool or wrench.

Fig. 2 is a partial longitudinal sectional view of the tool or wrench shown in Fig. 1.

Fig. 3 is a fragmentary elevational view of the left hand end of the tool or wrench, as viewed in Fig. 1, and is taken looking from a position ninety degrees removed from the position in which Fig. 1 is taken.

Fig. 4 is a partial longitudinal sectional view of a modified form of the tool or wrench.

Fig. 5 is a fragmentary detail sectional view taken substantially on the line 5—5 of Fig. 4 looking in the direction of the arrows.

Fig. 6 is an elevational view of one form of fastening with which the tool or wrench may be used advantageously, the two members of the fastening being shown in separated or non-assembled position.

Fig. 7 is a detail end elevational view of the left hand member of the fastening shown in Fig. 6 and is taken from line 7—7 looking in the direction of the arrows.

Fig. 8 is a detail end elevational view of the right hand member of the fastening shown in Fig. 6 and is taken from line 8—8 of Fig. 6 looking in the direction of the arrows.

Fig. 9 is a longitudinal sectional view through the two members of the fastening shown in Fig. 6 when said members are initially connected together and positioned in an opening through superimposed plates preparatory to permanently mounting the member in the opening and securing the plates together, the end of the tool or wrench being shown in elevation and in position to complete the assembly of the two members of the fastening and to effect a mounting of the fastening in the opening of the plates, and

Fig. 10 is an elevational view of the fastening after it has been mounted in the opening in the plates to secure the plates together, said plates being shown in section.

The tool or wrench illustrated in Figs. 1 to 3 inclusive comprises a handle 10, preferably provided with a knurled portion 11 and with a pair of diametrically disposed pins 12 which may be grasped by the fingers of the user of the tool or wrench. Extending from the end of the handle opposite to the end provided with the knurled portion 11 is a rod 3 which is rigid with the handle. The rod 13 may be secured to the handle in any suitable way or, if desired, it may be formed integral therewith. The rod 13 intermediate its ends is provided with an annular recess 14, see Fig. 2, for a purpose later to be described. The outer or left hand end of the rod 13 is provided with a centrally disposed axial bore which communicates with a recess 15 formed inwardly of the outer end of the rod and having a flat bottom surface and an inclined end, as indicated at 15*a*.

A second rod 16 of reduced diameter is mounted in the bore in the end of the rod 13 and has its inner end located in the recess 15. The second rod 16 has a snug fit in the bore in the rod 13, while its inner end is shaped or flattened to engage the flat bottom surface of the recess 15 and the inclined end surface 15*a* thereof, wherefore the rod 16 cannot turn relative to the rod 13. The outer end of the rod 16 extends a substantial distance beyond the end of the rod 13 and is provided at its extreme outer end with a screw-driver-like portion 17.

A tubular sleeve 18 is mounted on the rod 13 so as to be capable of rotation thereon as well as having limited endwise movement relative to said rod, for a purpose which will later be explained. As illustrated, the sleeve 18 is provided inter-

mediate its ends with an integral rounded boss 19 from which extends handles 20 arranged diametrically of the boss 19 and adapted to be engaged by the fingers of the operator of the tool or wrench. The boss 19 has mounted therein a set screw 21, the inner end of which engages in the annular recess 14 of the rod 13, from which it will be seen that the sleeve 18 can be rotated relative to the rod 13 and can also have relative endwise movement thereon equivalent to the axial length of the annular recess 14.

The outer end of the sleeve 18 is provided exteriorly with a pair of diametrically disposed axially extending grooves in which are secured by means of a tight press fit complementary tongues 22 formed on the inner end of a wrench portion 23 and which wrench portion is provided on its outer end with screwdriver projections 24 arranged in alignment with each other and extending diametrically of the end of the wrench portion 23. Although the wrench portion 23 has been illustrated and described herein as separate from the sleeve 18, it will be understood that said portion instead of being separate might be formed integral with said sleeve 18.

The wrench portion 23 is provided with a bore therethrough that terminates intermediate the screwdriver projections 24 and is of such size as to slidably and rotatably receive the rod 16, it being noted that the inner end of the bore in the portion 23 terminates in a shallow counterbore of a diameter such as to receive the outer end of the rod 13.

The sleeve 18 and the portion 23 rigid therewith can be assembled on the rods 13 and 16 by telescoping the sleeve and portion thereon from the outer end of the rod 16 and until the outer end of the rod 13 engages the bottom of the counterbore at the inner end of the bore through the portion 23, as clearly shown in Fig. 2. At this time the inner end of the sleeve 18 will engage the inner end of the handle 10 and the set screw 21 when screwed inwardly will have its inner end located in the recess 14 at the inner end of the latter.

It will be noted that the rod 16 extends through the bore in the portion 23 and outwardly thereof beyond the screwdriver projections 14. It will further be seen that the sleeve 18, in addition to being rotatable relative to the rods 13 and 16, can be moved relatively endwise thereon from the position shown in Fig. 2 until it is in a position wherein the screw 21 is at the left hand end of the recess 14, as viewed in said Fig. 2, the purpose of this arrangement being apparent when the manner in which the tool or wrench is used is set forth.

As already stated, the tool or wrench is particularly useful in applying or mounting fastenings in an opening in a plate or plates, wherein access can be had to only one end of the opening. By way of illustration the use of the tool or wrench will be explained in connection with the fastening illustrated in Figs. 6 to 10 inclusive, and which fastening is similar to the fastenings shown in the said Anderson Patent No. 2,051,066, hereinbefore referred to.

The fastening illustrated in Figs. 6 to 10 inclusive comprises two separable members or main parts. Referring to Fig. 6 one of said members or parts is indicated at 25 and may be called the outer part or member and is in the form of a sleeve or thimble of such diameter that it can be passed through an opening in the plate or plates to which the fastening is to be applied. The left hand end of the member or part 25 as viewed in Fig. 6 is closed by means of an integral closure portion 26, in which is formed a diametrically extending slot 27 for a purpose later to be explained. The opposite end of the member or part 25 is expansible for a portion of the length of the member, as indicated at 28, while intermediate the closed end and the expansible end the member or part is interiorly threaded.

The other member or part of the fastening is indicated at 29 and comprises an exteriorly threaded shank 30 of a diameter such as to screw into the interiorly threaded portion of the member or part 25, said shank terminating in an enlarged conical shoulder 31 which, when the member 29 is screwed fully into the member 25, acts to expand the expansible portion 28 of the member 25. The outer end of the conical portion 31 has integrally formed therewith an enlarged flange or head 32, as clearly shown in the drawing.

The member 29 is provided with a bore therethrough of a size to rotatably receive the rod 16 and said bore terminates in the conical portion 31 in a shallow counterbore provided with axially disposed diametrically located grooves 33 formed in the flange or head 32 and extending inwardly thereof.

In using the tool or wrench to apply a fastening, such as has been described, to the opening in a plate or plates, the two parts 25 and 29 of the fastening are first partially threadedly interconnected. The interconnected parts of the fastening may then be mounted upon the tool or wrench by passing the rod 16 through the bores in the parts 29 and 25 until the end portion 17 of the rod is engaged in the slot 27 at the closed end of the member 25, at which time the screwdriver projections 24 should be engaged with the recesses 33 in the portion 29. The fastening may then be passed through the aligned openings in the plates 34 and 35, as clearly shown in Fig. 9. When this has been done the operator by grasping the handles 10, 12 and 20 then causes a relative rotation between the sleeve 18 including portion 23 and the rods 13 and 16, with the result that the parts 25 and 29 of the fastening are rotated relative to each other and cause the part or member 29 to be screwed inwardly of the part or member 25 until the conical portion 31 of the first member expands the expansible portion 28 of the second member, that is, until the portion 28 is in the condition indicated in Fig. 10 and the flange or head 32 of the member 29 has been brought into engagement with the outer side of the plate 35. As the member or part 29 is screwed into the member or part 25, the sleeve 18 can be moved relatively endwise of the rod 13 so as to maintain the projections 24 in constant engagement with the recesses 33, as will be clearly understood.

From the foregoing description it will be apparent that the tool or wrench hereinbefore described is admirably adapted for applying fasteners of the type specified and wherein access can be had from only one end of the fastener, and it is necessary to rotate one part of the fastener relative to the other to apply the fastener to a plate or plates.

In Figs. 4 and 5 there is disclosed a modified form of the tool or wrench embodying the present invention. In this form there is a handle 36 which is preferably knurled and which is provided with a centrally disposed recess 37 located

intermediate the ends of the handle and terminating in a counterbore in the left hand end of the handle, as viewed in the drawing. A member **38** is operatively associated with the handle **36** and has its enlarged or right hand end, as viewed in Fig. 4, arranged within a sleeve **39** secured in the counterbore at the left hand end of the handle **36**. The large portion of the member **38** is provided with an annular recess **40** into which extends through an opening in the sleeve the reduced end of a screw **41** threadedly mounted in a radially disposed opening in the handle **36**, wherefore it will be seen that the member **38** can rotate relative to the handle **36** but will not have endwise movement relative thereto. A rod **42** is mounted in the recess **37** in the handle **36** and extends into a counterbore **43** formed in the member **38** and communicating with a reduced bore extending to the outer or left hand end of the member **38**. The rod **42** is provided with a reduced portion **44** which may be fixed to the rod **42** or integral therewith, and said portion **44** extends through the reduced bore in the member **38** and outwardly of the outer end thereof and is provided at its outer end with flats **45** forming a portion similar to the portion **17** of the rod **16**. The outer end of the member **38** is provided with aligned screwdriver projections **46** extending diametrically of the end of the member **38** and corresponding to the screwdriver projections **24** of the previously described form.

The inner end of the rod **42** is provided with an axially elongated flat **47** that is engaged by the inner end of a set screw **48** mounted in a radially disposed threaded opening in the handle, as clearly shown in Fig. 4, the engagement of the inner end of the set screw **48** with the flat **47** causing the handle **36** and rod **42** to rotate together as a unit but allowing relative endwise movement between the rod and the handle as will be fully understood.

The member **38** is provided adjacent the enlarged portion of the member that is within the sleeve **39** with ratchet teeth **49**. An operating handle **50** has an enlarged portion **51** provided with an opening and mounted on the member **38** over the ratchet teeth **49**. The portion **51** of the handle is recessed, as indicated at **52**, and in said recess there is pivotally mounted a pawl **53** held normally in engagement with the ratchet teeth **49** by means of a spring **54**. The handle **50** is held in position on the member **38** between the shoulder formed by the enlarged portion of the member **38** and the sleeve **39** and a locking collar **55** secured to the member **38** and holding the portion **51** against said shoulder and against endwise movement on the member **38**, but allowing the same to be rocked or rotated on said member.

It will be seen that when the handle **50** is rocked or rotated in one direction the pawl **53** engaging with the ratchet teeth **49** will effect a rotation of the member **38**, while when the handle is rocked in the reverse direction the pawl **53** will merely idle over the ratchet teeth.

The modified form of tool or wrench embodying the invention which has just been described will operate in substantially the same way as the previously described form.

It will be understood that the end portion **45** of the rod **44** engages in the slot **27** of the member **25** of the fastening, while the screwdriver projections **46** engage in the recesses **33** of the member **29** of the fastening. The operator by holding the handle **36** stationary and by rocking or rotating the handle **50** in the correct direction will effect a relative rotation between the rod **44** and the member **38**, thus causing the parts or members of the fastening to be screwed together to effect an expansion of the expansible portion **28** of the fastening member **25**.

Although preferred forms of the invention have been illustrated and described herein it will be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claim.

Having thus described my invention I claim:

A tool or wrench of the character described comprising a handle provided with a recess and a counterbore concentric therewith, a rod mounted in said recess and extending through said counterbore outwardly of the handle, said rod being provided in said recess with an axially elongated flat, a screw carried by said handle and engaging said flat whereby said handle and rod will rotate as a unit but can have limited relative endwise movement, a member mounted on said rod and provided with a portion extending into said counterbore, said member terminating at all times inwardly of the outer end of said rod, cooperating means carried by said member and handle and interconnecting the same far relative rotation but holding said handle and member against relative endwise movement, said rod having a reduced portion at its outer end seated in a like reduced bore in the outer end of said member forming stops to limit relative outward movement of the rod in said member, the outer ends of said rod and member being provided with portions for engagement with a slot and socket respectively, and a second handle mounted on said member outwardly of said first handle, to rotate the same relative to said rod and said first handle.

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