S. PLYMALE.

Dynamic Wrench.

No. 164,100. Patented June 8, 1875.

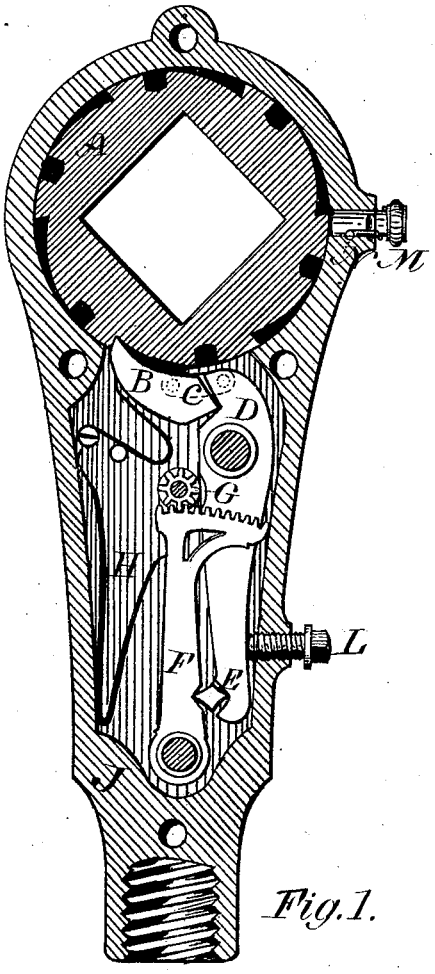

Fig. 1.

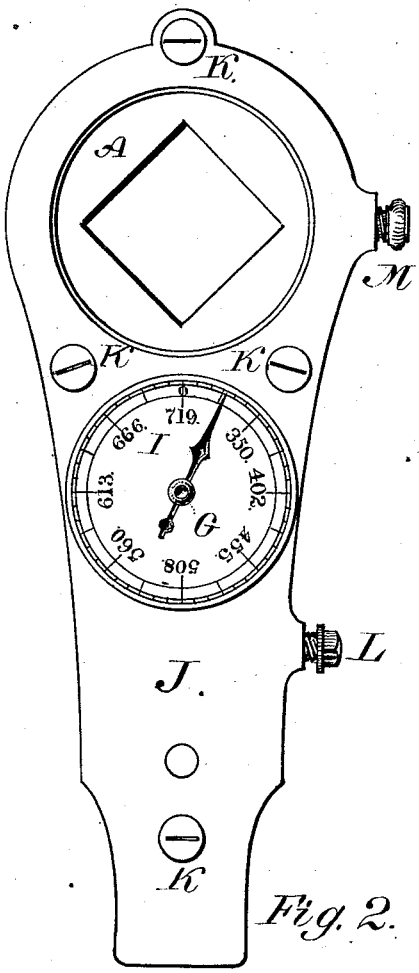

Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

SEBASTIAN PLYMALE, OF PORTLAND, OREGON.

IMPROVEMENT IN DYNAMIC WRENCHES.

Specification forming part of Letters Patent No. **164,100**, dated June 8,-1875; application filed February 25, 1875.

To all whom it may concern:

Be it known that I, SEBASTIAN PLYMALE, of Portland, in the county of Multnomah, in the State of Oregon, have invented an Improvement in Dynamic Wrenches, of which the following is a specification:

My invention consists in the application of certain levers, springs, &c., to a movable ratchet held in the case of a wrench; and consists, substantially, of the parts represented in the drawings by Figs. 1 and 2.

Figure 1 shows a section in a lateral and longitudinal manner through the middle of the wrench-case, and Fig. 2 shows the exterior of the same with the indicator, dial, &c.

The ratchet A has in its center a square five or six side mortise, corresponding to the bolt-head or nut to be used. The ratch-cuts do not run entirely across the face of the piece A, but are made in such a way that a web is left on either edge, forming a cylindrical bearing, and fitting into the case J neatly, or in such a way that it may turn freely in it when a vibratory motion is given it by the handle screwed into the smaller end; also, in the piece A a number of small round holes are bored, into which the pin M fits for certain uses. B is a pawl, whose back end forms a fulcrum, against which one end of the lever D works, and is connected to D by a link, C. In the larger end of D a short rock-shaft is formed in the solid casing, whose ends are held by the wrench-case J, and at the smaller end of D a second fulcrum, E, is placed loosely between the levers D and F. The circumferential end of F is formed into a circular rack, which engages with the index-pinion G.

The weighing-spring H presses the whole system of levers and fulcrums firmly together and against the adjusting-screw L. In addition to these a small U-shaped spring is used to press the pawl B into the ratch. By means of these parts the index-pinion G gives motion to the indicator on the face of the dial I, Fig. 2.

The screw L is used to set the indicator at any given number of pounds, when the wrench is used as an ordinary wrench, until the pressure becomes great enough to move the indicator. As soon as this is noticed the operation of turning the nut ceases, as it shows that the desired tension on the bolt has been reached.

The strength of the spring H is ascertained by experiment, and the dial I graduated accordingly.

Simply turning the screw L compresses the spring H, and at the same time turns the indicator, showing the number of pounds represented by the compression, and, as a matter of course, the force represented in turning the handle of the wrench, and communicated through the pawl B to the ratch A, is instantly registered, when the force used in turning becomes greater than the influence of the spring H acting against the levers F and D.

Screws K hold the face of the case on.

This wrench is useful wherever nuts and screws are used, as, by means of it, bolts may be made to carry a uniform load, and the exact weight or pressure they are holding ascertained in pounds; more especially useful in the case of suspension-rods of bridges, roofs, and suspended structures; for ascertaining the strain on cables attached to screws, or capstans fitted for this purpose.

When it is desired to fix the ratch A firmly in the case J, the pin M is inserted in one of the holes in ratch A, and turned partially round, or until a groove cut across the pin locks it fast behind the wire N. To unloose it the operation is reversed, and a spiral spring around the pin M, and between the milled head of M and the wrench-case, returns it to its first or unengaged position.

The wear of any of the parts will not essentially interfere with the weighing apparatus, as all such wear is compensated by means of the spring H and the screw-pin L, against which the system bears.

I claim—

The ratch A, pawl B, link C, levers D and F, fulcrum E, spring H, screw L, and pin M, operating in a case, J, on an indicator, G, over a dial, I, substantially as described, and for the purpose set forth.

SEBASTIAN PLYMALE.

Witnesses:

CHAS. B. TALBOT,

RICHD. M. TABOR.