

UNITED STATES PATENT OFFICE

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WRENCH OF THE ADJUSTABLE ALLIGATOR TYPE.

1,062,047.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY ADALBERT SMITH, a citizen of the United States, residing at Elgin, in the county of Kane and State of Illinois, have invented new and useful Improvements in Wrenches of the Adjustable Alligator Type, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in wrenches, especially those of the adjustable alligator type, and has for its object the production of a tool part in which great ease of adjustment and strength are attained.

A further object is the production of a device of simple though efficient construction and one that is not liable to get out of order or suffer deterioration of parts, and one that can be cheaply constructed or repaired.

These, and such other objects, as may hereinafter appear, are attained by my device, an embodiment of which is illustrated in the accompanying drawings, in which—

Figure 1 represents a plan view of my device with part of the saddle broken away and the jaws open; the dotted lines indicating the lines when the jaws are closed; and Fig. 2 represents a plan view of a portion of a wrench, showing the ordinary construction now in use.

Like numerals of reference indicate like parts in the several figures of the drawings.

Referring now to the drawings, 3 represents a suitable handle, one end of which is extended, forming a fixed jaw 4. A movable jaw 5, serrated on its gripping face 6, is formed with a circular bearing 7, adapted to fit within a curved socket 8 on the fixed jaw. A saddle 9 is formed from a metal plate bent to fit snugly over the mechanism of the wrench and held in place by means of suitable bolts, screws or rivets 10—10 and a screw bolt 11 forms a pivot, about which the jaw moves. The forward portion of the handle or fixed jaw is formed with a lower recess 12, adapted to receive a spring 13, and an upper recess 14, the purpose of which will be explained later. The upper portion of the rear of the movable jaw is formed into a slightly convex shoulder 15, and from the rear of the lower curved portion extends a lug or ear 16, adapted to rest below the end of the spring 13.

A screw-post or threaded bolt 17 is mount-

ed within the sides of the saddle between the convex bearing or shoulder 15 and the shoulder 18 at the back of the recess 14. The upper end of the shoulder 18 is cut away, forming a seat for the saddle and holding it firmly in place. A knurled nut 20 is mounted on the post or bolt 17, the post or bolt being preferably flattened and is positioned in an opening 21 in the saddle.

Referring now to the spring 13, this is preferably formed of phosphor bronze, or some non-rusting material, the extended end of which is placed above the lug 16. The spring is curved slightly upward at 23 to give it a greater resiliency and is curved more sharply at 24 to fit within the recess 12, and is again curved sharply downwardly at the end 25 and at substantially right angles with the main body of the spring. When the movable jaw is wide open, the spring is at rest and the post bolt 17 screwed into its extreme rearward position, but at all times bearing against the convex shoulder 15 to resist and hold the backward thrust of the jaw.

While I have shown the shoulder 15 as convex in order to provide a bearing for the end of the threaded post or bolt, it is evident that I may make this concave and make the end of the post or bolt slightly convex and attain the same result. In closing the jaws, the nut 20 is turned, screwing the bolt upwardly and forcing the jaw 5 downwardly, at the same time raising the lug 16 against the pressure of the spring 13. Before the jaws are completely closed, the body of the spring strikes the end 25 of the spring. It is thus apparent that while in the initial movement of the jaw downwardly, the entire spring is under tension continuously throughout its entire length, as soon as the main body of the spring, say at 23, strikes the end 25, a new resolution of force occurs, and the direct tension or strain, instead of following the line of the spring, now passes through the end 25 and partly back through the curved portion 24, thus relieving the main spring of the constant tension in one direction, and making in effect a shorter and quicker acting spring for the short period when the lug 16 is above the level of the end 25, as the final tension is always in the reverse direction, either through the entire spring or through the first portion in the shape of a direct thrust from the end 25. The handle of the wrench is also so formed

as to enable independent accessory devices to be attached thereto. This is clearly shown in Fig. 2 in dotted lines.

The end of the handle is notched or sectionally cut away at 30, and in the end of the handle a large circular opening 31 is provided while further toward the front a smaller threaded set screw hole 32 is provided. I insert within the opening 31 a die 33 provided with a flange 34 adapted to rest against the face of the handle. This die is held in place by means of a plate 35 fitting thereover and extending over nearly the entire surface of the handle and having at its end a hook 36, adapted to fit over the notched end 30. A threaded bolt 37 passes through this plate and screws into the hole 32, making it possible to hold the retaining plate 35 securely in place.

I find when using a large sized die that use of the necessary force is apt to cause the plate to slip sidewise out of the ordinary notched end, consequently I have formed the end with an arc shaped center 30^a terminating in flat hollowed pockets 30^b. In this construction the arc face serves to hold the plate from slipping sidewise and mounting over the edge 30^c, the plate bearing against the inner faces 30^d of the notch.

I have heretofore had much trouble from the breaking of springs as in the prior construction, one end of a two leaf spring was confined as shown in Fig. 2, the ends 26 being inserted in a slot or recess in the handle 27, and the metal adjacent upset to pinch the springs firmly as shown at 28. In this construction, the metal of the unconfined portion of the spring at 29 was subjected to great strain and soon became crystallized at 28 and was easily broken there, making frequent repairs necessary.

In the assembling of the parts to form the complete tool, an upsetting operation was also necessary, which is entirely eliminated in my improved structure, as the spring 13 can be slightly compressed and slipped into place where it will remain firmly in position. Also in the old spring, two leaves were necessary in order to give extra stiffness and quick action when the spring was at its greatest tension. In the new spring consisting of a single leaf, I do away with

assembling two leaves and also the expense of two springs. In the old form of spring, difficulty was experienced by reason of the springs rusting when the tools were exposed to the elements or to the action of the salt air on the sea coast or on board ship. I obviate this difficulty by making the spring of phosphor bronze or some similar material that is absolutely rust proof.

The value of a tool of this character rests largely in the fact that it is at all times ready for use, and with the spring broken, the old form of wrench was valueless for automatic opening of jaws unless returned to the maker and a new spring put in place at considerable expense and such inconvenience to the owner of the tool.

In the present construction, however, with either the steel spring or phosphor bronze spring of this design in use, the springs are not so expensive, and extra springs can be furnished and inserted at a small cost, so if a spring after long use should break, a new one can be quickly inserted and the tool become in as good working condition as when new.

I claim:

In a wrench, the combination of a fixed jaw, a pivoted jaw, a handle having a recess in its forward end back of said pivoted jaw, a spring one end of which engages said pivoted jaw and tends to open the same and the other end of which spring is bent upon itself and sprung into the recess in the handle, means for closing the pivoted jaw against the tension of said spring, means for engaging the spring intermediate its ends during part of the movement of the pivoted jaw whereby said jaw is held under two different tensions during its movement, said means comprising an abutment formed by the extremity of the bent over portion of the spring, and a saddle attached to the fixed jaw and incasing the devices for operating the pivoted jaw.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

HENRY ADALBERT SMITH.

Witnesses:

F. H. DRURY,
MABEL REYNOLDS.