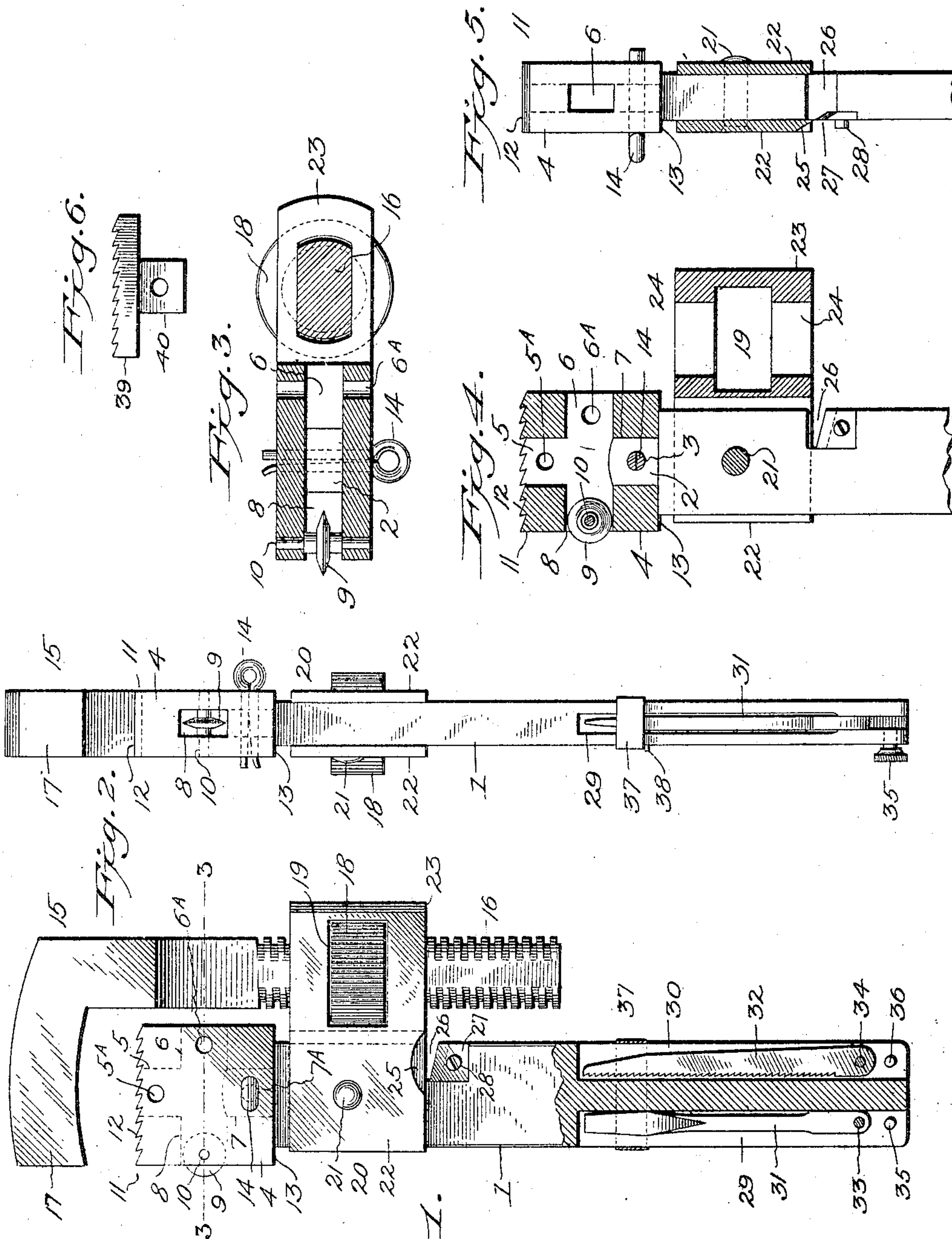


J. J. A. MILLER.  
WRENCH.

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Fig. 1.

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# UNITED STATES PATENT OFFICE

JOHN J. A. MILLER, OF DENVER, COLORADO.

## WRENCH.

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Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, JOHN J. A. MILLER, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Wrenches; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to an improved combination-wrench.

The object of the invention is to provide a wrench having the usual movable jaw and a reversible head, the faces of which when used in connection with the jaw constitute a nut-wrench, a pipe-wrench, or a pipe-cutter, according to the position of the reversible head, the handle of said wrench being provided with a saw and screw-driver which are normally inclosed within the handle and with a knife-edge which acts in combination with the movable jaw-supporting yoke to form a wire-cutter.

A further object of the invention is to provide a simple and inexpensive wrench which can be used for a variety of purposes and in which the reversible head may be quickly removed from the handle and replaced again in order to present the proper face in connection with the movable jaw for the required work to be performed.

In the accompanying drawings, Figure 1 is a side elevation of the improved tool, the handle thereof being partly in section. Fig. 2 is a front elevation of the same. Fig. 3 is a transverse sectional view on the line 3 3 of Fig. 1. Fig. 4 is a view showing the upper portion of the handle with the reversible head and movable jaw-supporting yoke shown thereon and in section. Fig. 5 is a rear view of Fig. 4, the yoke being in section to better illustrate the beveled portion upon the lower edge of one of its sides which acts in connection with the knife to form the wire-cutter, and Fig. 6 illustrates a removable pipe-gripping face which may be used in connection with the reversible head.

Referring to the accompanying drawings, the numeral 1 indicates the handle of the improved tool, which is constructed of suitable metal and from the upper end of which pro-

jects a lug or tenon 2, which is provided with a hole 3. Upon this lug is secured a reversible head 4, consisting of a square metal block of slightly-greater width and thickness than the handle. The block is provided with two rectangular apertures, one of which extends centrally of the block from top to bottom, while the other extends centrally of the block from right to left, the two apertures intersecting at the center of the block. These apertures form four recesses or openings 5, 6, 7, and 8, or one in each face of the block, and the lug or tenon 2 upon the top of the handle may be fitted into any one of the openings 5, 6, and 7, while the remaining opening 8 has mounted therein a pipe-cutting disk 9 by means of a pin 10, which passes through the sides of the opening and centrally through the disk. Instead of the two rectangular openings which extend through the block from top to bottom and from side to side each face of the block could be formed with a mortise, which would accomplish the same purpose. The face 11 of the head 4 is formed with teeth 12, which act in connection with the movable jaw to provide a pipe-wrench, and when the head is reversed to bring the diametrically opposite face 13 uppermost the tool is arranged as a nut-wrench. The head is formed with holes 5<sup>A</sup>, 6<sup>A</sup>, and 7<sup>A</sup>, which intersect the openings or mortises 5, 6, and 7, and when the lug 2 is placed in any one of these openings the head is held upon the lug by a split pin 14, which passes through the hole in the head and the hole 3 in the lug. When the opening 6 is placed over the lug, the face of the head having the pipe-cutting disk 9 will be uppermost, and the tool may then be employed as a pipe-cutter. Thus by reversing the head the tool may form a pipe-wrench, a nut-wrench, or a pipe-cutter, as may be desired.

The movable jaw 15 is of a form in common use and comprises a threaded shank 16 and the jaw 17, which projects over the reversible head. This jaw is operated by the usual nut 18, which is centered in an opening 19 of a yoke 20, which is pivoted to the handle by a pin 21. This yoke comprises the side plates 22, which embrace the handle and through which the pin 21 passes, and a rearward projection 23, having the horizontal opening 19, in which the nut 18 rests, and a vertical opening 24, which intersects the opening 19. The threaded shank 16 passes through this open-



ing 24 and through a threaded opening in the nut, this arrangement being well known and in general use. The yoke 20 has a slight pivotal movement upon its pin 21, which where the tool is used as a pipe-wrench permits the jaws to slip upon the pipe in taking a fresh grip and also effects a clamping of the pipe when pressure upon the handle is exerted in the opposite direction. The pivotal movement of the yoke is also necessary when the tool is employed as a wire-cutter, as will now be explained. One of the sides 22 of the yoke is beveled to a knife-edge 25 at a point adjacent to the rear side of the handle, and the rear edge of the handle at this point is formed with a notch or recess 26, the bottom of which is a short distance below the lower edge of the yoke. Just below the knife-edge 25 of the yoke and to one side of the notch 26 a knife 27 is secured to the side of the handle, preferably by a screw 28. The cutting edge of this knife has a slight upward incline from the edge of the handle, and the knife is embedded in the handle so as to lie flush with its surface. In manipulating the tool as a wire-cutter the wire is passed into the recess 26 between the knife-edges, the handle is grasped with one hand and the jaw 15 with the other hand, and the yoke is rocked upon its pivot, which causes the knife-edges to impinge upon the wire in a similar manner to the blades of a pair of shears, and thus to sever the wire.

The front and rear edges of the lower half of the handle are recessed, as shown at 29 and 30, and in the lower end of the recess 29 is pivoted a screw-driver 31, while in the lower end of the recess 30 is pivoted a saw 32. The screw-driver and saw are each pivoted at one end by pins 33 and 34, respectively, and normally lie within the recesses; but when in use they are swung out so as to extend beyond the lower end of the handle and are clamped in this position by thumb-screws 35 and 36. In order to confine the screw-driver and saw within their respective recesses when they are not in use, I employ a spring-metal band 37, which has a sliding movement upon the handle and normally stands in the position shown in Figs. 1 and 2, in which position it will prevent one or both implements from swinging out of their recesses, further downward movement of the band being prevented by a stop pin or screw 38. When either the saw or screw-driver is required, it is only necessary to slide the band up, swing the required implement to its operative position, and clamp it in this position with the thumb-screw. Then slide the band down again until it contacts with the stop-screw 38, when the other implement will be held in its recess.

In Fig. 6 I illustrate a removable pipe-gripping face 39, having an apertured lug 40, adapted to fit into the opening 5 of the reversible head, and when this face is em-

ployed the teeth on the face of the head are dispensed with.

The improved combination tool or implement herein set forth is simple and practical and can be cheaply manufactured, and the combination of tools employed enables the implement to be used in a variety of ways.

Having described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a combination-wrench, a handle, having a reversible head; a jaw vertically removable with respect to said head, and a yoke pivoted to said handle for supporting said jaw.

2. In a combination-wrench, a handle having a tenon at one end; a rectangular, reversible head, having recesses in its four faces, which fit upon said tenon; an adjustable jaw having a movement toward and away from said head, and a support for said jaw, which is pivoted to said handle.

3. In a combination-wrench, a handle having an apertured tenon at one end; a rectangular reversible head having recesses in its faces which fit upon said tenon; said head being provided with apertures which intersect its recesses, and are in line with the recess in said tenon; a split pin which passes through the apertures in said head, and said tenon, to hold said head upon the handle in any one of its positions; a jaw, adjustable toward and away from the top face of said head, and a yoke pivoted upon said handle for supporting said jaw.

4. In a combination-wrench, a handle having an apertured tenon at one end; a reversible rectangular head having a recess in each of its four faces which fit upon said tenon, one of said faces being provided with teeth, while a cutting-disk is pivoted in the recess of one of the adjoining faces; a jaw which is adjustable toward and away from the top of said head, and a yoke pivoted to the handle, which supports said jaw.

5. In a combination-wrench, a handle; a yoke pivoted upon said handle, having a horizontal and a vertical aperture which intersect; a nut having a threaded bore, which is centered in said horizontal aperture, and a jaw having a threaded shank, which extends through said nut, and said vertical aperture; a tenon on the top of said handle; a reversible, rectangular head, having a recess in each of its four faces, which fit upon said tenon, and means for holding said head upon the handle.

6. In a combination-wrench, a handle having a yoke pivoted thereto, adjacent to its upper end; an adjustable jaw supported in said yoke; a tenon upon the upper end of said handle; a reversible, rectangular head having a recess in each of its four faces, which fit upon said tenon; said head being arranged to form in connection with the adjustable jaw, a nut-



wrench, a pipe-wrench, and a pipe-cutter, according to its position upon the handle, and means for securing said head upon the handle.

5 7. In a combination-wrench, the combination with a handle; a yoke pivoted thereto, and an adjustable jaw supported in said yoke, of a reversible rectangular head, upon the end of said handle, having a cutting-disk pivoted in a recess in one of its faces, so as to extend slightly beyond said face, and having one of its adjoining faces provided with teeth, and means for securing said head upon the handle.

15 8. In a combination-wrench, the combination with a handle having a yoke pivoted thereto, and an adjustable jaw in said yoke of a reversible rectangular head upon the end of said handle, having a cutting-disk in one of its faces, the adjoining face being toothed, while the other two faces are smooth, and means for securing said head upon the end of the handle.

25 9. The combination with a handle having a tenon on one end, of a reversible, rectangular, head, having a recess in each of its faces, one of said recesses having a cutting-disk centrally mounted therein, and one of said faces

being toothed, said tenon being adapted to fit into any one of the said recesses; a split pin which passes through said head and tenon, and a jaw adjustable with respect to said head. 30

10. In combination with a handle, having an adjustable jaw, of a reversible rectangular head on said handle, having a toothed face and a cutting-disk mounted in a recess of another of its faces. 35

11. In combination with a handle having a tenon on one end, and an adjustable jaw pivoted to said handle, of a rectangular, reversible head, having a pair of rectangular apertures extending through it at right angles to each other; teeth upon one face of said head; and a cutting-disk revolvably mounted in the end of one of said apertures; said tenon being adapted to fit into the ends of said apertures. 40 45

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

JOHN J. A. MILLER.

Witnesses:

G. SARGENT ELLIOTT,  
BESSIE THOMPSON.