

APPLICATION FILED SEPT. 20, 1911.

Patented June 18, 1912.
2 SHEETS—SHEET 1.



Tested before me
George Andersen,
By Joshua A. N. Dorn
his Attorney.

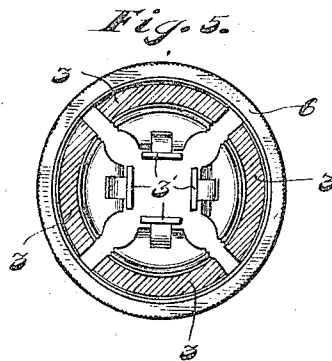
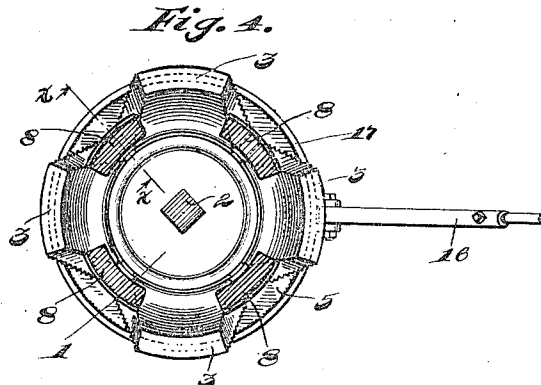
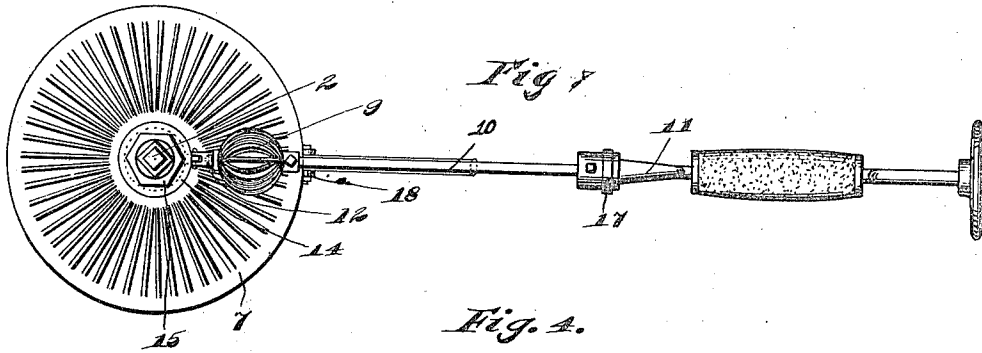
G. ANDERSEN.
WRENCH.

APPLICATION FILED SEPT. 20, 1911.

1,029,905.

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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

GEORGE ANDERSEN, OF CHICAGO, ILLINOIS.

WRENCH.

1,029,905.

Specification of Letters Patent.

Patented June 18, 1912.

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To all whom it may concern:

Be it known that I, GEORGE ANDERSEN, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

My invention relates to improvements in socket wrenches and has for its object the production of a wrench of this character which will be of an adjustable nature so as to adapt the same for use in connection with nuts or other similar objects of various sizes.

A further object is the production of a wrench as mentioned which will be of durable and economical construction and efficient in use.

Other objects will appear hereinafter.

With these objects in view my invention consists in the combinations and arrangements of parts hereinafter described and claimed.

My invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a substantially central longitudinal section of a wrench embodying my invention, Fig. 2 is a detail sectional view of the wrench, the section being taken on substantially line $x-x$ of Fig. 4, Fig. 3 is a top plan view of the wrench, and Figs. 4 and 5 are transverse sections taken on substantially lines $y-y$ and $z-z$ respectively of Fig. 1.

The preferred form of construction as illustrated in the drawings comprises a disk 1 which is carried upon one end of a stem 2 to which said disk is rigidly secured. Arranged about the disk 1 is a plurality of jaw members 3, the same being tiltably mounted intermediate their extremities upon the periphery of said disk as clearly shown in Fig. 1; said periphery being preferably formed with a single screw thread for engagement with screw threads correspondingly formed upon the inner surfaces of said jaw members, such provision being made to permit of ready assemblage of the parts, it being clear that with this construction the disk 1 may be readily threaded into proper position intermediate the jaw members. Also with this construction it is apparent that said jaw members will be held against longitudinal movement upon the periphery of the disk 1

while free tilting movement of said jaw members will be permitted. Each of the jaw members 3 is of curved construction and preferably of ogee form as shown, the outer surfaces thereof being screw-threaded. A split spring ring 4 encircles the jaw members 3 substantially coplanar with the disk 1 for maintaining said jaw members in close proximity with said disk when otherwise released. Arranged about the jaw members 3, the same engaging the external threads of said jaw members are two nuts 5 and 6, the periphery of said nuts being preferably knurled to facilitate manual rotation thereof. The nuts 5 and 6 are adapted by adjustment of the positions thereof upon the jaw members 3 to effect tilting adjustment of the latter, it being clear that by rotating said nuts to move the same upwardly with reference to said jaw members, the lower ends of the latter will be spread and that by lowering said nuts with reference to said jaw members the said ends of the latter will be contracted, it being clear that simultaneous adjustment of the nuts 5 and 6 is required in effecting tilting adjustment of said jaw members. Thus said jaw members may be adjusted so as to adapt the same for engagement with edges of various sizes, the lower ends thereof being provided with engaging members 3' pivoted thereto for engagement with the objects to be grasped.

Slidably mounted upon the stem 2 is a gear member 7, said stem being preferably squared and said gear provided with a socket of corresponding form so as to effect locking of said gear against rotation on said stem. Depending from the gear 7 adjacent the periphery thereof are tapering fingers 8 which are adapted to engage between the adjacent jaw members 3 so as to effect locking of the latter to the stem 2. The fingers 8 are made tapering in form as shown, in order to adapt the same for insertion between the jaw members 3 regardless of the tilted positions thereof. The exterior surfaces of the fingers 8 which are cylindrical in form are provided with screw-threads for engagement by the internal threads of the nut 5 so that in operation the latter will serve to lock said fingers 8 and hence the gear 7 against relative longitudinal movement.

The gear 7 is concave at its upper side and is provided with gear teeth as clearly shown in Fig. 1, the periphery of said gear

being also concave and also provided with gear teeth for employment in the manner hereinafter described. Meshing with the gear teeth in the upper side of the gear 7 is a substantially spherical gear or pinion 9 which is adjustably secured upon a stem 10 mounted in a brace 11 of usual form. The outer end of the brace stem 10 is provided with a swivel 12 which is pivotally connected with a ring 13 loosely slidable in the grooved periphery of a nut 14 threaded upon the stem 2; a lock-nut 15 being also threaded upon said stem for coöperation with the nut 14 for securing the latter in positions of adjustment upon said stem. The outer end of the stem 10 and the brace 11 are maintained in proper positions through the medium of a longitudinal adjustable brace rod 16 which is pivotally connected at its outer end with a ring 17 rotatably mounted on the socket end of said brace, the inner end of said brace rod being pivotally connected to a ring 18 which is rotatably mounted in the grooved periphery of the nut 5. Thus the stem 10 and brace 11 are rotatably mounted and held in a positive position relative to the remainder of the construction with the gear member 9 engaging the teeth in the upper side of the gear 7, and so that by rotation of said brace in the ordinary manner the gear 7 and hence the jaw members 3 may be rotated by an operator positioned at right angles to the nut, bolt or other object to be turned. By reason of the adjustment afforded the nut 14 upon the stem 2, the angular position of the stem 10 and hence the brace 11 may be altered without effecting the disengagement of the gear member 9 with the gear 7, angular adjustment of the stem 10 and brace 11 obviously requiring corresponding longitudinal adjustment of the brace rod 16. With this construction then it will be seen that the wrench is rendered adjustable so that the same may be used for engagement and rotation of nuts, bolts or other similar objects positioned at various angles. The construction is such that if desired the connection of the stem 10 with the nut 14 and of the brace rod 16 with the nut 5 may be interchanged, in which event the nut 9 will be moved longitudinally upon the stem 10 and engaged with the teeth in the periphery of the gear 7. This adjustment as is apparent adapts the device for use in a still greater number of instances. Where the work to be engaged is readily accessible the stem 2 may be provided with a suitable device for rotating the same, such as a brace, in which event the gear 9 and the members connected therewith may be dispensed with.

In using the wrench the gear 7 is first detached or slid to a position at the upper end of the stem 2, the nuts 5 and 6 being loosened. The jaw members 3 will then be free for tilt-

ing to adjust the same for engagement with the object which it is desired to engage. After adjusting said jaw members to the proper position the gear 7 is slid downwardly upon the stem 2, the fingers 8 being engaged between the adjacent ends of said jaw members as shown in Fig. 1. The nuts 5 and 6 are then threaded in opposite directions upon the jaw members 3 to effect the locking thereof in their positions of adjustment, said adjustment of the nut 5 simultaneously effecting the locking of the fingers 8 against longitudinal movement by reason of the internal teeth of said nut engaging the external teeth of said fingers, as clearly shown in Fig. 2. This completes the adjustment of the wrench for rotation in either of the manners above set forth.

A wrench of the construction set forth will be found to be strong and durable and of high efficiency in use.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modifications without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a wrench, the combination of a circular fulcrum member; a plurality of longitudinally curved jaw members arranged about said fulcrum member and adapted to be tilted thereon; and means arranged around said jaw members for maintaining the latter in various tilted positions, substantially as described.

2. In a wrench, the combination of a fulcrum member; a plurality of jaw members arranged about said fulcrum member and adapted to be tilted thereon; and means arranged around said jaw members and in screw-threaded connection therewith for maintaining said jaw members in various tilted positions, substantially as described.

3. In a wrench, the combination of a fulcrum member; a plurality of jaw members arranged about said fulcrum member and adapted to be tilted thereon; and two nuts arranged around and in screw-threaded connection with said jaw members for adjustably maintaining said jaw members in various tilted positions, substantially as described.

4. In a wrench, the combination of a disk having an axial stem; jaw members arranged about said disk and adapted to be tilted thereon; means arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in

various tilted positions; and means adapted for engagement between adjacent of said jaw members for connecting the latter with said stem, substantially as described.

5 5. In a wrench, the combination of a disk having an axial stem; jaw members arranged about said disk and adapted to be tilted thereon; means arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in various tilted positions; and tapering means adapted for engagement between adjacent of said jaw members for connecting the latter with said stem, substantially as described.

10 6. In a wrench, the combination of a disk having an axial stem; jaw members arranged about said disk and adapted to be tilted thereon; means arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in various tilted positions; and tapering means mounted on said stem and adapted to be slid to engagement between said jaw members for connecting the latter with said stem, substantially as described.

15 7. In a wrench, the combination of a disk having an axial stem; longitudinally curved members arranged about said disk and adapted to be tilted upon the periphery thereof; means arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in various tilted positions; and means slidably mounted upon said stem but locked against rotation thereon having depending fingers adapted for engagement between adjacent of said jaw members for connecting the latter with said stem, substantially as described.

20 8. In a wrench, the combination of a fulcrum member; a plurality of jaw members arranged about said fulcrum member and adapted to be tilted thereon; nuts arranged around said jaw members and in screw-threaded connection therewith for adjustably maintaining said jaw members in various tilted positions; and resilient means encircling said jaw members for maintaining the same in close proximity with said fulcrum member when said nuts are loosened, substantially as described.

25 9. In a wrench, the combination of a disk having an axial stem; longitudinally curved members arranged about said disk and adapted to be tilted upon the periphery thereof; means arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in various tilted positions; means slidably mounted upon said stem but locked against rotation thereon having depending fingers adapted for engagement between adjacent of said jaw members for connecting the latter with said stem; and manually operable means cooperating with said last mentioned

slidable means for rotating said stem, substantially as described.

10. In a wrench, the combination of a disk having an axial stem; longitudinally curved members arranged about said disk and adapted to be tilted upon the periphery thereof; means arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in various tilted positions; means slidably mounted upon said stem but locked against rotation thereon having depending fingers adapted for engagement between adjacent of said jaw members for connecting the latter with said stem, there being gear teeth formed upon said last mentioned slidable means; and manually operable means meshing with said gear teeth for rotating said stem, substantially as described.

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11. In a wrench, the combination of a disk having an axial stem; longitudinally curved jaw members arranged about said disk and adapted to be tilted upon the periphery thereof; means arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in various tilted positions; a connecting member slidably mounted upon said stem but locked against rotation thereon having depending fingers adapted for engagement between adjacent of said jaw members for connecting the latter with said stem, there being gear teeth formed upon said connecting member; and a brace carrying a gear meshing with said gear teeth for manually rotating said stem, substantially as described.

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12. In a wrench, the combination of a disk having an axial stem; longitudinally curved jaw members arranged about said disk and adapted to be tilted thereon; nuts arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in various tilted positions; a gear slidably mounted upon said stem but locked against rotation thereon having depending tapering fingers adapted for engagement between adjacent of said jaw members for connecting the latter with said stem; a brace carrying a gear adapted to mesh with said first mentioned gear for manually rotating said stem; a swiveled connection between said brace and said stem; and brace means for said brace connected with one of said nuts, substantially as described.

105 110 115 120

13. In a wrench, the combination of a disk having an axial stem; longitudinally curved jaw members arranged about said disk and adapted to be tilted thereon; nuts arranged around and in threaded connection with said jaw members for adjustably maintaining the latter in various tilted positions; a gear slidably mounted upon said stem but locked against rotation thereon having depending tapering fingers adapted

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for engagement between adjacent of said jaw members for connecting the latter with said stem; a brace carrying a gear adapted to mesh with said first mentioned gear for
 5 manually rotating said stem; and brace means for said brace connected with one of said nuts, said connections of said brace with said stem and of said brace means with said nut being interchangeable, substantially
 10 as described.

14. In a wrench, the combination of a fulcrum member having an axial stem; a plurality of jaw members arranged about said fulcrum member and adapted to be
 15 tilted thereon; nuts arranged around said jaw members and in screw-threaded connec-

tion therewith for adjustably maintaining said jaw members in various tilted positions; and tapering means connected with said stem adapted for engagement between
 20 adjacent of said jaw members for locking the latter to said stem, one of said nuts being adapted to engage said tapering means to lock the latter against longitudinal movement, substantially as described. 25

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

GEORGE ANDERSEN.

Witnesses:

ARTHUR A. OLSON,
 JOSHUA R. H. POTTS.