

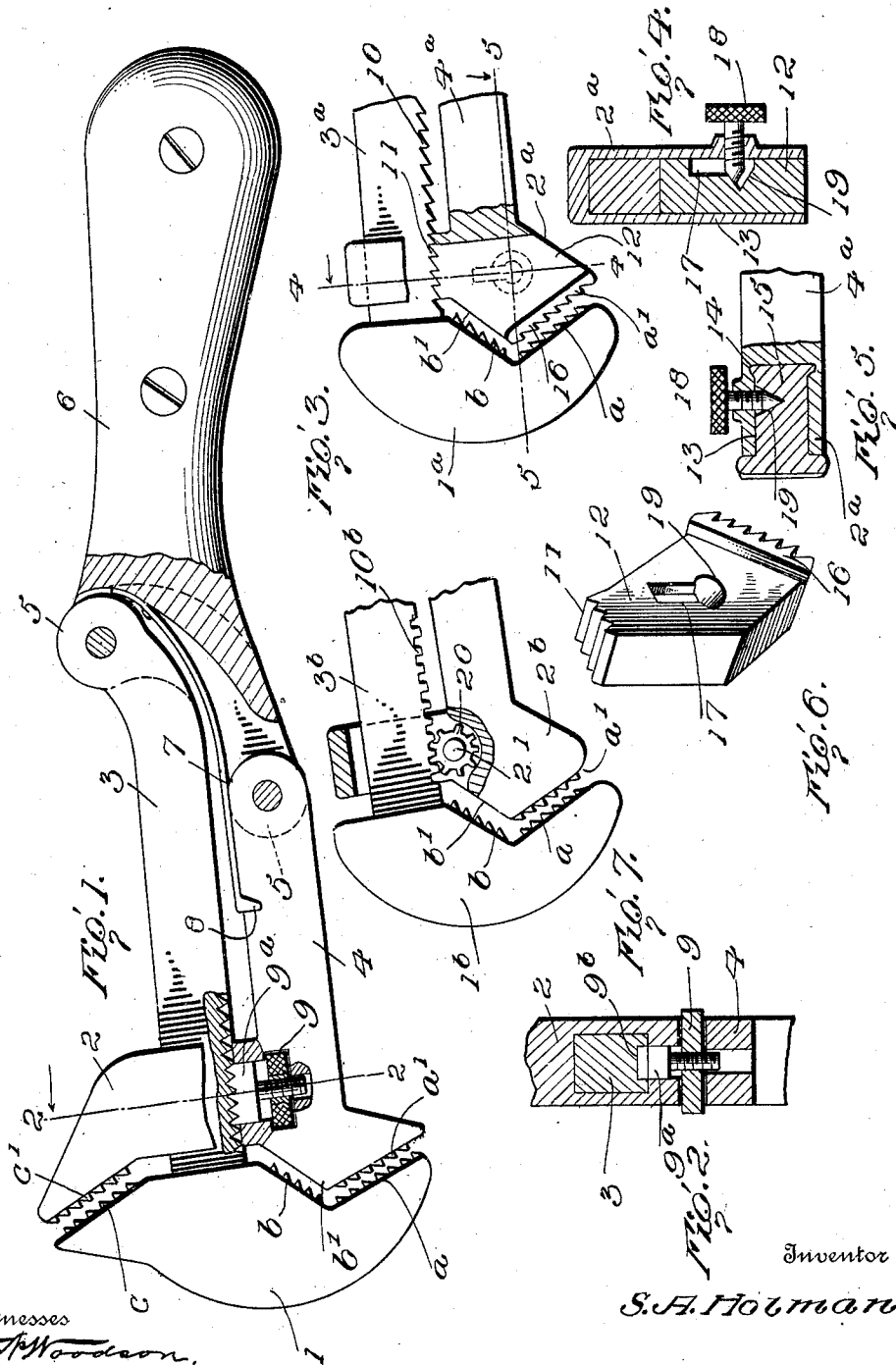
S. A. HOLMAN.

WRENCH.

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976,740.

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Witnesses
H. H. Woodson,
Joanna M. Gallin,

Inventor
S. A. Holman
By
H. H. Woodson, Attorney

UNITED STATES PATENT OFFICE.

STEPHEN A. HOLMAN, OF SANTA MARIA, CALIFORNIA.

WRENCH.

976,740.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, STEPHEN A. HOLMAN, a citizen of the United States, residing at Santa Maria, in the county of Santa Barbara and State of California, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

The primary object of this invention is a simple and durable construction of wrench which may be used with equal facility and effectiveness as a nut wrench or a pipe wrench.

The invention also has for an object an improved wrench which may be operated easily as a ratchet wrench or the jaws secured firmly and rigidly against the work. And the invention also has for its object to generally improve this class of devices and produce a tool of this character, the parts of which may be cheaply manufactured and readily assembled.

With these and other objects in view as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side elevation, partly in section, of one embodiment of the invention; Fig. 2 is a transverse sectional view on the line 2—2 of Fig. 1; Fig. 3 is a side elevation, partly broken away, of a portion of a wrench embodying a modification of the invention; Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 5; Fig. 5 is a section taken on the line 5—5 of Fig. 3; Fig. 6 is a detail perspective view of a jaw locking device which is embodied in that form of the invention illustrated in Figs. 3, 4 and 5; and, Fig. 7 is a part side elevation and part sectional view, of a portion of a wrench embodying another modification.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

In that embodiment of my invention illustrated in Fig. 1, the numerals 1 and 2 designate, respectively, the outer and inner jaws of my improved wrench, the jaw 1 being formed preferably integral with its shank

3 which works through an opening formed in the inner jaw 2. At one side of the shank 3 the jaws 1 and 2 are formed with corresponding angular faces $a-a'$ and $b-b'$, which may be either toothed or plane, as desired, and on the opposite side of said shank with corresponding plane or toothed working faces $c-c'$, preferably disposed in inclined relation to the shank. The jaw 2 is secured to or formed on the outer end of an arm 4, and the shank 3 and this arm 4 are pivotally connected at corresponding ends between the pairs of ears 5 which are obliquely disposed in relation to each other on one end of the handle 6. A spring 7, which may be of any desired character, either coil or flat, is arranged to bear upon the parts with a tendency to rock the arm 4 away from the shank 3. In the present instance I employ for this purpose a flat or plate spring interposed between the shank 3 and arm 4, as this type of spring enables the arm to approach the shank 3 to the maximum extent and thereby economizes space and adapts the wrench to uses where it otherwise could not be put. One end of this spring 7 is secured as by screws or rivets to one end of the handle 6 between the pairs of ears 5, and the said spring curves, as shown, and extends forwardly between the opposing edges of the shank 3 and arm 4 and is formed at its free forward end with side edge lugs 8 which embrace the arm 4, as clearly illustrated in the drawings.

From so much of the description as has preceded, taken in connection with Fig. 1 of the drawing, it will be understood that in the operation of this embodiment of my invention as a ratchet wrench, the handle 6 is grasped and tilted with relation to the jaws so as to open the same the desired extent to embrace the work, and tilted in the opposite direction to cause the jaws to come together into engagement with the work, a back and forth motion of the handle manifestly producing a ratchet effect upon the nut or the like to screw the same on or off the bolt, for instance. The inclined or angular work engaging faces $a-a'$ and $b-b'$ of the jaws 1 and 2 are to be particularly noted, for by this formation of the parts it will be understood that the two jaws may be operated with equal facility and effectiveness on either nut or pipe work, the faces a and a' being used to engage the nut and the faces a and a' in connection with the faces $b-b'$

being used to engage a pipe, rod or the like. The faces *c* and *c'* may, of course, be used with nut work also.

In order that the wrench may be used as a rigidly formed wrench and not as a ratchet wrench, I provide means whereby the jaw 2 may be rigidly connected to the shank 3. This means may consist of a milled nut 9, as best illustrated in Fig. 1, said nut being carried by the jaw 2 and projecting out from both side faces of the arm 4 thereof, the turning of said nut in one direction or the other on the stem of a toothed block 9^a causing said block to engage with or disengage from the grooved and toothed edge 9^b of the shank 3, the engagement of the toothed block with the said shank binding the parts together.

It is to be understood that my invention is not limited to the use of three sets of work engaging faces; that it is not limited to the use of toothed work engaging faces; and that it is not limited to the use of the nut 9 and block 9^a, the invention being susceptible of various modifications and variations in the construction and arrangement of the parts without departing from the scope of the invention as defined in the appended claims. For instance, as illustrated in Fig. 3, where one modification of the invention is illustrated, 1^a designates the outer jaw, 2^a the inner jaw through which the shank 3^a of the outer jaw extends, and 4^a the arm on which the inner jaw 2^a is formed. In this form of the invention, the jaws are provided with opposing work engaging faces which embody angular portions extending substantially parallel to each other, as indicated at *a-a'* and *b-b'*, the same being either toothed or plane. In this form of the device, the shank 3^a is toothed or serrated on one edge, as indicated at 10, and is designed for engagement by teeth 11 which are formed on one end of a web 12 constituting part of a block which forms the work engaging member of the jaw 2^a. This web 12 is adapted to fit within a slot or recess 13 formed in the jaw 2^a, the said recess being then enlarged at its inner end, as indicated at 14, and the web being correspondingly enlarged, as indicated at 15, whereby to retain the parts after they have been assembled, while at the same time permitting a movement of the web so that its teeth 11 will move into or out of engagement with the teeth 10 of the shank 3^a. 16 designates the laterally extending outer portion of the block of which the web 12 forms a part, said portion 16 being toothed and constituting the part which directly engages with the work designed to be engaged by the jaw 2^a. The web 12 is formed in one side with a longitudinally extending groove 17 terminating at one end in a cavity 19, a set screw 18 working through the corresponding side of

the jaw 2^a into the groove 17, and, if screwed up far enough, entering the cavity 19.

In the practical use of this form of the invention which has just been described, it is obvious that the back and forth movement of the handle will effect a ratchet action upon the jaws so as to first tightly engage the work, (nut or pipe, or the like) and then disengage the same to obtain a fresh hold. If desired, however, the jaws may be rigidly held together by merely moving the block before described until the teeth 11 engage with the teeth 10 and subsequently tighten the set screw 18 with its end received in the cavity 19, the block being thereby prevented from movement relative to the jaw 2^a and tightly holding said jaw in rigid connection with the shank 3^a.

For another embodiment of the invention, reference is to be had to Fig. 7, wherein 1^b designates the outer jaw, 2^b the inner jaw, and 3^b the shank of the outer jaw, working in the inner jaw 2^b. *a-a'* and *b-b'* are the angularly disposed nut or pipe engaging faces of the two jaws. In this form of the invention the teeth 10^b of the shank 3^b are not of ratchet formation, but similar to rack teeth, and the inner jaw 2^b carries a spur pinion 20 mounted on a stud 21 and designed to engage the teeth 10^b.

While it is not essential to have a set screw in this pinion 20, the same may be provided with a set screw if desired.

From the foregoing description in connection with the accompanying drawing, it will be seen that I have provided a very simple, durable and efficient construction of wrench in which the angular arrangement of the working faces of the jaws renders the tool sufficient as a nut wrench and a pipe wrench, as has been before stated and as is evident from the drawing and description, the wrench may be operated as a ratchet wrench or the two jaws may be rigidly connected together in engagement with the work. The angular arrangement of the jaw faces causes a direct and forceful binding of the arm and shank carrying the jaws when strain is placed upon them, which makes the wrench practically rigid under strain, while at the same time permitting the jaws to loose their hold upon the work for the ratchet action.

Having thus described the invention, what is claimed as new is:

1. A wrench of the character described, comprising an outer jaw, an inner jaw, a shank secured to the outer jaw and movable through the inner jaw, an arm to which the inner jaw is connected, a handle pivotally connected to the shank and arm, and a plate spring connected to said handle and interposed between the shank and arm and exerting a tension upon the same to spread them apart.

2. A wrench of the character described, comprising an outer jaw, an inner jaw, a shank to which the outer jaw is connected, said shank being movable through the inner jaw, an arm to which the inner jaw is connected, a handle having a pivotal connection with both arm and shank, and a plate spring connected to one end of the handle and extending forwardly between the shank and arm, the forward free end of said spring being formed with side lugs embracing the said arm.

3. A wrench of the character described, comprising an outer jaw, a shank to which said jaw is connected, an inner jaw through which the shank extends, an arm to which the inner jaw is connected, a handle having pivotal connection with both arm and shank,

and means carried by the inner jaw arranged to be rigidly engaged with the shank. 20

4. A wrench of the character described, comprising an outer jaw, a shank to which said jaw is connected, an inner jaw through which the shank extends, an arm to which the inner jaw is connected, a handle having pivotal connection with both arm and shank, a movable block carried by the inner jaw and designed to engage the shank, and means for holding said block in rigid engagement with the shank. 25 30

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

STEPHEN A. HOLMAN. [L.S.]

Witnesses:

EDWARD MORRIS,

L. M. SCHWABACHER.