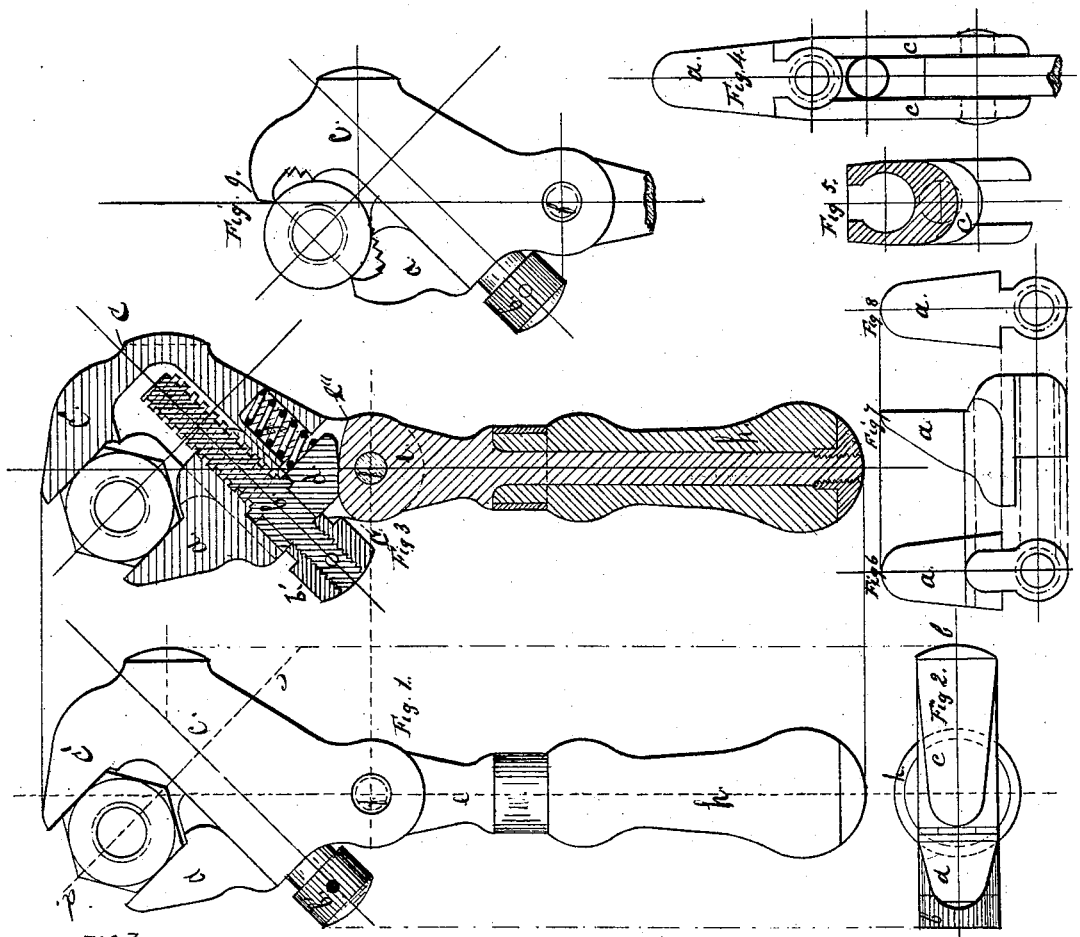
P. SAMUEL.

Wrench.

No. 166,814. Patented Aug. 17, 1875.



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IMPROVEMENT IN WRENCHES.

Specification forming part of Letters Patent No. **166,814**, dated August 17, 1875; application filed February 16, 1875.

To all whom it may concern:

Be it known that I, P. SAMUËL, of the city, county, and State of New York, have invented a new and Improved Wrench; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a side elevation, and Fig. 3 a sectional elevation, of my improved wrench. Figs. 2, 4, 5, 6, 7, and 8 are detail views, which will be readily understood without particular description.

The invention relates to the construction and arrangement of parts, as hereinafter described and claimed, whereby an improvement is produced in the class of diagonal or S wrenches having a pivoted cam-handle.

Referring to Figs. 1 and 3 of drawing, the head *c* of the wrench is provided with the usual form of fixed jaw *c'*, and is likewise recessed longitudinally to accommodate the screw *b*, by which the adjustment of the movable jaw *a* is effected. The jaw *a* has laterally-projecting portions or shoulders, by which it is supported and guided on the straight parallel sides of the head *c*. The screw *b* has a swiveled arm, *d*, which is beveled on its lower end to adapt it to work in frictional contact with the double cam-head *e* of the handle *h*. The spiral spring *g*, which is arranged in a recess of head *c* beneath the screw *b*, acts on the swiveled arm *d*, tending to hold the jaw *a* away from fixed jaw *c'*. The screw *b* has a fixed circular rib or shoulder, and a removable milled head, *b'*. Between these the swiveled arm *d* is secured, as shown, the jaw *a* being rabbeted or recessed, to accommodate the same. The arm *d* has, therefore, no longitudinal movement on the screw. The jaw *a* is, on the contrary, reciprocated by the screw, which passes through the part thereof that projects down into the recess in the head *c*. As shown in Figs. 4 and 8, the shape of that part of the jaw is in such relation to the said recess as to give it due steadiness, and prevent its being removed except the pivoted handle *h* be first removed.

The operation is as follows: The movable jaw *a* is first adjusted relatively to the jaw *c'*, to embrace the nut between them, as shown; but, as is well known, by the action of a screw the jaws of a wrench cannot be made to clamp a nut so tightly as to prevent more or less play, and consequent danger of abrasion of the corners of the nut. This is a serious objection in case the nut be silver or nickel plated, or otherwise highly finished. The first effect of pressure applied to handle *h* is to cause it to advance the jaw *a* and clamp the nut tightly. The increase of pressure increases the closeness of such contact, so that abrasion of the nut is impossible. When the handle *h* is turned (on its pivot *f*) to the left the cam or projection *e'* will act on the arm *d*, and thus on the jaw *a;* and when to the right the cam *e''* acts similarly, so that the wrench may be operated to screw nuts on or off their bolts. This result has not been heretofore attained by wrenches of this class, and is of special and obvious value and importance. The spring *g* moves the jaw *a* away from the side of the nut; at once the action of the handle *h* ceases, so that the wrench may be readily removed from the nut.

I show in Fig. 9 a suitable form of jaws to act on pipes or other cylindrical objects.

What I claim as new is—

In a wrench, the combination of a pivoted handle having the two-faced cam with a longitudinally-recessed head having a fixed jaw, the movable jaw *a* having a swiveled arm, *d*, a spring, and the screw *b*, substantially as described.

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