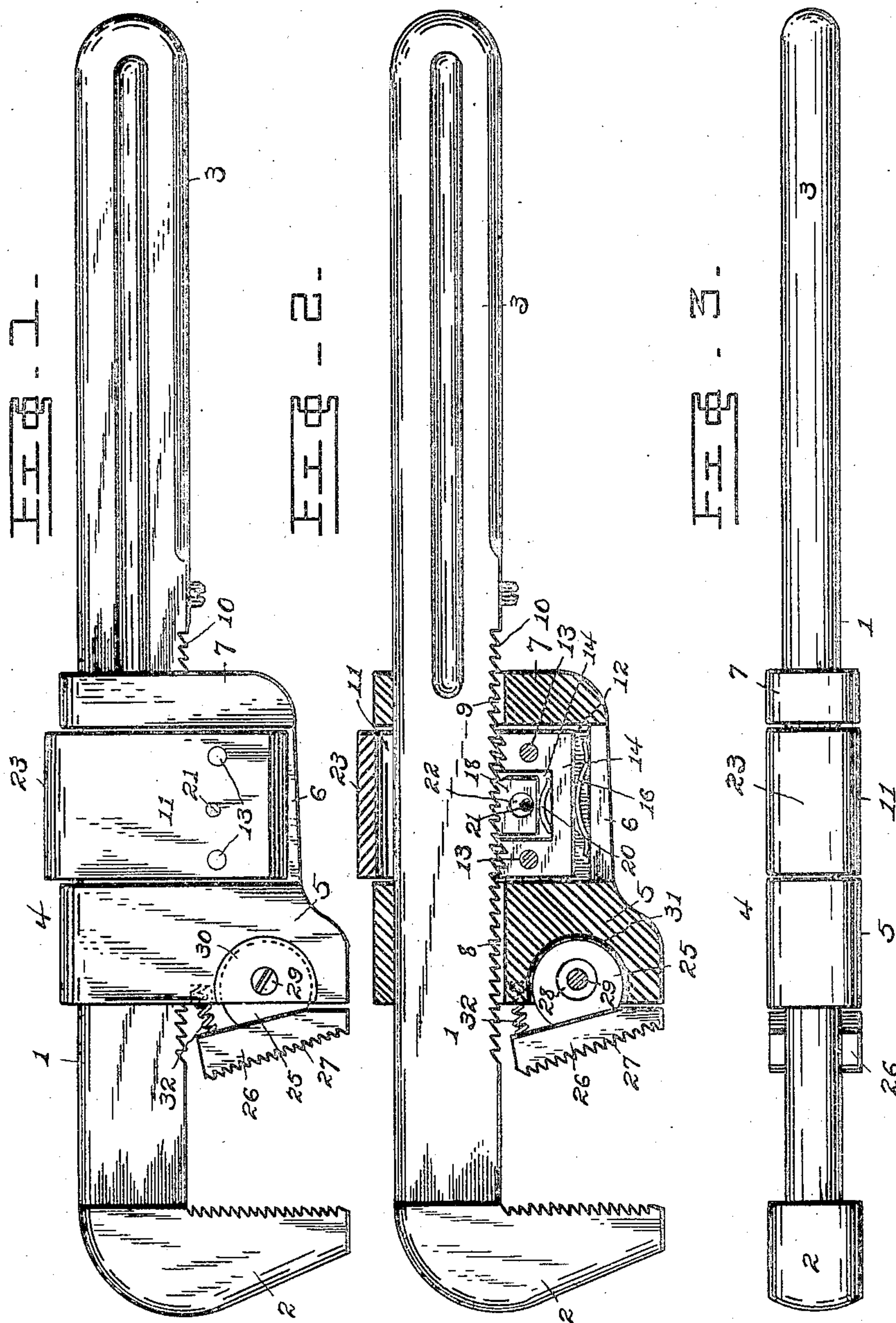


No. 843,969.

PATENTED FEB. 12, 1907.

H. B. SHAVER.
NUT AND PIPE WRENCH.
APPLICATION FILED JULY 11, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

Robt F. Dilworth
E. Lennard

INVENTOR

Hustead C. Shaver

By

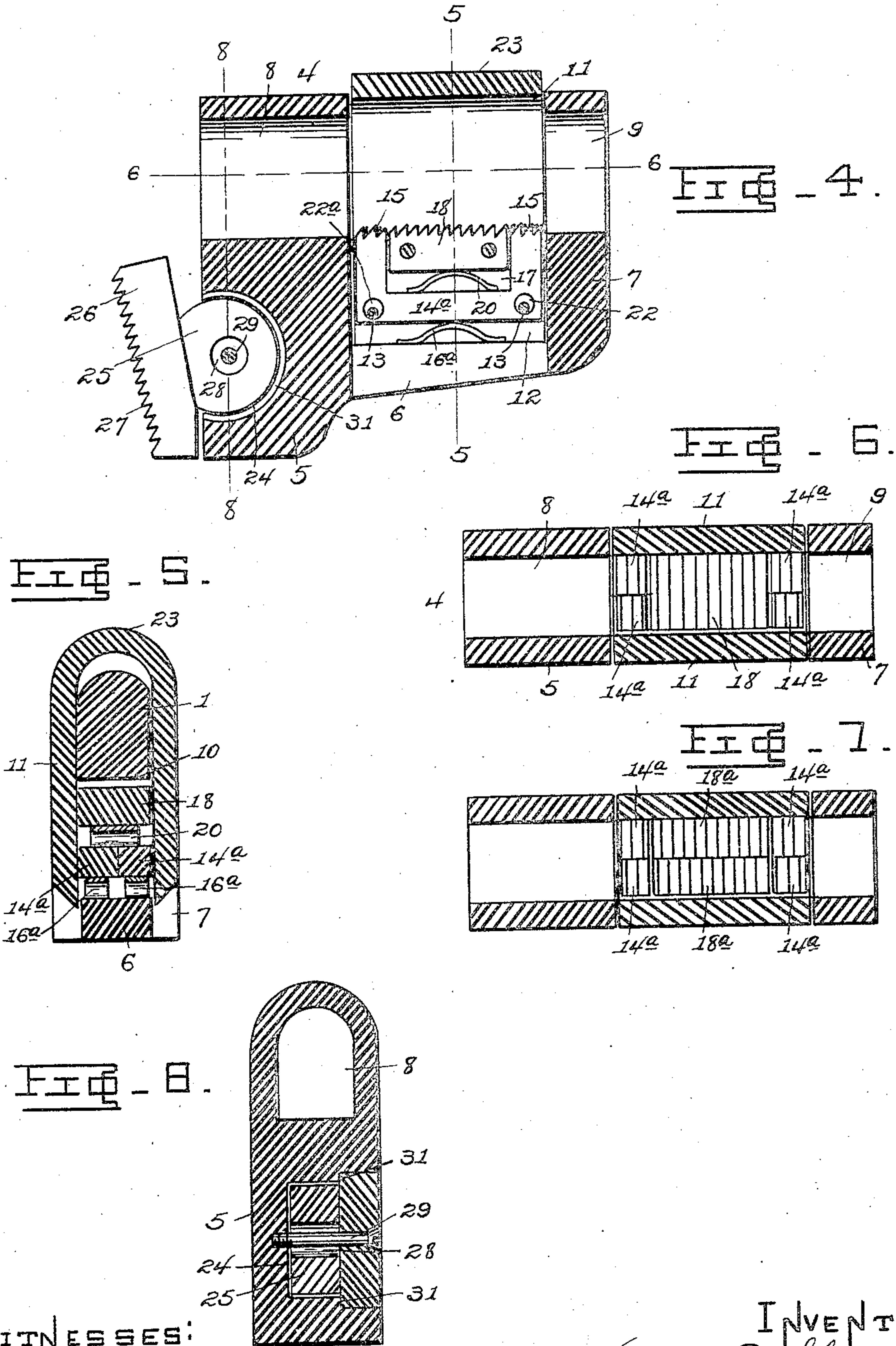
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WITNESSES:

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UNITED STATES PATENT OFFICE.

HUSTEAD B. SHAVER, OF FLEMINGTON, WEST VIRGINIA, ASSIGNOR OF ONE-HALF TO JOHN W. DAVIDSON, OF FLEMINGTON, WEST VIRGINIA.

NUT AND PIPE WRENCH.

No. 843,969.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed July 11, 1906. Serial No. 325,642.

To all whom it may concern:

Be it known that I, HUSTEAD B. SHAVER, a citizen of the United States of America, and resident of Flemington, county of Taylor, and State of West Virginia, have invented certain new and useful Improvements in Nut and Pipe Wrenches, of which the following is a specification.

My invention relates to new and useful improvements in wrenches, and more particularly to a quick-acting wrench of the sliding-jaw type; and it has for its object to provide a simple, durable, and comparatively inexpensive wrench adapted for use either as a nut-wrench or pipe-wrench.

A further object is to provide a combination nut and pipe wrench having a rack-bar and a movable jaw and having novel adjusting means whereby a close adjustment of the movable jaw may be had without sacrificing strength either in the teeth of the rack or in the teeth of the rack-engaging mechanism carried by said jaw.

A further object of the invention is to provide a wrench of the character mentioned in which the movable parts work with extreme ease and freedom and in which the parts are but little liable to become out of order.

In describing the invention in detail reference is herein had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of the wrench. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a rear edge elevation of the same. Fig. 4 is a longitudinal sectional view, enlarged, of the movable jaw detached from the shank or rack-bar. Fig. 5 is a cross-sectional view of the wrench, taken on the line 5 5, Fig. 4. Fig. 6 is a longitudinal sectional view of the movable jaw, taken on the line 6 6, Fig. 4, and showing three spring-pressed detents. Fig. 7 is a similar view showing four spring-pressed detents; and Fig. 8 is a cross-section of the wrench, taken on the line 8 8, Fig. 4.

Referring to said drawings, in which like reference numerals designate like parts throughout the several views, 1 indicates the stem or shank of the wrench, having an integral jaw 2 and handle 3. Slidably mounted upon said stem is a movable jaw 4, consisting of a longitudinally-apertured body 5, having

formed integral therewith a longitudinal tailpiece 6, which is connected at its rear end with or carries integral therewith an apertured lug 7, as shown. Said body 5 and said lug 7 stand parallel to each other, and the apertures 8 and 9, respectively provided therein, are in line in respect to each other, forming a shankway in which the shank or rack-bar 1 is held. Said tailpiece 6 stands parallel to and at a suitable distance from the toothed edge 10 of the rack-bar. Vertically slidable between said body 5 and the lug 8 is a yoke or stirrup 11, which straddles the shank or rack-bar and incloses the rectangular chamber 12, which is bounded or defined on four sides by the rack-bar 1, the body 5, the tailpiece 6, and the lug 7. Mounted in said chamber 12 and rigidly secured by pins or rivets 13 to the opposite sides or members of the yoke or stirrup 11 is a detent or clutching member 14, having a series of teeth 15, adapted to engage the teeth of the rack-bar. Said detent 14 is of a width substantially the same as that of the rack-bar. Hence the teeth 15 thereof, which are spaced to correspond with the spacing of the teeth of the rack-bar, are of equal strength with those of the rack-bar. A spring 16, suitably mounted beneath the detent, holds the same normally in engagement with the rack-bar. Intermediate its ends said detent 14 is provided with a substantially rectangular recess 17, in which is mounted a second detent 18, the teeth of which are normally held in engagement with the rack-bar by a spring 20, which is suitably mounted for the purpose. A bolt, screw, or rivet 21 is projected through a transverse aperture 22 in said detent 18, the ends of which are fixed in the opposite sides or members of the stirrup 11. Said aperture 22 is relatively larger in size than the pin or rivet 21, which extends therethrough. Therefore the said detent 18 is freely movable, being in no way retarded in its vertical or reciprocating movement by said pin or rivet.

It will be noted that the teeth of the detents 14 and 18 are so arranged that the teeth of but one detent may stand in operative or clutching engagement with the teeth of the rack-bar at a time, the teeth of the other detent being half withdrawn from the teeth of the rack-bar while the teeth of the other are in perfect engagement therewith. Thus in shifting the movable jaw on the stem

or rack-bar the detents alternately drop into clutching engagement with the rack-bar, coaction between the teeth of the detents and the teeth of the rack-bar being alternately
5 secured at intervals equal to one-half the spaces between the teeth of the rack-bar.

In adjusting the wrench to fit a given object the movable jaw is pushed forward toward the stationary jaw, the detents alter-
10 nately dropping into locking or clutching engagement with the teeth of the rack-bar until the desired adjustment is secured. There being two locking-points for a space the width of a tooth, a close adjustment is
15 secured, while the teeth are sufficiently large to sustain any ordinary strain to which they may be subjected.

To retract the movable jaw from the stationary jaw, pressure is applied to the head 23
20 of the stirrup 11 to depress said stirrup, thereby depressing the detent 14, which, as before stated, is rigidly secured to said stirrup, and also depressing the detent 18 through the medium of the pin or rivet 21. This de-
25 pression of the detents frees the teeth thereof from the teeth of the rack-bar, when the movable jaw may be readily moved back the requisite distance. Upon removing the
30 pressure from the stirrup the detents are forced back by their respective springs into engagement with the rack-bar, one or the other of the detents having a locking or clutching engagement with the teeth of said rack-bar.

As illustrated in Figs. 4, 5, and 6, two parallel detents 14^a, each of substantially half the width of the shank 1, may be employed instead of the single detent 14, in which case the teeth of said detents are staggered in re-
40 spect to each other, thus providing means whereby a finer or closer adjustment of the movable jaw may be had, as will be readily understood by those skilled in the art to which this device appertains. Said detents
45 14^a are provided with separate springs 16^a, as shown, and instead of the rivets 13 rigidly holding said detents, as shown in Fig. 2, said rivets are projected through relatively larger openings or apertures 22^a, provided in said
50 detents, thus admitting of an independent free movement of said detents, they being at the same time under the control of the stirrup. With this arrangement of parts the de-
55 tent 18 is preferably rigidly secured by rivets 21^a to the stirrup, as shown in Fig. 4.

In Fig. 7 is illustrated a further modification, in which two detents 14^a are employed instead of the single detent 14 and in which two parallel detents 18^a are employed instead
60 of the single detent 18, the teeth of said detents 18^a being staggered relatively to each other, thus providing for a still finer or closer adjustment of the movable jaw. With this construction, as will be seen, there are four
65 locking-points for a space the width of a tooth

of the shank. Hence a very close adjustment may be had, and at the same time the strength of the teeth of the detents is not materially sacrificed in order to secure such ad-
70 justment. When the four separate detents are employed, they are all provided with transverse apertures through which relatively smaller pins or rivets are projected, thus providing for the free and independent move-
75 ment of said detents.

A recess 24 is preferably provided in the face of the body 5 of the movable jaw, and fitted in said recess is the lug 25 of a detach-
80 able jaw 26, having serrations or teeth 27 formed on its face, said jaw being adapted for use when the device is employed as a pipe-wrench. A central aperture 28 is pro-
85 vided in the lug 25, through which is projected a pin or screw 29 of a size smaller than that of the aperture, as is clearly shown in
90 Figs. 2, 4, and 8. This arrangement admits of the lug when under pressure being forced back against the rear wall of the recess, which serves as a bearing for said lug and prevents the said pin or screw 29 from being
95 subjected to the strain which would result were the aperture and screw of corresponding sizes. A washer 30, through which said pin or screw 29 is projected, serves to hold said
100 lug in place in the recess 24, said washer fitting firmly upon a bearing-shoulder 31, provided in said body 5, so that undue or binding pressure may not be brought to bear upon the lug 25. A suitably-mounted spring 32 serves to normally hold the heel of the jaw 26
105 pressed forward, as shown.

Changes in the form, proportion, and minor details of construction may be re-
110 sorted to without departing from the spirit or sacrificing any of the advantages of this in-
115 vention.

Having thus described my invention, what I claim as new, and desire to secure by Let-
120 ters Patent, is—

1. In a wrench, the combination with a
125 rack-bar, of a sliding jaw carried by said rack-bar, a spring-pressed detent carried by the jaw and coöperatively engaging the rack-bar, said detent being provided with a recess in-
130 termediate its ends constituting two rack-en-
135 gaging portions, one at each end of said de-
140 tent, a second detent mounted in said recess, the teeth of said detents being arranged so that but one of the detents at a time is in
145 clutching engagement with the teeth of the rack-bar, the other detent being partially withdrawn therefrom, and a stirrup opera-
150 tively connected with said detents whereby, when the former is depressed, the latter are removed from engagement with the rack-bar.

2. A wrench comprising a coarse-toothed
155 rack-bar having an integral jaw, a jaw slid-
160 able upon said rack-bar, a spring-controlled detent vertically movable in a chamber pro-
165 vided in said movable jaw, said detent hav-

ing a recess therein intermediate its ends constituting two separate rack-engaging portions a second spring-controlled detent mounted and vertically movable in said recess, each detent having coarse teeth corresponding with the teeth of the rack-bar, said detents being adapted to ride on the face of the rack-bar as moved forward thereon and having their teeth relatively arranged so that they alternately fall into clutching engagement with the rack-bar, and means whereby said detents may be simultaneously disengaged from the rack-bar.

3. A wrench comprising a coarse-toothed shank having a fixed jaw, a jaw slidably mounted on the shank, a series of spring-pressed detents within the movable jaw, each detent being vertically movable and having teeth spaced to correspond with the teeth of the shank, said detents working independent of each other to operatively engage the teeth of the shank one at a time, and a stirrup having direct separate and independent connections with said detents whereby pressure applied to its head simultaneously removes all the detents from engagement with the shank.

4. A wrench comprising a coarse-toothed shank having a fixed jaw, a jaw slidably mounted on the shank, said movable jaw comprising a body having a shankway therethrough, a tailpiece carried by said body, a lug having a shankway therethrough connected with said tailpiece, a stirrup vertically movable over the shank between said body and said lug, and spring-pressed detents mounted over said tailpiece between the body and the lug and inclosed by the members of the stirrup, each of said detents being bifurcated constituting two separate shank-engaging portions, detents mounted upon the first-mentioned detents in the bifurcations thereof, all of said detents being normally held in engagement with the toothed face of the shank, the teeth of said detents being so arranged that but one of the detents at a time is in clutching engagement with the shank, and connections between the stirrup and said detents whereby when the stirrup is depressed the detents are simultaneously disengaged from the shank said connections normally admitting of free and independent vertical movement in each of said detents.

5. A wrench comprising a toothed shank, a sliding jaw on said shank and having a chamber therein, a series of spring-pressed detents arranged to be vertically movable in said chamber parallel to the shankway, said detents being provided with teeth spaced to

correspond with the teeth of the shank, the teeth of the different detents being staggered relatively to each other, one set of said detents being recessed intermediate their ends constituting in each detent two separate rack-engaging portions, and the remaining detents being mounted in the recesses of the detents composing the set, a stirrup embracing said shank intermediate the ends of said movable jaw and having connections with said detents whereby, when pressure is applied thereto, the detents are simultaneously disengaged from the shank, said connections admitting of a freedom of vertical movement in said detents.

6. A wrench comprising a toothed shank, a fixed jaw carried by said shank, a movable jaw upon said shank, parallel spring-pressed detents independently carried by said movable jaw, each of said detents being substantially of one-half the width of the shank and each being bifurcated, constituting two separate shank-engaging portions freely movable toward and away from the shank, the teeth of said detents being so arranged that the teeth of but one detent is in perfect engagement with the teeth of the rack at a time, said detents having transverse apertures there-through, a detent mounted in the bifurcations of the first-mentioned detents, a stirrup embracing said detents on opposite sides thereof, pins projected through the apertures in said detents and rigidly mounted in the opposite members of said stirrup, said pins being relatively smaller in diameter than the apertures in the detents and constituting connections whereby a depression of the stirrup disengages said detents and whereby the latter normally stand independent of the stirrup.

7. In a wrench, a shank carrying a fixed jaw, a movable jaw on said shank, clutching means carried by said movable jaw, a shouldered recess in the face of the movable jaw, a rocking jaw member having a lug integral therewith, said lug being mounted in said recess, a washer mounted upon the shoulder in said recess, a pin projected through said washer and lug for retaining them in place, said lug having an enlarged aperture through which said pin passes whereby a strain upon the rocking jaw member is prevented from being communicated to said pin.

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

HUSTEAD B. SHAVER.

Witnesses:

Mrs. J. W. DAVIDSON,
R. G. CATHER.