Dec. 26, 1944. W. W. PIKE 2,365,839

SPEED WRENCH

Filed June 29, 1943

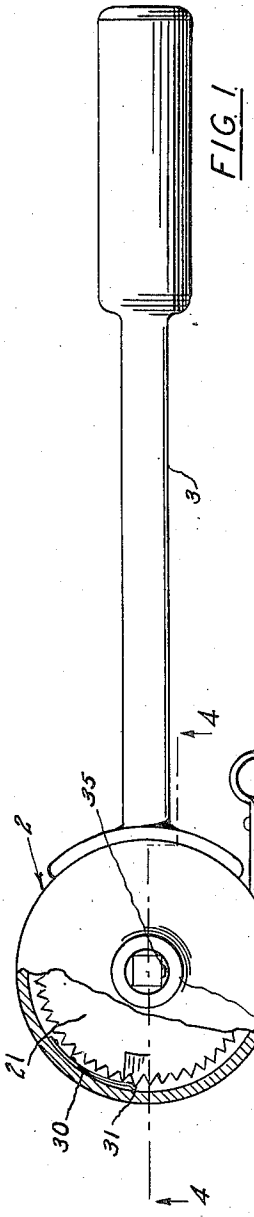


FIG. 1

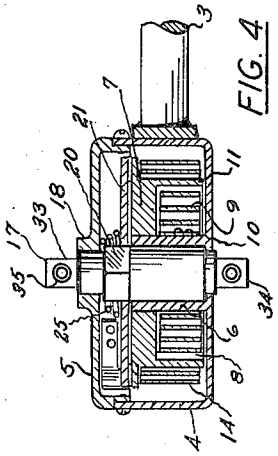


FIG. 4

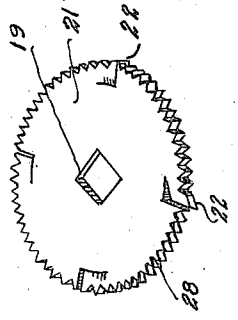


FIG. 5

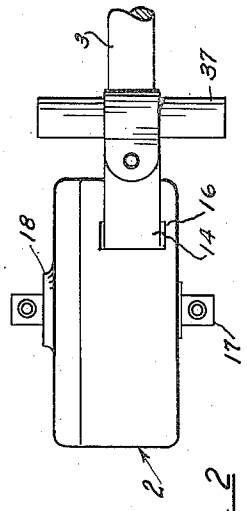


FIG. 2

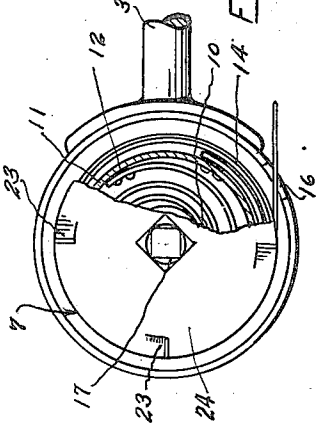


FIG. 3

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SPEED WRENCH

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Application June 29, 1943, Serial No. 492,744

2 Claims. (Cl. 81—58)

This invention pertains to speed wrenches and has for its objects, first, the provision of a wrench whereby a nut can be rapidly twisted or turned on or off a bolt where there is little torsion required, and may optionally be operated as a ratchet wrench;

Second; the provision of a combination speed wrench and ratchet wrench, wherein rapid rotation of the wrench socket holding element is attained by the unwinding of a steel tape from a bobbin which transmits rotary motion thru a ratchet element and is adapted to accumulate a plurality of unwinding movements; the parts being arranged so that the ratchet element will act in a direct manner between the socket holding element and a supporting case when the tape is fully wound;

Third; the provision of the above wrench wherein means are included for maintaining the tape wound, and for preventing counter rotation of the socket holding element.

Other objects will appear hereinafter.

In the drawing Figure 1 is a plan view of the entire tool; Figure 2, a side elevation view of the body housing; Figure 3, a plan view with part of the upper housing broken away to show the interior construction. Figure 4 is a sectional side view taken on line 4—4 Figure 1, and Figure 5 is a prospective view of the ratchet disk.

Similar numbers refer to similar parts in all views.

To the outside of the body case 2, a handle 3 is attached extending radially. The case includes a lower portion 4, into which the upper half 5 is fitted. Within the center of the lower half an inwardly extending boss 6 forms a bearing. Bobbin 7 bears on the outside of this boss and revolves within the case part 4. An annular groove or counterbore 8 within this bobbin houses a spiral return spring 9 having its inner end secured to the outside of boss 6 at 10 and its outer end to the annular partition 11 of the bobbin at 12. Steel tape 14 is coiled around the outside of this partition with its inner end attached at 15 and its outer end extending through a slot 16 in case part 4.

Spindle 17 extends axially through case 2 with its lower end bearing within boss 6 and its upper end bearing in boss 18 in case part 5. Above lower part of this spindle 17, which is rounded to form a journal, is a square shank 20 sized to loosely fit a square hole 19 in ratchet disk 21. This ratchet disk has downwardly extending ratchet detents 22 formed on its lower face by cutting and depressing the metal near its rim as shown particularly in Figure 5. These detents are faced as shown so as to impart clockwise rotation to disk 21 by engagement with lugs or teeth 23 similarly formed on the upper face 24 of bobbin 7. A spiral helix spring 25 surrounding spindle 17 holds disk 21 against bobbin face 24. The bobbin drives the ratchet disk when tape 14 is unwound by pulling. A second set of ratchet teeth 28 is formed around the periphery of disk 21. These ratchet teeth are formed by stamping notches.

A light flat spring 30 forming a pawl is fastened to the inside of case part 4 with the free end bearing against the faces of this ratchet to prevent clockwise movement of disk 21. This prevents spindle 17 from backing up in case there is excessive friction between the bobbin and the ratchet disk. The free end of spring 30 is provided with an angular bend 31 so that under excessive pressure in a reverse direction the detent will release.

Squared bosses 33 and 34 are formed at each end of spindle 17 adapted to receive the squared holes in wrench heads or other tool appliances which may be retained by spring loaded bearing balls 35.

In use the required heads are slipped on to either bosses 33 or 34, depending on which direction the nut or screw is to be turned, and the wrench head or other tool applied to the work.

When there is considerable distance to be taken up at slight resistance the wrench is operated by pulling the crosshandle 37 on the outer end of tape 10 while the wrench head is held in position on the nut by grasping the handle 3. This motion unwinds tape 14 from the bobbin and as the lugs on the top face of the bobbin engage detents on disk 21 rotary motion is imparted to spindle 17. When the tape is released the return spring 9 rewinds bobbin 7 and thus retracts and rewinds the tape. Pawl 30 prevents a reverse motion of spindle 17 in case the nut on which the device is used has not sufficient frictional resistance to neutralize the frictional engagement between the bobbin and the disk during the takeup motion.

As the nut meets resistance, upon tightening, the handle may be worked arcuately to give the case and interment rocking motion. This motion is communicated through disk 21 to spindle 17 as soon as cross handle 37 is firmly engaged against the sides of slot 16. The mechanism then operates as a ratchet wrench. Reversal of motion of the wrench head, as applied to nuts or bolt heads may be had by inserting the opposite end of the spindle in the wrench head.

Having now described my invention and explained its use, I realize that, to those familiar with the art, many variations and substitutes may suggest themselves, all of which might well remain within the intention and spirit of the invention, therefore I wish to be limited only by the following claims.

I claim:

1. A speed wrench comprising, in combination, a cylindrical case consisting of an upper part and a lower part fitted thereon, a peripheral slot formed in said case parts, a radially extending handle attached to said lower case part and an axially positioned bearing boss formed in said lower part, a spindle journaled within said case having squared bosses at each end adapted to receive and yieldably retain wrench heads or the like, a bobbin having an axially concentric annular recess opening on its bottom face and ratchet engaging lugs on its upper face bearing on said bearing boss in said case, a ratchet disk attached to said spindle to turn therewith and have axial movement thereon having detents adapted to engage said lugs on said bobbin when said bobbin is rotated in the direction imparted by withdrawing a metal ribbon wrapped around said bobbin, and having notches formed around its periphery, a spring urging said ratchet disk toward said bobbin face, a metal ribbon wound around said bobbin with its inner end attached thereto and its free end extending thru said slot in said case, a handle attached to the free end of said ribbon and adapted to engage the sides of said slot and prevent the free end of said ribbon from entering therein, a return spring operative intermediate said case and said bobbin adapted to resiliently maintain said ribbon wound on said bobbin, and a yieldable spring element attached to the interior of said case adapted to frictionally engage the said notches on said ratchet disk to impede rotation of said ratchet disk in the direction imparted by said return spring.

2. A speed wrench comprising, in combination, a cylindrical case having a peripheral longitudinally extending slot and a radially extending handle and an axially positioned bearing boss; a spindle, having squared bosses at each end adapted to receive and retain wrench heads, journaled in said bearing boss; a bobbin, having an outer annular channel adapted to receive convolutions of a steel tape, a counterbore forming an inner annular recess, and a disk like face provided with raised ratchet teeth, journaled within said case on said bearing boss; a return spring wound within the recess in said bobbin with its inner end attached to said bearing boss and its outer end attached to said bobbin; a steel pull tape wound around the outer annular channel of said bobbin, with the inner end attached to said bobbin and the outer end provided with a cross handle; a ratchet disk keyed to said spindle and adapted to slide axially thereon, having depending ratchet detents on its lower face adapted to engage the raised ratchet teeth on said bobbin, to attain rotation therefrom in one direction, and notches formed around its periphery; a spring resiliently holding said ratchet disk in operative engagement with said bobbin; and a spring detent attached to the interior of said case adapted to yieldably engage said notches on the periphery of said ratchet disk, said pull tape being adapted to extend tangentially out thru the slot in said case, and said handle being proportioned to engage the case adjacent said slot when said tape is fully wound on said bobbin.

WILLIAM W. PIKE.