S. BROWN.

EXPANSION RATCHET WRENCH.

APPLICATION FILED JAN. 5, 1916.

1,213,583.

Patented Jan. 23, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

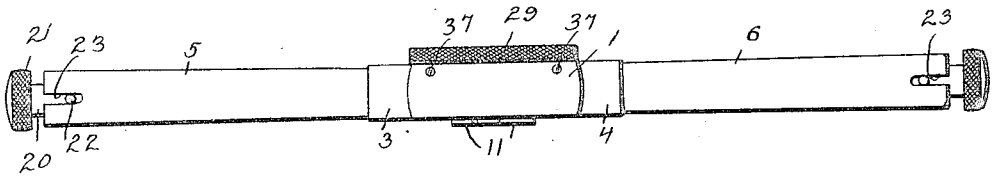


Fig. 2.

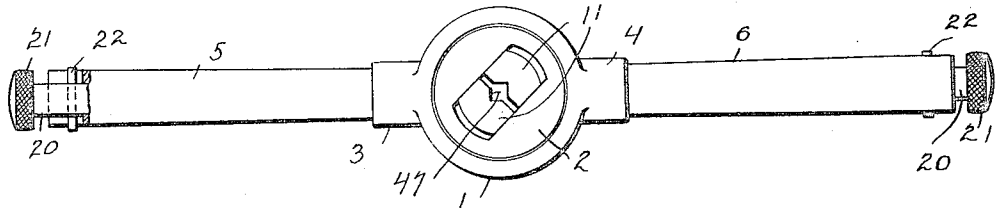


Fig. 12.

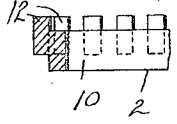


Fig. 4.

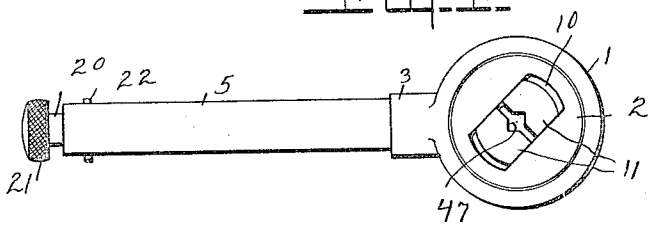


Fig. 3.

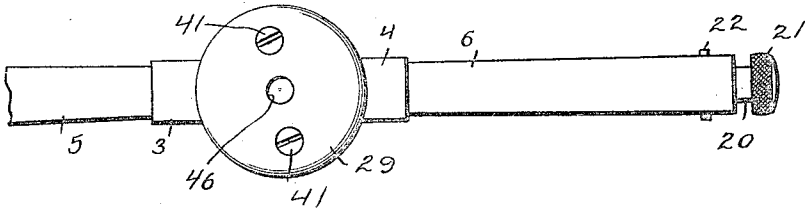
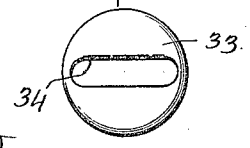


Fig. 11.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

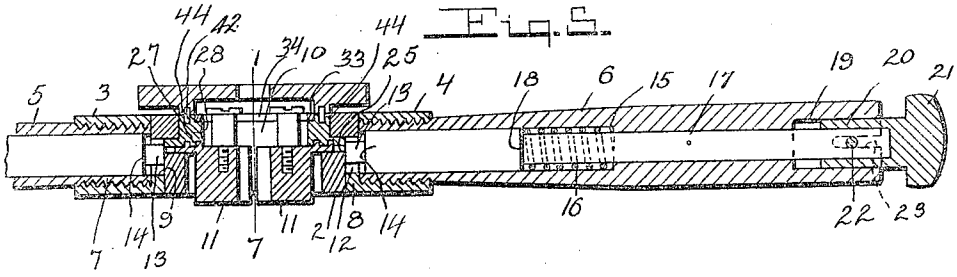


Fig. 6.

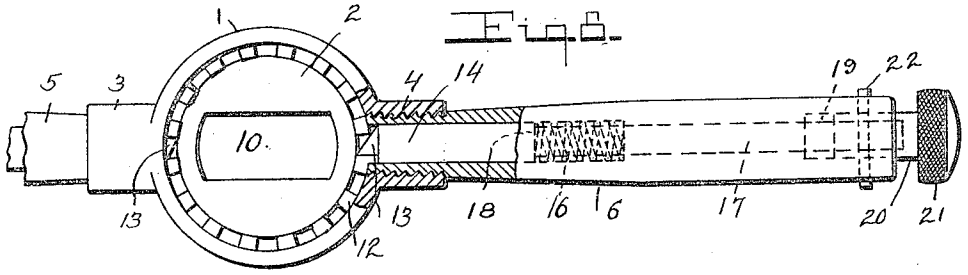


Fig. 7.

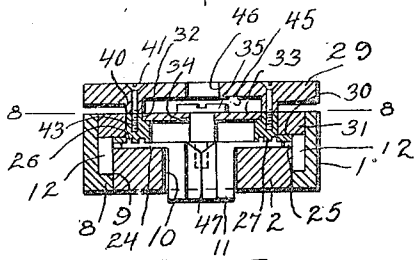


Fig. 9.

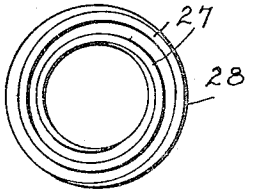


Fig. 8.

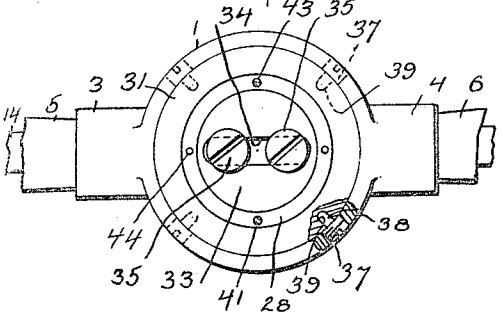
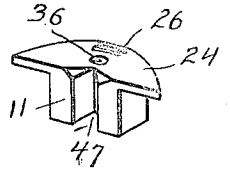


Fig. 10.



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EXPANSION RATCHET-WRENCH.

1,213,583. Specification of Letters Patent. Patented Jan. 23, 1917.

Application filed January 5, 1916. Serial No. 70,505.

To all whom it may concern:

Be it known that I, STEPHEN BROWN, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Expansion Ratchet-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 invention relates to improvements in ratchet wrenches.

The object of the present invention is to improve the construction of wrenches and to provide a simple and comparatively inexpensive ratchet wrench of great strength and durability, capable of ready adjustment for engaging nuts of different sizes and also to enable it to ratchet in either direction for screwing a nut on or off.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings Figure 1 is a side elevation of a ratchet wrench constructed in accordance with this invention, Fig. 2 is a plan view of the same, Fig. 3 is a reverse plan view, Fig. 4 is a plan view of a ratchet wrench provided with a single operating handle, Fig. 5 is a longitudinal sectional view of the ratchet wrench, Fig. 6 is a similar view taken at right angles to Fig. 2, parts being omitted to show the ratchet mechanism more clearly, Fig. 7 is a transverse sectional view on the line 7—7 of Fig. 5, Fig. 8 is a horizontal sectional view on the line 8—8 of Fig. 7, Fig. 9 is a plan view of the nut for operating the adjustable jaws, Fig. 10 is a detail perspective view of one of the adjustable jaws. Fig. 11 is a detail view of the guide plate of the nut. Fig. 12 is a detail sectional view of the rotary head.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

In the accompanying drawings in which is illustrated the preferred embodiment of the invention, 1 designates a cylindrical casing forming a bearing for a rotary head 2 and provided at diametrically opposite points with tubular projections 3 and 4 for the reception of hollow handles 5 and 6.

The tubular extension 3 is interiorly threaded for the reception of the threaded end 7 of the hollow handle 5 to enable the latter to be removed when it is desired to operate the wrench in a corner or other place. The other handle 6 may be permanently secured within the tubular projection 4 in any suitable manner, or threaded. The cylindrical casing is provided at one of its side faces with an inwardly extending annular flange 8 forming a seat for the rotary head 2 which is provided at the said seat with a circumferential groove or recess 9. The flange 8 fits in the annular recess 9 and the outer face of the rotary head 2 is arranged in substantially flush relation with the adjacent side edge or face of the cylindrical casing.

The rotary head 2 is provided with an oblong slot or opening 10 for the reception of adjustable jaws 11 and is provided at its periphery with teeth 12 adapted to be engaged by a tooth 13 of a dog 14 mounted in each of the hollow handles 5 and 6. Each hollow handle is counter-bored to form a shoulder 15 which is engaged by a coiled spring 16 disposed on a stem 17 of the dog and interposed between the said shoulder 15 and a shoulder 18 formed by the inner end of the dog. The stem 17 is of less diameter than the dog 14 and the hollow handle is counter-bored at its outer portion at 19 to receive a sleeve 20 of a milled or knurled knob 21 secured to the outer end of the stem 17 by a transverse pin 22 adapted to engage notches or slots 23 formed in the outer ends of the handles at diametrically opposite points and adapted to hold the dogs in their adjustment. The tooth 13 of each dog is beveled at one side and shouldered at the other as clearly illustrated in Fig. 6 of the drawings and it is adapted to be rotated to arrange the tool or wrench for ratcheting in either direction.

The wrench is operated in the usual manner by oscillating it and when the handle is moved in one direction the dog ratchets over the teeth of the rotary head and when the handle is swung in the opposite direc-

tion the shoulder of the tooth of the dog engages one of the teeth of the circular head and actuates the latter. When it is desired to adjust the pawls or dogs the knobs are pulled outwardly to carry the transverse pins out of engagement with the notches 23 and the dogs are then rotated one half of a revolution to reverse their position. By adjusting the dogs the head 2 may be rotated in either direction when the stock formed by the cylindrical casing and the handles is oscillated. The jaws 11 which are approximately rectangular in plan view present flat side faces to the walls of the oblong slot or opening 10 and the said jaws are movable inwardly and outwardly with respect to each other to vary the size of the space between them to adapt them for engaging nuts of different sizes. The jaws are provided at their inner portions with segmental plates 24 arranged in a recess 25 in the inner face of the rotary head 2 and provided at their inner faces with thread sections 26 formed by short curved ribs and adapted to be engaged by facial threads 27 of a nut 28 which is in the form of a ring and which fits in the recess 25 of the rotary head 2. The recess 25 extends to the teeth 12 which project beyond the inner face of the rotary head. The nut which is preferably in the form of a ring as shown is actuated by an exterior operating plate 29 and when it is rotated it engages the projecting ribs or thread sections 26 of the jaws and moves the latter inwardly and outwardly according to the direction of rotation of the nut. The nut 28 which is provided with an exterior annular groove or recess 30 to receive and enable the nut to fit in a bearing ring 31 is also provided with an inner annular recess 32 forming a bearing for a guide disk 33 provided with an oblong slot 34 corresponding with the slot or opening 10 and receiving screws 35 extending through the slot 34 and engaging threaded perforations 36 of the jaws. The bearing ring 31 which engages the nut at the groove or recess in the outer periphery thereof is secured within the cylindrical casing by screws 37 engaging threaded openings in the said casing and having reduced portions 38 projecting inwardly from the casing and engaging suitable sockets or perforations 39 of the bearing ring. The outer face of the nut is arranged in flush relation with the outer face of the bearing ring and the exterior operating plate is provided at its inner face with an annular rib or flange 40 fitting against the outer face of the nut and secured to the same by screws 41 and studs or projections 42. The screws engage threaded perforations 43 and the studs or projections fit in sockets 44 of the said nut. The operating plate is recessed at 45 within the rib or flange 40 to provide a space to receive and clear the heads of the screws 35. The said operating plate which is also provided with a central opening 46 to enable a tool or instrument to pass through the wrench has a roughened periphery to permit it to be readily grasped and rotated for adjusting the jaws of the wrench. The jaws 11 which have flat inner engaging faces are provided at the centers thereof with angular recesses 47 for engaging various objects.

What is claimed is:—

1. A ratchet wrench of the class described including a rotary head, jaws slidably mounted in and carried by the head, a rotary nut located within the casing and operatively connected with the jaws for moving the same toward and from each other, a bearing member secured within the casing and receiving and forming a bearing for the nut and retaining the latter in the rotary head, and an exterior operating plate extending through the bearing member and connected with the nut for operating the same.

2. A ratchet wrench of the class described including a stock having a casing, a rotary head mounted in the casing and provided with an oblong opening, jaws slidable in the opening toward and from each other, a rotary nut mounted in the casing and operatively connected with the jaws for moving the same toward and from each other, said nut consisting of a ring having an inner bearing, a guide disk fitting in the bearing of the nut and provided with an oblong slot, fastening means carried by the jaws and operable in the slot of the guide disk and means operable exteriorly of the casing for rotating the nut.

3. A wrench of the class described including a stock having a casing, a rotary head mounted in the casing and provided with an oblong opening, jaws slidable in the opening and provided at their inner ends with plates having thread sections, said head being also provided at its inner face with a recess receiving the said plates, a nut consisting of a ring fitting in the recess of the head and having facial threads engaging the thread sections of the said plates, said nut being provided with an annular groove, a bearing ring receiving the said nut and an exterior operating plate connected with the nut and fitting in the annular groove thereof and arranged in flush relation with the said nut.

4. A wrench of the class described including a stock having a casing, a rotary head mounted in the casing and provided with an oblong opening, jaws slidable in the opening and provided at their inner ends with plates having thread sections, said head being also provided at its inner face with a recess receiving the said plate, a nut consisting of a ring fitting in the recess

of the head and having facial threads engaging the thread sections of the said plates, a guide disk arranged within the nut and provided with a slot, headed fastening devices extending through the slot and connected with the jaws, a fixed bearing ring secured within the casing and receiving the nut, and an exterior operating plate having a rib or flange fitting against the nut and secured to the same.

In testimony whereof I affix my signature in presence of two witnesses.

STEPHEN BROWN.

Witnesses:
EUGENE GAGNONE,
HENRY CÔTE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."