

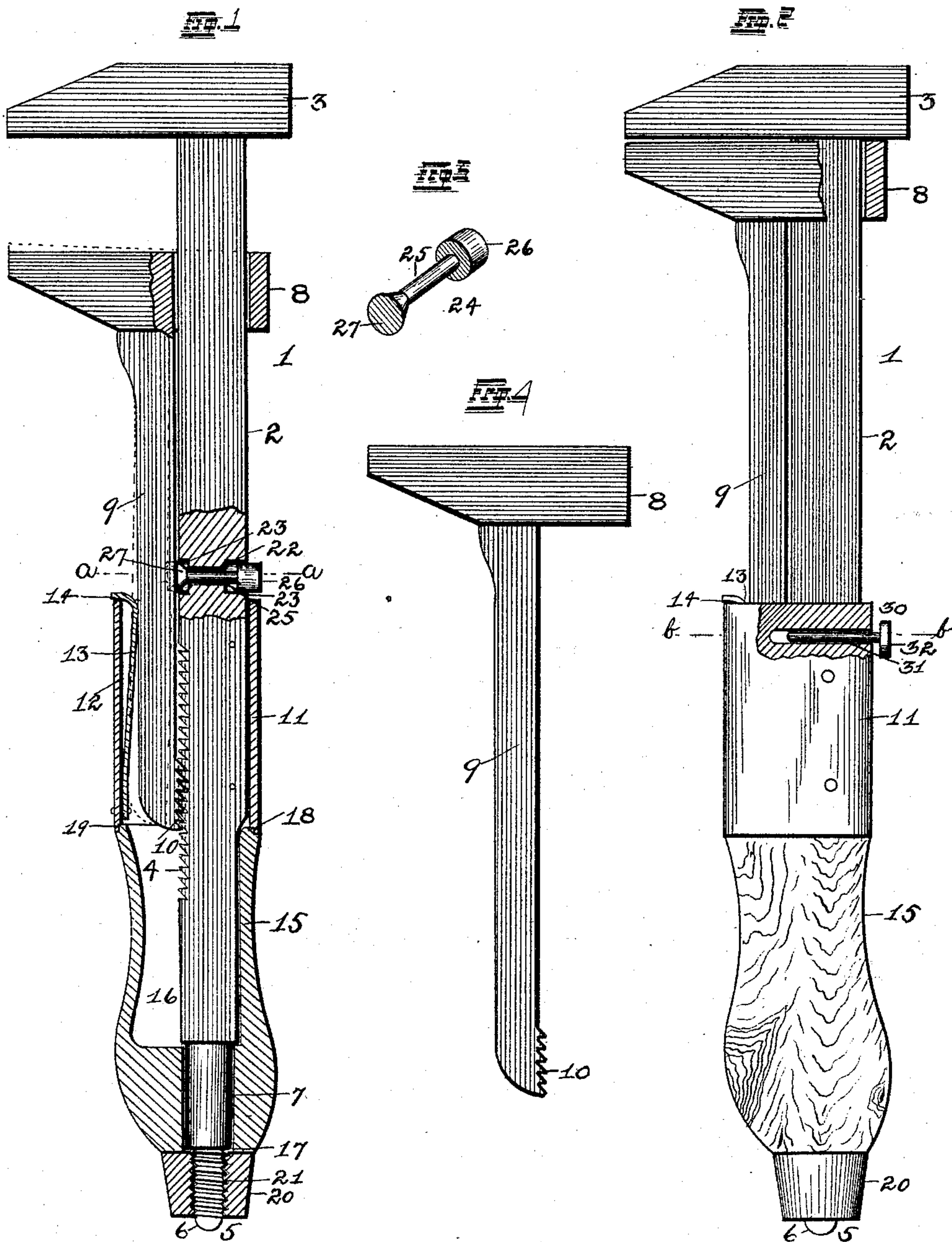
(No Model.)

2 Sheets—Sheet 1.

E. B. SMITH.  
WRENCH.

No. 497,138.

Patented May 9, 1893.



Witnesses  
Alfred A. Eicher  
Herbert L. Robinson

Inventor  
Emery B. Smith,  
By his Attorneys Higdon & Higdon & Longau.

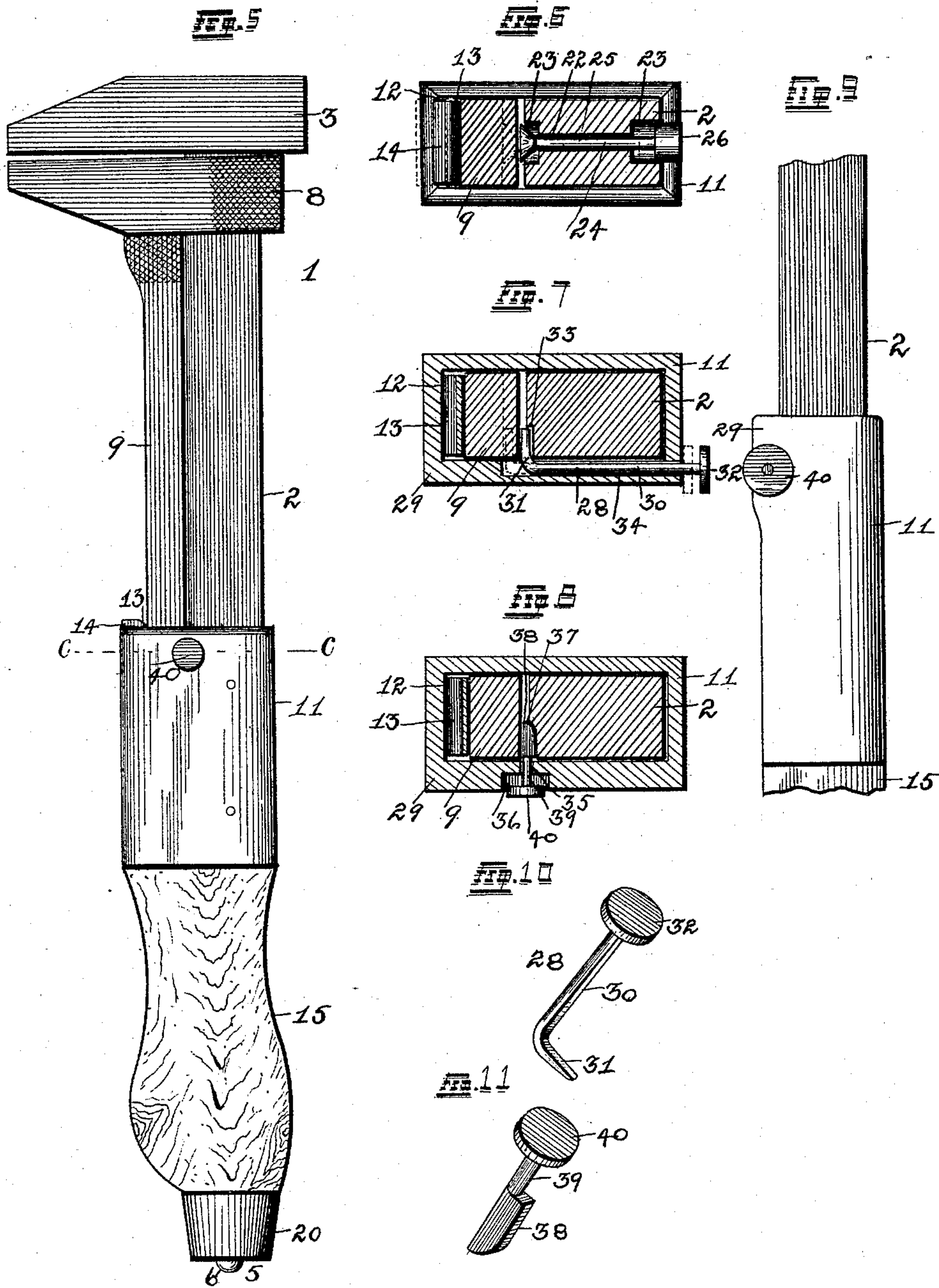
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# UNITED STATES PATENT OFFICE.

EMERY B. SMITH, OF ST. LOUIS, MISSOURI, ASSIGNOR OF THREE-FOURTHS  
TO LOUIS C. BILLON, WILLIAM E. VACH, AND JOSEPH W. PICKEL, OF  
SAME PLACE.

## WRENCH.

SPECIFICATION forming part of Letters Patent No. 497,138, dated May 9, 1893.

Application filed October 3, 1892. Serial No. 447,644. (No model.)

*To all whom it may concern:*

Be it known that I, EMERY B. SMITH, of the city of St. Louis and State of Missouri, have invented certain new and useful Improve-  
5 ments in Wrenches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in  
10 "wrenches," and consists in the novel arrangement and construction of parts as will be more fully hereinafter described and set forth in the claims.

The object of my invention is to construct  
15 a wrench having an adjustable locking-jaw adapted to be instantaneously released from its engagement with the article to be operated and at the same time including a simpleness and durability in construction, which will  
20 guarantee the certain operation of the wrench.

In the drawings: Figure 1 is a vertical sectional view of my complete invention, showing the handle and ferrule in section, and other parts in detail. Fig. 2 is a side elevation of the wrench, with a portion of the locking-jaw and ferrule broken away and showing a modified form of a means for releasing the locking-jaw, the same being different from the one shown in Fig. 1. Fig. 3 is an enlarged  
25 detail perspective view of the device used as shown in Fig. 1 to release the locking-jaw. Fig. 4 is a side elevation in detail, of the moving adjustable locking-jaw and its depending shanks. Fig. 5 is a side elevation of a  
35 complete wrench, showing milled surfaces for hand contact, and a modified construction, the operation of which releases the locking-jaw. Fig. 6 is a cross-sectional view taken on a line *a a* in Fig. 1. Fig. 7 is a cross-sectional  
40 view taken on a line *b b* in Fig. 2. Fig. 8 is a cross-sectional view taken on a line *c c* in Fig. 5. Fig. 9 is a rear elevation, of the wrench shown in Fig. 5 with parts of same broken away. Fig. 10 is a detail perspective view of  
45 the device shown in Fig. 2, the operation of which releases the locking-jaw. Fig. 11 is a perspective detail view of the device shown in Fig. 5, to release the locking-jaw.

Referring to the drawings: 1 indicates the  
50 complete wrench, having a shank 2, a fixed jaw 3 upon one end of said shank 2 and at

right angles with its front and rear faces. The fixed-jaw 3 projects a greater distance from the front face of the shank 2, than from the rear, in order to present a gripping sur-  
55 face in front of the shank and a peening hammer beyond the rear face of same.

At a point intermediate of the length of the shank 2 and nearer to the end opposite to the jaw 3, and upon the front face of said shank  
60 2, are a number of ratchet teeth 4 for purposes more fully hereinafter described.

The end 5 of the shank 2 is slightly tapered and provided upon the extreme end with an exteriorly screw-threaded portion 6 which is  
65 of much less diameter than the next immediate portion 7, which is circular in cross-section thus differing from the main portion of the shank 2, which is rectangular in cross-section.

The sliding adjustable jaw 8 is similar in form to the jaw 3, except that that portion beyond the rear face of the shank 2, is shorter than the extending portion of the jaw 3. The upper or inner surface of said locking-jaw 8 is  
75 slightly outwardly and downwardly inclined, in order that an object may be more firmly held by the wrench when in operation. As is usual in wrench construction, the jaw 8 is provided with a rectangular opening, which  
80 fits over the shank 2.

Adjacent the front face of the shank 2, depending from the jaw 8 and preferably integrally therewith, is an arm 9, which is provided near its lower end and upon its inner  
85 face with a number of projecting ratchet teeth 10, adapted to engage in the teeth 4, hereinbefore described.

A ferrule 11 substantially rectangular-shaped in cross-section is provided, to not  
90 only protect the parts, but also upon its front inner surface 12, is secured a spring 13 which is secured near the lower edge of said ferrule 11, and projects upwardly to the upper edge of said ferrule 11, and at this point has an  
95 outwardly projecting portion 14 which is adapted to project over the upper edge of said ferrule 11, to prevent the ingress of dirt, filings, &c., which would materially deteriorate the operation of the device.

A handle 15 preferably constructed of wood  
100 has a hollow chamber 16 therein, which is



substantially about two thirds of the length of said handle and which continues into a round bore 17, in which the round portion 7 of the shank 2 is adapted to fit. The handle 15 is provided upon its upper periphery with an upwardly projecting flange 18 which is less in circumference, than said periphery and which is adapted to fit into a depression 19 in the inner periphery of said ferrule 11, in order to hold said handle in a prescribed position. A nut 20 provided with a central and interiorly screw-threaded bore 21, is adapted to be screwed upon the exteriorly screw-threaded portion 6 of the shank 2, to hold said handle 15. Said nut 20 is circular in cross-section, and tapers inwardly at its extremity, in order to complete the finish of the wrench, and upon its exterior flat surface is provided with a slot by means of which said nut 21 may be adjusted by means of a screw driver or a similar device.

The function of the spring 13 will be readily understood by reference to the drawings, wherein the upper end of said spring is shown as distended from the inner face 12 of said ferrule 11, thus compelling the arm 9 to remain in contact with the teeth 4 upon the front face of the shank 2, by means of its projecting teeth 10, and the portion 14, which is practically at right angles with the length of the spring extends over the upper edge of the ferrule 11.

In Fig. 5 of the illustrations, I have shown portions of both side faces of the jaw 8 and the arm 9 adjacent said jaw 8, roughened or milled to facilitate the grasping of the jaw 8 and its arm 9 to release the position of the jaw 8 and widen the breach between the two inner surfaces of the jaws 3 and 8, which may be done by slightly inclining the arm 9 and jaw 8 outwardly, thus disengaging the teeth 10 from the teeth 4 and compressing the spring 13.

In the improvements are included various means for compressing the spring 13 and allowing the reversing of the jaw 8, other than the means just described.

In Fig. 1 at a point intermediate of the length of the shank 2, and running transversely through same, is a circular bore 22 having counter bores 23 adjacent the front and rear face of said shank 2. Into this construction is adapted to be inserted, a device 24 which under compression, releases the engagement of the teeth 4 and 10. It consists in a shank 25 with a button 26 upon one end of same, which is adapted to fit into the counter bore 23 in the front face of said shank 2. After the construction in this form has been placed in position, the end 27 is flattened out to prevent the device from slipping through the bore 22. The shank 25 between the inner faces of the portions 26 and 27, is of such a length that upon the compression or pushing in of the button 26, the arm 9 is moved a similar distance, thus releasing the engage-

ment of the teeth 4 and 10 and allowing the reversing of the jaw 8.

In Figs. 2 and 7 I have shown a modified form of construction by the use of which the same end is attained. In this construction I locate the pushing device 28 in a thickened portion 29 of the ferrule 11. The device 28 consists of a shank 30, a portion 31 at one end at right angles with the shank 30, and a button 32 upon the opposite or outer end. A longitudinal portion 33 of the front face of the shank 2 is cut away, to allow the operation of the arm 31, between the arm 9 and shank 2, without interfering with the function of the teeth 4 and 10. The shank 30 is located and operative in a horizontal bore 34 which extends from the rear side of the ferrule 11 inwardly a desired distance. By pressing in upon the button 32 the arm 31 engages the arm 9 of the jaw 8 and compresses the spring 13. Thus it will be seen that this construction and arrangement of modified parts bring about the same results as the constructions hereinbefore shown and described, namely the releasing of the jaw 8 and attendant parts.

In Figs. 5 and 8 I have shown still another modified construction, the result of its operation being similar to the others. In this form the ferrule 11 has the bulged-out portion 29 and in the side of said ferrule 11 at a point opposite to the joint of the arm 9 and shank 2, is a center bore 35 with an enlarged counter bore 36 which opens direct from the side face of said ferrule 11. The front face of the shank 2 has a longitudinal inclined cut-out portion 37 into which is adapted to fit a wedged shaped projection 38 upon one end of the shank 39 which is adapted to fit into the circular bore 35, and the opposite end of said shank 39 provided with a button 40. Thus by pushing in upon the button 40 the wedge 38 is tightened in its slot, thus forcing the arm 9 outwardly and releasing the engagement of the teeth 4 and 10.

My improved wrench is exceptionally simple in its operation and it is believed that no amount of rough usage will in any way affect its successful operation. The function of the inclined upper face of the movable jaw 8, materially aids the gripping of an object. To illustrate this development, it will be seen that it might be desired to apply the wrench to a nut which was of such a diameter that when the jaws were spread apart, the ratchet teeth 10 would strike intermediate of the teeth 4. As the nut would not allow of any forcing of the jaw 8 to the next notch, it would necessitate the returning of the jaw to the next notch backward, thus leaving the wrench loose upon the nut and if the nut were a polished one, it would necessarily be marred. By using the downwardly inclined face of the jaw 8, the operator is enabled to grasp the nut firmly at some point between the front face of the shank 2 and the outer end of the jaws 3 and 8 thus



preventing any lost movement upon the nut. The bending over of the spring 13, over the upper edge of the ferrule 11 forms an important feature, as it prevents any dirt, filings, oil, &c., from entering into the chamber between the arm 9 and inner face 12, which would materially affect the operation of the spring and attendant parts. The superior advantages gained by the several ways in which I have shown means for loosening and releasing the jaw 8 and arm 9 from engagement with the shank 2 will be obvious. Owing to the position of the teeth 4 and 10, the jaw 8 and arm 9 may be readily pushed upward toward the jaw 3 by the hand, as owing to this arrangement of the teeth, the teeth 10 readily ride over the teeth 4.

Having fully described my invention, what I claim is—

1. As an improvement in wrenches, the combination, with a hollow handle carrying a shank, the latter being provided with a fixed jaw and with ratchet teeth intermediate its length, and a reciprocating arm provided with a jaw and with opposing ratchet teeth, of a spring secured at its lower end to the interior surface of the handle opposite the front face of the reciprocating arm, and having its upper end bent outwardly and closing the opening to the hollow handle; substantially as and for the purpose set forth.

2. An improved wrench having a ferrule secured to the shank, a chamber formed by said ferrule, in front of said shank, a moving-jaw, an arm depending from said moving-jaw, said arm operative in said chamber, a spring secured near the lower end and upon the inner face of said ferrule opposite the front face of said arm, said spring adapted to normally keep said arm against the shank, and said spring having its upper extremity bent outwardly at right angles with its length, to prevent the ingress of dirt into the chamber within said ferrule, substantially as set forth.

3. An improved wrench having a ferrule secured to the shank, a moving-jaw operative upon, and a depending arm operative adjacent said shank, said depending arm adapted to reciprocate within a chamber formed by said ferrule, a hollow handle or casing adapted

to fit over the lower end of said shank, said handle secured in position against said ferrule by a screw-nut, and an interior chamber in said handle in which said depending arm is adapted to reciprocate, substantially as set forth.

4. As an improvement in wrenches, the combination, with a shank provided with a rigid jaw, a hollow handle, and with ratchet-teeth upon its front face within the handle, a reciprocating arm carrying a jaw and provided at its lower end with ratchet-teeth opposing the ratchet-teeth on the shank, and a spring secured within the handle and adapted to normally hold said arm against the shank, of a finger projecting between said arm and the shank, and means for operating said finger to separate the arm and shank; substantially as and for the purpose set forth.

5. An improved wrench having a shank 2, a movable jaw 8 adapted to reciprocate upon said shank 2, a depending arm 9 therefrom, a ferrule 11 secured to said shank 2, said ferrule 11 having its side near its upper extremity thickened, a horizontal bore 34, a pushing device 28 operative therein, said device 28 consisting of a shank 30, and end portions 21 bent at right angles therewith, a button 32 upon the opposite end of said shank 30, a longitudinal cut-out portion 33, in which said bent portion 31 of the shank 30 is adapted to operate, and the pushing in of the said button 32 adapted to compress the spring 13 and release the engagement of the teeth in the serrations, substantially as set forth.

6. An improved wrench having a shank 2, a fixed jaw 3 preferably formed therewith, a movable jaw 8, an arm 9 depending therefrom, a ferrule 11 secured to said shank 2, a spring 13 secured interior of said ferrule 11, and normally adapted to keep said arm 9 in contact with said shank 2, and portions of said arm 9 and movable jaw 8 roughened or milled to facilitate hand contact, substantially as set forth.

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

EMERY B. SMITH.

Witnesses:

HERBERT S. ROBINSON,  
ED LONGAN.