March 15, 1966 T. C. ESTES 3,240,087

MAGNETIC FASTENER HOLDER FOR SOCKET WRENCHES

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Fig. 1

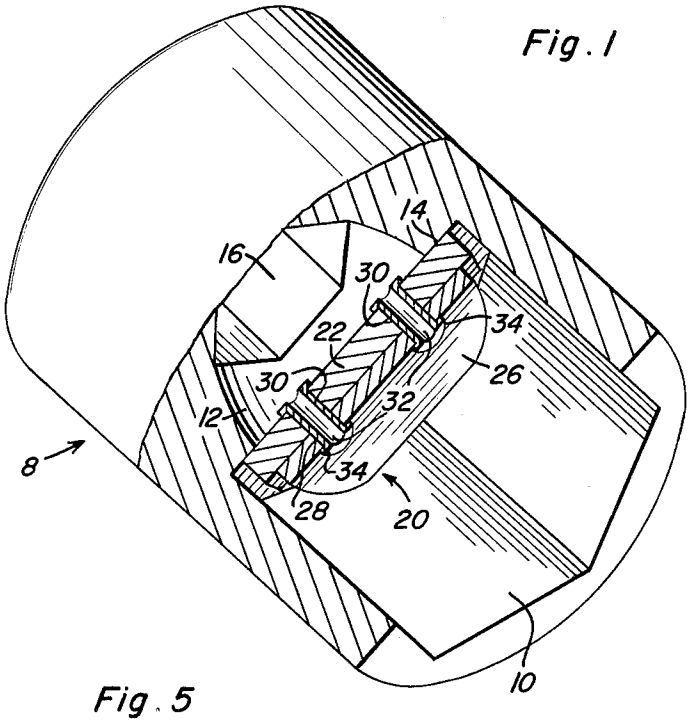


Fig. 5

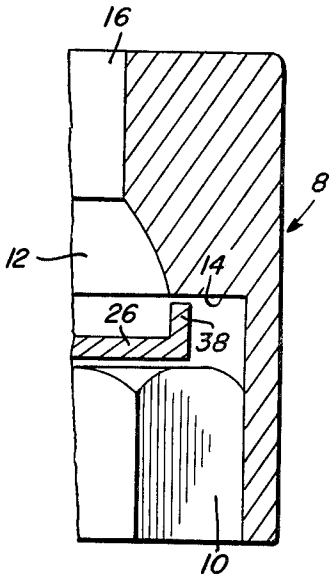
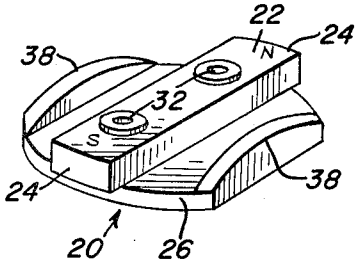


Fig. 2



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Fig. 3

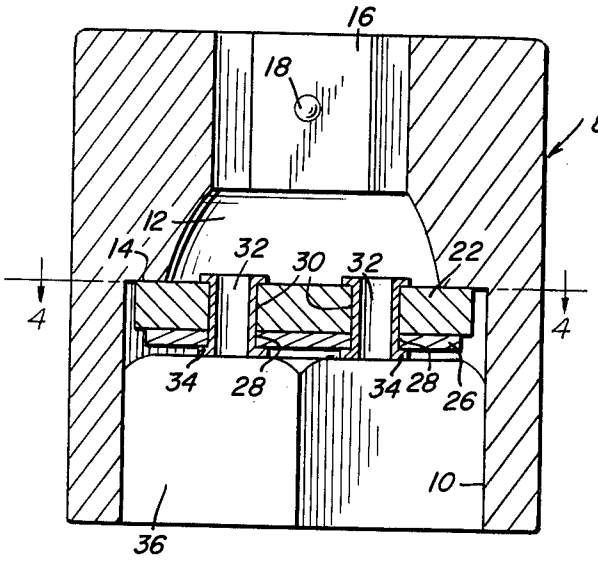


Fig. 6

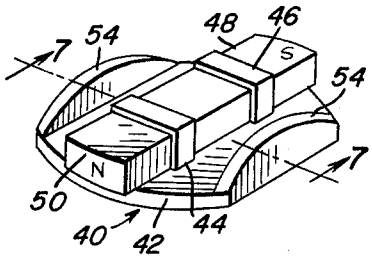


Fig. 7

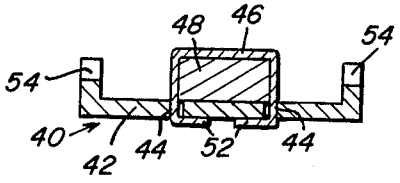
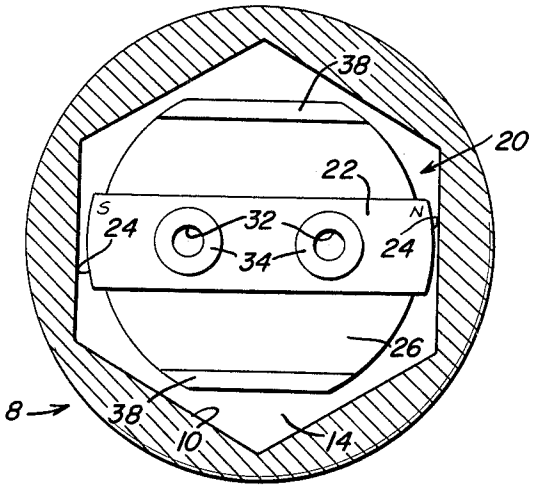


Fig. 4



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MAGNETIC FASTENER HOLDER FOR SOCKET WRENCHES

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9 Claims. (Cl. 81—125)

The present invention generally relates to new and useful improvements in wrenches of the rigid, enclosed jaw-type and has for its primary object to provide, in a manner as hereinafter set forth, novel means for magnetically retaining nuts in the usual sockets of such tools.

Another highly important object of the present invention is to provide a magnetic nut holder or retainer of the character described which may be readily used in various types and sizes of sockets and which, further, may be expeditiously inserted therein or, when desired, removed therefrom.

Still another object of the invention is to provide an imroved nut holder of the character set forth which is magnetically self-retained in the socket.

Another object is to provide an improved nut holder comprising a permanent bar magnet wherein the bar is magnetically adhered to the socket at its two strongest points, while the nut is retained by two relatively weak portions of said bar.

Other objects are to provide an improved magnetic nut holder for socket wrenches which holder is comparatively simple in construction, strong, durable, compact, of light weight and which may be manufactured at low cost.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view principally in longitudinal section, showing a wrench socket having mounted therein a magnetic nut holder embodying the present invention;

FIGURE 2 is a perspective view of the device per se;

FIGURE 3 is a vertical sectional view, showing a nut being retained in the socket by the magnetic holder;

FIGURE 4 is a sectional view taken substantially on the plane of the line 4—4 of FIGURE 3;

FIGURE 5 is a fragmentary view in vertical section through a side portion of the assembly;

FIGURE 6 is a perspective view, showing a modification of the device; and

FIGURE 7 is a view in transverse section through the modification, taken substantially on the line 7—7 of FIGURE 6.

Referring now to the drawing in detail, it will be seen that reference numeral **8** generally designates a conventional wrench socket. The socket **8** includes the usual polygonal jaw **10**, a reduced intermediate portion or chamber **12** providing a shoulder **14**, and a further reduced polygonal upper portion **16** having therein a detent **18** for releasably retaining the socket on the shank or shaft of the wrench.

A nut holder or retainer embodying the present invention is generally designated by the reference numeral **20**. The holder **20** is adapted to be removably mounted in the socket **8**. Toward this end, the device comprises a permanent bar magnet **22** of suitable material. The bar magnet **22** is of a length to substantially traverse the jaw **10** of the socket **8** for engaging its end portions beneath the shoulder **14** at diametrically opposite points, thus removably securing the device in said socket. As shown to advantage in FIGURE 4 of the drawing, the bar magnet **22** includes rounded ends **24** which are spaced from the perhiphery of the jaw **10**.

The bar magnet **22** is mounted diametrically on a substantially segmental disk or plate **26** of suitable non-magnetizable metal and projects beyond the periphery thereof. The disk or plate **26** has formed therein a pair of spaced openings **28** which are aligned with openings **30** in the bar magnet **22**. The aligned openings **28** and **30** accommodate tubular rivets **32** of suitable metal which rigidly secure the bar magnet **22** and the disk **26** together. The flanged or clinched lower end portions of the tubular rivets **32** further provide magnetic points or contacts **34** with which the nut to be applied, as indicated at **36**, is engageable. Formed integrally with the marginal portions of the disk or plate **26** on opposite sides of the bar magnet **22** and in spaced parallelism therewith is a pair of upstanding, substantially integral ears or flanges **38**.

It is thought that the use of the device will be readily apparent from a consideration of the foregoing. Briefly, the holder **20** is inserted upwardly in the wrench jaw **10** for engaging and magnetically adhering the end portions of the bar magnet **22** beneath the shoulder **14** at diametrically opposite points. Thus, the device is installed in the socket, being retained in position by its own magnetism. The nut **36** to be applied is of course inserted in the jaw **10** and said nut is engaged with the contacts **34** to be magnetically retained thereby. By reason of the fact that the nut **36** is retained by relatively weak inner or intermediate portions of the bar magnet as compared with the end portions thereof, the nut may be detached from the holder without detaching said holder from the socket, as will be understood. However, the device, if desired, may readily be removed simply by inserting a suitable punch or other tool in the socket **8** from the upper end thereof. The construction and arrangement is such that the holder shown may be used in various types and sizes of wrench sockets within a given range.

In the modification of FIGURES 6 and 7 of the drawing, reference numeral **40** designates generally a holder to be inserted in the socket **8**. The holder **40** comprises a plate or disk **42** which is substantially similar to the member **26** with the exception that it includes pairs of spaced openings **44**. The openings **44** are for the reception of generally U-shaped fasteners **46** of suitable magnetic metal which firmly secure a permanent bar magnet **48** diametrically on the disk **42**. The magnet **48** is substantially similar to the magnet **22** and comprises rounded end portions **50** which project beyond the periphery of the disk **42**. The lower end portions of the fasteners **46** are bent or clinched inwardly to secure the assembly and, further, to provide magnetic points or contacts **52** for engagement by the nut being applied. The disk **42** comprises integral, upstanding substantially segmental ears or flanges **54** which extend in spaced parallelism to the bar magnet **48**.

Of course, the end portions of the bar magnet **48** are engageable beneath the shoulder **14** at diametrically opposite points for securing the holder **40** in the socket **8**. The nut to be applied is inserted upwardly in the socket **10** and engages with the elements **52** by which it is magnetically retained.

The upstanding flanges **38** and **54** of the two embodiments hold the bottom of the device parallel with the bottom of the socket cavity or jaw should there be irregularities in the shoulder **14**. In this event, the flanges **38** and **54**, which are normally spaced from the shoulder **14** as shown in FIGURE 5 of the drawing, would engage therewith.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention

to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A nut retainer for a metallic wrench socket comprising a permanent bar magnet insertable diametrically in the socket and engageable at its end portions therewith for magnetic retention therein, and means on the bar magnet for magnetically anchoring a nut in the socket, said means including a nonmagnetic insulating disk mounted beneath the bar magnet, and spaced magnetic fasteners securing the disk to the bar magnet and passing through said disk for contacting and magnetically retaining the nut.

2. A nut retainer in accordance with claim 1, said fasteners comprising magnetic rivets securing the bar magnet and the disk together, said bar magnet and said disk having registering openings therein receiving the fasteners therethrough.

3. A nut retainer for a metallic wrench socket comprising a permanent bar magnet insertable diametrically in the socket and engageable at its end portions therewith for magnetic retention therein, and means on the bar magnet for magnetically anchoring a nut in the socket, said means including a non-magnetic insulating disk mounted beneath the bar magnet, spaced magnetic fasteners securing the disk to the bar magnet and passing through said disk for contacting and magnetically retaining the nut, said fasteners comprising magnetic rivets securing the bar magnet and the disk together, said bar magnet and said disk having registered openings therein receiving the fasteners therethrough, said rivets being tubular and comprising end flanges, certain of the end flanges providing contacts engageable with the nut.

4. A nut retainer in accordance with claim 3, said bar magnet including rounded end portions projecting beyond the periphery of the disk.

5. The combination of claim 4, together with upstanding marginal stabilizing flanges on the disk engageable with the socket.

6. A nut retainer for a metallic rench socket comprising a permanent bar magnet insertable diametrically in the socket and engageable at its end portions therewith for magnetic retention therein, and means on the bar magnet for magnetically anchoring a nut in the socket, said means including a non-magnetic insulating disk mounted beneath the bar magnet, and spaced magnetic fasteners securing the disk to the bar magnet and passing through said disk for contacting and magnetically retaining the nut, said fasteners being generally U-shaped and comprising legs including end portions clinched beneath the disk and engageable with the nut for magnetically retaining same.

7. The combination of claim 6, together with upstanding stabilizing flanges on the disk on opposite sides of the bar magnet and engageable with the interior of the socket.

8. A nut retainer for a metallic wrench socket comprising magnetic means insertable diametrically in the socket and engageable at its end portions therewith for magnetic retention therein, means on said magnetic means for magnetically anchoring a nut in the socket, said anchoring means including a non-magnetic insulating member mounted beneath said magnetic means, spaced magnetic fastening means securing said insulating member to said magnetic means and passing through said insulating member for contacting and magnetically retaining the nut, said fastening means comprising magnetic rivets securing said magnetic means and said insulating means together, said magnetic means and said insulating means having registered openings therein receiving the rivets therethrough, said rivets being tubular and including end flanges, certain of the end flanges providing contacts engageable with said nut.

9. A nut retainer for a metallic wrench socket comprising magnetic means insertable diametrically in the socket and engageable at its end portions therewith for magnetic retention therein, means on said magnetic means for magnetically anchoring a nut in the socket, said anchoring means including a non-magnetic insulating member mounted beneath said magnetic means, spaced magnetic fastening means securing said insulating member to said magnetic means and passing through said insulating member for contacting and magnetically retaining the nut, said fastening means being generally U-shaped and comprising legs including end portions clinched beneath the insulating member and engageable with the nut for magnetically retaining same.

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