

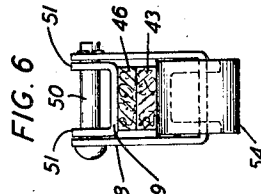
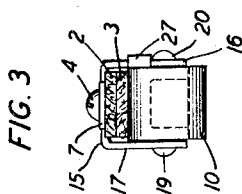
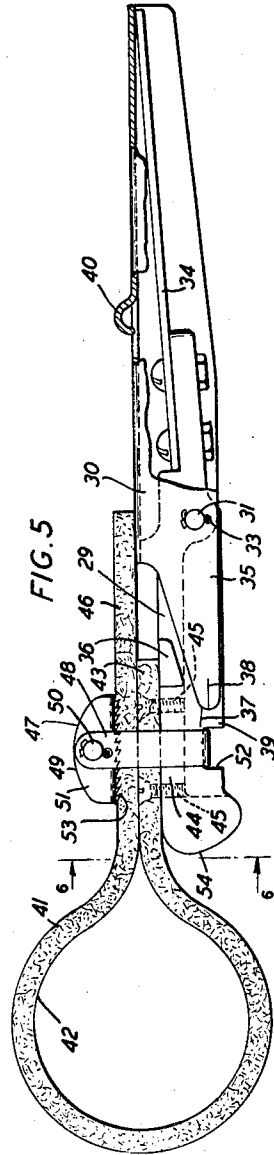
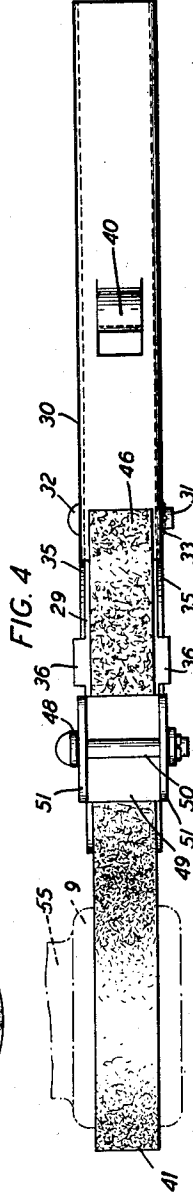
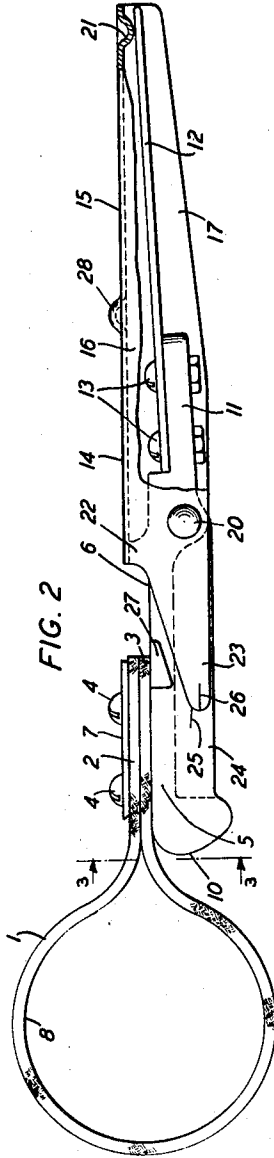
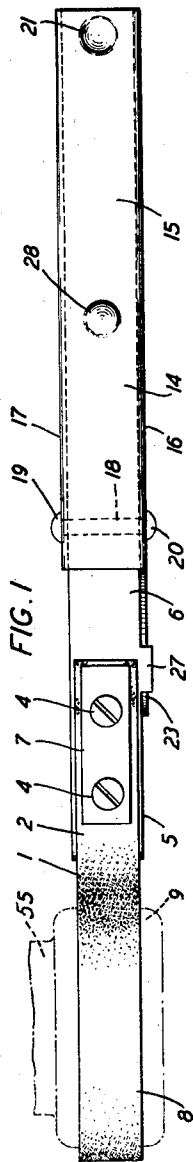
Sept. 6, 1938.

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2,128,991

WRENCH DEVICE

Filed Sept. 12, 1936



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2,128,991

WRENCH DEVICE

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Application September 12, 1936, Serial No. 100,462

1 Claim. (Cl. 81-64)

This invention relates to wrenches and more particularly to wrenches adapted to grip frangible articles.

The object of the invention is to provide a wrench suitable for use in manipulating a frangible cap or ring without breaking the frangible article.

A feature of the invention resides in a lever structure adapted to compensate excess pressures.

Another feature resides in indicating means to indicate applied safe and unsafe pressures.

Another feature resides in an adjustable strap arrangement.

In the drawing:

Figs. 1 and 2 are respectively a top and a side elevational view of the wrench;

Fig. 3 is an end view taken on the line 3-3 of Fig. 2;

Figs. 4 and 5 are respectively a top and a side elevational view of a wrench similar to Figs. 1 and 2 but having an adjustable strap; and

Fig. 6 is an end view of the wrench shown in Figs. 4 and 5 and taken on the line 6-6 of Fig. 5.

In applying internally threaded cap members of frangible material to externally threaded supports, the cap members are frequently broken because too much pressure is applied to the cap in screwing the cap on the support. This is particularly true in cases where a wrench is utilized as a means for applying turning movements to the cap. For instance, when a telephone transmitter or receiver cap molded from insulating material is applied to a handset telephone instrument and a wrench is used as a means to turn the cap relative to the hand-grip portion of the structure, the cap will be broken if the turning force applied through the wrench to the cap is greater than can be withstood by the cap. It frequently happens that when a cap of the above-mentioned type has been applied and an effort is made to further turn the cap to be sure that the cap is turned all the way down on the telephone instrument, the pressure applied is greater than can be withstood by the cap and the cap is broken. A considerable loss in caps, therefore, occurs in the assembling of telephone instruments.

In this invention two relatively movable parts and an interposed spring are provided in the wrench device, the parts above-mentioned serving to reduce the liability of applying excessive pressures to a frangible cap engaged by the wrench. Pressure indicating means are also included in the structure to indicate the amount of pressure applied and stop means are provided to limit the

relative movement of the parts above-mentioned.

As shown in Figs. 1, 2 and 3, a strap 1 of flexible material is formed into a loop and end portions 2 and 3 of the strap 1 are brought into face-to-face relation and secured by means of screws 4 to an end portion 5 of a bar 6. An apertured plate 7 is applied between the heads of the screws 4 and the outer face of the end portion 2 of the strap 1. The loop portion 8 of the strap 1 is made to a little larger diameter than a cap 9 to which the wrench is to be applied, the loop portion 8 being adapted to encircle the cap 9 and fitting rather loosely around the cap 9.

The end portion 5 of the bar 6 is formed to provide a cam 10 to bear against the loop portion of the strap 1 when the bar 6 is moved to apply a turning movement to the cap 9. On the free end portion 11 of the bar 6 a flat spring bar 12 is secured by means of bolts 13 or other suitable fastening means. A handle 14 is applied over the spring bar 12 and is pivotally supported on the bar 6. The handle 14 has a top wall 15 and spaced side walls 16 and 17. Extending transversely through the bar 6 and through the side walls 16 and 17 of the handle 14 is a pivot pin 18 which serves as a pivotal support for the handle 14. The pivot pin 18 may be upset on its extreme end portions 19 and 20 as shown in Figs. 1 and 2 or any other suitable means may be provided to prevent accidental dislodgement of the pivot pin 18 from the bar 6 and the handle 14. The handle 14 has a downwardly extending projection 21 formed near its extreme right end, the projection 21 bearing against the upper surface of the free end portion of the spring bar 12. The left end of the top wall 15 of the handle 14 rests on an upwardly extending portion 22 of the bar 6. The portion 22 is above the pivot pin 18 and is displaced slightly offset to the left relative to the longitudinal axis of the pivot pin 18 and presents a flat surface against the under surface of the left end of the top wall 15 of the handle 14 to prevent movement of the handle 14 upwardly relative to the bar 6.

A finger portion 23 is provided on at least one of the side walls of the handle 14. The finger portion 23 as shown in the drawing extends toward the left from the pivotal point of support and lies parallel to a longitudinal rib 24 on the bar 6.

When the wrench is being used to turn the cap 9 on its support 25 and pressure is applied to the handle 14 to move the wrench arcuately relative to the support 25, the cam end 10 of the bar 6 rolls against the loop portion 8 of the strap 1,

and reduces the loop so that the strap 1 is tightened about the cap 9 with sufficient frictional engagement to tightly grip the cap. The application of further pressure causes the spring bar 12 to be flexed since the pressure applied is transmitted through the projection 21 against the free end of the spring bar 12. The pressure applied is gradually transmitted through the spring bar 12 to the bar 6. In flexing the spring bar 12, the handle 14 moves on its pivotal point of support, namely, the pivot pin 18. The finger portion 23, therefore, moves relative to the rib 24. By gauging the extent of movement of the finger portion 23 across the side surface of the rib 24, the amount of pressure applied may be determined. To serve as an indication to a user of the wrench of the amount of pressure being applied and to indicate when the pressure applied is becoming dangerous to the cap 9, gauge marks are provided on the rib 24 of the bar 6 and on the finger portion 23 of the handle 14. The gauge marks may be any suitable indicating points or indicia marked or otherwise provided on the relatively movable parts of the structure. As shown, for instance, in Fig. 2 a scratch mark 55 is provided on the side of the rib 24 of the bar 6 and a corresponding scratch mark 26 is provided on the side of the finger portion 23 of the handle 14. The scratch marks 55 and 26 under normal conditions, that is, with no pressure applied to the wrench are not in longitudinal alignment but are offset from each other a sufficient distance to allow application of sufficient pressure to the wrench to grip the cap 9 and to turn the cap 9 for allowable movement, that is, movement permitted by the engaged screw threads of the cap 9 and its support 25. The spacing apart of the scratch marks 55 and 26 is predetermined and so arranged that pressures not dangerous to the cap 9 may be applied through the wrench without bringing the mark 26 above the mark 55. It is obvious, therefore, that with the wrench above described having the indicating marks arranged as set forth, a user of the wrench may readily determine whether or not the pressure applied to the frangible cap 9 is dangerous to the cap.

To also serve as a guide to the operator of the wrench a positive stop 27 is provided for the finger portion 23. The stop 27 may be a lug extending outwardly from the side of the bar 6 and in the path of movement of the finger portion 23 of the handle 14, the stop being so located that when the scratch marks 55 and 26 are brought into longitudinal alignment the finger portion 23 will collide with the stop 27 and by the slight shock resulting therefrom call the operator's attention to the fact that the extent of allowable pressure has been reached.

To call an operator's attention to the fact that in order to properly use the wrench the handle 14 should be grasped near its free end and not in the region of the pivotal point of support, a projection 28 is provided on the top wall 15. The projection 28 is located a sufficient distance inwardly of the free end of the handle 14 to provide room for the operator to grasp the handle 14 without having the operator's hand come over the pivotal point of support.

The structure above described is suitable for use in applying a cap of slightly less diameter than the diameter of the loop portion of the strap 1. In some cases, however, a wrench of this type is required in applying caps of different sizes. In the structure shown in Figs. 4, 5 and 6 I have provided a wrench for such use. The wrench

comprises a bar 29 and a handle 30 corresponding respectively to the bar 6 and the handle 14 shown in the structure illustrated by Figs. 1, 2 and 3. The handle 30 as shown in Figs. 4, 5 and 6 is pivotally supported on a pivot pin 31 which extends transversely through the bar 29 and the side walls of the handle 30. The pivot pin 31 may be held against accidental dislodgement, for instance, by having a head 32 on one end and a cotter pin 33 in the other. A spring bar 34 is attached to one end of the bar 29 and extends diagonally upward within the handle 30 and into engagement with the free end of the handle 30.

Two spaced finger portions 35—35 are provided on the inner end portion of the handle 30. Projections 36—36 are provided on the bar 29 to serve as stops for the finger portions 35—35 of the handle 30. Gauge points or scratch marks 37 and 38 are provided respectively on a rib 39 of the bar 29 and the free end portion of a finger 35. The scratch marks 37 and 38 are normally not in longitudinal alignment but are offset from each other a predetermined distance and serve to indicate the extent of movement of the finger portion 38 across the side surface of the rib 39. The scratch marks 37 and 38 correspond to the scratch marks 55 and 26 shown in Fig. 2, and are used to indicate to a user of the wrench when the pressure applied is dangerous to the cap 9. A portion 40 of the handle 30 is cut out and displaced upwardly of the top surface of the handle to define the inward extent of the portion of the handle to be grasped by a user of the wrench.

To make the wrench adjustable to meet various sizes of caps, an adjustable strap 41 is provided. The strap 41 is formed into a loop portion 42 adapted to encircle the cap. One end portion 43 of the strap 41 is secured to the upper surface of the end portion 44 of the bar 29 by means of the screws 45—45 or other suitable fastening means. The other end portion 46 of the strap 41 lies over the end portion 43 and is engaged by a clamp 47. The clamp 47 comprises a U-shaped yoke 48 and a shoe member 49. The shoe member 49 is pivotally supported in its center by means of a pivot pin 50 which passes through the free ends of the leg portions of the yoke 48 and transversely through spaced upwardly extending walls 51—51 of the shoe member 49. The closed end of the yoke 48 passes through a notch 52 formed in the rib 39 of the bar 29 and the leg portions of the yoke 48 extend upwardly on opposite sides of the bar 29 and above the upper surface of the end portion 46 of the strap 41. The shoe member 49 of the clamp 47 has teeth 53 on its lower surface to engage the upper surface of the end portion 46 of the strap 41, the teeth being inclined toward the handle 30. The end portion 46 of the strap 41 may be slipped between the upper surface of the end portion 43 and the shoe member 49 to reduce or enlarge the loop portion 42 of the strap 41 to adjust the loop portion 42 to a required size to fit a cap 9. The end portion 44 of the bar 29 is curved to provide a cam 54.

When the wrench is operated to apply a turning movement to the cap 9, the shoe member 49 of the clamp 47 is drawn by means of the yoke 48 against the upper surface of the end portion 46 of the strap 41 with sufficient pressure to press the teeth 53 into the strap 41 and thus prevent sliding of the free end of the strap 41. The cam 54 rolls against the loop portion 42 of the strap 41 and reduces the loop portion so that the strap 41 tightly embraces the cap 9.

When the wrench is operated to turn the cap 9, the finger portions 35—35 are moved relative to the bar 29. The position of the scratch mark 38 relative to the scratch mark 37 serves to indicate the pressure applied. The stops 36—36 are engaged by the finger portions 35—35 when the scratch marks 37 and 38 are brought into alignment.

What is claimed is:

- 10 A wrench device comprising a work engaging loop strap, a bar holding end portions of said strap, a handle pivotally mounted on said bar, a

long straight spring bar attached at one end to said bar and engaged at its free end by a free end of said handle, a finger portion on said handle extending adjacent said bar and movable relative to said bar, a stop on said bar, said stop extending into the path of movement of said finger portion and pressure indicating means on said bar and on said finger portion to indicate by their relative positions the pressure applied through the wrench to the work piece engaged by said loop strap.

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