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WRENCH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES E. BRADFORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wrenches, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in wrenches and has for its object to improve the construction and increase the utility of a wrench of that character disclosed in my prior Patent No. 934,589, issued September 21st, 1909.

Another object of the invention resides in the provision of a wrench embodying a shank having a jaw on one end, a rack longitudinally movable with relation to the shank, a sliding jaw adjustable upon the shank and carrying means for engagement with the rack, and additional means for moving said rack to secure a further adjustment of the sliding jaw with relation to the stationary jaw.

Still another object of the invention resides in the provision of the spring held rack mounted for longitudinal movement in the shank of the wrench, a jaw slidable on the wrench shank and having means to engage the teeth of the rack, and a rotatable handle for the wrench to engage said rack and move the same longitudinally on the shank to adjust said jaw.

Another object of the invention is to provide a wrench of such construction that the same may be utilized as a vise and which will be extremely strong and durable in construction and efficiently perform the functions for which the same is devised.

With the above and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of my improved wrench; Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a detail elevation of the movable rack; Fig. 4 is a detail perspective view of the sleeve holding spring arranged in the sliding jaw; and Fig. 5 is a similar view of the supplementary stationary jaw.

Referring in detail to the drawing 5 designates the wrench shank and 6 the sta-

tionary head which is formed upon one end thereof. The other end of this shank is provided with a reduced longitudinally extending stem 7 which is of cylindrical form and is provided at its point of connection to the end of the shank with the screw threads 8. Upon the cylindrical stem 7 the handle 9 of the wrench is arranged, and this handle is provided upon one end with a metal disk 10 which has a central screw threaded bore 11 to co-engage with the threads 8 on the stem 7. This disk is also provided with a tubular portion 12 which receives the reduced end 13 of the handle and is securely riveted thereto as indicated at 14. The handle 9 is loose upon the cylindrical stem 7 and a pin or screw 15 is provided with a left hand thread and is threaded into the end of said stem to limit the outward movement of the handle thereon and prevent its entire removal from the stem. The head of this screw is of greater diameter than the stem and forms a stop which abuts against the end of the wrench handle.

One face of the wrench shank 5 is provided with a longitudinal guide-way or channel 16, the opposite longitudinal edge walls of which are outwardly beveled or inclined as indicated at 17 and are adapted to engage the beveled longitudinal edges 19 of the sliding rack 18 which is mounted in said channel. These co-engaging beveled surfaces serve to retain the rack upon the wrench shank.

On one end of the rack 18 a stud 20 is formed which projects into an opening 21 provided in the stationary wrench jaw 6, one end of said opening being closed by a threaded cap or plug 22. A coiled spring 23 is arranged in said opening and upon the stud 20 and serves to hold the sliding rack yieldingly against longitudinal movement. This spring also retains the other end of the sliding rack in constant engagement with the face of the metal disk 10 on the end of the handle 9 as clearly shown in Fig. 1.

An adjustable jaw 24 is longitudinally movable on the wrench shank and is provided with a rectangular opening 25 extending at right angles to the longitudinal axis of the shank. A sleeve 26 is movably arranged in this opening of the jaw and consists of the U-shaped plate 27 between the ends of which the locking block 28 is

rigidly secured, said block being provided on its inner face with teeth for engagement with the teeth of the sliding rack 18. Between the intermediate portion of the plate 27 and the opposed faces of the wrench shank, the spring plates 29 are arranged, said plates being curved or bowed in opposite directions and engaging with the shank face and the plate 27 respectively. The ends of these spring plates are provided with tongues and recesses, the tongue on one plate fitting into the recess of the other plate and suitable pivot pins 30 are extended through the ends of said plates to loosely connect the same. These bowed spring plates normally hold the sleeve 26 yieldingly against sliding movement and retain the teeth of the locking block 28 in engagement with the teeth of the rack 18.

As thus far described, in the use of the wrench, the sliding jaw 24 may be rapidly adjusted upon the wrench shank by pressing upon the sleeve 26 to disengage the locking block from the rack whereby the jaws and the wrench may be properly spaced apart for application to a nut or other element to be engaged thereby. When it is desired to utilize the wrench as a vise, this sliding jaw is first adjusted and the handle 9 is then rotated upon the stem 7 of the wrench shank. Owing to the fact that the metal disk 10 is threaded upon said stem, the handle will move inwardly thereon and force the sliding rack 18 longitudinally with respect to the shank and in the direction of the jaw 6, thereby effecting a further movement of the adjustable jaw toward the stationary jaw. In this manner it will be readily understood that the stationary jaw may be very minutely adjusted so as to securely clamp the element being operated upon between the opposed jaws.

In order to enable the device to be used as a pipe wrench, I provide a supplementary stationary jaw 31 which is adapted to be applied to the jaw 6. This supplementary jaw is longitudinally bifurcated as indicated at 32 to receive the shank of the wrench and has a flat face to engage against the inner face of the jaw 6. Said supplementary jaw is also provided with an inclined face which is serrated as indicated at 33 whereby said jaw may effectively grip a pipe or other object having a curved surface. The separated portions of the jaw 31 which are provided by forming the bifurcation therein have studs 34 integrally formed therewith which are adapted to be received in sockets 35 provided in the wrench jaw 6, said studs preventing any lateral movement of the supplementary jaw with relation to the wrench shank.

From the foregoing it is believed that the

construction and manner of application and use of my improved wrench will be fully understood. The construction is comparatively simple and affords means for easily and quickly applying the wrench to objects of various sizes. The device is also extremely durable in construction, highly efficient in practical use and may be manufactured at comparatively small cost.

While I have shown and described the preferred construction and arrangement of the various parts, it will be understood that the device is susceptible of considerable modification without departing from the essential feature or sacrificing any of the advantages thereof.

Having thus described the invention what is claimed is:—

1. A wrench comprising a shank having a stationary jaw formed on one end and a cylindrical stem on its other end, said stem being threaded adjacent to the shank, a rack longitudinally slidable in one face of the shank, an adjustable jaw longitudinally movable on the shank and rack, locking means carried by the jaw cooperating with said rack, a spring mounted in the stationary jaw normally acting to force said rack in one direction, and a handle rotatable on said stem and engaged with the threaded portion thereof, said handle engaging the sliding rack to force the same in the opposite direction when the handle is rotated whereby said movable jaw is adjusted.

2. A wrench comprising a shank having a stationary jaw formed on one end and a cylindrical stem on its other end, said stem being provided with screw threads adjacent to the shank, a rack mounted for longitudinal sliding movement on one face of the shank, a jaw slidable upon said wrench and rack, locking means carried by the jaw and cooperating with the rack, said stationary jaw having an opening therein, said rack being provided with a stud on one end projecting into said opening, a spring on said stud normally acting to force the rack in one direction, a handle rotatable upon said stem, a disk secured to one end of the handle having threaded engagement upon the threaded portion of the stem and also engaging the other end of said rack whereby the rack is moved in the opposite direction when the handle is rotated to adjust the movable jaw, and a stop secured to the end of said stem to be engaged by the handle to prevent its removal from the stem.

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

CHARLES E. BRADFORD.

Witnesses:

C. F. BOYER,

JESSIE S. WILSEY.