

C. T. ROOT.
ANGLE WRENCH.
APPLICATION FILED OCT. 9, 1920.

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1,398,116.

FIG. 2.

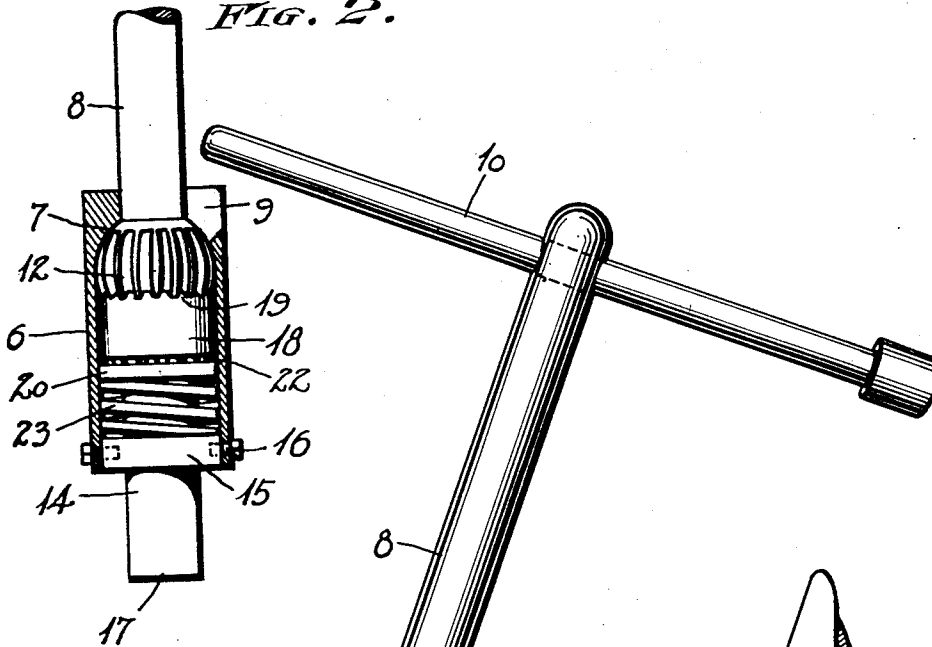


FIG. 1.

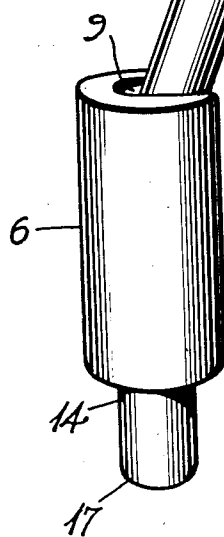
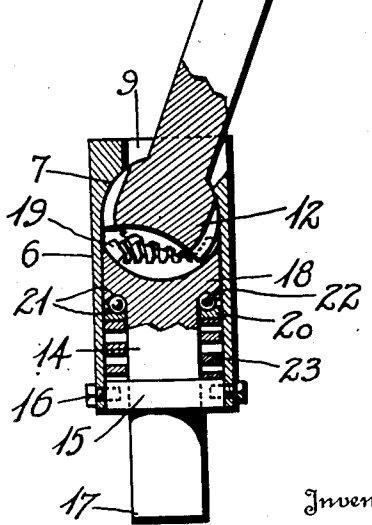


FIG. 3.



Inventor

C. T. ROOT

By *W. J. Fitzgerald Co.*
Attorney

UNITED STATES PATENT OFFICE.

CARLTON TITUS ROOT, OF ORLAND, INDIANA.

ANGLE-WRENCH.

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To all whom it may concern:

Be it known that I, CARLTON T. ROOT, a citizen of the United States, residing at Orland, in the county of Steuben and State of Indiana, have invented certain new and useful Improvements in Angle-Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to wrenches, and aims to provide a novel and improved wrench wherein the wrench member can be located in an angular position with respect to an operating shaft, for turning nuts, bolts, screws, or the like, in inaccessible places.

Another object is the provision of such a wrench comprising novel means for mounting and operatively connecting the wrench member and shaft to be positioned at an obtuse angle or in alinement with respect to one another, and providing an efficient and practical structure.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawing, wherein;—

Figure 1 is a perspective view of the improved wrench showing the shafts at an angle with one another.

Fig. 2 is a side elevation, with the case shown in longitudinal section, and a portion of the operating shaft broken off.

Fig. 3 is a view similar to Fig. 2, showing other portions in section also and the shafts in alinement.

In carrying out the invention, there is provided a cylindrical case 6, one end of which is open, and the other end provided with a concaved seat 7 therein at the end of the recess or bore. The operating shaft 8 extends longitudinally or at an obtuse angle from the case 6, and enters the case through a radial slot 9 in the closed end thereof and extending from the center to one side. The end of the shaft remote from the case 6 has a suitable handle or tommy bar 10 slidable therein for rotating the shaft, and the end of the shaft within the case is

formed with a ball or convexed gear 12. The back of the gear 12 is convexed to snugly fit the concaved seat 7, thus providing a bearing for the gear, and permitting said gear to be shifted to different positions.

The wrench member comprises a shaft 14 disposed axially within the case 6, and passing through a ring or collar 15 secured within the open end of the case 6, by means of set screws 16, or the like, whereby said shaft is mounted for rotary and sliding movement within the ring 15 and case 6.

The protruding end of the shaft 14 is of angular form, as at 17, for engaging a screw, bolt, or the like, or for the engagement of suitable socket member or other device to be used for turning the nut, bolt, screw or other object. The shaft or spindle 14 is provided at its inner end with a head 18 fitting slidably and rotatably within the case 6, and provided with a concaved annular series of gear teeth 19 meshing with the convexed gear 12.

In order to maintain the mesh of the gear members, a collar 20 surrounds the shaft 14 within the case 6, and the head 18 and collar 20 have complementary annular ball races 21 in which anti-friction balls 22 travel. A coiled expansion spring 23 is disposed within the case around the shaft 14, and is confined between the ring 15 and collar 20, whereby to yieldingly move the shaft 14 inwardly, to yieldingly hold the teeth 19 in engagement with the gear 12 and the shafts 8 and 14 in alinement.

In using the wrench, the case 6 and shaft or wrench member 14 are manipulated by the shaft 8, which can be of any suitable length, and the shaft or spindle 14 is then moved into engagement with the object to be rotated. The shaft 8 can then be swung in the slot 9 to a position at an angle with the axis of the shaft 14, and object to be rotated, and can be turned, whereby the rotation of the gear 12 will turn the head 18 and shaft 14 in any relative position of the shafts.

The spring 23 holds the gear members in snug engagement, to prevent loose play and to cause the gearing to operate efficiently at all times. The gears mesh or "clutch" each other throughout the annular extent of the teeth when the shafts are in alinement, and when the device is "broken" and the shafts brought at an angle with each other, then the gear 12 assumes an angular position

and meshes with the gear teeth 19 at one side only adjacent to the slot 9, similar to bevel gears. The wrench is especially useful for operating on bolts or screws in engine crank casings or other inaccessible places.

Having thus described the invention, what is claimed as new is;—

1. A wrench comprising a case, a shaft entering said case and having a gear thereon within the case, another shaft extending within the case for rotary and sliding movements and having a gear head to mesh with the aforesaid gear, and a spring within the case surrounding the second-named shaft for pressing said gear head against said gear.
2. A wrench comprising a case, a shaft entering said case and having a gear within the case, a ring removably secured within the case, another shaft rotatable and slidable within said ring having a gear head within the case to mesh with said gear, and a coiled expansion spring within the case surrounding the second named shaft and confined between said head and ring for moving said head and holding it against said gear.
3. A wrench comprising a case, a shaft entering the case and movable to different positions, said shaft having a convexed gear seated within the case for turning movement in different directions for the rotation of said shaft and the swinging thereof to different positions, and another shaft slidably and rotatably mounted in the case and having a head with concaved gear teeth to mesh with said convexed gear in the different positions thereof.
4. A wrench comprising a case, a shaft entering the case and movable to different positions with respect to the case, a convexed gear on said shaft fitted in the case for turning movement in different directions for the rotation of said shaft and the swinging thereof to different positions, another shaft disposed in the case for rotary and sliding movements and having a head with concaved gear teeth to mesh with the convexed gear in the different positions thereof, and a spring within the case surrounding

the second named shaft for holding the head, 50 convexed gear and case together.

5. A wrench comprising a case having a concaved seat and a slot at one end, a ring secured within the other end of the case, a shaft rotatable and slidable within said 55 ring having a head within the case provided with concaved gear teeth, an operating shaft having one end extending through said slot into the case, said operating shaft being movable to positions in aline- 60 ment or at different obtuse angles with the first named shaft, a convexed gear on said end of the operating shaft and meshing with said teeth, said gear having a convexed back bearing against said seat for the swing- 65 ing movement of the operating shaft to different positions, and an expansion spring between said head and ring to hold the head, convexed gear and case together.

6. A wrench comprising a case having a 70 concaved seat and a slot at one end, a ring secured within the other end of the case, a shaft rotatable and slidable within said ring having a head within the case provided with 75 concaved gear teeth, an operating shaft having one end extending through said slot into the case to be moved to positions in alignment or at different obtuse angles with the first named shaft, a convexed gear on said 80 end of the operating shaft and meshing with said teeth, and having a convexed back seating against said seat for the swinging movement of the operating shaft to different positions, a coiled expansion spring surround- 85 ing the first named shaft within the case and confined between said ring and head to hold the head, convexed gear and case together, a collar between the spring and head, and anti-friction balls between said collar and 90 head.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARLTON TITUS ROOT.

Witnesses:

WILLIAM P. BOOTH, Jr.,
ORRIN C. DICKINSON.