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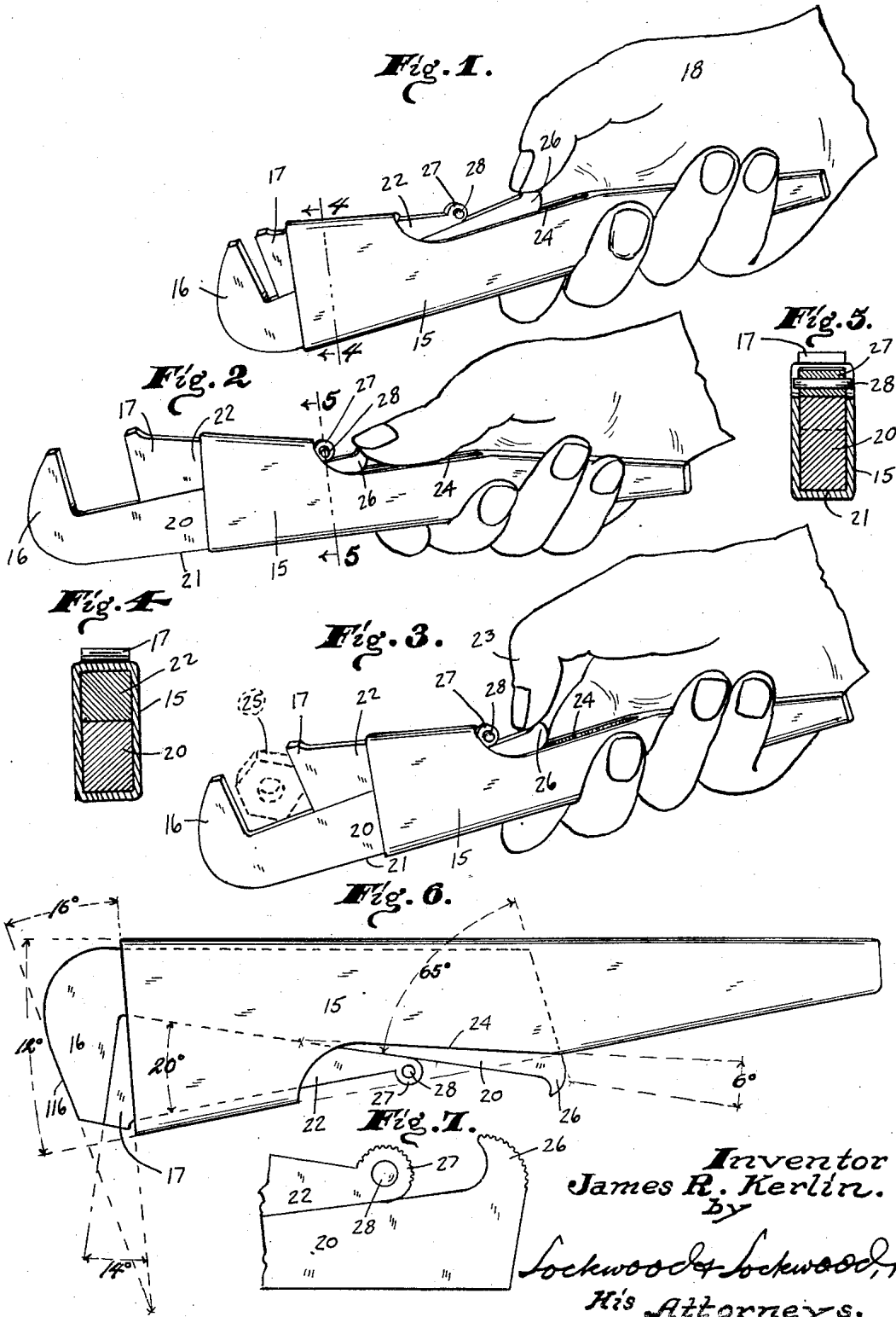
J. R. KERLIN

1,903,052

WRENCH

Filed Sept. 11, 1930

2 Sheets-Sheet 1



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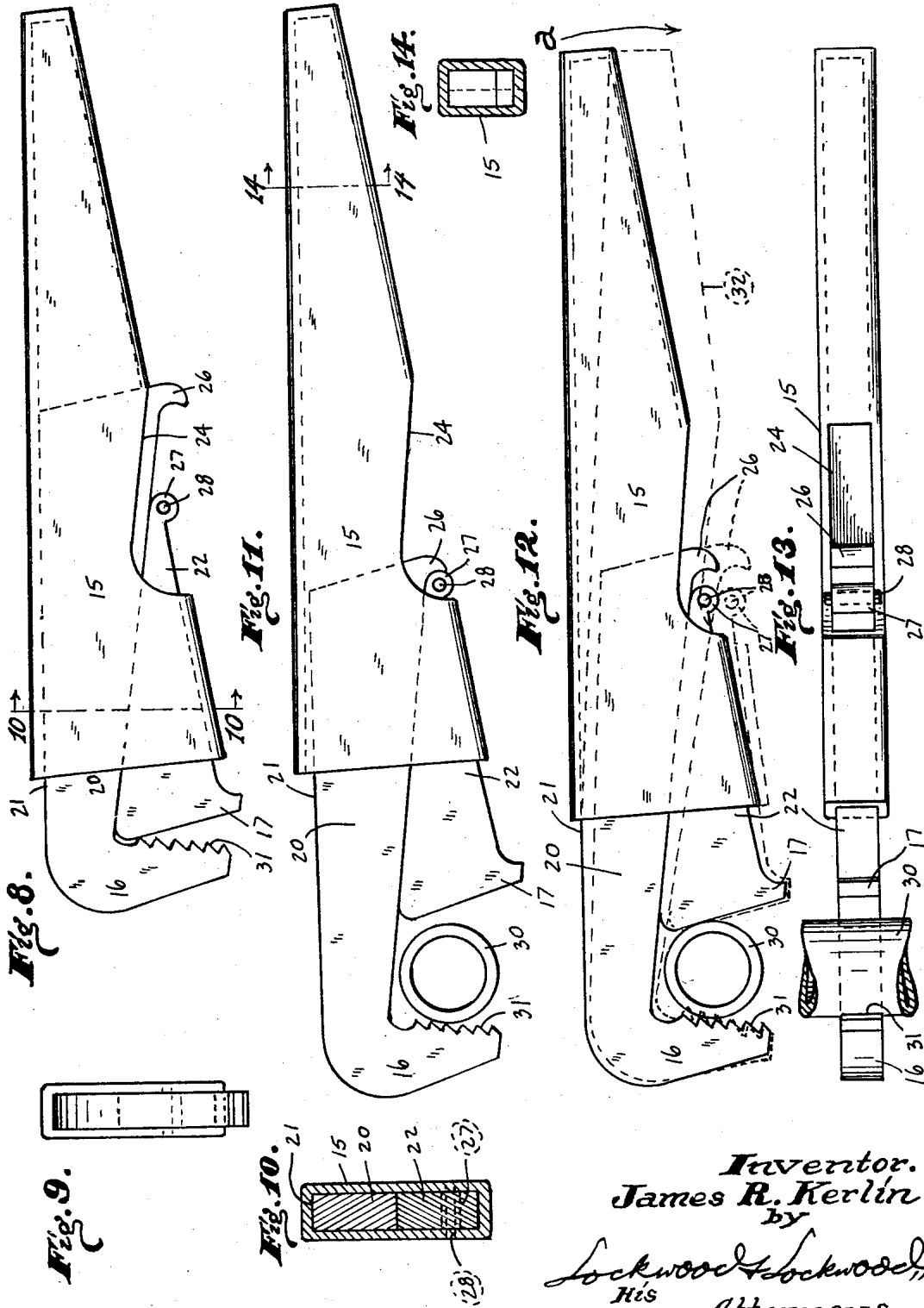
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UNITED STATES PATENT OFFICE

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WRENCH

Application filed September 11, 1930. Serial No. 481,191.

This new wrench is a one-hand wrench improvement over the wrench shown and described in my Patent Number 1,816,015, dated July 28, 1931.

5 The chief improvement and virtue in this wrench over my former wrench is that, while the former wrench might at some inconvenience be manipulated with one hand, this new type of wrench is such in its construction that
 10 it is easy and convenient for the workman to operate it at all times with one hand if so desired. This enables the workman to carry on his work with much more convenience and speed, even while holding himself
 15 with one hand, when necessary, and operating the wrench with the other hand. Workmen are required at times to work in many close and inconvenient quarters where they
 20 must hold themselves with one hand and operate the wrench with the other hand, and an object of this invention is to provide a wrench that is especially adapted for their use on such occasions.

25 This and other improvements in this new wrench will appear more fully from the accompanying drawings and the following description and claims:

In the drawings Fig. 1 is a side view of the wrench in a hand with the thumb engaged with the shanks of the main jaw ready to move it toward an open position. Fig. 2 is a similar view during a further step in the operation of opening the jaws. Fig. 3 is a similar view, with the wrench jaws arranged over a nut. Fig. 4 is a cross section on line 4—4 of Fig. 1. Fig. 5 is a cross section on line 5—5 of Fig. 2. Fig. 6 is a side view of the wrench in unoperated position and showing diagrammatically the lines on which the wrench is constructed. Fig. 7 is an enlarged view of the inner ends of the shanks of the two jaws showing knurled projections, the outer portions of the shanks being broken away. Fig. 8 is a side view of the wrench adapted to engage round pipes, rods and the like. Fig. 9 is a view of the left hand end of the wrench, shown in Fig. 8. Fig. 10 is a cross section on line 10—10 of Fig. 8. Fig. 11 is a view similar to Fig. 8, with the jaws of the wrench extended and arranged over a

pipe. Fig. 12 is the same as Fig. 11, with the handle of the wrench moved forward so both jaws will tightly grip the pipe, the changed position of the wrench to engage the pipe being shown by dotted lines, and also
 55 dotted lines indicate the gripping engagement of the jaws with the pipe when the handle is moved in the direction of the arrow. Fig. 13 is a plan view of the wrench, with the parts shown in their positions in Fig. 12.
 60 Fig. 14 is section on line 14—14 of Fig. 11, showing the handle formed of sheet steel that is bent into proper form.

There is shown in Figs. 1 to 7 herein illustrations of the nut wrench type of said one-hand wrench. It consists of four members
 65 only: a relatively long hollow tapering handle member 15 formed of sheet steel, a main outer jaw member 16, and a companion inner jaw member 17 and cross pin 28 all preferably
 70 formed of steel. The shanks of the jaw members are mounted and operated within the larger or wider portion of said handle with portions of their inner ends protruding
 75 through a slotted recess in the handle so they can be engaged by the hand 18. In other words the handle is hollow and tapered inwardly on its narrow sides from its open to its closed
 80 end, and has a slotted recess in one of its narrow sides through which finger pieces of the shanks protrude so they can be reached for manipulation by an operator's thumb. The main or outer jaw has a relatively long integral shank 20 extending far into said handle
 85 15 and slidable therein and increasing gradually in width from the jaw to its inner end. The back side 21 of the shank 20 of the jaw 16 is straight and lies snugly and slidably on the inner surface of the closed narrow side wall of the handle 15, and is always parallel therewith. The other side of the shank 20 of the jaw 16 is also straight but is angular to the back side 21, thereby causing gradually increased width of said shank inwardly.

The inner jaw member of the wrench has a shorter shank 22 than the outer jaw member, as shown, and on its narrow sides are tapered inwardly. One of its narrow sides is straight and rests and slides on the shank 20 of the jaw member 16. The other narrow side of the

inner jaw member 17 is likewise straight and parallel with the recessed slotted side of the hollow handle 15. Therefore, said shanks 20 and 21 fill the handle as far as they extend into it and are snugly embraced by said handle 15, yet they fit loosely enough to enable them to slide therein longitudinally.

The inner ends of said jaw shanks 20 and 22 are accessible to the thumb 23 of the operator's hand, as shown in Fig. 3. This is accomplished by forming a longitudinal slot 24 or cut-away portion in one of the narrow sides of the handle between its ends. This is a relatively reduced slot and it is only recessed sufficiently deep and long to enable the ends of shanks 20 and 22 to be engaged and moved longitudinally by the thumb. Said slot 24 is recessed so as not to weaken materially the handle 15 which must resist considerable power, and with jaws 16 and 17 and their shanks constitute a unitary lever adapted to apply great power when in use tightening nuts 25 and pipes, and releasing them. Since the shanks of the jaw members 16 and 17 are reversely tapered and fit together, one upon the other, and fill the handle as far as they extend therein and engage both the inner walls of the narrow sides thereof in the different positions of the shanks, the relative great leverage is obvious.

The inner end of the shank 20 of the main or outer jaw member 16 has on its inner end an upturned hooked thumb-piece 26, with a knurled curved surface, whereby the thumb can move said shank 20 in either direction. A lug 27 is located on the inner end of the shank 22 of the jaw member 17, which is semicylindrical and has a laterally extending stop pin 28 through it adapted to engage the walls of the handle 15 and thus limit the outward movement of both of said jaw members 16 and 17 and prevent their escape from the handle after they are assembled.

The method of operating said one-hand wrench above described is illustrated in Figs. 1, 2 and 3. The wrench is held in the right hand by the handle 15 as seen in Fig. 1, with the thumb placed on the lug 26 of shank 20 of the outer jaw 16. The wrench then is in its unoperated position.

The jaw members are pushed forward, as shown in Fig. 2, so as to open the jaws and permit the wrench to be placed over the nut or material. This movement is effected by the thumb engaging the rear surface of the lug 26, as shown in said figure, and then to set the jaws firmly on the nut the handle is shoved forward until the inner jaw 17 contacts with the nut, as seen in Fig. 3. Then, by using the thumb on the hooked side of the lug 26, as shown in Fig. 3, the outer jaw 16 is pulled backward until it engages the nut. The handle is then pressed downward and the wrench grasps the nut and it can be turned and tightened, or by lifting up on the

handle the nut can be released and turned for removing it. By a slight reversal of the movement of the wrench it is disengaged from the nut or material and falls away therefrom.

The preferable form of the parts of said wrench and their relation to each other is indicated by diagram in Fig. 6. As shown, the inner face of the outer jaw 16 is substantially perpendicular to one side of the shank 20 thereof and at an angle of about 14° from the outer end of the handle 15. Both of said surfaces are straight, as shown. The outer face of the inner jaw 17 is substantially parallel with the opposite face of the jaw 16, as seen in Figs. 3 and 6. The outer edge 116 of the tapering portion of the jaw 16, as seen in Fig. 6, is substantially on the line that is at an angle of about 16° from the outer end of the handle 15. This gives the preferable strength and taper to said jaw.

Both the wide and narrow sides of the handle 15 are straight and the narrow sides are at an inclination or angle to each other of about 12° , as shown in Fig. 6. The combined transverse area of the shanks of the two jaws are substantially equal to the internal width of the handle, as seen in Fig. 6. The opposite narrow sides of the shank 22 of the inner jaw 17 are at an angle to each other of about 20° , as shown in Fig. 6. The inner end of the shank 20 of the jaw 16 is straight and at an angle to the inclined narrow side of said shank of about 65° , as seen in Fig. 6, and the straight portion of the walls of the recessed slot 24 is at an angle of about 6° with said inclined narrow side of the shank 20.

The invention is not limited to the foregoing shapes and angular relationship of the parts of said wrench, but they are preferable as providing for the desired strength of the parts and their easy cooperation and manipulation.

A modified form of the inner ends of the shanks of the two jaws is shown in Fig. 7, wherein the hooked lug 26 has its rear surface knurled, and the lug 27 on the end of the shank 22 is also knurled. This enables the thumb to more readily push said shanks.

Said invention in the form of a pipe or round rod wrench is illustrated in Figs. 8 to 13, wherein the wrench is shown in inverted position in comparison to its showing in Figs. 1 to 3, for adapting it to use as a wrench for a pipe 30, and the like.

In the pipe wrench the inner face of the outer jaw is serrated for biting the pipe and the outer face of the inner lug 17 is at more of an angle therefrom in this form than in the preceding form, so as to enable the wrench to be placed over the pipe or rod quickly, and to facilitate its subsequent gripping of the pipe or rod. The teeth 31 are inclined inwardly so that when engaged with the pipe 30 they are tangential to its periphery so that

instead of cutting directly into the pipe to possibly crush it they enter tangentially so as to turn the pipe on its axis without marring its cylindrical passage.

5 The method of operating the pipe wrench is substantially the same as the method of operating the nut wrench, excepting it is inverted and after the two jaws are placed on the pipe, the handle is pressed downward or
10 forward, as shown by the arrow α in Fig. 12, substantially to the dotted line position 32, which locks the wrench to the pipe or rod. This locked effect is due chiefly to the angular relationships of the jaws and other parts of the wrench above described, as shown in Fig.
15 6. This enables the wrench to be effectively applied to the pipe or rod and operated wholly by one hand.

I claim for my invention:

20 1. A wrench comprising a hollow handle tapered on its narrow sides from its open to its closed end, and with a longitudinal recessed slot in one of the narrow sides thereof between its ends, an outer jaw with its shank
25 increasing in width from the jaw and slidable in said handle, an inner jaw with a tapering shank slidable in said handle and engaging the edge of the shank of the outer jaw, so that the portions of the jaw shanks not extending
30 out beyond the large end of the handle will be enveloped by the handle for their full length, a hooked lug integral with the inner end of the outer jaw shank adapted to be limited in movement by the inner end wall of
35 said slot and whereby the outer jaw may be moved by the thumb in either direction, a lug integral with the end of the inner jaw shank, and a pin extending transversely through said lug adapted to contact with the
40 outer end wall of said slot to limit the movement of said shank out of said handle.

2. A wrench comprising a hollow tapering handle with its narrow sides straight and sloping at an angle of about 12° from its open
45 to its closed end thereof and having a recessed slot in one of its narrow sides, an inner jaw with a shank extending into and engaging the narrow slotted side of said handle and with the other side of the shank straight and inclined about 20° relative to the side contact-
50 ing with the narrow slotted side of the handle, an outer jaw with the shank increasing in width from the jaw and fitting in said handle with one side parallel with and engaging the
55 inner wall of the unslotted narrow side of the handle and the other side of the shank parallel with and engaging the inclined side of the shank of the inner jaw, and a knurled lug integral with and extended from the inner
60 end of each shank adapted to be engaged and operated by the thumb of the hand holding the wrench.

3. A wrench comprising a hollow handle rectangular in cross section with the wider
65 sides parallel with one another and with the

narrow sides extending angularly inwardly from its open to its closed end and having a recessed slot in one of the narrow sides between the ends, an outer jaw, a shank thereto
70 extending slidably in the handle and having a straight side engaged with an inner wall of the unslotted side of said handle and increasing in width from the jaw inward and having a straight inner end extending at an
75 angle of about 65° from the side engaged with the unslotted narrow side of said handle, and an inner jaw with a tapering wedge-shaped shank between the slotted narrow wall of said handle and the outer jaw shank, and a semi-cylindrical knurled lug integral with
80 and extended from the inner end of said wedge-shaped shank, a cross pin through said lug, and a hooked extension integral with and extended from the inner end of the shank of
85 said outer jaw having an inner surface formed to engage and fit snugly over the periphery of said semi-cylindrical extension and also having a knurled outer surface adapted to be engaged by the thumb of a hand holding the
90 wrench, whereby the shanks can be moved in either direction by the thumb.

In witness whereof, I have hereunto affixed my signature.

JAMES R. KERLIN.

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