June 21, 1955 A. E. DURAND 2,711,112

MULTIPLE SOCKET WRENCH

Filed Nov. 30, 1953 2 Sheets-Sheet 1

FIG. 1

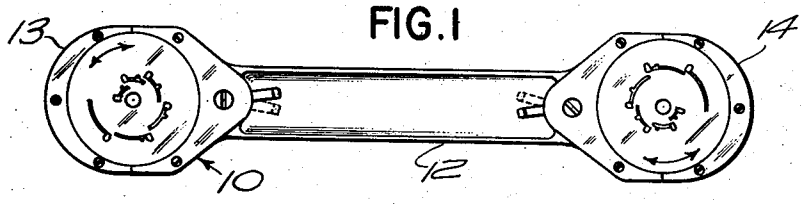


FIG. 2

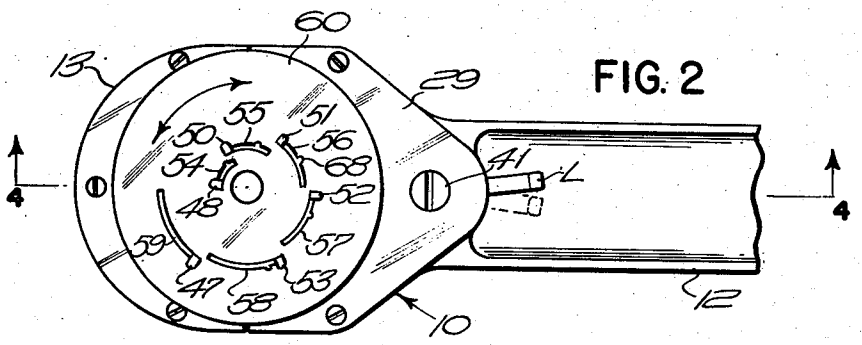


FIG. 3

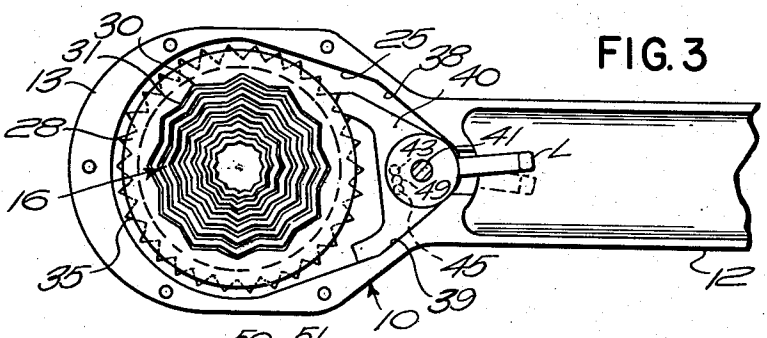
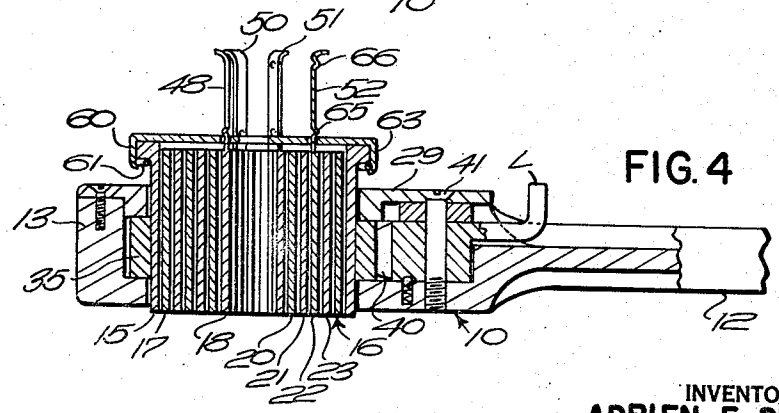


FIG. 4



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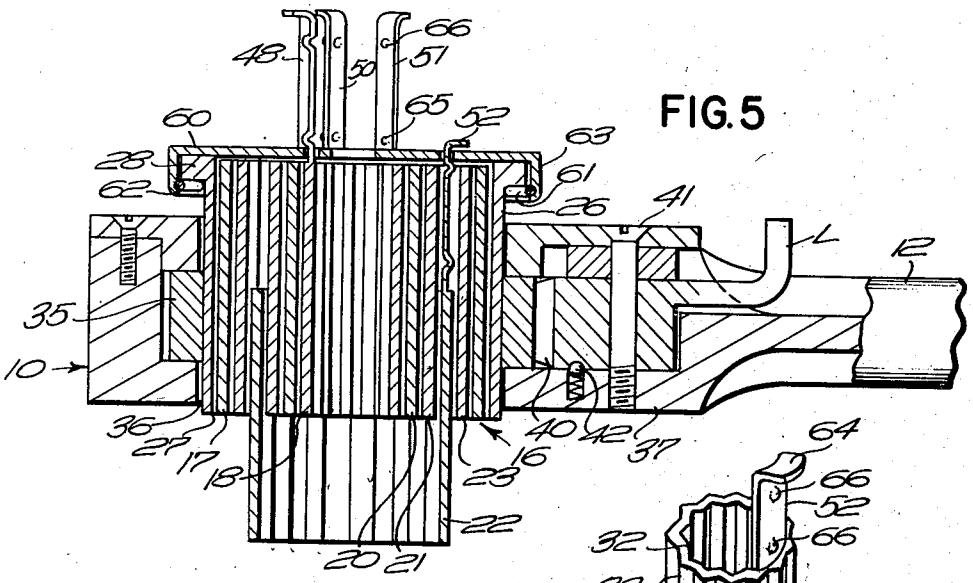


FIG. 5

FIG. 6

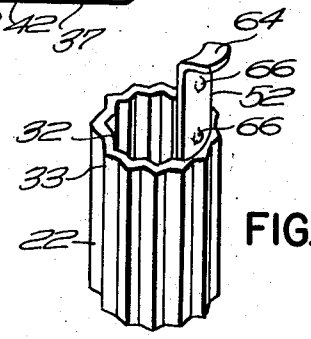
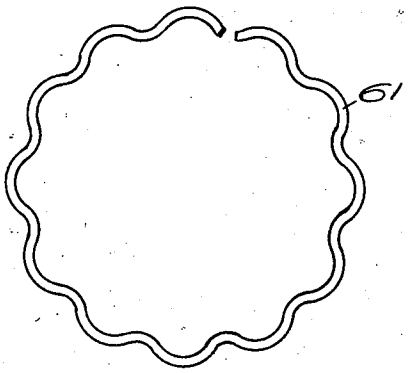


FIG. 7



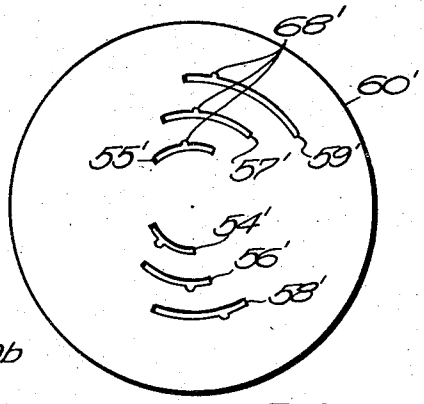


FIG. 9

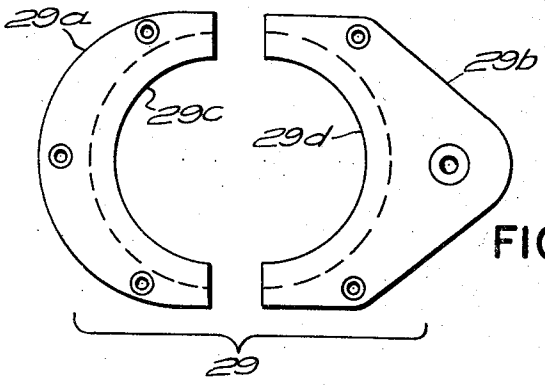


FIG. 8

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MULTIPLE SOCKET WRENCH

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6 Claims. (Cl. 81—185)

This invention relates in general to wrenches of the multiple socket type and, more particularly, to an improved wrench construction, with or without a ratchet mechanism, in which a plurality of nested socket members are embodied at one or at both ends of the wrench handle.

One of the objects of the invention is to provide an improved wrench structure having a plurality of longitudinally shiftable socket members of different sizes in nested position in one end of a handle, and including means for selectively and releasably latching the socket members revolvably arranged with respect to the socket members and turnable in appropriate directions either to lock and secure all the socket members in their retracted nested relation within one another or to selectively release a particular sized socket member only so that it alone may be shifted so as to project outwardly beyond the others for service on a nut or a bolt head of corresponding size.

Another object of the invention is to provide a wrench structure having a nested series of lonigtudinally shiftable socket members combined in a head member which is rotatable in opposite directions by a ratchet mechanism that is adjustable to ratchet in one or the other direction, the wrench including a revolvable selector device for the several socket members arranged so that any one of such members may be selectively released and unlatched from a retracted nested position normally retained within the others as to permit it to be longitudinally shifted therefrom and secured into an extended position well beyond the others for service with retention of the remaining unselected socket members of the set against such outward movement by the selector device.

A further object of the invention is to provide a multiple socket wrench in which the socket members are retained in a latched nested position by a selector device which is revolvable into appropriate positions to selectively release any one of the socket members for movement outwardly to project beyond the others and retain it in such extended position against retraction while in service while simultaneously locking the other socket members of the set against such outward movement.

These and other objects and advantages of my improved construction, however, will more fully appear as the specification proceeds and the particular features of the invention will be specifically pointed out in the appended claims.

In the accompanying drawings I have shown for the purposes of illustration two embodiments which my invention may assume in practice, in which:

Fig. 1 is a top plan view of a ratchet type multiple socket wrench constructed in accordance with my invention;

Fig. 2 is a top plan view, on enlarged scale, of the multiple socket-carrying portion at the left end of the wrench shown in Fig. 1, the wrench handle being broken away;

Fig. 3 is a view similar to Fig. 2 but with the selector disk removed to illustrate the reversible ratchet mechanism, the parts of which being disposed for rotation of the ratchet in one direction;

Fig. 4 is a longitudinal sectional view taken on the line 4—4 of Fig. 2 with the socket members nested;

Fig. 5 is a view similar to Fig. 4 but on greatly enlarged scale showing one of the socket members projected in an extended position for service;

Fig. 6 is a top plan view of the corrugated locking spring for revolvably attaching the socket selector disk member to the flanged head member;

Fig. 7 is a detail perspective view of one of the socket members;

Fig. 8 is a top plan view showing the two-piece construction of one of the cover plates associated with the socket-carrying portions of the Fig. 1 wrench; and

Fig. 9 is a top plan view of a modified form of revolvable socket selector disk member.

In the illustrated construction shown in Figs. 1 through 5, I have shown a wrench body generally indicated at **10** and having a handle **12** the intermediate portion of which is of a channel type construction while the opposite ends thereof are formed with relatively deep-chambered enlarged head portions **13** and **14** carrying rotatable hollow turning members therein, one being shown at **15** in Figs. 3, 4 and 5. These turning members are each open at the bottom and have a suitable multi-ribbed contour interiorly therefrom. Within these turning members are arranged a plurality of longitudinally shiftable nested socket members of different sizes and with the contour thereof conforming to that of the opening in the associated turning member, as generally indicated at **16** in Figs. 4 and 5. The number of nested socket members associated with the head portions **13** and **14** may vary as desired, the wrench here shown, however, having six sockets in each set, viz., an outer socket member **17**, an inner socket member **18** and four intermediate socket members **20**, **21**, **22** and **23** respectively. Thus, for example, the nested series of six sockets combined in the head portion **13** may be in socket sizes of 3/8", 1/2", 5/8", 3/4", 7/8", and 1 inch respectively while those combined in the head portion **14** may be in socket sizes of 7/16", 9/16", 11/16", 13/16", 15/16" and 1 1/16" respectively. Obviously, differently sized sockets can be combined, or in lesser number, depending upon the type of work involved and the particular trade of the user.

Since the construction and arrangement of the various parts are similar in both head portions **13** and **14**, the description of one therefore will suffice for the other. Referring now more specifically to Figs. 3, 4 and 5, it will be noted that the hollow turning member **15** is rotatable in a chamber **25** formed in the head portion **13**, and, as here shown, comprises a thin-walled sleeve-like body, preferably made of a hardened steel, open at both ends and having a cylindrical outer peripheral portion **26** and a central opening **27** which extends axially therethrough and is of a size and of suitable multi-ribbed contour to slidably receive for longitudinal shifting movement thereof and house the outer socket member **17** of the nested series of sockets **16** combined in the head member **13**. The turning member **15** also is provided around its upper end with a circular flange **28**, the purpose of which will be hereinafter described. A cover plate **29**, consisting of two members **29a** and **29b** respectively with semi-circular cutout portions **29c** and **29d**, see Fig. 8, embraces the upper part of the turning member **15** adjacent the flange **28** and is suitably fastened by screws to the head portion **13** to close the top thereof.

As shown in Fig. 3 the inner surface portion of the opening **27** extending through the turning member **15** is formed with a series of alternate vertically arranged V-shaped recesses **30** and inwardly extending V-shaped ribs

31. The series of socket members 17, 18, 20, 21, 22 and 23 each comprises a shell having a vertical wall of multi-ribbed formation both interiorly and exteriorly made with alternate inwardly and outwardly vertically extending V-shaped ribs 32 and 33 which define a series of recesses on the outside and inside peripheral surfaces of these socket members so that in their nested position within one another they will be separately shiftable as well as interlock with the opposite ribbed surface of the adjacent members, and the ribbed outside surface of the outer socket member 17 will shiftably fit and interlock with the inside ribbed surface of the turning member 15 whereby all the socket members will turn in unison when the latter revolves. Similarly, the inner and smallest socket member 18 will have its outwardly extending ribs 33 interlocked with the recesses between inwardly extending ribs 32 on the inner surface of the adjacent encompassing socket member 23.

Mounted upon an intermediate portion of the rotatable turning member 15 is a ratchet 35 which is received within the chamber 25 of the head portion 13, the lower cylindrical outer portion of the turning member being rotatably mounted in a suitable opening 36 in the bottom wall 37 of the chamber, see Fig. 5. The rear part of the chamber 25 has opposed converging side walls 38 and 39 between which is positioned a pawl 40 of bifurcated form and having limited pivotal movement on a screw 41 so as to be swung either side of the chamber by the control lever L integral with the upper part of the pawl to move the latter into a position for the pawl ends to selectively engage and cooperate with the teeth of the ratchet 35. A spring-loaded ball 42 mounted in the bottom wall 37 of the chamber 25 alternately engages a series of semi-spherical holes 43, 44 and 45 in the bottom end of the pawl to retain the pawl 40 in either of its ratchet positions or in a neutral position. The specific ratchet-actuating mechanism here shown is merely for the purpose of illustration and forms no part of the present invention. It will be apparent that other well-known and conventional ratchet-actuating mechanisms may be employed instead of that here shown.

As shown in Figs. 4 and 5 the socket members 17, 18, 20, 21, 22, and 23 are slidably nested together in an encompassing relation and they are substantially co-extensive in length with one another within the particular rotatable member 15 in which they are combined so that when fully retracted therein the corresponding end edges of all the socket members are normally flush with one another and also lie flush with the lower end of the rotatable member 15. In order to impart longitudinal sliding movement of the socket members to individually project them outwardly from the particular head portion 13 or 14 with which they are associated, the socket members 17, 18, 20, 21, 22 and 23 are provided at their inner ends with vertical fingers 47, 48, 50, 51, 52 and 53 which project through appropriate arcuate slots 54, 55, 56, 57, 58 and 59 of suitable length in a selector disk 60 covering the inner ends of the socket members and revolvably mounted upon the flange 28 of the turning member 15. The selector disk 60 is secured in place by means of a corrugated wire spring 61 which is of a split construction and inserted underneath the flange 28 of the turning member 15 and expansively engages the outer periphery thereof adjacent this flange and the inner portion of a circular groove 62 in the confronting inner face of the depending skirt 63 of the circular selector disk 60.

The fingers 47, 48, 50, 51, 52 and 53 respectively are of arcuate form and their thickness is about one-half that of the wall thickness of their corresponding socket member. These fingers have their outer terminal ends bent over at right angles in order to provide a suitable lip portion 64 whereby they may be pushed out of or pulled back into retracted nested positions whenever they are individually released. In order to lock the individual socket members when nested or to lock them singly in their individual extended positions, each of the fingers is

provided with a pair of ball-like projections 65 and 66 which are so spaced vertically above one another that when the fingers are in their outermost position the lower projection 65 will be engageable over the top surface of the selector disk 60 as shown in Fig. 4, and when any of the fingers is depressed to project the associated socket member into an extended position for use, the finger will be locked in a depressed position by engagement of the upper projection thereof with the underside of the selector disk 60, as illustrated in Fig. 5.

As shown in Figs. 2 and 5, the selector disk 60 has its slots so arranged that the actuating fingers for the socket members are sufficiently spaced from one another that they can be easily pushed by a person while gripping the wrench handle. It will be noted that each of the arcuate slots accommodating the actuating finger for a particular socket member is provided with a semi-circular cut-out 68 in a portion of its side to enable the projections on the finger to pass therethrough during selective shifting of the particular socket member to expose it from the others for service. After a socket member has been shifted into an extended position by selective dialing of the particular socket size desired, the selector disk 60 may be turned a slight additional amount to engage between the under side of the lip portion 64 and the upper projection 66 of the depressed actuating finger of that socket member. Suitable indicia may be provided on the selector disk 60 adjacent the arcuate slots thereof for visually indicating the particular sized sockets controlled by the fingers which project through the particular slots of the disk.

It thus will be seen that by means of my improved construction one merely has to rotate the selector disk 60 to bring the semi-circular cut-out portion 68 of the proper slot corresponding to the socket size desired into vertical registry with the projections 65 and 66 of the actuating finger thereof thus releasing the latter and enabling it to be readily depressed through the selector disk 60 and outwardly move the selected socket member into a projected position beyond the others where it will be readily available for use on a nut or a bolt head of corresponding size.

In Fig. 9 there is shown another form of slotted selector disk 60' wherein the arrangement of the arcuate slots 54, 55, 56, 57, 58 and 59 containing the actuating fingers for the socket members instead of being arranged in a somewhat spiral-like manner are there shown as grouped together in sets of three each in each half of the disk top as indicated at 54', 55', 56', 57', 58' and 59'. Similarly, these arcuate slots are provided with semi-circular cut-outs 68' through which the ball-like projections 65 and 66 of the actuating fingers pass when manipulated to effect extension or retraction of a particular sized socket member with respect to the others.

While I have illustrated the openings in the sockets as being of twelve-ribbed and recessed shape for use on hexagonal nuts and bolt heads, it is obvious that they may be made instead of either hexagonal, octagonal or square shape, as desired, suitable for operation upon the particular shape nuts or bolt heads on which they are to be used.

What is claimed is:

1. A multiple socket wrench comprising a handle, a head member in the form of a socket on one end of said handle, a plurality of variously sized socket members nested in encompassing relation in the socket of the head member and longitudinally slidable one within another, and means for selectively and releasably latching said socket members in retracted nested position and arranged to release any one of them for longitudinal sliding movement relative to the others whereby it may be pushed outwardly into an extended position for service or pulled back into a retracted nested state, said means including a slotted selector disk revolvably mounted with respect to said head member and said socket members, and actuating fingers individually carried by said socket members protruding outwardly through the slots in said disk and

arranged to be interengaged and releasably locked by said disk in certain of its rotated positions against longitudinal shifting movement therethrough but selectively releasable therefrom upon turning movement of the disk into different selected positions to effect manual shifting and exposure of a particular sized socket member for use or its retraction into a completely nested state within the others.

2. A socket wrench including a hollow ratchet head member flanged at one end and open at both ends, a set of socket members nested in encompassing relation, open at each end positioned within and longitudinally movable relative to the head member and to each other for selective movement into and out of an extended position outwardly of the unflanged open end of the head member, actuating means individually carried by said socket members projecting outwardly beyond the flanged open end of the head member and manually operable independently of one another for moving the individual socket members into extended and retracted positions, and means covering the inner ends of said socket members revolvable about the flanged end of the head member and provided with arcuate slots cooperating with and through which said actuating means for the socket members protrude, said slots being disposed for selectively and releasably latching the socket members in retracted nested position when said covering means is revolved into one position, and to release a selected socket member of a particular size when said covering means is turned to another position whereby the desired socket may be subsequently pushed into an extended position and there latched against retraction during use without release of the remaining socket members from their nested and latched position in the head member.

3. A socket wrench including a hollow ratchet head member flanged at one end and open at both ends, a set of socket members nested in encompassing relation, open at each end positioned within and longitudinally movable relative to the head member and to each other, for individual selective movement into and out of an extended position outwardly of the unflanged open end of the head member, actuating fingers in overhanging relationship on adjacent ends of the socket members projecting outwardly beyond the flanged open end of the head member and manually operable for moving the individual socket members into extended and retracted positions, and a selector disk revolvable about the flanged end of the head member, said disk containing arcuate slots therethrough cooperating with and through which the actuating fingers for the socket members protrude, said disk being revolvable into different selected positions for releasably latching the socket members in retracted nested positions to release a selected socket member of a particular size whereby it may be subsequently pushed into an extended position from the head member, and there latched against retraction during use upon further turning of the selector disk to effect an inter-engagement between the actuating finger of the particular socket member and portions of the slot through which said finger passes and without release of the remaining socket members from their nested and latched position.

4. In combination, a hollow head member flanged at one end and open at both ends forming a tubular shell-like enclosure, a plurality of nested annular shells of varying sizes and known diametrical dimensions slidable axially in fitted relation in the head member and in one another, actuating finger means individual with said shells including a cooperating selector member revolvably carried by the flanged end of said head member adapted for movement into interengaging relation with said finger means to lock all of the shells in retracted nested position within said enclosure against axial shifting movement with respect to said head member, and movable therefrom into other different positions for selectively releasing any one of the shells without unlocking the others whereby it may be pushed freely into an extended position outwardly beyond the others within said enclosure for service whenever said finger means is depressed, said selector member being further revolved into interengaging relation with said depressed finger means so as to retain it against retraction while in service.

5. A socket wrench including a hollow ratchet head member flanged at one end and open at both ends, a set of socket members nested in encompassing relation, open at each end positioned within and longitudinally movable relative to the head member and to each other, for individual selective movement into and out of an extended position outwardly of the unflanged open end of the head member, actuating fingers in overhanging relationship on adjacent ends of the socket members projecting outwardly beyond the flanged open end of the head member and manually operable for moving the individual socket members into extended and retracted positions, a disk selector member revolvably mounted upon the flanged end of the head member, said disk having a depending skirt portion and containing arcuate slots through its top portion cooperating with and through which the actuating fingers for the socket members protrude, and a spring member of corrugated annular formation positioned beneath the flange portion of the head member and having detachable interlocking engagement with the skirt portion of said selector member for securing the latter to said head member, said selector member being revolvable into different selected positions for releasably latching the socket members in retracted nested positions to release a selected socket member of a particular size whereby it may be subsequently pushed into an extended position from the head member, and there latched against retraction during use upon further turning of the selector disk to effect an inter-engagement between the actuating finger of the particular socket member and portions of the slot through which said finger passes and without release of the remaining socket members from their nested and latched position.

6. In a wrench of the character described, a handle provided at one end with an enlarged head portion having a large central circular opening therethrough, a hollow turning member having a cylindrical outer periphery mounted to rotate in the central opening of said enlarged head and a polygonal internal peripheral wall, a plurality of longitudinally shiftable polygonal sided socket members telescopically fitting in said turning member and in one another, each of said socket members carrying at its upper end an actuating finger extending outwardly beyond and longitudinally of the socket members, each of said fingers being provided at the outer terminal end thereof with an upset lip portion and having a latch projection below and slightly spaced from said lip and another latch projection disposed near to the lower end of the finger in slightly spaced relation from the point of attachment of the finger to such socket member, a selector disk member attached to and revolvable about the upper end of said turning member, said selector disk being formed with slots individual with said fingers and through which they pass exteriorly of said turning member, the marginal side edges of said slots having interfitting latching engagement between the upper projection and said lip, or the lower projection and the upper end of a socket member when any of the fingers are positioned in either extreme position of its movement so as to prevent shifting of the fingers thus-latched from such position, each of said slots being provided at a predetermined location in the marginal edge portion thereof bordering said finger projections with a cut-out adapted to pass the projections of said particular finger freely therethrough whenever said selector disk is turned to bring said cut-out into vertical registry with the projections of the actuating finger of a particular size socket member whereby it may be unlatched and manually shifted longitudinally either outwardly or inwardly with respect to the other socket members into an extended exposed position from said head

portion for use or into a completely nested state within the others as desired.

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