PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in or relating to Adjustable Spanners or Wrenches

We, CHARLES WILSON MACDOWALL, a Subject of the King of Great Britain, of "Glenfeochan House", Oban Argyllshire, and MACDOWALL EQUIPMENT COMPANY LIMITED, a Company registered under the laws of Great Britain, of North Street, Romford, Essex, do hereby declare the nature of this invention to be as follows:—

This invention concerns adjustable spanners or wrenches and has for an object to provide an improved construction of a known form of spanner or wrench whereby a smoother action is obtained, and which permits of infinite adjustability within the limits of capacity of the spanner or wrench.

The known construction referred to above comprises a shank or body part terminating at its upper end in a fixed jaw and having a movable jaw of triangular or substantially triangular shape held in sliding contact with a smooth inner surface on the shank part below the fixed jaw by means of a sleeve embracing the movable jaw and the shank part. The movable jaw is connected to the shank part by a spring which may be constituted by a tension spring accommodated in co-acting recesses in the inner surfaces which are in sliding contact on the movable jaw and shank part respectively, and anchored between these members in such a way as to bias the movable jaw away from the fixed jaw. The outer surface of the shank part, on the opposite side to the inner surface engaged by the movable jaw, tapers upwards relatively thereto at an acute angle for a distance substantially equal to the range of adjustment of the movable jaw, whilst the outer surface of the movable jaw meets the lower end of the inner surface which slides on the shank part at an acute angle. These angles are chosen so that the movable jaw can be adjusted towards or away from the fixed jaw by sliding the sleeve up or down the shank member, but when a load is applied tending to separate the jaws, the sleeve tends to lock on the shank part to prevent displacement of the movable jaw.

In a previous construction it has been deemed necessary to ensure tight locking of the sleeve on the shank part by forming the outer tapered surface of the shank part with serrations and providing similar inter-engageable serrations on the internal surface of the sleeve which co-acts therewith. The provision of these serrations involves additional machining and where, as is common practice, the shank part is formed from flat bar stock material, the opening through the sleeve has a relatively small transverse dimension which renders machining of the internal surface of the end wall difficult. Moreover, in a spanner having serrations as described above, the adjustability of the movable jaw relatively to the fixed jaw is not infinite since the serrations tend to inter-engage at fixed and definite locations, and where the spanner is to be used on relatively small nuts, these steps in the adjustment may be too coarse. In addition, the presence of the serrations causes the action of the spanner during adjustment to be somewhat harsh.

It has now been found that a spanner of the general construction described above can be constructed without the serrations on the outer or back edge of the shank and on the corresponding internal surface of the sleeve, and that by careful selection of the angles between the several co-acting parts, an efficient wedge action can be ensured, preventing the displacement of the movable jaw away from the fixed jaw due to a load applied between them. The omission of the serrations substantially reduces the cost and time of production of the spanner, and results in a much smoother action and in an infinite adjustability of the jaw towards and away from the fixed jaw. A tool according to the present invention is thus more satisfactory from the point of view of both manufacture and of use.

Accordingly, the present invention

[Price 2/-]

provides an adjustable spanner comprising a shank or body member having upwardly converging smooth inner and outer surfaces, a fixed jaw projecting laterally from the inner side thereof at its upper end, a movable jaw of triangular or substantially triangular shape having an inner surface slidably engaged with the inner surface on the shank below the fixed jaw and an upper side extending in the same general direction as the fixed jaw, spring means acting between the shank and the movable jaw for biasing the latter away from the fixed jaw, and a sleeve embracing both the movable jaw and the shank and having internal smooth surfaces to engage the said corresponding smooth outer surfaces on the movable jaw and the shank, the angles between the inner surfaces thereon and their respective outer surfaces being selected so that the sleeve grips both the said outer surfaces by wedge action when a force is applied between the jaws tending to separate them.

Preferably, the spring means acting between the shank and the movable jaw comprises a tension spring anchored at one end to the movable jaw adjacent its upper side and at the other end to the shank part, the inner relatively slidable surfaces of the movable jaw and of the shank part being longitudinally recessed to accommodate the spring.

The co-operating surfaces of the two jaw parts may be knurled or serrated in known fashion to improve the grip on the article engaged. They may also be either straight and parallel, or they may have any desired curvature according to the particular application envisaged for the tool.

Conveniently, the shank part and the fixed jaw are formed integrally from a length of flat bar stock material, and a short projection may be formed at the lower end of the inner surface of the shank part against which the movable jaw is slidable to determine the maximum opening of the jaws. The outer edge surfaces of the shank part and of the movable jaw part, together with the co-acting smooth internal surfaces of the sleeve are preferably finished smooth and may be ground or polished if desired to improve the smoothness of action of the tool.

Dated this 29th day of October, 1948.

For the Applicants,
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COMPLETE SPECIFICATION

Improvements in or relating to Adjustable Spanners or Wrenches

We, CHARLES WILSON MACDOWALL, a Subject of the King of Great Britain, of "Glenfeochan House", Oban Argyllshire, and MACDOWALL EQUIPMENT COMPANY LIMITED, a Company registered under the laws of Great Britain, of North Street, Romford, Essex, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention concerns adjustable spanners or wrenches and has for an object to provide an improved construction of a known form of spanner or wrench whereby a smoother action is obtained, and which permits of infinite adjustability within the limits of capacity of the spanner or wrench.

The known construction, an example of which is described in British Patent Specification No. 169,675 comprises a shank or body part terminating at its upper end in a fixed jaw and having a movable jaw of triangular or substantially triangular shape held in sliding contact with a smooth surface on the shank part below the fixed jaw by means of a sleeve embracing the movable jaw and the shank part. The movable jaw is connected to the shank part by a tension spring accommodated in co-acting recesses in the inner surfaces which are in sliding contact on the movable jaw and shank part respectively, and anchored between these members in such a way as to draw the movable jaw away from the fixed jaw into the sleeve. The outer surface of the shank part, on the opposite side to the inner surface engaged by the movable jaw, tapers upwards relatively thereto at an acute angle for a distance substantially equal to the range of adjustment of the movable jaw, whilst the outer surface of the movable jaw meets the lower end of the surface which slides on the shank part at an acute angle. These angles are chosen so that the movable jaw can be adjusted towards or away from the fixed jaw by sliding the sleeve up or down the shank member, but when a load is applied tending to separate the jaws, the sleeve tends to lock on the shank part to prevent displacement of the movable jaw.

According to the present invention, however, an adjustable spanner comprises a shank or body member having upwardly converging inner and outer surfaces, a

fixed jaw projecting laterally from the inner side thereof at its upper end, a movable jaw of triangulalr or substantially triangular shape having an inner surface slidably engaged with the inner surface on the shank below the fixed jaw and an upper side extending in the same general direction as the fixed jaw, a compression spring acting between an abutment on the shank and an abutment on the movable jaw for biasing the latter away from the fixed jaw, and a sleeve embracing both the movable jaw and the shank and having internal surfaces to engage the said corresponding outer surfaces on the movable jaw and the shank, the angles between the inner surfaces on the movable jaw and shank and their respective outer surfaces being selected so that the sleeve grips both the said outer surfaces by wedge action when a force is applied between the jaws tending to separate them.

It is preferred to dispose the spring entirely within a bore or channel formed in the movable jaw parallel with the inner surface of the latter which co-operates slidably with the inner surface of the shank, the end of the bore or channel remote from the fixed jaw being closed to constitute the abutment for the corresponding end of the spring while the other end of the bore or channel is open to the operative upper side of the movable jaw so that the abutment provided on the shank may enter into the bore or channel to engage the corresponding end of the spring.

With advantage, this abutment is constituted by a ball-headed pin secured in the inner surface of the shank along which the movable jaw is adapted to slide. In order to permit this sliding motion, the appropriate surface of the movable jaw is slotted longitudinally, the slot opening into the channel or bore for receiving the spring and being of a width to permit the shank of the ball-headed pin to pass therethrough.

In order to limit the motion of the movable jaw, a stop is provided at an end of the inner surface of the shank.

One form of spanner according to the invention will now be described by way of example and with reference to the accompanying drawings in which:—

Figure 1 is a view of the spanner with the sleeve partly broken away, and

Figure 2 is a section on the lines II—II of Figure 1.

The adjustable spanner comprises a shank or body member 1 having upwardly converging smooth inner and outer surfaces 2 and 3. A fixed jaw 4 projects laterally from the inside of the shank at its upper end and is formed integrally with the shank 1 and the handle 5 either as a casting or from a length of flat bar stock material. A movable jaw 6 of substantial triangular shape is slidably engaged along an inner surface 7 with the inner surface 2 on the shank below the fixed jaw. The movable jaw has a smooth outer surface 8 at an angle to the inner surface, an upper side 9 extending parallel to the fixed jaw 4.

The inner surface 2 on the shank 1 is made perfectly flat and has secured therein an upstanding ball-headed pin 20 at a position slightly nearer to the lower end of the surface than corresponds to the disposition of the operative upper side 9 of the movable jaw 6 when this is in its position of maximum displacement away from the fixed jaw 4. The sliding surface 7 on the movable jaw 6 is also made perfectly smooth but the jaw has a bore 21 formed therein from its upper side closely adjacent and parallel with the sliding surface 7, this bore 21 extending practically to the opposite end of the movable jaw. Within this bore 21 is disposed a compression spring 22 which, in its uncompressed condition, extends from the base 23 of the bore to just beyond the upper side 9 of the movable jaw. In addition, the sliding surface 7 of the jaw has a slot 24 cut longitudinally therein to open into the spring-receiving bore 21 and extending from the operative upper side of the jaw to a point approximately midway along the length of the sliding surface 7.

The movable jaw is held in engagement with the shank by means of a sleeve 15 embracing both the movable jaw and the shank and having internal smooth surfaces 16 and 17 to engage the corresponding smooth outer surfaces 8 and 3 of the movable jaw and the shank. The angles between the inner surfaces on the movable jaw and shank and their respective outer surfaces are selected so that the sleeve 15 grips both the said outer surfaces 8 and 3 by wedge action when a force is applied between the jaws 4 and 9 tending to separate them.

A short projection 19 at the lower end of the inner surface 2, against which the sleeve 15 may abut, determines the maximum opening of the jaws 4 and 9.

In the assembly of the parts, the movable jaw 6 is presented to the sliding surface 2 on the shank so that the projecting end of the spring 21 seats against the ball end 25 of the pin 20 and is then moved along the sliding surface 2 in the direction of the fixed jaw 4 to cause the ball-headed pin 25 to compress the spring

slightly while entering into the bore 21. The sleeve 15 normally provided to encircle the shank 1 and the movable jaw 6 is then slipped over these parts and the spanner is then ready for service.

A short projection 18, at the upper end of the inner surface 2 against which the movable jaw is slidable limits the movement of the movable jaw in one direction.

It will be understood that, should it be desired at any time to dismantle the parts, the movable jaw 6 is slid towards the fixed jaw 4 while holding the sleeve 15 in its lowest position whereupon the sleeve may easily be slipped over projection 19 and the handle portion of the shank and the movable jaw 6 may be completely detached from the latter, carrying the spring with it.

The outer edge surfaces of the shank and the movable jaw together with the smooth internal surfaces of the sleeve are finished smooth and may be ground or polished. The co-operating surfaces of the two jaw parts may be knurled or serrated in known fashion to improve the grip on the article engaged. They may also be either straight and parallel or they may have any desired curvature according to the particular application envisaged for the tool.

The compression spring used in a spanner according to the invention becomes more effective as the jaws of the spanner are moved wider apart, whereas a tension spring would become less effective after the jaws have been opened a number of times.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An adjustable spanner comprising a shank or body member having upwardly converging inner and outer surfaces, a fixed jaw projecting laterally from the inner side thereof at its upper end, a movable jaw of triangular or substantially triangular shape having an inner surface slidably engaged with the inner surface on the shank below the fixed jaw and an upper side extending in the same general direction as the fixed jaw, a compression spring acting between an abutment on the shank and an abutment of the movable jaw for biasing the latter away from the fixed jaw, and a sleeve embracing both the movable jaw and the shank and having internal surfaces to engage the said corresponding outer surfaces on the movable jaw and the shank, the angles between the inner surfaces on the movable jaw and shank and their respective outer surfaces being selected so that the sleeve grips both the said outer surfaces by wedge action when a force is applied between the jaws tending to separate them.

2. An adjustable spanner according to claim 1 wherein the spring is disposed entirely within a bore or channel formed in the movable jaw parallel with the inner surface of the latter which co-operates slidably with the inner surface of the shank, the end of the bore or channel remote from the fixed jaw being closed to constitute the abutment for the corresponding end of the spring while the other end of the bore or channel is open to the operative upper side of the movable jaw so that the abutment provided on the shank may enter into the bore or channel to engage the corresponding end of the spring.

3. An adjustable spanner according to claim 2 wherein the abutment provided on the shank is constituted by a ball-headed pin secured in the inner surface of the shank, the inner surface of the movable jaw being slotted longitudinally, the slot opening into the channel or bore for receiving the spring and being of a width to permit the shank of the ball-headed pin to pass therethrough.

4. An adjustable spanner according to any of the preceding claims wherein a stop is provided at an end of the inner surface of the shank.

5. An adjustable spanner constituted and arranged substantially as described and shown in the accompanying drawings.

Dated this 29th day of October, 1949.

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FIG. 1.

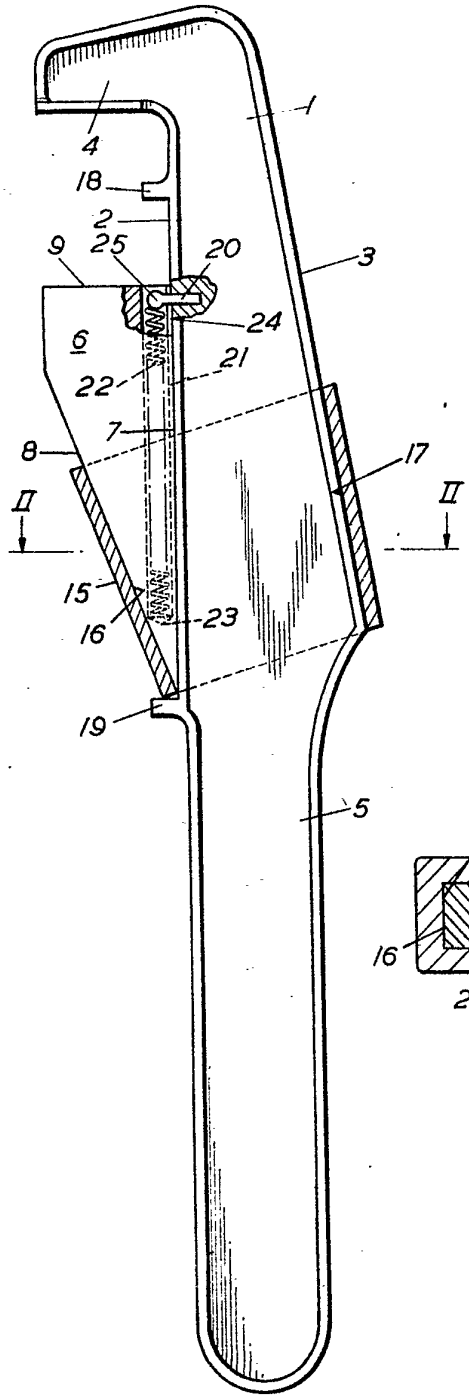
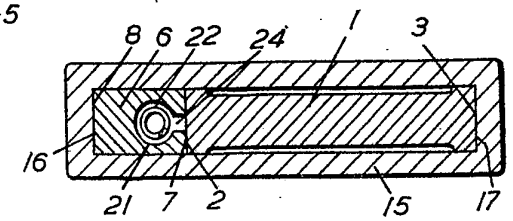


FIG. 2.



H.M.S.O. (Ty.P.)