

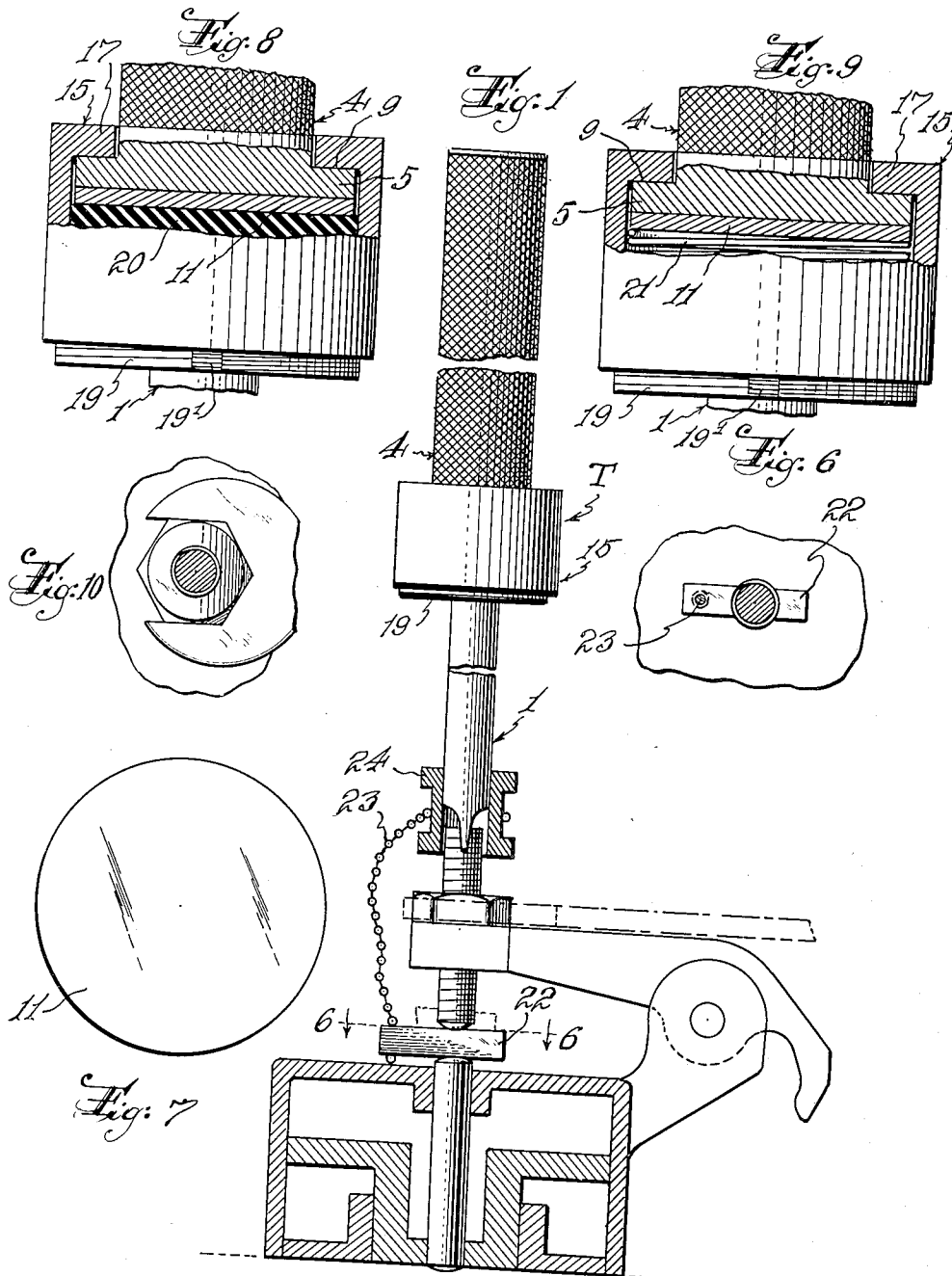
Jan. 24, 1956

J. W. DAVIES ET AL
TORQUE-RELEASE WRENCH

2,731,864

Filed Jan. 8, 1954

2 Sheets-Sheet 1

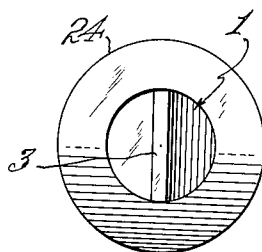
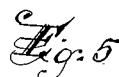
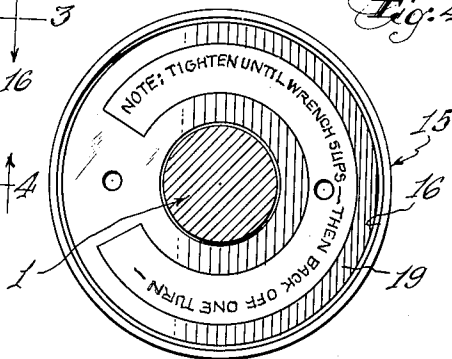
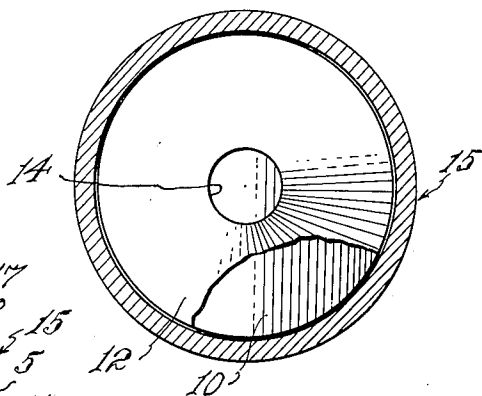


Inventors:
JOHN W. DAVIES
MARTIN L. KAPIN
WILLIAM C. KOTHE

J. W. DAVIES ET AL
TORQUE-RELEASE WRENCH

Filed Jan. 8, 1954

2 Sheets-Sheet 2



Inventors:
JOHN W. DAVIES
MARTIN L. KAPIN
WILLIAM C. KOTHE

2,731,864

TORQUE-RELEASE WRENCH

John W. Davies, Roseland, Martin L. Kapin, Roselle, and William C. Kothe, Rutherford, N. J.; said Kapin and said Kothe assignors to said Davies

Application January 8, 1954, Serial No. 402,921

1 Claim. (Cl. 81—52.4)

My invention relates to an adjustment tool for Fordomatic and Mercomatic front servo bands, and has for its primary purpose to provide a tool of this character which is cheap to manufacture, sturdy in construction, simple to operate, and at the same time accurate in performing its special purpose. Heretofore tools of this nature have been complicated in construction and inaccurate in performance due to the awkward method employed to accurately set torque and operate the tool. In my improved tool I have incorporated advantageous novel features heretofore unknown and have eliminated all of the faults of the past prior art encountered in tools of this nature. Having thus set forth the advantages of my new adjusting tool, attention is now called to the drawing and specification in which like characters refer to like parts.

Fig. 1 represents a preferred form of my improved tool, shown in position to adjust a front servo band.

Fig. 2 is a vertical central section through my improved tool.

Fig. 3 is a section taken on the line 3—3 in Fig. 2.

Fig. 4 is a section taken on line 4—4 in Fig. 2.

Fig. 5 is a view taken on the line 5—5 in Fig. 2.

Fig. 6 is a section taken on the line 6—6 in Fig. 1.

Fig. 7 is a plan view of one of the wear discs incorporated in my improved tool.

Figs. 8 and 9 are fragmentary elevations, partly in section and showing, respectively, two modifications of my improved torque-setting unit incorporated in my improved tool, and

Fig. 10 illustrates the method used to release the lock-nut of the servo adjusting screw.

Referring now in detail to the drawing, my improved tool T comprises a shank or tool member 1 having at its upper end an enlarged, disc-like head 2 and being provided at its opposite end with a screw-engaging portion 3 adapted, as shown in Fig. 1, to engage the outer end of the adjusting screw of the servo band.

Co-acting with the shank member 1 and in vertical axial alignment therewith is a cylindrical handle member 4 provided at its lower end with a disc-like enlargement 5 similar in dimensions to the enlarged head 2 of the shank 1. Both the enlarged head 2 of the shank 1 and the disc-like enlargement 5 of the handle member 4 serve a double purpose, to wit, to provide a flat, seat area 6 and a shoulder area 7 on the shank 1 and a flat, seat area 8 and a shoulder area 9 on the handle member 4. The purpose of these seat and shoulder areas will later appear. Seated upon the seat area 6 is a wear plate 10, equal in outside diameter to the outside diameter of the seat area 6. Seated against the seat area 8 is a wear plate 11. Seated between these two wear plates 10 and 11 are spring discs 12 and 13 which are identical in outside diameter to the outside diameter of the seats 6 and 8 and the wear plates 10 and 11. Discs 12 and 13 are identical to each other. The center area of each disc is offset with respect to the outer circumference of the disc to produce a flattened, cone-like member of thin, spring steel. The center of each disc is cut away as indicated

at 14 to provide a flat, circular area at this point. In assembling the two discs into their proper seating position upon their respective seats, they are seated with their circumference areas abutting their respective seats and with their central, flat areas abutting each other. This forms a spring-like convex-concave structure between the plates 10 and 11.

An adjustable housing for discs 12 and 13, parts 2 and 5, and plates 10 and 11 is provided by a hollow, open-ended collar member 15 having an internally-threaded portion 16, a shoulder-engaging portion 17, and an aperture 18. This member 15 is slipped over the handle member 4 until its area 17 engages the shoulder of the enlarged portion 5 of the handle 4. An externally-threaded spanner nut 19 is then slipped over the shank 1 of the tool into engagement with the threaded portion 16 of housing 15, and is tightened against the shoulder 7 of the enlarged area 2 of the shank 1. It will be seen from this construction that the shaft 1 and the handle 4 have been permanently joined by a resilient coupling construction capable of axial adjustment simply by manipulating nut 19 to compress, more or less, the spring discs 12 and 13.

Rotation of the handle 4 causes the entire structure to rotate. However, if there is enough restraining torque on shaft 1, the handle will rotate without rotating the shaft 1, due to slippage of adjacent parts of the spring-coupling construction because of insufficient friction-grip of the shoulders 2 and 5. The amount of grip corresponds directly with the extent to which discs 12 and 13 are compressed by adjustment of nut 19. It will thus be seen that by adjusting the spanner nut the tool may be set to any torque-setting desired, which, in the case of the front servo band adjustment, will require a torque-setting of 10 inch-lbs. In Figs. 8 and 9 I have shown modified forms of compression units, that shown in Fig. 8 being in the form of a solid rubber-like pad 20 and that shown in Fig. 9 being a coil spring 21. To assure a correct spacing between the servo adjusting screw and the coating rod, a gauge block 22 may be fastened to the tool by any suitable flexible means such as a chain 23 and a collar 24 force-fitted about the lower end of the shank 1. This collar may extend slightly below the end of the shank 1 to provide a keeper so that in use the tool, as shown in Fig. 1, will not slip off the end of the adjusting screw.

In order to permit the tool to be quickly adjusted to the proper inch-pounds, the spanner nut 19 is provided with graduations 19' which, by calibration, show the amount of compression produced within the spring coupling.

In using tool T it is important, first, to set it for the correct torque. In the case of the so-called Fordomatic and Mercomatic front servo bands, nut 19 is turned one way or the other, until the scale 19' shows a setting for ten inch-pounds. The oil is drained, and the pan removed. The tool is now applied to the adjustment screw, as shown in Fig. 1, and the screw held against rotary movement while the associated lock nut is loosened. The adjustment screw is now backed off a little. As is also shown in Fig. 1, the quarter-inch gauge block or spacer 22 is now placed between the servo lever and the servo stem, and handle 4 is turned clockwise to tighten the adjustment screw until the spring friction clutch or torque-release means slips. By his sense of touch, the mechanic knows when this happens and then backs off the screw one complete turn. The correct setting has been made, so the screw is held against rotary movement and the lock nut is tightened. The pan is now replaced. In making the setting as just explained, the mechanic takes care not to press down on handle 4 because this would change the torque-release point as previously fixed by the

3

setting of nut 19, since any downward pressure on handle 4 would diminish the pressure at 8 and 9 and increase the pressure at 6 and 7. In such case, these changes in pressure might not compensate for each other.

The various forms of clutch means shown in Figs. 2, 8 and 9, respectively, for a predetermined torque-release, are similar to those shown in my co-pending application Serial No. 402,922, filed January 8, 1954.

The three forms of torque-release means disclosed in Figs. 2, 8 and 9 are similar, respectively, to those shown in Figs. 4, 9 and 10 of my copending application Serial No. 402,922.

What I claim is:

In a torque-release wrench of the character described, a tool member and a handle member held and coupled together in aligned and longitudinally-spaced relation with respect to each other, said members being provided at the respective adjacent ends thereof with similar circular flanges, and coupling means holding said members in aligned and longitudinally-spaced relation and for rotation relatively with respect to each other about their common axis; said coupling means comprising a cup-shaped and cylindrically-shaped housing fitted loosely on said handle member and engaging said flange thereof, a

4

nut fitted loosely on said tool member and threaded into the open end of said housing and engaging said flange of said tool member, circular plates disposed between said flanges and within said housing and having a loose fit with respect to the latter, one of said plates being flush with and engaging one of said flanges, one of said plates being flush with and engaging the other of said flanges, and resilient means disposed between said plates and compressed between the same to a degree sufficient to maintain a condition whereat said plates are pressed firmly against the respective adjacent faces of said flanges.

References Cited in the file of this patent

UNITED STATES PATENTS

15	1,253,398	Lewis	Jan. 15, 1918
	1,433,590	Zeigler	Oct. 31, 1922
	1,985,916	Coates et al.	Jan. 1, 1935
	2,411,600	Spase	Nov. 26, 1946
20	2,429,561	Miller	Oct. 21, 1947
	2,576,069	Hoag et al.	Nov. 20, 1951

FOREIGN PATENTS

	703,769	Germany	Mar. 15, 1941
25	884,780	Germany	July 30, 1953