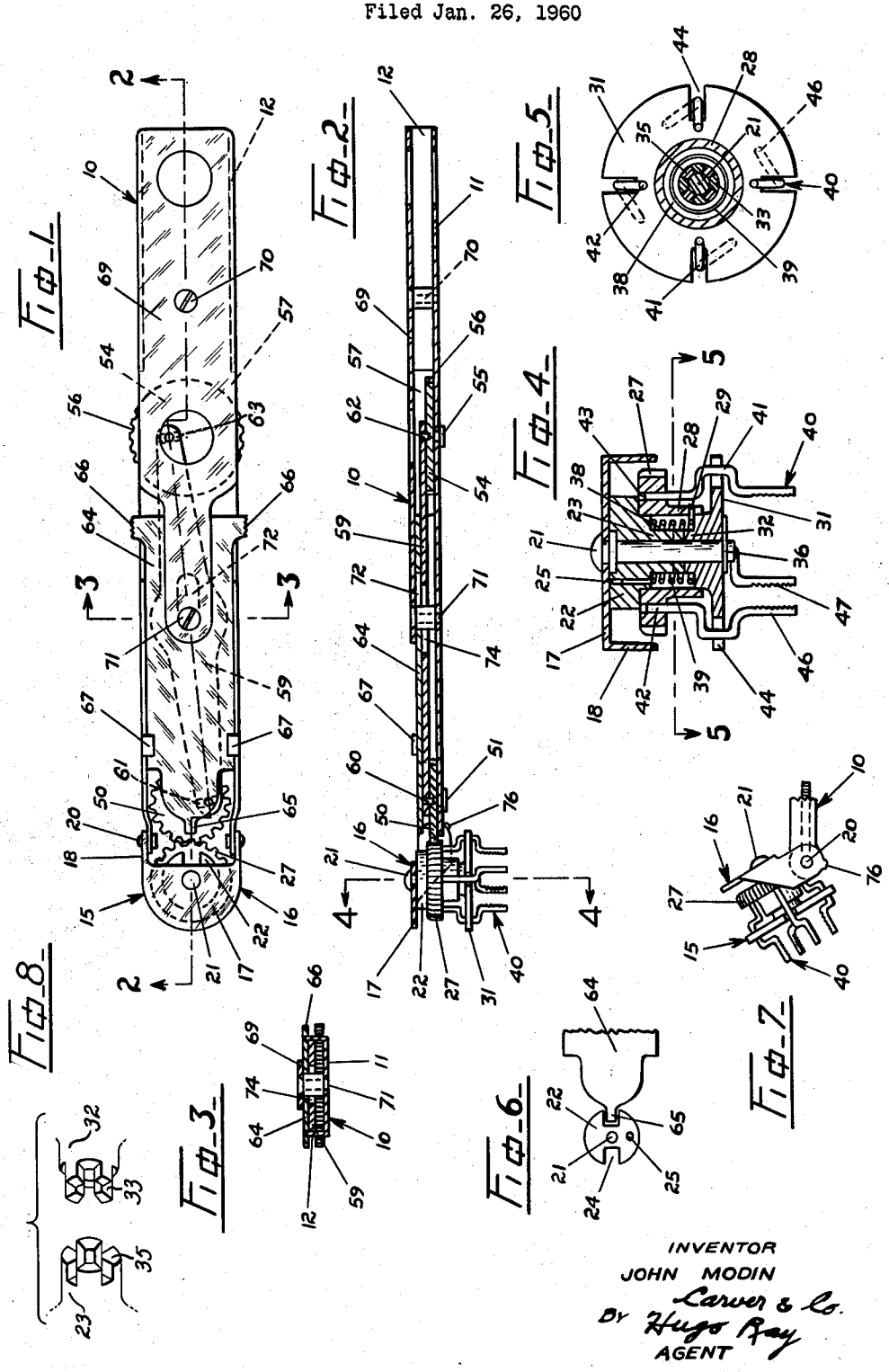
May 16, 1961 J. MODIN 2,984,134

NUT HOLDING AND STARTING TOOL

Filed Jan. 26, 1960



INVENTOR
JOHN MODIN
Carver & Co.
BY Hugo Ray
AGENT

United States Patent Office 2,984,134 Patented May 16, 1961

2,984,134

NUT HOLDING AND STARTING TOOL

John Modin, Suite 12, 1208 Burnaby St., Vancouver, British Columbia, Canada

Filed Jan. 26, 1960, Ser. No. 4,818

4 Claims. (Cl. 81—53)

My invention relates to improvements in tools of the type designed for use in starting or removing nuts or other fastening devices.

The object of the invention is to provide a device which will facilitate the difficult task of starting a nut on a bolt which is located in a confined space not accessible to the hand.

A further object is to provide means whereby the tool may be used either aligned with the bolt or disposed at right angles thereto.

These and other objects will appear in the following specification and be shown in the accompanying drawings in which:

Figure 1 is a plan of the tool.

Figure 2 is a longitudinal section taken on the line 2—2 of Figure 1.

Figure 3 is a transverse section taken on the line 3—3 of Figure 1.

Figure 4 is an enlarged vertical section taken on the line 4—4 of Figure 2.

Figure 5 is a sectional plan taken on the line 5—5 of Figure 4.

Figure 6 is a detail view showing the chuck collar and disc engaged by the slide and locked against rotation.

Figure 7 is an elevation of the chuck head disposed at an angle to the handle.

Figure 8 is an exploded perspective view showing the dogs coupling the collar to the chuck disc.

In the drawing like characters of reference indicate corresponding parts in each figure.

The numeral **10** indicates generally a handle which is preferably formed of a length of relatively shallow channel having a bottom wall **11** and side walls **12**. At one end of the handle the side walls **12** project beyond the wall **11** and swingingly mounted upon the projected side wall portions is a chuck head generally indicated as at **15**.

The head **15** consists of a hinge piece **16** having a semicircular top flange **17** and depending sides **18** which overlap the adjoining ends of the side walls **12** and are connected thereto by means of hinge pins **20**. A short spindle **21** is secured to the center of the flange **17** and rockingly mounted upon the spindle beneath the flange is a collar **22** having an integral sleeve **23**. The collar is provided with diametrically opposed recesses, **24**, see particularly Figure 6, and extending through said collar is an opening **25**. Rotatably fitted to the sleeve **23** is a gear **27** having depending skirt portion **28**. Beneath the gear **27** the spindle **21** is fitted with a chuck disc **31** and integrally formed with said disc is a sleeve **32** which is provided at its upper end with a number of circumferentially spaced dogs **33**. The dogs **33** engage corresponding dogs **35** formed on the lower end of the sleeve **23** so that the disc **31** and the collar **22** are locked together to rotate in unison about the spindle **21**. A snap ring or other suitable fastening device **36** is secured to the spindle beneath the disc to hold the several parts together. The sleeves **23** and **32** are spaced from the inner periphery

of the skirt portion **28** to define an annular space **38** and housed within said space is a torsion spring **39**. One end of the spring **39** projects into the opening **25** in the collar **22** and the opposite end of said spring is similarly anchored as at **29** in the skirt portion **28**.

The head **15** is provided with a plurality of jaws **40**, in this instance four in number and each jaw consists of a piece of wire which is cranked as at **41** intermediate its length. The upper ends **42** of the jaws are rotatably received in suitably spaced openings **43** formed in the gear **27** and the cranks **41** slidably extend through radial slots **44** provided in the periphery of the disc **31**. As best shown in Figure 5 the lower ends **46** of the jaws are offset substantially 45° from their upper ends **42** and the inner opposing edges of the ends **46** are provided with teeth **47**, see particularly Figure 4. Prior to fitting the snap ring **36** to the spindle **21** the dogs **33** and **35** are disengaged and the disc **31** is rotated to apply a suitable amount of tension to the spring **39**. This spring pressure is such as to rotate the disc **31** in counter-clockwise direction as viewed in Figure 5 and the movement of the disc swings the wire jaws about vertical axes so that the lower ends **46** are moved toward one another. In other words the jaws **40** are normally held in closed position by the pressure of the spring **39**.

The gear **27** is engaged by a gear **50** which is rotatably secured to the bottom wall **11** of the handle **10** by means of an axle rivet **51**. Intermediate the length of the handle **10** is a wheel **54** is rotatably mounted upon an axle rivet **55** which also is secured to the bottom wall **11**. The notched periphery **56** of the wheel **54** projects through gaps **57** formed in the side walls **12** and said wheel and the gear **50** are operatively connected by a crank arm **59**. A pin **60** is fitted to one end of the arm **59** and projects into a shallow arcuate slot **61** formed in the gear **50**. The opposite end of the arm **59** is similarly fitted with a pin **62** and this pin projects into a shallow arcuate slot **63** formed in the wheel **54**.

Above the arm **59** a slide **64** is mounted in the handle of the tool and this slide is provided at one end with a centrally disposed tongue **65** and at the other end has serrated lugs **66** which project beyond the side walls **12** of said handle. A pair of inwardly directed tabs **67** are formed on the walls **12** to serve as a guide for the slide **64**. The handle is fitted with a cover plate **69** which is secured thereto by screws **70** and **71**. The screw **71** extends through a slot **72** provided in the slide **64** so that said slide may be moved toward and away from the head **15** as required. A centrally disposed slot **74** is formed in the crank arm **59** and the screw **71** projects therethrough, thus permitting the arm to slide back and forth as it is rocked within the handle.

In normal position of use the chuck head **15** is disposed at substantially right angles to the handle as shown in Figure 2. When in this position the underside of the bottom wall **11** is engaged by stops **76** formed on the sides **18** of the hinge piece **16** so that the head cannot swing inwardly beyond the vertical position. However, the head may be swung out into substantial alignment with the handle if so desired or it may be disposed in any intermediate position as illustrated in Figure 7.

If the tool is to be used to start a nut on a bolt which is inaccessible to the user's hand the operating procedure is as follows. The slide **64** is advanced to enter the tongue **65** into a recess **24** in the collar **22** and in this way the collar and the disc **31** are held against rotation. The wheel **54** is given a partial turn in the appropriate direction to rock the arm **59** and turn the gear **50** and drive is transmitted from said gear to the gear **27**. Since the upper ends of the jaws **40** are journalled in the gear **27**, movement of said gear causes the cranks **41** to travel

outwardly along the slots 44 and this results in the lower ends 46 being moved to open position. The jaws are placed over the nut and the wheel is released so that the ends 46 of the jaws are snapped into a gripping engagement with the nut by the spring 39. When the slide 64 is withdrawn to retract the tongue from the collar the tool may be used to place the nut against the end of its bolt and by again rotating the wheel 54 the nut may be started on the bolt thread. A nut being removed from a bolt is backed off by the use of conventional wrenches until only a few turns are required to release the nut. The present tool may then be used to reach in and grip the nut which can be completely removed from the bolt without danger of the nut being dropped.

What I claim as my invention is:

1. A tool comprising a handle, a head secured to one end of the handle, a disc rotatably mounted in the head and having radial slots, a driven member in the head rotatably mounted with respect to the disc, chuck jaws carried in the driven member, said jaws having cranked portions slidably extending through the slots in the disc, a drive member carried by the handle in engagement with the driven member of the head, means on the handle for rotating the drive member and means for selectively locking the disc against rotation.

2. A tool as claimed in claim 1 and spring means normally retaining the chuck jaws in closed position.

3. A tool comprising a handle, a head hingedly secured to one end of the handle, a spindle in the head, a disc rotatably mounted on the spindle and having radial slots,

a driven member mounted on the spindle for rotation with respect to the disc, chuck jaws rockingly mounted in the driven member, said jaws having cranked portions slidably extending through the slots in the disc, a torsion spring connecting the disc and the drive member to urge the chuck jaws to closed position, a drive member journalled on the handle in engagement with the driven member of the head, a wheel carried by the handle, a crank arm operatively connecting the wheel and the drive member and means for selectively locking the disc against rotation.

4. A tool comprising a handle, a head hingedly secured to one end of the handle, a spindle carried by the head, a disc rotatably mounted on the spindle and having radial slots, a collar secured to the disc and having a peripheral recess, a driven member rotatably mounted on the spindle, chuck jaws rockingly mounted in the driven member, said jaws having cranked portions slidably extending through the radial slots in the disc, a spring connecting the disc and the driven member to urge the jaws to closed position, a drive member carried by the handle in engagement with the driven member of the head, a slide on the handle, said slide having a tongue adapted to be projected into the peripheral recess in the collar and means on the handle for rotating the drive member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,745,560	Seilheimer	Feb. 4, 1930
2,491,133	Randrup	Dec. 13, 1949