

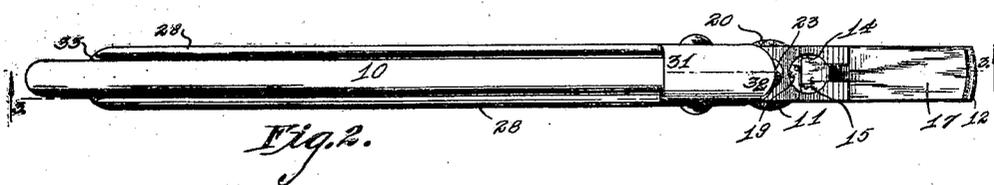
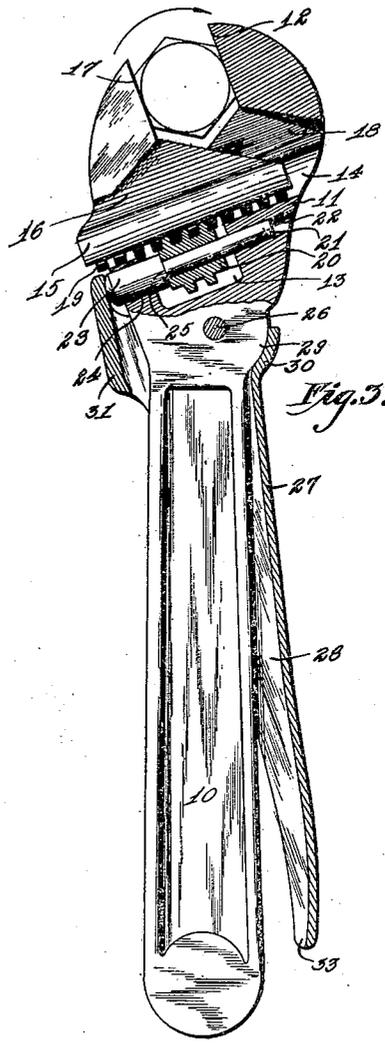
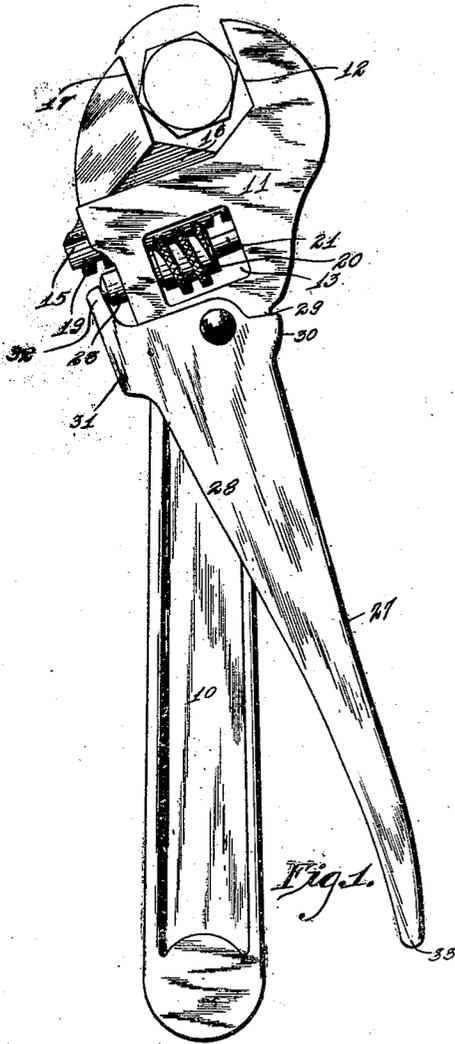
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W. A. NORTON

WRENCH

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Inventor
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by Orwig & Hague, Attys.

UNITED STATES PATENT OFFICE.

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WRENCH.

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To all whom it may concern:

Be it known that I, WILLIAM A. NORTON, a citizen of the United States, and a resident of Marshalltown, in the county of Marshall and State of Iowa, have invented a certain new and useful Wrench, of which the following is a specification.

The object of my invention is to provide a wrench which may be used similar to the straight wrench having fixed jaws, or that may be used in the same manner as a ratchet wrench, at the will of the operator, without any adjustments.

A further object is to provide in a wrench having an adjustable jaw, improved means whereby the adjustable jaws may be made to accurately and snugly fit all sizes of nuts or bolt heads within the adjustable range of the wrench.

A further object is to provide in a wrench having adjustable jaws, means whereby the said jaws may be capable of being clamped to the said nuts, or bolt heads, in such a manner that the bolt head may be grasped by said jaws and the bolt placed in a hole or any other desired position, and when placed the bolt may be firmly held against either rotary or longitudinal movement.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of my improved wrench showing the manner in which it is applied to a nut when used as a ratchet wrench.

Figure 2 shows an edge elevation of the same.

Figure 3 shows a longitudinal, sectional view taken on the line 3—3 of Figure 2.

My improved wrench comprises a handle 10 having a head member 11 formed integral therewith. The said head member 11 is provided with a jaw engaging jaw member 12, and also a rectangular opening 13.

Between the opening 13 and the jaw 12, I have provided a dove tailed groove 14, said groove being at an angle substantially ninety degrees with the face of the jaw 12.

Slidably mounted in the groove 14, I have

provided a slide member 15 having one of its edges provided with a flange 16 which is designed to carry a jaw member 17, the flange 16 being designed to work in a groove 18 in the head 11 in such a manner that the jaw member 17 will be held against lateral movement, the face of the jaw member 17 being parallel with the face of the jaw member 12.

The slide member 15 is mounted in the groove 14 in such a manner that the face of the jaw member 17 may be moved toward or from the face of the member 12. The said slide member 15 has its inner edges provided with a series of teeth 19 designed to coact with the teeth of a worm 20, the said worm 20 being rotatively mounted on a pin 21, one end of which is slidably mounted in an opening 22, while the opposite end 23 is enlarged and slidably mounted in an opening 24 in such a manner that the worm 20 may be moved a considerable distance in the opening 13 in a line parallel with the movement of the member 15.

The outer edges of the threads of the member 20 are knurled and of a diameter slightly greater than the width of the member 11 so that the said screw 20 may be rotated between the operator's thumb and finger, and the member 15 adjusted relative to the pin 21. The member 23 is of a larger diameter than the member 21 to provide a bearing 25 against which one end of the worm 20 may rotate.

Mounted in the inner end of the head 11, I have provided a pin 26 on which is pivotally mounted a lever or handle 27. This handle is formed U-shaped in cross section and has side flanges 28 designed to overlap the sides of the handle 10, the members 28 being designed to receive the pin 26.

The head 11 is also provided with a curved portion 29 having a radius in the center of the pin 26, said curved portion being designed to be engaged by a curved portion 30 of the handle 27.

The inner ends of the side flanges 28 are connected together by means of a plate 31, the said plate being provided with cam portion 32 designed to engage the outer end of the enlarged portion 23 of the pin 21, as clearly shown in Figures 1 and 3.

The handle 27 is so arranged that as its free end 33 is moved toward the free end of the handle 10, the member 32 will move the

pin 21 inwardly which in turn will move the slide 15 and the jaw member 17 inwardly in such a manner that the jaw members 17 and 12 may be made to engage a nut or the head of a bolt, and when so engaged will be firmly gripped and held.

The operator may then place the bolt within the hole if so desired without having to grasp it by his hand. This I find is very convenient in a large number of instances where it is desired to place bolts in certain positions almost impossible otherwise due to the fact that the place is too small to permit the operator's hand to enter.

By rotating the worm 20, the jaw member 17 may be adjusted relative to the jaw 12 so as to fit bolts of different sizes.

In making this adjustment, said jaws may be separated a distance greater than the diameter of the bolt head or nut to which it is to be applied, after which the nut may be placed between the said heads and the worm 20 rotated to move the heads together. When the said heads have engaged the nut, a further rotation of the worm 20 will cause the free end of the handle 33 to be moved outwardly from the end of the handle 10. When the heads have so engaged the nut, the movement of the worm 20 should be continued about a quarter revolution. This will give about the right amount of separation between the end of the handle 10 and the member 33 so that as the handles 27 and 10 are grasped by the operator's hand and squeezed together, the heads 12 and 17 will be brought firmly in contact with the nut. The said handles may then be rotated in either direction as illustrated in Figures 1 and 3, and rotary movement imparted to the nut.

In this connection, it will be seen that the main part of the force is applied to the handle 27 which has a tendency to cause the two jaws to grip the nut as rotated. It will also be noted that the pin 26 is comparatively close to the pin 32 so that a considerable leverage is provided so that but a slight gripping pressure is required by the operator's hand to firmly hold the heads 17 and 12 together.

By this means I have provided a wrench by which the nut of a bolt may be rotated, either as a straight wrench or as a ratchet wrench. When it is desired to use the wrench as a ratchet, the operator releases the gripping action as applied to the handles 10 and 27 and may rotate the handle 10 in either direction. This movement will cause the jaws 17 and 12 to rotate about the corners of the nut as illustrated in Figure 1. When the said rotation takes place, the nut will have a tendency to stand stationary due to the frictional engagement with the bolt, and on account of the relative movement between the heads 17 and 12 and the said nut,

the head 17 will be moved from the head 12, thereby permitting the wrench to rotate without rotating the nut.

When the faces of the jaws are parallel with the faces of the nut, the operator then moves the handles 27 and 10 toward each other gripping the nut as before described.

It will also be seen that the wrench may be used as a straight wrench by merely holding the handle 27 into engagement with the handle 10 during all of the movements, the heads being so adjusted that they will be easily moved into and out of engagement with the nut.

This I find by actual practice is a great improvement over the ordinary ratchet wrench due to the fact that there is no perceptible looseness between the jaw members and the handle member which is common with the ordinary ratchet wrench.

Thus it will be seen that I have provided a simple, durable and inexpensive wrench which may be used as a straight wrench or as a ratchet wrench at the will of the operator, and one when used as a straight wrench will have its jaw members firmly grip the head of the bolt or nut, while it is being operated.

This is a very important feature whether in wrenches having the ordinary fixed head type or the adjustable head type. In the fixed head type it is necessary that the distance between the faces of the jaws be fixed and slightly greater than the width of the nut so that the jaws may be easily applied.

I find that even with standard size heads, a considerable variation in the size of the heads exist in the different makes of nuts, so that it is impossible to get a standard wrench that will accurately fit all standard heads.

If the distance between the faces of the jaw members is slightly greater than that of the faces of the nuts, then the wrench has a tendency to rotate about the nut rather than to turn it, this being permitted by the corners of the nut being turned over and crushed in, due to the pressure of the jaws against the said corners. After the wrench has been applied to a nut this way several times, it becomes substantially round instead of having flat faces.

The excess pressure caused by the angularity between the faces of the jaws of the wrench and those of the nut cause undue strain on the head of the wrench, and are in that way sprung apart.

With my improved wrench this difficulty is always overcome due to the fact that the faces of the jaws are always held in absolute contact with the faces of the nut.

By providing the curved portion 29 so as to engage the curved portion 30 of the handle 27, I have provided means whereby a comparatively small pivot member 26

may be used, thereby permitting the said pivot member to be mounted comparatively close to the edge of the opening 13, and the distance between the said pivot 26 and the pin 21 to be comparatively short so that a large amount of leverage may be obtained through the handle 27, the said leverage being in proportion to the distance between the center of the pivot 26 and the pin 21, to the length of the handle 33.

I claim as my invention:

1. A wrench comprising a handle having a head and a fixed jaw, the said head being provided with an opening, one edge of said handle being provided with an outwardly extended curved portion, a movable jaw slidably mounted in said head, a lever pivoted to the said head having a portion designed to engage the said curved portion of said handle, said curved portion being concentric to the pivot of said lever, and means actuated by said lever for moving said slidable jaw member toward or from the said stationary jaw member.

2. A wrench comprising a handle having a head and a fixed jaw member, said head

being provided with an opening, a movable jaw member slidably mounted in said head and provided with teeth communicating with said opening, a pin through said opening having each of its ends slidably mounted in the jaw member, one end of the said pin being provided with an enlarged portion extending through and slightly beyond the head member, the smaller portion of said pin being provided with a screw member having teeth in engagement with the teeth of said movable jaw member, said screw member being of a length less than the length of said opening and slidably and rotatively mounted on said pin, a lever pivoted to said head member having a cam portion designed to engage the outwardly extending portion of said pin so arranged that as the lever is operated in one direction relative to the handle of the wrench, the pin will be moved longitudinally and with it the movable jaw member by the enlarged portion of the pin engaging one end of said screw member.

WILLIAM A. NORTON.