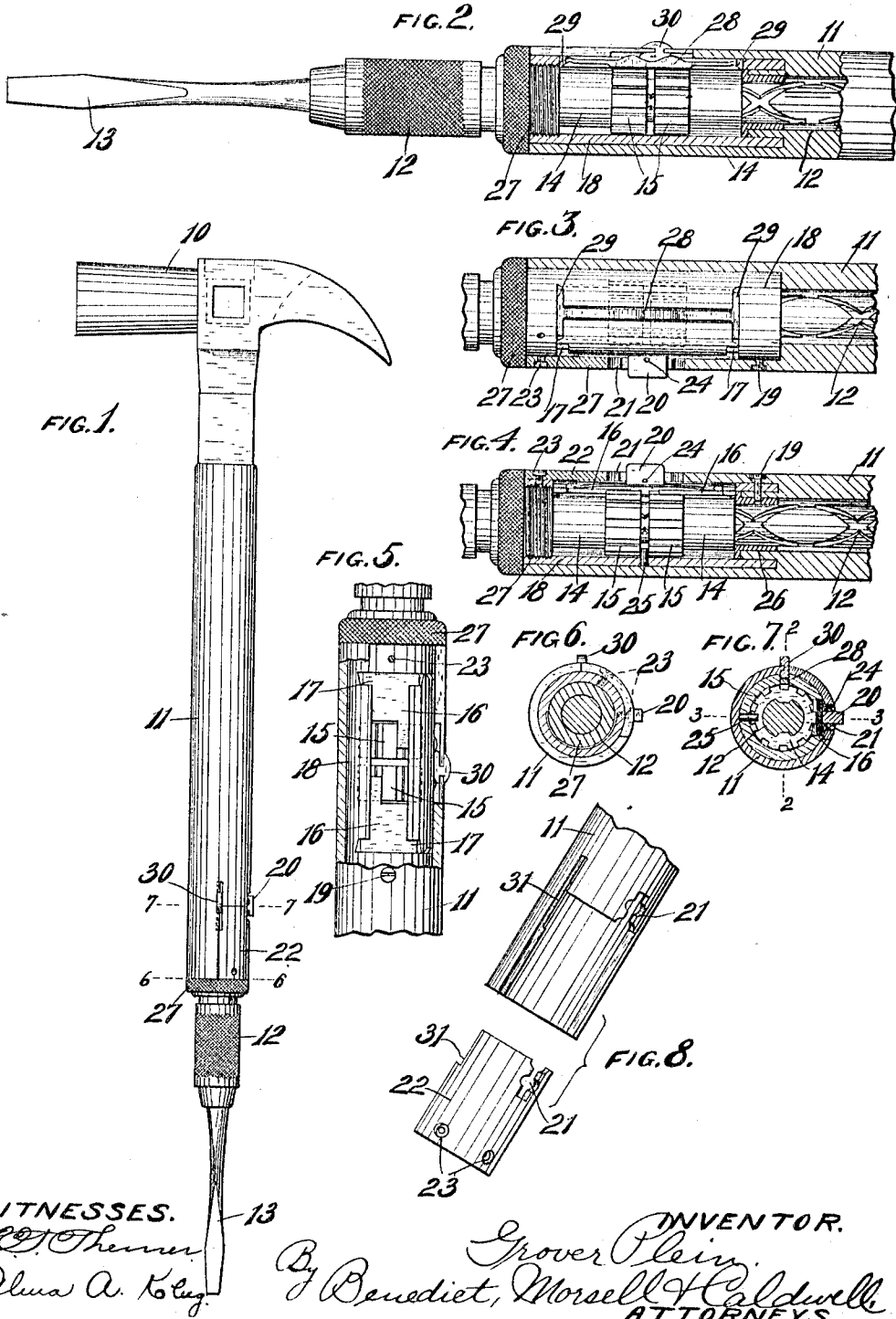


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 SPIRAL TOOL DRIVER.
 APPLICATION FILED JAN. 24, 1910.

1,107,701.

Patented Aug. 18, 1914.



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SPIRAL TOOL-DRIVER.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GROVER PLEIN, residing in Racine, in the county of Racine and State of Wisconsin, have invented new and useful Improvements in Spiral Tool-Drivers, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention has for its object to provide a convenient means for locking the spindle of a spiral tool driver, and comprises a spring retracted stop for engaging the ratchet teeth of the right and left nuts, which work on the double threaded spindle, and thereby prevent the spindle from turning in either direction and consequently from sliding outwardly.

With the above and other objects in view the invention consists of the spiral tool driver herein claimed and all equivalents.

Referring to the accompanying drawings in which like characters of reference indicate the same parts in the different views: Figure 1 is a plan view of a spiral tool driver constructed in accordance with this invention; Fig. 2 is an enlarged detail view of a portion thereof, with parts sectioned on the plane of line 2—2 of Fig. 7, showing the relation of the stop to the ratchet teeth of the nuts; Fig. 3 is a similar view on the plane of line 3—3 of Fig. 7, showing the manner of mounting the stop on the sleeve; Fig. 4 is a similar view on the same sectional plane, showing the relation of the spring slide dogs; Fig. 5 is a similar view on the same sectional plane as Fig. 2, showing the relation of the dogs to the ratchet teeth of the nuts; Fig. 6 is a transverse sectional view on the plane of line 6—6 of Fig. 1; Fig. 7 is a similar view on the plane of line 7—7 of Fig. 1; and Fig. 8 is a perspective view of the lower end of the handle casing and the removable plate thereof.

In these drawings 10 indicates a hammer head mounted on a tubular handle 11 which forms a casing for an automatic screw driver having a spindle 12 carrying a bit 13, slidably mounted therein to move in and out thereof to produce its turning movement to either the right or the left, according to which of two nuts 14 then has its ratchet teeth 15 engaged by one of the spring pressed dogs 16, said nuts having right and left hand threads fitting in right and left hand threads of the spindle. The dogs 15

are pivotally mounted as usual by having trunnion projections 17 fitting in notches at the end of the slot in a sleeve 18 through which the dogs play to engage the projections at their inner ends with the ratchet teeth 15 of the nuts 14. The sleeve 18 fits within the end of the casing 11 and is held in place therein by a screw 19, as shown in Fig. 4. A spring slide 20 bears at its opposite spring ends against the dogs 16 to press one or the other thereof into active engagement with the ratchet teeth of its nut or to hold both dogs in such active relation, according to the position of said slide in a notched groove 21 formed partly in the casing 11 and partly in a removable plate 22 which is fitted in an opening or cut-away portion in the end of the casing. The plate 22 serves to complete the cylindrical shape of the casing and is removably secured in place by one or more screws 23 passing through and threaded in the sleeve 18.

The spring slide 20 has lugs 24 on its sides to engage the notches of the slot 21 for holding it in its positions of adjustment. A spacing pin 25 projects inwardly from the sleeve 18 to space the nuts 14 apart, and a bushing 26 forms a bearing for the other end of one nut, which bushing is held in place by the screw 19 before mentioned, while a bushing 27 threaded in the end of the sleeve forms a bearing for the other end of the other nut.

So much of the mechanism as has been described is sufficient for the ordinary operation of the automatic screw driver, the bit being turned to the left or the right when the hammer head is used as a handle for sliding the casing over the spindle 12, according to whether the spring slide 20 is in position to press one or the other of the dogs into operative relation with the ratchet teeth of its nut. But, even when the slide 20 is in the intermediate position, for pressing both dogs into engagement with the ratchet teeth of the nuts, the outward movement of the spindle is permitted, since both dogs are so positioned as to allow of the escapement of the ratchet teeth of the nuts as turned by that movement, and consequently it is desired to provide mechanical means for locking both nuts against turning in either direction and thereby prevent such outward movement of the spindle when the tool is being used as a hammer. For this purpose a spring stop 28 is provided, having a mid-

dle portion with a straight edge for engaging the ratchet teeth of both nuts 14 and an outer cam edge by means of which it is forced inwardly, and having narrow oppositely extending end portions for giving spring action thereto with cross pieces 29 at their extremities fitting in grooves of the sleeve 18. The central portion of the stop works through a slot of the sleeve to make its engagement with the ratchet teeth of the nuts. A slide 30 fits in a slot 31 formed partly in the lower end of the casing 11 and partly between the wall of the cut-away portion of said casing and the edge of the plate 22, there being a groove in one side face of the slide 30 to receive the undercut wall of the slot, as shown in Fig. 7, to prevent the slide being lost from the slot. The inner edge of the slide bears on the cam surface of the stop for forcing said stop inwardly into engagement with the ratchet teeth of both nuts when the slide is moved in its slot from the position shown in Fig. 2.

By means of the stop of this invention both nuts 14 may be locked against turning in either direction and thus the spindle is prevented from turning and consequently is securely held within the casing when the tool is used as a hammer. The arrangement of parts is such that they may be assembled on the spindle and then the sleeve inserted in the casing and locked therein by means of the screw 19 and finally the spring slide 20 and the slide 30 may be placed in their respective slots and the plate 22 fastened in place by means of its screws 23. This construction enables the parts to be confined within the tubular casing presenting the appearance of the ordinary hammer handle.

What I claim as new and desire to secure by Letters Patent is—

1. A screw driver, comprising a tubular handle forming a screw driver casing, a spindle mounted to slide in and out of the casing, a bit carried by the spindle, a pair of nuts having right and left thread engagements with the spindle, dogs for rendering one or the other of the nuts effective to produce the turning of the spindle by preventing the turning of the nut in one direction, and a locking means independent of the dogs adapted in any position of the spindle to engage both nuts and prevent their turning in either direction, whereby the movements of the spindle may be prevented.

2. A screw driver, comprising a tubular handle forming a screw driver casing, a spindle mounted in the casing to move in and out thereof, a pair of ratchet toothed nuts contained within the casing and having respectively right and left thread engagements with the spindle, spring actuated dogs forming ratchet engagements with the ratchet teeth of the nuts for locking either of the nuts against turning in one direction

and permitting it to turn in the other direction, the turning direction of one nut when under ratchet engagement being opposite from the turning direction of the other nut when under ratchet engagement, and a stop independent of the dogs mounted in the casing and adapted in any position of the spindle to be moved into engagement with the ratchet teeth of both nuts for preventing their turning in either direction and thereby locking the spindle against movement.

3. A screw driver, comprising a tubular handle forming a screw driver casing, a spindle mounted in the casing to move in and out thereof, a pair of ratchet toothed nuts contained within the casing and having respectively right and left thread engagements with the spindle, spring actuated dogs forming ratchet engagements with the ratchet teeth of the nuts for locking them against turning on the movement of the spindle into the casing, a spring retracted stop within the casing independent of the dogs and adapted in any position of the spindle to engage the ratchet teeth of both nuts for preventing their turning, said casing being provided with a slot, and a slide mounted to move in the slot and adapted to engage the stop for forcing it into engagement with the ratchet teeth of the nuts.

4. A screw driver, comprising a tubular handle forming a screw driver casing, a sleeve fitting in the casing, a spindle mounted in the casing to move in and out thereof and surrounded by the sleeve, a pair of ratchet toothed nuts contained within the sleeve and having respectively right and left thread engagements with the spindle, dogs having trunnion bearings on the sleeve and working through a slot thereof to engage the teeth of the nuts to form ratchets therewith, a spring slide movable in a slot of the casing and bearing on the dogs for holding one or the other thereof in engagement with the ratchet teeth, a spring stop independent of the dogs having cross pieces at its ends seated on the sleeve and working through a slot thereof to engage the ratchet teeth of both nuts in any position of the spindle, and a slide working in a slot of the casing and engaging the stop to force it into locking engagement with the ratchet teeth of the nuts.

5. A screw driver, comprising a tubular handle forming a screw driver casing, a sleeve fitting within the casing, a spindle mounted in the casing to move in and out thereof and surrounded by the sleeve, a pair of ratchet toothed nuts contained within the casing and having respective right and left thread engagements with the spindle, said casing having a cut-away portion at its end, a plate to fit in said cut-away portion of the casing, said sleeve being provided

with slots, dogs having trunnion bearings at the ends of one slot of the sleeve and working through said slot to engage the ratchet teeth of the nuts, there being a
5 notched slot formed partly in the casing and partly in the plate, a spring slide movable in said notched slot and bearing on the dogs to force one or the other thereof into
10 engagement with the ratchet teeth of the nuts, lugs on the slide engaging the notches of the notched slot, a spring stop independent of the dogs having cross pieces at its ends seated on the sleeve at the ends of another slot thereof and working through said

slot to engage the ratchet teeth of both nuts 15 in any position of the spindle, there being an undercut slot formed partly in the casing and partly in the plate, and a slide grooved to fit in said undercut slot and engaging the stop to force it into engagement 20 with the ratchet teeth of the nuts.

In testimony whereof, I affix my signature, in presence of two witnesses.

GROVER PLEIN.

Witnesses:

MABEL L. PLEIN,
GEO. E. DAHL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."