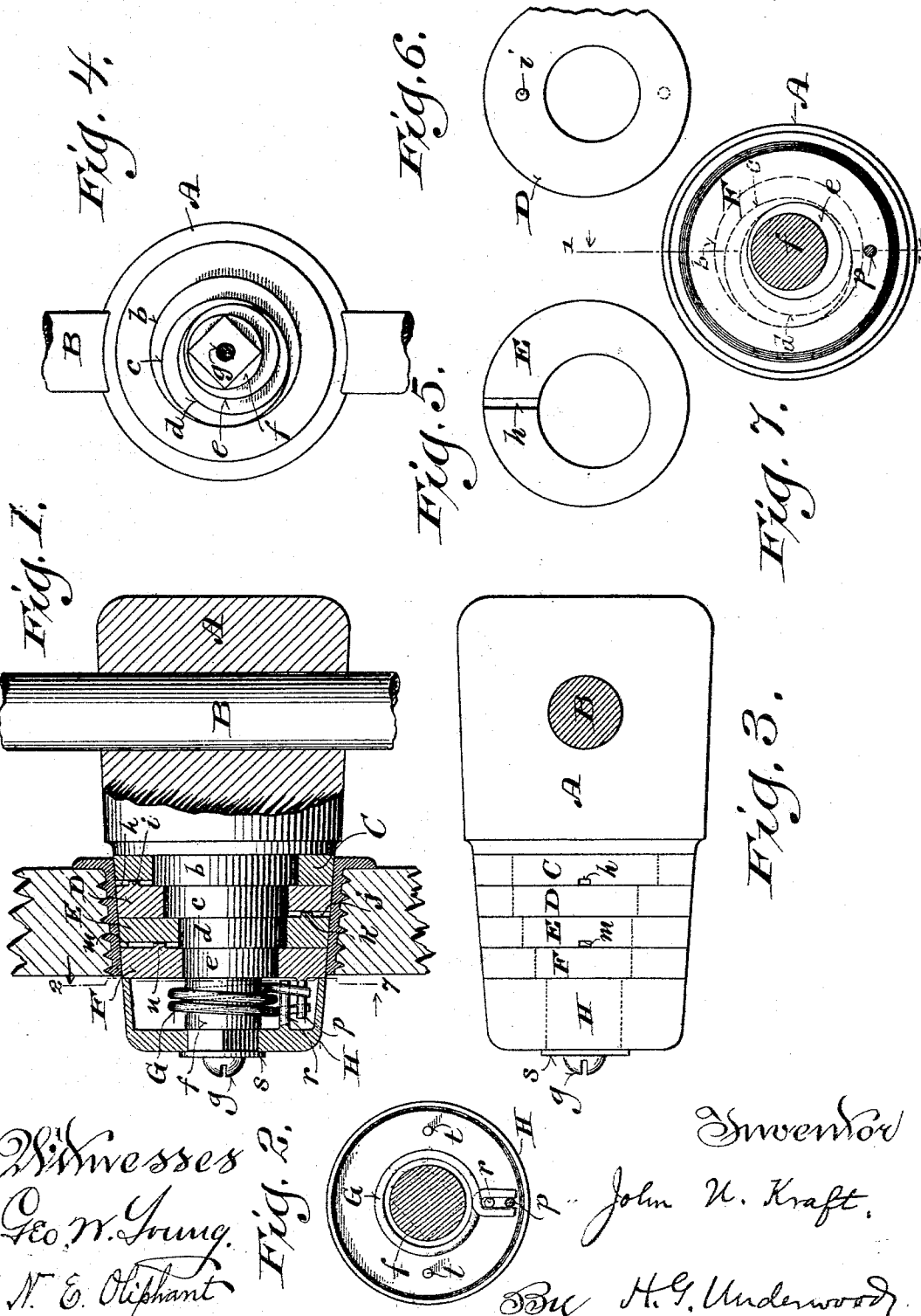


(No Model.)

J. U. KRAFT.
WRENCH.

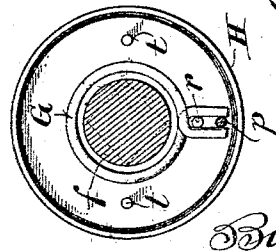
No. 514,477.

Patented Feb. 13, 1894.



Witnesses
Geo. W. Young.
N. E. Oliphant.

Fig. 2.



Inventor
John U. Kraft.

By H. G. Underwood
Attorneys

UNITED STATES PATENT OFFICE.

JOHN U. KRAFT, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO
WILLIAM KOESTER, OF SAME PLACE.

WRENCH.

SPECIFICATION forming part of Letters Patent No. 514,477, dated February 13, 1894.

Application filed October 27, 1893. Serial No. 489,293. (No model.)

To all whom it may concern:

Be it known that I, JOHN U. KRAFT, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Wrenches; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a simple, powerful wrench especially designed for use as a means for setting or removing bung-bushings, and it consists in certain peculiarities of construction and combination of parts hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings: Figure 1 represents a sectional view of my wrench in working position, the section being taken on line 1—1 of the seventh figure; Fig. 2, a section on line 2—7 of the preceding figure; Fig. 3, an elevation of the wrench; Fig. 4, a plan view of the wrench-stock inverted, a screw that serves to hold certain parts on the stock being shown in transverse section; Figs. 5, and 6, plan views of eccentric disks that form parts of the wrench, and Fig. 7, a section taken on line 7—2 of the first figure.

Referring by letter to the drawings A represents the head of a stock that forms part of my improved wrench, said head being shown as provided with an opening in which to insert a hand-bar B, although other suitable means may be employed for the purpose of imparting necessary circular motion to the stock. Below its head, the wrench-stock is reduced to form an annular collar *b*, succeeded by a series of eccentric shoulders *c*, *d*, *e*, having variable diameters less than the collar, and in its successive order each shoulder is diametrically smaller than its predecessor. Succeeding the eccentric shoulders the wrench-stock is reduced to form a shouldered stem *f*, the latter being tapped to receive a screw *g* that serves to hold in place certain parts hereinafter specified. As best shown in Fig. 4, the shoulders *c*, *d*, *e*, of the wrench-stock have their greatest projections at different points, and the purpose of this construction will be made apparent in the subsequent description.

Fitting loose on the annular collar *b* of the wrench-stock is a centering ring C having a radial groove *h* loosely engaged by a lug *i* extending from a disk D loose on the shoulder *c* succeeding said ring. The disk D is in turn provided with a radial groove *j* loosely engaged by a lug *k* extended from a succeeding disk E that is loose on the wrench-stock shoulder *d*, and this latter disk has a similar groove *m* loosely engaged by a lug *n* extended from still another disk F loose on the shoulder *e* of said wrench-stock.

Extended from that side of the disk F farthest from the lug *n* is a pin *p* that comes between the extremities of a spring G coiled around the stem portion *f* of the wrench-stock, said spring-extremities being crossed on each other, as best shown in Fig. 2, so as to obtain the necessary tension. The crossed extremities of the spring also oppose a pin *r* extended inward from a cap H fitted on the shouldered portion of the stem *f* above specified, and the several parts engaging the wrench-stock are held in place by the screw *g* hereinbefore set forth, a washer *s* being preferably interposed between the screw-head and adjacent cap.

To limit expansion of the spring in either direction, I provide the cap H with stop-lugs *t* preferably arranged on a line at right-angles to the pin *p*, as shown in Fig. 2 and thus the rotation of the wrench-stock to the right or left is limited to one-quarter of a circle.

As herein shown I square the shouldered portion of the wrench-stock stem *f* and provide the cap H with a corresponding central opening, but a rigid connection between said stem and cap may be made in various ways other than that herein set forth, this being a mere matter of mechanical expediency not affecting my invention.

The centering ring C, disks D, E, F, and the cap H are of such relative diameters as to exteriorly present a conical surface when in their normal positions, the taper of this surface being approximately the same as that of the interior of a bung-bushing I such as is shown in Fig. 1, but it is to be understood that the tool herein set forth may be employed to turn straight-bore bushings, rings or sockets, the amount of taper given said

ring, disks and cap being such as may be found necessary or desirable. It is also to be understood that non-tapered disks may be employed to turn a taper-bore bushing or analogous device, and it is possible to employ but one disk either tapered or otherwise, according to the part operated upon.

In practice the tool is inserted in the bushing or analogous device and its stock given a turn to cause the eccentric shoulders thereof to throw the disks D, E, F, outward against the resistance of the spring H, and as each disk will project at a point out of line with all the others in the series, the friction contact of said tool and adjacent surface is divided and exerted at several places on the device to be set or removed from its seat. The slightest movement of the wrench-stock causes a relative throw of the eccentric disks out of their normal position, and as the frictional contact increases with the exertion of power a very considerable leverage is the result, hence the bushing or analogous device with which the tool is engaged is readily seated or unseated with but little effort. The spring H being expanded by the rotary movement of the wrench-stock its contraction will automatically return the disks to their normal position when the exertion of power on said wrench-stock ceases whereby the tool may be removed from the bushing or other device operated upon, the necessary radial movement of said disks out or in being due to the groove and lug engagement of themselves and the centering ring C in successive order, as hereinbefore specifically set forth. It is possible to do away with the centering ring C and have the disk-lug work in a groove cut in the wrench-stock without departure from the spirit of my invention, it being essential to the latter that a disk or plurality of the same have a radial movement simultaneous with a circular motion of said wrench-stock.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A wrench comprising a stock having an eccentric shoulder, a disk in loose engagement with the shoulder, and suitable means for compelling radial movement of the disk simultaneous with circular motion of the stock, substantially as set forth.

2. A wrench comprising a stock having a plurality of eccentric shoulders, the greatest projections of which are at different points, a disk loose on each shoulder, and suitable means for compelling radial movement of each disk simultaneous with circular motion of the stock, substantially as set forth.

3. A wrench comprising a stock having a plurality of eccentric shoulders variable as to diameter in successive order, a series of peripherally tapered disks loose on the shoulders, and suitable means for compelling radial

movement of the disks simultaneous with circular motion of the stock, substantially as set forth.

4. A wrench comprising a stock having an annular collar succeeded by an eccentric shoulder, a ring loose on the annular collar and having one of its sides provided with a radial groove, a disk loose on the eccentric shoulder, and a lug that extends from the disk into the ring-groove, substantially as set forth.

5. A wrench comprising a stock having an annular collar succeeded by a plurality of eccentric shoulders the projections of which are at different points, a ring loose on the annular collar and having one of its sides provided with a radial groove, a disk loose on each eccentric shoulder, a lug extended from the innermost disk into said groove, and a lug on each succeeding disk engaging a radial groove in its predecessor, substantially as set forth.

6. A wrench comprising a stock having an eccentric shoulder, a disk loose on the shoulder, suitable means for compelling radial movement of the disk simultaneous with circular motion of the stock, a spring coiled around said stock and crossed at its extremities, a cap fast on the aforesaid stock, and pins projecting from the disk and cap intermediate of the spring extremities, substantially as set forth.

7. A wrench comprising a stock having an eccentric shoulder, a disk loose on the shoulder, suitable means for compelling radial movement of the disk simultaneous with circular motion of the stock, a spring coiled around said stock and crossed at its extremities, a cap fast on the aforesaid stock, pins projecting from the disk and cap intermediate of the spring-extremities, and stops on the cap for limiting expansion of the spring, substantially as set forth.

8. A wrench comprising a stock having an annular collar succeeded by a plurality of eccentric shoulders the greatest projections of which are at different points, a centering ring loose on the collar, a disk loose on each eccentric shoulder, suitable means for compelling radial movement of the disks simultaneous with a circular motion of the stock, a spring coiled on said stock and crossed at its extremities, a cap having a detachable rigid engagement with the aforesaid stock, and pins projecting from the cap and outermost disk intermediate of the spring-extremities, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

JOHN U. KRAFT.

Witnesses:

N. E. OLIPHANT,
HENRY DANKERT.