April 25, 1933. J. D. LAMB 1,905,388

UNIVERSAL RATCHET WRENCH

Filed March 31, 1931

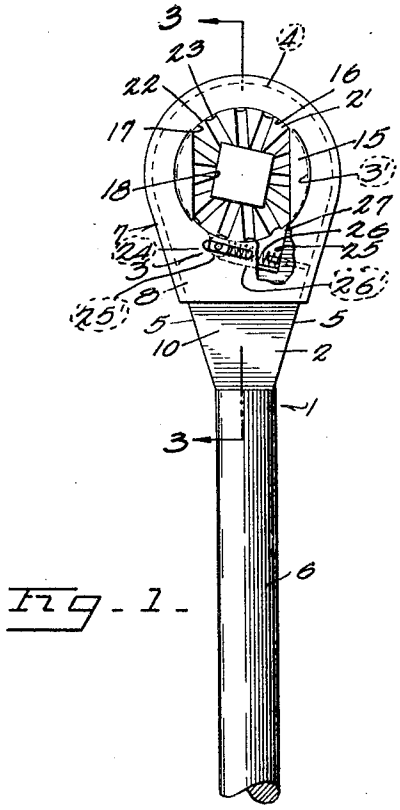


Fig. 1.

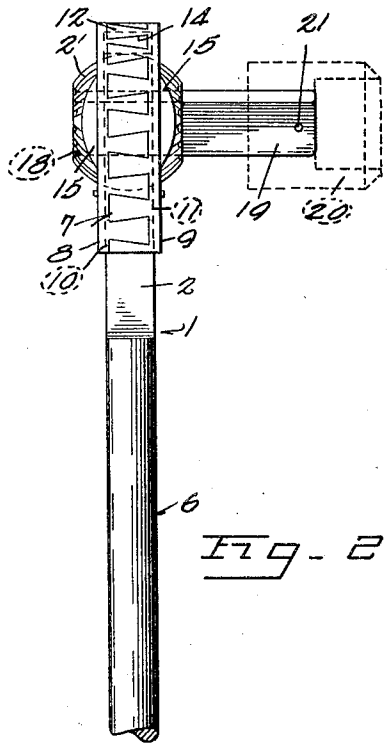


Fig. 2.

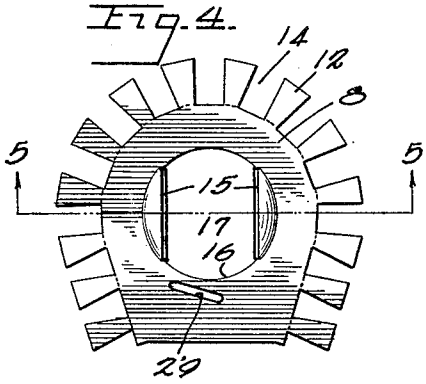


Fig. 4.

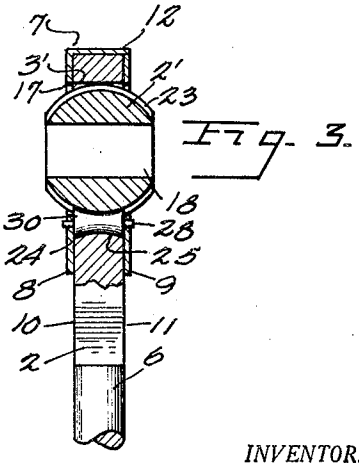


Fig. 3.

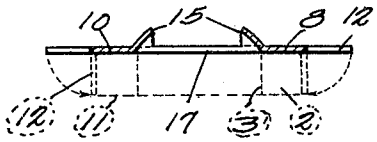


Fig. 5.

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UNITED STATES PATENT OFFICE

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UNIVERSAL RATCHET WRENCH

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The present invention relates to improvements in universal ratchet wrenches, and it consists in the combinations, constructions and arrangements hereinafter described and claimed.

An object of my invention is to provide a ratchet wrench having the rotatable member thereof universally mounted in the operating handle so as to present a wrench having the advantages of an ordinary ratchet wrench, and in addition, an increased range of usefulness due to the universal feature. The wrench may be used to advantage in many places where obstructions prevent the use of an ordinary ratchet wrench.

A further object is to construct a wrench of the character described having a relative high strength for its size on account of the novel design thereof.

It is further proposed in the present invention to simplify the various structural features necessary for carrying out the above objects in such a manner that the wrench may be cheaply manufactured, easily manipulated, and readily prepared for the particular function which it is to serve.

Other objects and advantages will appear as the specification proceeds, and the novel features will be particularly pointed out in the claims hereto annexed.

My invention is illustrated in the accompanying drawing forming a part of this application in which

Figure 1 is a plan view of a wrench constructed in accordance with my invention;

Figure 2 is a side view thereof;

Figure 3 is a section along line 3—3 of Figure 1;

Figure 4 is a development of a portion of the device; and

Figure 5 is a section taken along line 5—5 of Figure 4.

In carrying my invention into practice, I provide a universal ratchet wrench indicated generally at 1, and comprising a body portion 2 having a head 2′ rotatably and universally mounted therein, and ratchet means indicated at 3 operatively connected with the head.

Referring now to Figure 1, it will be noted that the body 1 is fashioned from a suitable material with an arc-shaped end 4 and merging into converging sides 5, which later terminate in an operating handle 6. The head 2′ is disposed in an opening 3′ that is formed in the body portion.

A casing 7 encloses a portion of the body, and preferably consists of two substantially identical sections 8 and 9, which are abutted against the faces 10 and 11 respectively, and have their edges provided with dove-tailing fingers 12. The tapering sides of the body prevent the casing from moving relative to the body 2. These fingers are spaced by cut-away portions 14 in such a manner that the fingers of one section register with the cut-away portions of the other section for forming the complete housing.

The head 2′ is revolvably mounted in the casing 7, and is held therein by curved flanges 15, the latter being arranged along the marginal edges 16 of openings 17 formed in the sections 8 and 9. The casing may also be formed of material that is crimped, pressed, welded, spot welded, riveted, bolted, etc., according to the method of manufacture selected.

In Figure 2, I show the head 2′ as being a portion of a sphere, and perforated at 18 so as to removably receive a shank 19 of conventional design. This shank has a socket 20 attached thereto, and preferably secured in position by means of a spring pressed ball 21. The socket and shank are free to swing into various angular positions relative to the operating handle, and this is particularly desirable in cases where the work is not readily accessible.

The head 2′ is formed with alternating meridian-like ribs 22 and grooves 23 which are engaged by a roller 24 that in turn is mounted in a recess 25 extending inwardly of the opening in the body 2, see Figure 1. A spring 26 has one end thereof bearing against the wall 27 of the recess, and its opposite end abutting against the roller 24 for urging the latter into engagement with the grooves in the head 2′. Trunnions 28 project from the roller of the ratchet into guide slots 29 in the sections 8 and 9.

It should be particularly noted that the slots extend at an angle with respect to the longitudinal axis of the handle 6, and that roller 24 recedes from engagement with the grooves in the head 2′ on movement of the handle 6 in a clockwise direction with reference to Figure 1. Spring 26 yields so as to permit this movement of the roller, and the spring immediately becomes active for preventing the handle from turning in a counter-clockwise direction with respect to the head 2′.

Referring now to Figures 1 and 3, it will be noted that the bottom of the recess is provided with stepped ledges 25′ and 26′, and that these steps are transversely curved so as to conform to the shape of the roller. The roller contacts with the head 2′ and is supported by the bottom of the recess 25 throughout the entire length of the roller.

The normal action of the wrench is for the roller to engage a groove in the head 2′ and become locked between the head and the bottom of the recess 25 with the roller arranged on the ledge 25′. When the handle 6 is turned in a clockwise direction in Figure 1, the roller moves toward the step 26′, and one of the ribs 22 engages with the roller surface. The slots 29 are slightly wider than the diameter of the trunnions 28, and this allows the roller to be positioned on the ledge 26′. The flanged ends 30 of the roller bear against the inner surfaces of the casing, though with no weight or strain when the wrench is in use.

Grooves 23 extend over the surface of the spherical-shaped head 2′, and this permits the head to swing into various angular positions, and at the same time the roller remains in engagement with the grooves.

From the foregoing description of the several parts of the wrench, the operation thereof may be readily understood. The wrench is adapted for use in confined places, and has all of the advantages of an ordinary ratchet wrench and in addition thereto, the head 2′ is universally secured to the body proper. The strength of the wrench lies in the fact that the pressure is distributed over a large area of the roller instead of being applied to the point of a pawl as in the wrenches of conventional design. Particular attention is called to the fact that the trunnions 28 prevent displacement and loss of the roller through the opening 18, if the head should be turned until the opening is in registry with the roller while the shank 19 is removed.

While I have shown only the preferred form of my invention, it should be understood that various changes or modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A universal socket wrench comprising a body having a spherical-shaped bearing with diametrically opposed openings, a ball-shaped member having a non-circular socket and being receivable in the bearing for rotation in any direction, said ball having meridian grooves of the same width throughout, and a roller having a concave surface with a curvature similar to the curvature of the ball groove, and spring means for guiding the roller into binding engagement with the ball.

2. A universal socket wrench comprising a body having a head made from two similar pieces, each piece having wedge-shaped portions interlocking with similar portions on the other piece, each piece also having a central opening with spherical-shaped portions constituting a bearing for a ball, and a ball received in the spherical-shaped portions and having a non-circular socket.

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