

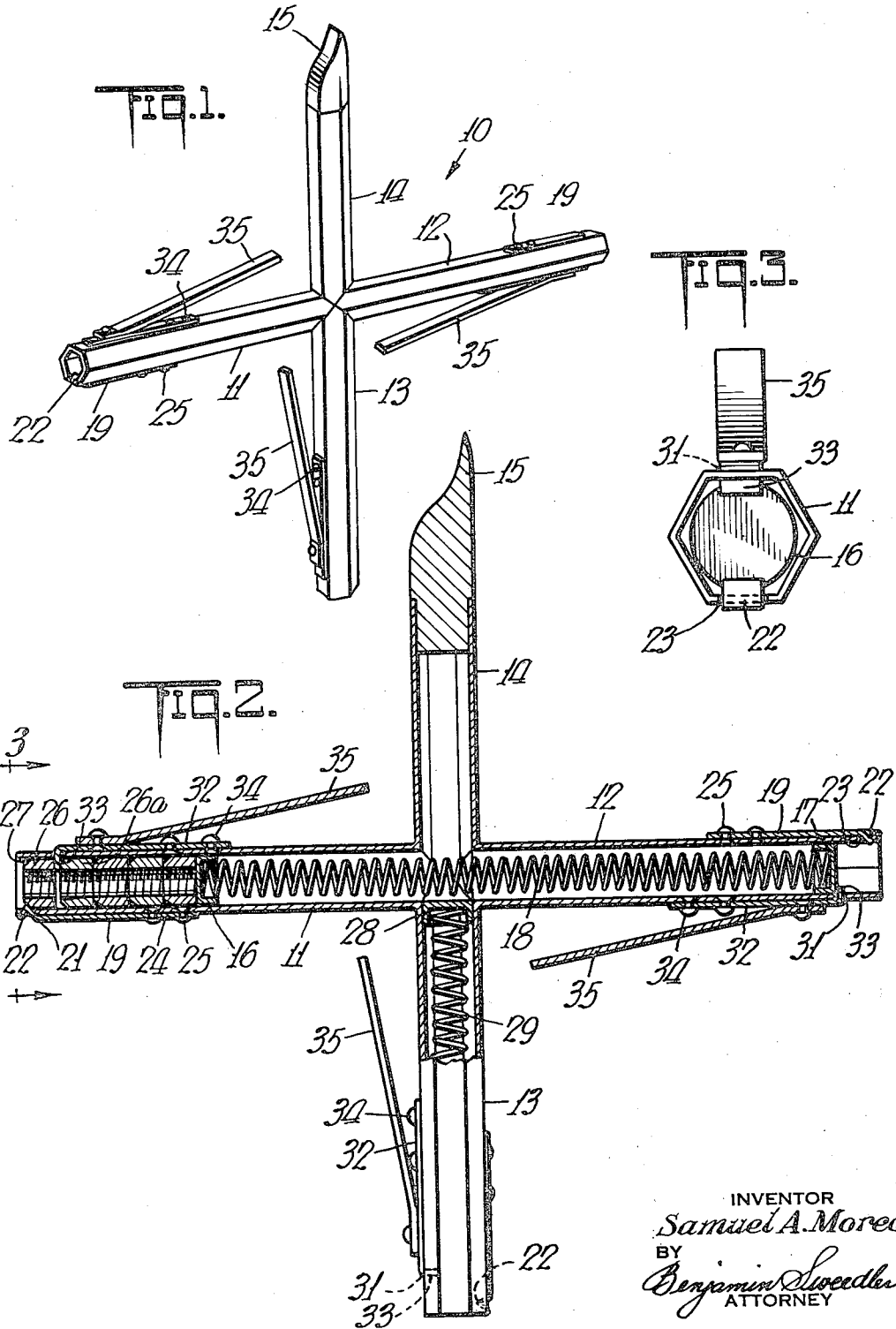
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S. A. MOREO  
MAGAZINE SOCKET WRENCHES

2,770,157

Filed May 24, 1954

2 Sheets-Sheet 1



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FIG. 4.

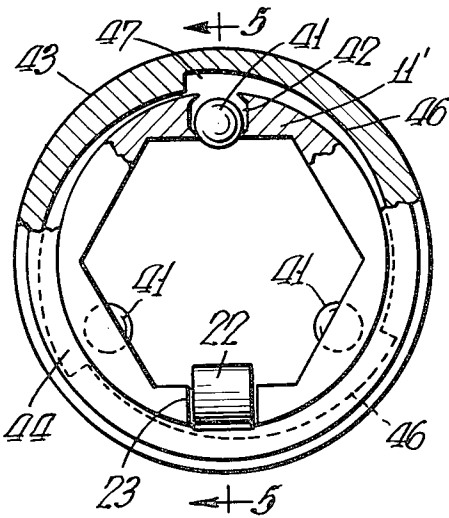


FIG. 5.

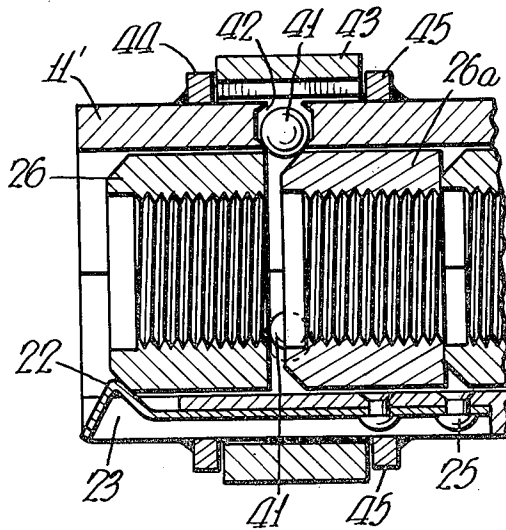


FIG. 6.

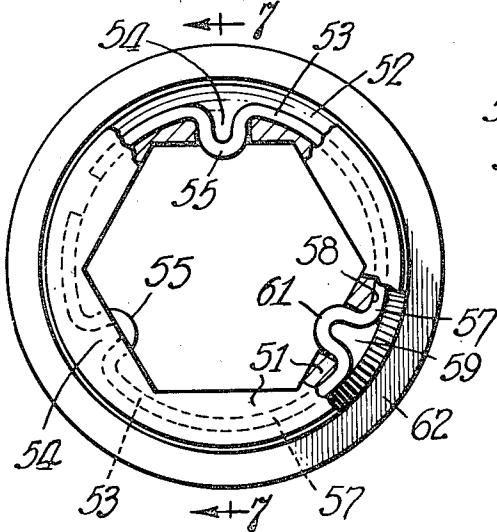
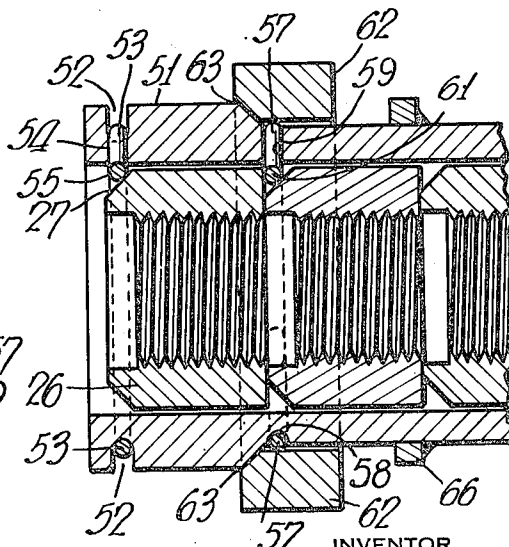


FIG. 7.



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MAGAZINE SOCKET WRENCHES

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2 Claims. (Cl. 81—125)

This invention relates to a magazine socket wrench designed to hold a plurality of nuts or bolts of the type used for securing detachable vehicle wheels.

It is among the objects of the present invention to provide a magazine socket wrench having a holding member at the forward end of the magazine for retaining threaded members, such as nuts or bolts, within the magazine, and having a second holding member spaced from the first holding member a distance equal to the thickness of a nut or the length of the head of a bolt, which second holding member functions to retain within the magazine succeeding threaded members while the leading threaded member is being fastened, and which second holding member is positioned to apply positive and controlled pressure on the head of the threaded member during the initial threading thereof, which wrench is of rugged construction in that the walls of the magazine are imperforate to the rear of the relatively small openings through which the second holding member extends, so that the wrench can be used to apply the necessary pressure to firmly secure nuts or bolts fastening the detachable wheels of automotive vehicles and which wrench is also so constructed that the second holding member can be moved independently of the first holding member to permit the ready entry of the threaded members into the magazine, one by one, as they are removed, and to retain all threaded members within the magazine once the wrench is removed from contact with the head of a threaded member.

Other objects and advantages of this invention will be apparent from the following detailed description thereof.

In the preferred embodiments illustrated on the drawings the invention is shown incorporated in a magazine socket wrench of the cross-arm type, the individual magazines being adapted to receive different sized nuts, and the present description will be confined to the present illustrated embodiment of the invention. It will be understood, however, that the novel features and improvements are susceptible to other applications, such, for example, as magazine socket wrenches containing only one chamber or a plurality of such chambers not arranged in the form of a cross-arm, or chambers designed to receive bolts or threaded studs. Hence, the scope of this invention is not confined to the embodiment herein described.

In the accompanying drawings forming part of this specification, and showing for purposes of exemplification, preferred forms of this invention, without limiting the claimed invention to such illustrative instances,

Figure 1 is a perspective view of a magazine socket wrench embodying this invention;

Figure 2 is a vertical section partly in elevation through the magazine socket wrench of Figure 1;

Figure 3 is a fragmentary end elevation, as seen from the viewing line 3—3 of Figure 2 except that an empty magazine is shown;

Figure 4 is a vertical section partly in elevation, in

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general, similar to the elevation of Figure 3, but showing a modified form of detent holding means for retaining succeeding nuts within the chamber while a leading nut is being tightened onto its stud or is being removed from the chamber;

Figure 5 is a fragmentary vertical section taken in a plane passing through line 5—5 of Figure 4, but showing a plurality of nuts in the magazine;

Figure 6 is a vertical section, partly in elevation, in general similar to the elevations of Figures 3 and 4, but showing still another modified form of wrench embodying this invention; and

Figure 7 is a vertical section taken in a plane passing through line 7—7 of Figure 6, but showing a plurality of nuts in the magazine.

Referring to the drawings 10 indicates a cross-arm type of socket wrench constituted of intercommunicating chambers 11 and 12 having at right angles thereto a third chamber 13 and an arm 14 provided with a prying tool 15 at its end for removing the hub cap of a vehicle wheel, etc. Each of the chambers 11, 12 and 13 desirably is hexagonal in cross section, the three chambers being dimensioned differently to accommodate different sizes of nuts or bolt heads.

Slidably mounted within the intercommunicating chambers 11 and 12 are cups 16 and 17 having therebetween a coil spring 18 which forces the cups 16 and 17 away from each other and towards the mouth ends of the chambers 11 and 12.

Spring 18 through cups 16 and 17 at all times exerts pressure on the nuts in the chambers in a direction towards the mouth ends of the chambers. Desirably, the ends of the spring 18 are fastened to the cups 16 and 17 and the resultant assembly is suitably secured within the chambers 11 and 12 so that the cups 16 and 17 can move longitudinally but the assembly remains within the confines of the chambers at all times. Positioned at the mouth end of each chamber is a spring 19 having its forward end 21 bent to provide a yieldable holding arm 22 extending through a slot 23 in the chamber wall. Spring 19 may be in the form of a flat narrow spring plate having its rear end 24 riveted or spot welded to the wall of the chamber, as at 25. Thus, holding arm 22 at the forward edge of each chamber releasably retains the nuts or bolts within the chamber. Movement of the leading nut 26, for example, when this nut is threaded onto its receiving stud, forces the arm 22 in a direction away from the chamber walls to permit the withdrawal of this nut. This motion of the spring is facilitated by the cam action which takes place between the inclined forward edge 27 of each nut and the holding arm 22.

Chamber 13 is provided with a spring-retaining cup 28 suitably secured to the inner end of the chamber. A coil spring 29 is confined between this member and a slidable cup within chamber 13 which is similar to cups 16 or 17. Coil spring 29 through this slidable cup thus exerts pressure on the threaded members within chamber 13 and urges them towards the mouth end of this chamber.

Each casing wall is provided with an opening 31, desirably spaced from the mouth end of the casing a distance approximately equal to the thickness of a nut or of the head of a bolt. Detent holding means, in the form of the invention shown in Figures 1 to 4, comprises a leaf spring 32 having its forward edge bent at right angles to form a retractable stop 33 extending through the opening 31. The leaf spring 32 has its rear end riveted or otherwise suitably secured as by spot welding to the casing wall, as at 34. Desirably the leaf spring 32 and spring 19 on each chamber are disposed on directly opposite walls thereof, as clearly shown in Figure 3. Suitably secured to an intermediate portion of

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the leaf spring 32 is an arm or handle 35 which, when depressed, moves the stop 33 out of the opening 31 to permit a succeeding nut 26a to move to the forward or mouth end of the chamber.

It will be noted that the stop 33, when in the position shown in Figure 2 of the drawing, bears against the head of the leading nut 26. Hence, when the wrench is rotated to tighten the leading nut 26, stop 33 applies pressure to the head of this nut during the engagement of the nut with the first few threads on the stud. Hence, this nut may be tightened to any desired extent. When this tightening takes place, the stop 33 has the added function of preventing succeeding nuts 26a from leaving the chamber, i. e., stop 33 retains them within the chamber.

In the modification of Figures 4 and 5, in which like parts are indicated by like reference numerals, the detent holding means consist of a plurality of balls or spheres 41, such as ball bearings, disposed in suitable openings 42 provided in the wall of a magazine chamber 11'. These openings and the balls carried thereby are positioned from the mouth end of the chamber a distance approximately equal to the thickness of a nut, as clearly shown in Figure 5. The openings 42 are so designed as to permit a segment of the ball 41 to extend within the chamber to act as a stop against which the leading end of a succeeding nut 26a abuts. When abutting the head of a nut, the balls prevent movement of the succeeding nuts in the same manner as the stop 33 of Figures 2 and 3, and also function to apply pressure to the head of the leading nut.

The balls 41 are maintained in this position by a rotatable collar 43, which is mounted for rotation on the outer wall of the chamber between two guide sleeves 44 and 45 welded or otherwise suitably secured to the outer wall of the chamber. Collar 43 has its inner wall formed with a plurality of cammed or eccentric surfaces 46, there being one such surface cooperating with each ball 41. Each such surface 46, as best shown in Figure 4, provides a suitable clearance space 47 for each ball into which space the ball may move permitting movement of a succeeding nut 26a into a position to be threaded onto its stud. In other words, with the collar in the position shown in Figure 4, the balls 41 are free to move in a direction towards the periphery of the chamber wall to release a succeeding nut. When it is desired to prevent such movement of a succeeding nut, collar 38 is turned to move cam portions 46 into position directly above and bearing on the balls 41 to force them into engagement with the head of a leading nut 26 and the face of a succeeding nut 26a. When in this latter position the collar 43 maintains the balls firmly locked in the position which, as above explained, prevents movement of a succeeding nut towards the mouth end of the magazine chamber and applies pressure to the leading nut to permit it to be tightened onto its stud to any desired extent.

While in the modification of Figures 4 and 5 three balls are shown, it will be understood any desired number of such balls may be used, the chamber wall and collar 43 being modified accordingly to accommodate the number of balls employed.

In the modification of Figures 6 and 7, still another form of detent holding means is shown, and also a modified form of retaining means for a succeeding nut is disclosed. In this modification each chamber preferably has its mouth end thickened, as at 51, and is provided with an annular groove 52 in which a circular spring member 53 is mounted. Annular groove 52 at a plurality of equally spaced points, three in the embodiment shown in Figures 6 and 7, is provided with openings 54 communicating with the interior of the chamber. Circular spring 53 is formed with centripetal projections 55, each desirably of U-shape, which projections extend through the opening 54 so that the projections 55 abut inclined edge 27 on the face of the leading nut 26. The projec-

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tions 55 thus serve as retaining means for maintaining the nuts within the magazine chamber. However, when the leading nut is threaded onto its stud, upon rotation of the magazine chamber the leading nut will move in a longitudinal direction, causing the projections 55 to move away from the nut and into the openings 54, thus permitting the desired withdrawal of the leading nut from the magazine chamber.

The detent means for maintaining a succeeding nut within the magazine chamber and applying pressure to the head of the leading nut in the modification of Figures 6 and 7 comprises an annular spring member 57 in the form of a heavy wire spring mounted in an annular groove 58 in the wall of the magazine chamber. Annular groove 58 is provided at spaced points with openings 59 communicating with the interior of the magazine chamber. Spring 57 is shaped, as best shown in Figure 6, to provide a plurality of projections 61, one such projection being positioned in each of the openings 59 and extending therethrough so that it can be forced inwardly to a position in which it bears against the head end of the leading nut and the face end of a succeeding nut. Cooperating with the spring 57 is a collar 62 rotatable on the outer wall of the magazine chamber. This collar 62 is confined between raised portion 63 of the magazine chamber and a ring 66 which is welded or otherwise suitably secured to the outer wall of the magazine chamber, as shown in Figure 7. When collar 62 is moved to a position abutting ring 66 spring 57 springs out of its annular groove 58 so that the projections 61 no longer prevent movement of a succeeding nut in the direction towards the mouth end of the magazine chamber. However, when it is desired to tighten a leading nut or prevent release of a succeeding nut, collar 62 is moved to the position shown in Figure 7. In moving to this position the inner wall of the collar contracts the spring ring 57 into the groove 58 to force the projections 61 into the position shown in Figure 7.

While the construction of the forward end of one magazine chamber only has been shown in Figures 4 to 7, it will be understood that the other magazine chambers are of the same construction, although, if desired, but not preferred, one magazine chamber of a wrench may have the retaining means at the forward edge of the construction shown in either Figure 2 or 6 and the detent means for maintaining a succeeding nut within the chamber while applying pressure to the leading nut, of the construction shown in Figures 2, 4 and 5, or 6 and 7, and another magazine chamber of the same wrench provided with different retaining and detent means.

Since certain changes may be made in the above described magazine socket wrenches and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A magazine socket wrench comprising a magazine polygonal in cross section and of a length to contain a plurality of threaded members, each defined by a peripheral polygonal wall and front and rear ends, means at the forward end of said magazine for engaging the front end of a leading threaded member and thus retaining all threaded members therein and arranged to be moved to permit a leading threaded member to be removed therefrom, the walls of said magazine having a plurality of small openings therein spaced about its periphery, said openings being spaced from the first-mentioned means a distance equal to the length of the peripheral wall of a threaded member, the walls of said magazine to the rear of said openings being imperforate, a ball in each of said openings, each movable from a first position where it abuts against the rear end of a leading threaded member and prevents discharge of succeeding threaded members

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to a second position where it permits a succeeding threaded member to be moved into contact with said first-mentioned means for later removal from said magazine, and a movable collar having a plurality of cam surfaces on its interior for cooperating with the balls so that in one position of said collar the cam surfaces engage the outer periphery of the balls and apply pressure thereto to maintain them in position to exert pressure on the rear end of a leading threaded member during the initial threading thereof into securing position, and said cam surfaces being so constructed and arranged as to permit the balls to move in said openings from said first to said second positions.

2. A magazine socket wrench comprising a magazine polygonal in cross section and of a length to contain a plurality of nuts, means at the forward end of said magazine for engaging the front end of a leading nut and thus retaining all nuts therein and arranged to be moved to permit a leading nut to be removed therefrom, the walls of said magazine having a plurality of openings therein spaced about its periphery, said openings being spaced from the first-mentioned means a distance equal to the width of a nut, the walls of said magazine to the rear of said openings being imperforate, a ball in each of said openings, each movable from a first position where it abuts against the rear end of a leading nut and prevents

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discharge of succeeding nuts to a second position where it permits a succeeding nut to be moved into contact with said first-mentioned means for later removal from said magazine, and a movable collar having a plurality of cam surfaces on its interior for cooperating with the balls so that in one position of said collar the cam surfaces engage the outer periphery of the balls and apply pressure thereto to maintain them in position to exert pressure on the rear end of a leading nut during the initial threading thereof onto a stud, and said cam surfaces being so constructed and arranged as to permit the balls to move in said openings from said first to said second positions.

## References Cited in the file of this patent

## UNITED STATES PATENTS

1,558,267	McGuckin	Oct. 20, 1925
2,256,012	Blair	Sept. 16, 1941
2,493,398	Fricke	Jan. 3, 1950
2,518,139	Hallowell et al.	Aug. 8, 1950
2,611,289	Frank	Sept. 23, 1952

## FOREIGN PATENTS

217,581	Great Britain	Mar. 5, 1925
402,949	Italy	Mar. 30, 1943