

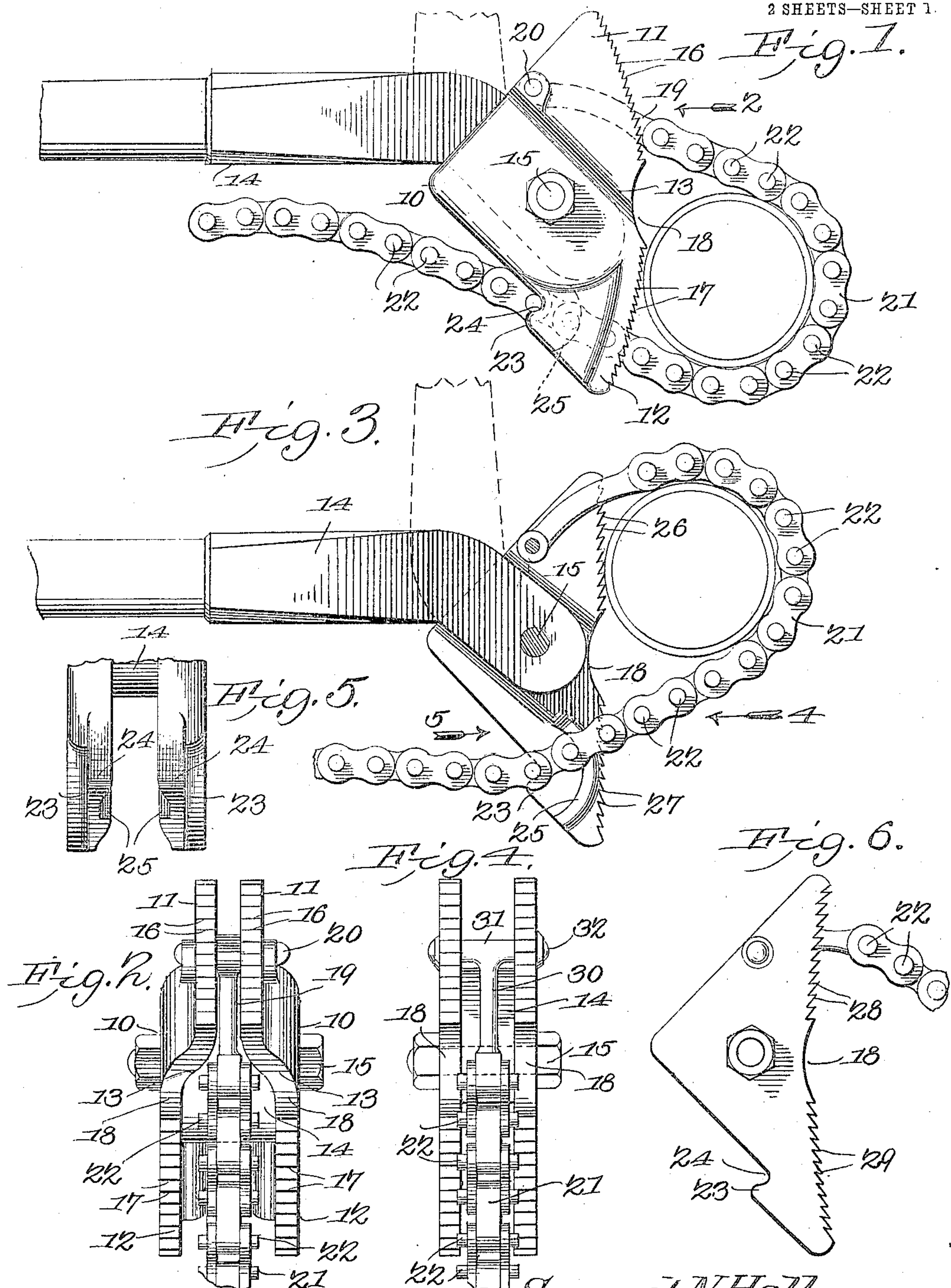
No. 818,371.

PATENTED APR. 17, 1906.

S. N. HALL.  
WRENCH.

APPLICATION FILED AUG. 1, 1905.

2 SHEETS—SHEET 1.



Witnesses

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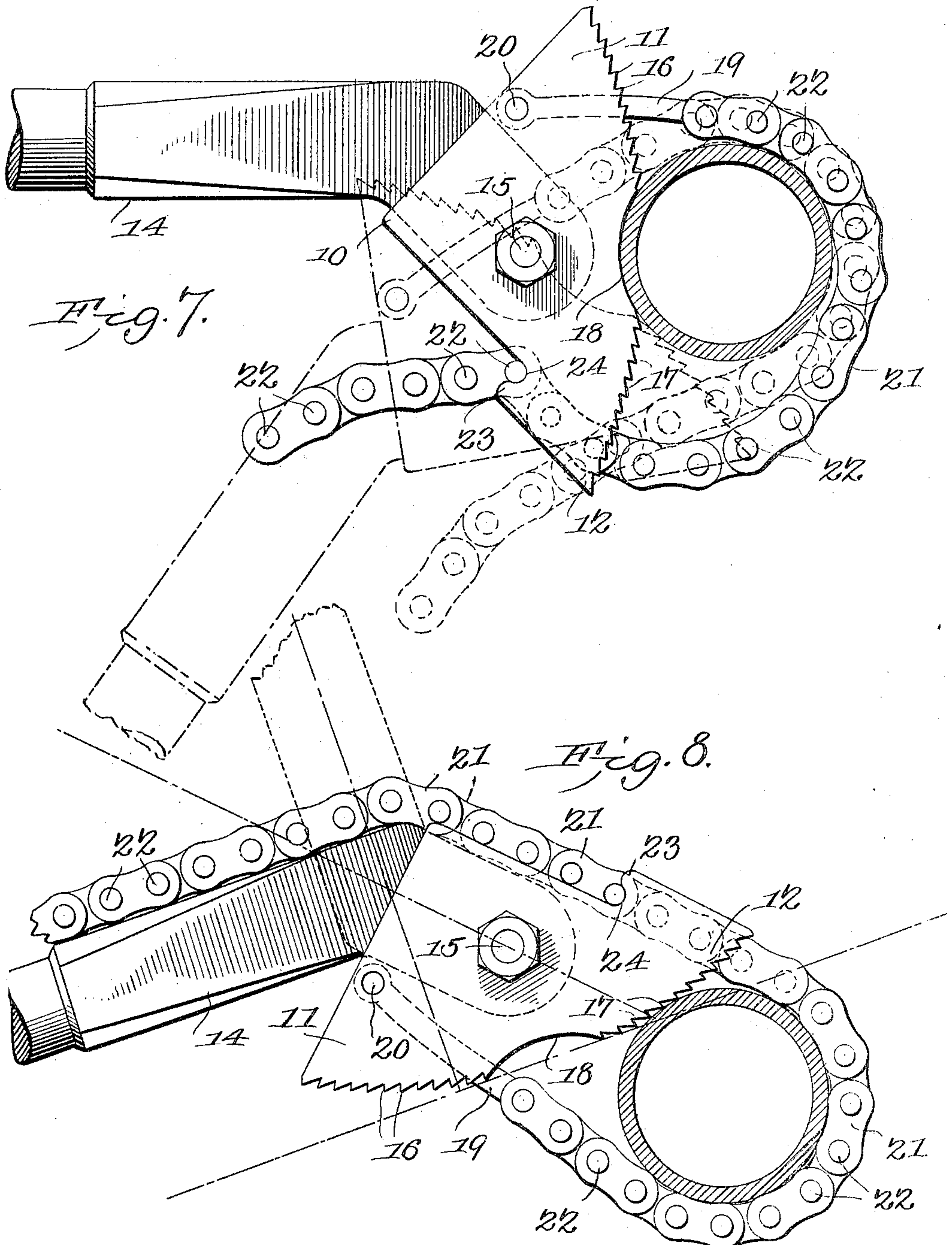
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# UNITED STATES PATENT OFFICE.

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## WRENCH.

No. 818,371.

Specification of Letters Patent.

Patented April 17, 1906.

Application filed August 1, 1905. Serial No. 272,181.

*To all whom it may concern:*

Be it known that I, SAMUEL N. HALL, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented a new and useful Wrench, of which the following is a specification.

This invention relates to wrenches, and has for its object to provide a wrench embodying new and improved features of utility, simplicity, and efficiency.

A further object of the invention is to provide a wrench for use upon round work, and which may be easily adjusted upon the work and when so adjusted will rotate the work in either direction without change of connection.

A further object of the invention is to provide a chain wrench embodying new and improved means for securing the free end of the chain to the wrench-head.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made without departing from the spirit of the invention or sacrificing any of its advantages.

In the drawings, Figure 1 is a view of the improved wrench in side elevation. Fig. 2 is a view of the wrench in end elevation and the form shown in Fig. 1 and looking in the direction of arrow 2. Fig. 3 is a vertical sectional view of the improved wrench, showing the work-engaging face straight. Fig. 4 is a view in end elevation of the improved wrench with the head-plates parallel and looking in the direction of arrow 4 in Fig. 3. Fig. 5 is a fragmentary detail view looking in the direction of arrow 5 in Fig. 3. Fig. 6 is a view in side elevation of the head of the improved wrench having concave work-engaging faces. Fig. 7 is a view illustrating the initial application of the wrench to the work, the gripped position being indicated by dotted lines. Fig. 8 is a view showing the wrench applied to the work with its handle resting upon the ground to prevent turning of the wrench with the work when being acted upon by another wrench.

Like characters of reference designate cor-

responding parts throughout the several views.

In its embodiment the improved wrench forming the subject-matter of this application comprises a pair of plates 10, parallel with but unequally distant from each other at each end, as shown more especially in Fig. 2, the ends 11 being nearer together than the ends 12. The ends 11 and 12 are connected by integral curves 13, and between the plates is secured a handle 14, as by the bolt 15. The outer edges of the plates are formed convex and with oppositely-inclined teeth 16 and 17 along the edges of the ends 11 and 12, respectively, and with a concavity 18, formed centrally of the plates and between the opposite tooth-sections and coincident with the curves 13. Between the ends 11 is pivoted a link 19, as by the pin 20, and to which is pivoted the chain 21. The chain 21 is provided with a plurality of studs 22, outstanding laterally therefrom, and the ends 12 have offset lugs 23, forming notches 24, proportioned to seat on the studs 22. Adjacent the notches 24 are formed on the inner surfaces of the ends 12 curved shoulders 25, arranged circumferential to the notches 24 as centers and proportioned to seat the stud 22 next in series to the notch 24.

Instead of convex edges the plates may be formed with substantially straight edges, as shown in Fig. 3, wherein the teeth 26 and 27 correspond with the teeth 16 and 17. The edges of the plates may also be formed with concave edges, as in Fig. 6, wherein the teeth 28 and 29 correspond with the teeth 16 and 17.

Instead of forming the plates with the curves 13 and nearer together at one end than at the other the plates may be parallel throughout their lengths, as in Fig. 4, wherein the link 30 is formed with a cross-head 31, pivoted by the pin 32, and corresponds to link 19.

In operation the chain is placed about the work, while the work is embraced within the concavity 18 and the chain 21 passed around the work and one aligned pair of studs 22 engaged within notch 24. By reason of their position and proportion the shoulders 25 engage the next aligned pair of studs and permitting them to move thereon about the notch 24 as a center. By moving the handle 14 in the direction indicated by the large arrow the teeth 16 or 17 will engage and rotate the work in the



direction indicated by the small arrow. By reason of the bend in the handle it is obvious it may be disconnected from the head and again connected in the position shown in outline.

From the foregoing it will be obvious that the work may be engaged by either set of teeth and to rotate the work in either direction without disengaging the wrench therefrom.

Upon reference to Fig. 7 of the drawings, wherein the initial application of the wrench to the work has been shown in full lines, it will be seen that the work is received in the work-receiving recess 18, and the distance between successive engagements of the chain with the shoulders 23 is proportioned with respect to the depth of the work-receiving recess as to produce sufficient slack in the chain to enable the convenient engagement of certain of the projections 22 with said shoulders. After the free end of the chain has thus been connected to the wrench-head the wrench is moved upon the work to the position indicated by dotted lines, whereupon the work will be wedged between the chain and one of the toothed jaw portions of the head in a manner to prevent slipping of the wrench upon the work. When it is desired to remove the wrench, it is moved backwardly across the work to the full-line position, with the work situated in the work-receiving recess 18, whereupon there will be sufficient slack in the chain to enable the convenient disengagement thereof from the shoulders 23.

From the foregoing explanation it will be understood that the provision of the work-receiving seat or recess between the jaw portions of the head, together with the fact that the chain has spaced successive connections with the wrench-head, is a very important feature of this invention, in that it enables the convenient engagement and disengagement of the wrench with respect to the work and also insures an effective gripping of the work by the wrench.

By applying the wrench to an upright pipe, particularly in connection with oil and Artesian wells, with the pipe received within the seat or recess 18, as illustrated in Fig. 7, there is sufficient looseness to permit of the handle of the wrench being tilted or inclined upwardly, so as to bite the upper edge of the wrench-head into the pipe so as to grip the tool upon the pipe after the manner of a clutch, whereby the pipe may be worked upwardly by manipulating the tool. After the pipe has been worked upwardly for a suitable distance it may be held by another tool of the same character until a new grip can be obtained by the first-mentioned tool, or by depressing the handle until the tool is loose upon the pipe the latter may be permitted to drop through the tool.

When the work is lying upon the ground or

other horizontal support, as indicated in Fig. 8, the wrench may be engaged with the work in such a position as to permit of the free end of the handle resting upon the ground, another wrench being employed to unscrew a coupling or other pipe-section, the first-mentioned wrench being held against turning with the work by reason of the free end of its handle lying upon the ground.

Another very important feature of the invention resides in the disposition of the handle-receiving seat or socket at an angle of about forty-five degrees to the working face of the wrench-head, together with the disposition of the inner terminal of the handle at an angle of about forty-five degrees to the longitudinal axis of the handle, whereby the handle may be shifted to assume positions at right angles to one another, which materially facilitates the handling of the wrench, and it enables the application of the latter in two different relations with the work. This feature will be appreciated by reference to Fig. 8, wherein it will be noted that the weight of the wrench tends to clutch the same upon the work, and the engagement of its handle with the ground prevents turning of the wrench with the work. If the handle were in the position indicated by dotted lines, it could not be engaged with the ground, and therefore it would not have the advantage of the use as indicated in Fig. 8.

Having thus described the invention, what is claimed is—

1. A wrench comprising a head having its working face provided with spaced jaw portions, a flexible work-embracing element loosely carried by one end of the head and capable of being drawn around the work, said work-embracing element having a series of detachable connections with the other end of the head, there being a work-receiving recess formed in the work-engaging face of the head between the jaw portions thereof, the successive engagements of the work-embracing element with the head being spaced relatively to the depth of the work-receiving recess to produce slack in the work-embracing element sufficient to permit of the wrench-head moving across the work until the latter becomes wedged between one of the jaw portions and the work-embracing element.

2. A wrench comprising a head having its working face provided with spaced jaw portions, a chain loosely connected to one end of the head and provided upon opposite sides with series of lateral projections, the other end portion of the head being provided with spaced seats for detachable engagement by the projections of the chain, there being a work-receiving recess formed in the work-engaging face of the head between the jaw portions thereof, the projections of the chain being successively spaced relatively with respect to the depth of the work-receiving re-



cess to produce slack in the chain when engaged with the seats to permit of the wrench-head being moved across the work until the latter becomes wedged between one of the jaw portions and the chain.

3. A wrench comprising a bifurcated head having its working face at opposite sides of the bifurcation provided with jaw portions, there being a work-receiving recess formed in each side of the head between the opposite jaw portions thereof, one end of the head having corresponding seats at opposite sides of its bifurcation, and a chain loosely connected within the bifurcation of the head at the other end thereof and provided at opposite sides with series of lateral projections for successive engagement with the seats, the projections being spaced relatively with respect to the depth of the work-receiving recess to produce slack in the chain when the work is in the work-receiving recess and the chain is engaged with the seats to permit of the wrench-head being moved across the work until the latter becomes wedged between one of the jaw portions and the chain.

4. A wrench comprising a head having its working face provided with opposite jaw portions and also provided with a handle-receiving seat disposed at an angle of substantially forty-five degrees to the working face of the head, a flexible work-embracing element connected to one end of the head and having a series of connections with the other end thereof, and a handle for interchangeable engagement with the seat of the head.

5. A wrench comprising a head having a working face and also provided with a handle-receiving seat disposed at an angle of substantially forty-five degrees to the working face of the head, a flexible work-embracing element connected to one end of the head and having a series of connections with the other end thereof, and a handle for interchangeable engagement with the seat of the head.

6. A wrench comprising a head having its working face provided with a jaw, a work-receiving recess and a handle-receiving seat disposed at an angle of substantially forty-five degrees to the working face of the head, a flexible work-embracing element connected to one end of the head and having a series of connections with the other end of the head, and a handle having one end set at an angle of substantially forty-five degrees to the longitudinal axis of the handle for inter-

changeable engagement with the handle-receiving seat.

7. A wrench comprising, a head embodying a plurality of plates parallel at each end and the ends connected by a lateral integral curve, and each having at each end oppositely-inclined work-engaging teeth, and means for holding the work in engagement with the teeth.

8. A wrench comprising, a head embodying a plurality of plates parallel at each end and the ends connected by a lateral integral curve and each having at each end oppositely-inclined work-engaging teeth and having transverse concavity formed at the curves and registering with each other and means for holding the work in engagement with the teeth.

9. A wrench comprising, a head embodying a plurality of plates convex along their edges and parallel with each other at each end and the ends connected by a lateral integral curve and each having at each end oppositely-inclined work-engaging teeth and having a transverse concavity formed at the curves and registering with each other and means for holding the work in engagement with the teeth.

10. A wrench comprising, a head embodying a plurality of plates convex along their outer edges and parallel with each other at each end and the ends connected by a lateral integral curve and each having at each end oppositely-inclined work-engaging teeth and having a transverse concavity formed at the curves and registering with each other a chain pivoted between the plates at one end and arranged to embrace the work and means for securing the chain between the plates at their other ends.

11. In a wrench a head formed of two toothed plates, a chain pivoted at one end between the plates and having spaced studs outstanding laterally therefrom lugs offset from the plates forming registering notches proportioned to receive alined studs and curved shoulders disposed circumferentially to the notches as centers and proportioned to seat adjacent alined studs.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SAMUEL N. HALL.

Witnesses:

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L. E. AREY.