July 19, 1955 C. A. POTEET 2,713,281

HEXAGONAL BAR WRENCH ADAPTER

Filed June 7, 1954

FIG_1

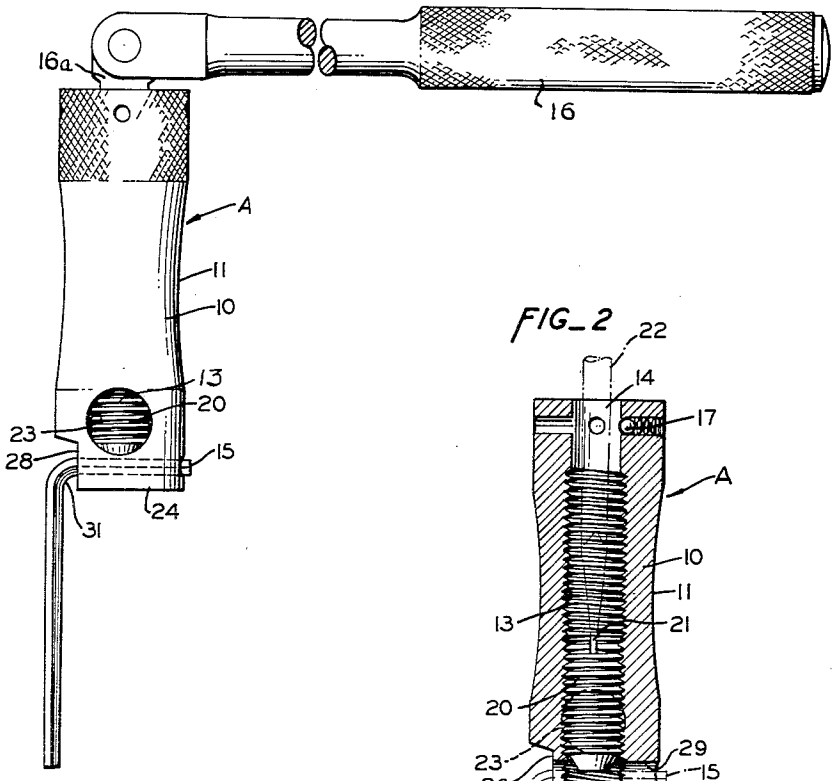



FIG_2




FIG_3

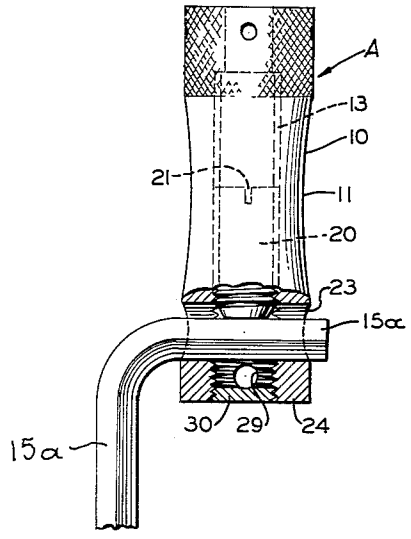
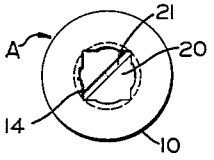



FIG_4




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# HEXAGONAL BAR WRENCH ADAPTER

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4 Claims. (Cl. 81—177)

The present invention relates to a tool holder and pertains more particularly to the holder or adapter for various sizes of socket wrenches for screws of the hollow head or "Allen" type.

In widespread use in industry is a class of screws having a hexagonal socket extending coaxially into the head thereof. These screws are generally referred to as "hollow head" or "Allen head" screws and are customarily manipulated by an L-shaped piece of hexagonal tool steel rod with one short leg and one long leg. The wrenches are made of different diameters and lengths of hexagonal rod to fit closely into the sockets of the various sizes of screws which are used. The rods from which these wrenches are made vary in diameter from approximately 1/16" to upwardly of 1/4".

Frequently, a screw will be so tightly lodged that it is impossible to free it without the use of some additional tool or adapter. Various types of adapters and tool holders have been provided in the past for this type of wrench such as that shown for example in Patent No. 2,569,069. Such holders as are known to applicant, however, while suitable for holding some sizes of Allen wrenches, are not suitable for holding an extremely wide range of sizes thereof. Therefore it usually is necessary for a mechanic who frequently is required to use wrenches of this type to provide himself with two or three different sizes of adapters so as to be able to handle wrenches for a wide range of screw sizes. Other mechanics, not wishing to be burdened with a number of such adapters, simply use an ordinary adjustable end wrench or a pair of pliers for handling the Allen wrenches, even though such tools are generally regarded as less satisfactory than a proper adapter.

The present invention contemplates the provision of an improved Allen wrench adapter. Another object of the invention is to provide an Allen wrench adapter which is capable of handling a wide range of Allen wrench sizes.

The invention further provides an Allen wrench adapter having a single wrench gripping element but having a plurality of seats arranged to receive selectively the short legs of Allen wrenches of a wide range of diameters and lengths.

These and other objects of the invention will be apparent in the following description and the accompanying drawings, wherein

Fig. 1 is a side elevational view of an Allen wrench adapter embodying the present invention, a small size Allen wrench being gripped therein ready for use and a socket wrench handle being fitted into the adapter.

Fig. 2 is a longitudinal median sectional view of the adapter shown in Fig. 1 as it appears when gripping a small Allen wrench therein.

Fig. 3 is a side elevational view of the adapter shown in Figs. 1 and 2, with a larger Allen wrench gripped therein, a lower portion of the adapter being broken away on a mid-plane to illustrate the structure thereof.

Fig. 4 is a top end view of the adapter shown in Figs. 1 to 3 inclusive.



Referring to the drawings in detail, an Allen wrench adapter A preferably consists of a generally tubular body portion **10** which preferably is of steel, with a central portion **11** thereof of slightly reduced diameter to facilitate handling the device.

For the purpose of the present description the device will be presumed to be in the position in which it is illustrated in Figs. 1, 2 and 3.

The lower portion **13** of the bore of the body portion **10** is threaded as illustrated in Figs. 1, 2 and 3, while the upper end portion **14** of the bore is of square or other suitable non-circular shape to receive a similarly shaped male end portion **16***a* on a conventional wrench handle **16** (Fig. 1). A conventional spring-pressed ball **17** (Fig. 2) is mounted to project into the socket portion **14** in a usual manner to retain the male portion **16***a* of the wrench releasably in the socket portion **14**.

A holding screw **20**, having a slot **21** in its upper end to receive a screw driver blade **22** (Fig. 2) is threadedly inserted in the lower end of the threaded bore portion **13**. The socket portion **14** of the bore preferably is of smaller diameter than the threaded bore portion **13** to prevent removal of the screw **20** upwardly therethrough.

A first wrench-receiving hole **23** is provided diametrically through the body **10** in upwardly spaced relation to the lower end **24** of the body **10**. This first hole **23** is of a size to receive the largest diameter Allen wrench which it is desired to use in the adapter A. A flat chordal face **28** is provided on a side of the body **10** at its lower end below the upper wrench-receiving hole **23**, the plane of the face **28** being parallel to the axis of the body **10**.

A second and smaller wrench-receiving hole **29** is provided diametrically through the lower portion of the body **10**, said hole being axially perpendicular to the face **28**, and penetrating said face. This smaller hole **29** preferably is located below the larger upper hole **23** as shown in Figs. 1 and 3.

A threaded bottom closure plug **30** (Figs. 2 and 3), of a thickness to fill the space between the lower end **24** of the adapter body **10** and the lower edge of the smaller, lower hole **29**, is screwed into the threaded bore portion **13** and preferably is secured permanently therein as by silver soldering or brazing.

In using the device, if a small Allen wrench **15** (Figs. 1 and 2) of a size to fit into the lower hole **29** is to be used, the wrench is inserted in this lower hole to bring the bend **31** (Fig. 1) of the wrench **15** as close as possible to the chordal face **28**. A screw driver blade **22** then is inserted through the socket portion **14** and the threaded bore portion **13** and is fitted into the slot **21** in the holding screw **20** as shown in Fig. 2. The screw **20** then is screwed down to grip the wrench **15** tightly against the bottom plug **30** as shown in Figs. 1 and 2. The screw driver blade then is withdrawn, and the adapter A with the small wrench **15** gripped therein is ready for use either manually or by the use of the wrench handle **16**. To remove the wrench **15** the process is reversed, the screw **20** being screwed upwardly clear of the wrench.

To employ a larger socket wrench such as that shown at **15***a* in Fig. 3, the wrench is inserted in the larger upper hole **23** as far as possible and the holding screw **20** is screwed down to grip the wrench tightly in the adapter. The larger wrench **15***a* is of sufficiently large diameter to resist being sprung or injured by pressure exerted thereon by the holding screw **20** even though the central portion of the wrench beneath the screw **20** is in shear and unsupported.

The plug **30** provides bottoming support for the smaller wrenches **15** however, and thereby prevents them from being sprung even though a considerable amount of force should be used in screwing down the holding screw **20**.

While I have illustrated and described a preferred

embodiment of the present invention, it will be understood however, that various changes and modifications may be made in the details thereof without departing from the scope of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is defined in the following claims.

I claim:

1. An adapter for holding hexagonal L-shaped wrenches of different diameters comprising a cylindrical body having a threaded axial bore extending inwardly from one end thereof, and having a non-circular socket of smaller diameter than the threaded bore extending coaxially through the remainder of the body beyond the threaded bore, a chordal face formed on a side of the body at the threaded bore end thereof, said body having a hole of small diameter extending diametrically therethrough to receive therein a hexagonal wrench up to a predetermined maximum diameter, said hole penetrating said chordal face, a threaded closure plug secured in said threaded bore end with the inner end of said plug flush with the small wrench-receiving hole in the body, said body having a second wrench-receiving hole extending diametrically through the body at right angles to the axis of the small diameter hole and being offset axially therefrom, said second wrench-receiving hole being of larger diameter than said first wrench-receiving hole to receive therein a hexagonal wrench of predetermined larger maximum diameter for manipulation thereby.

2. An adapter for holding hexagonal L-shaped wrenches of different diameters comprising a cylindrical body having a threaded axial bore extending inwardly from one end thereof, and having a non-circular socket of smaller diameter than the threaded bore extending coaxially through the remainder of the body beyond the threaded bore, a side portion of said body being cut away at the threaded bore end thereof, said body having a hole of small diameter to receive therein hexagonal wrenches up to a predetermined maximum diameter, said hole extending through said body at the cut away portion thereof, a threaded closure plug secured in an end portion of said threaded bore with its inner end flush with the small wrench-receiving hole in the body, said body having a second wrench-reciving hole extending diamtrically through the body at right angles to the axis of the small diameter hole and being offset axially therefrom, said second wrench-receiving hole being of a diameter to receive a hexagonal wrench of predetermined maximum diameter for manipulation thereby.

3. An adapter for holding hexagonal L-shaped wrenches of different diameters comprising a cylindrical body having a threaded axial bore extending inwardly from one end thereof, and having a non-circular socket of smaller diameter than the threaded bore extending coaxially through the remainder of the body beyond the threaded bore and continuous therewith, a threaded bore closure plug secured in the opposite end of said threaded bore from said socket, a wrench-securing screw threadedly mounted in the threaded bore for axial movement between said plug and said socket, the end of the screw directed toward the socket being formed for engagement by a tool inserted through the socket, said body having a pair of wrench-receiving holes of different diameters extending diametrically therethrough in axially separated relation from each other to receive hexagonal wrenches of different diameters therein, the smaller of said wrench-receiving holes being substantially tangent to the inner end of the bore closure plug.



4. An adapter for holding hexagonal L-shaped wrenches of different diameters comprising a cylindrical body having a threaded axial bore extending inwardly from one end thereof, and having a non-circular socket of smaller diameter than the threaded bore extending coaxially through the remainder of the body beyond the threaded bore and continuous therewith, a threaded bore closure plug secured in the opposite end of said threaded bore from said socket, a wrench-securing screw threadedly mounted in the threaded bore for axial movement between said plug and said socket, the end of the screw directed toward the socket being formed for engagement by a tool inserted through the socket, said body having a pair of wrench-receiving holes of different diameters extending diametrically therethrough in axially separated relation to receive hexagonal wrenches of different diameters therein, the smaller of said wrench-receiving holes being located closely adjacent the plugged end of the threaded bore, a side portion of the body having a cutaway recess at one end of the smaller wrench-receiving hole whereby when one leg portion of a small L-shaped wrench is inserted fully in said smaller wrench-receiving hole from the cut-away side of the body its outer leg portion will be close to the axis of the body.

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