

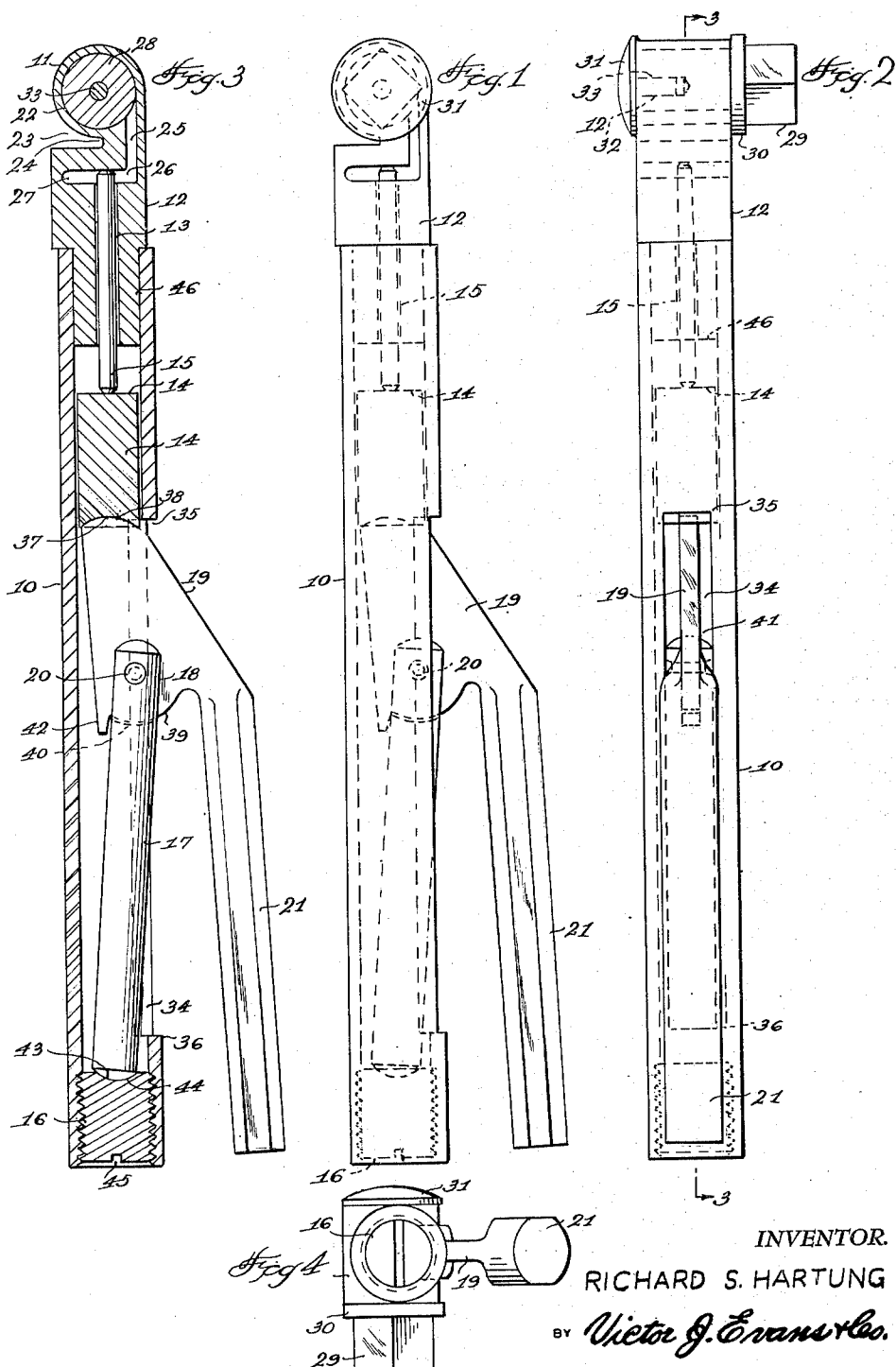
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R. S. HARTUNG

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POSITIVE GRIP FRICTION WRENCH

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POSITIVE GRIP FRICTION WRENCH

Richard S. Hartung, Marietta, Ohio

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6 Claims. (Cl. 81—58)

This invention relates to tools used primarily in working on and repairing machinery and machine tools, and in particular, a wrench of the socket wrench type in which means is provided for gripping and releasing nut and bolt receiving sockets without enlarging the socket holding portion or hub at the end of the wrench.

The purpose of this invention is to provide a wrench in the form of an elongated handle with a rotatable socket in one end and in which means is provided in the handle for gripping and releasing the socket.

Conventional wrenches, of the socket wrench type, are provided with hubs and the hubs are enlarged to provide a socket for receiving a nut or head of a bolt. In numerous instances, and particularly where bolt heads and nuts are positioned in recesses in heads of engine blocks the enlarged head of a socket wrench prevents the head or hub sliding downwardly to obtain a positive grip on a nut or bolt head. Furthermore, with the conventional type of ratchet used in a socket wrench of the reversible type, the ratchet elements cause extensions on the handle of the wrench that make use of the wrench impossible under certain conditions.

With these thoughts in mind, this invention contemplates a socket wrench in which the head is in the form of a cylindrical strap and in which toggle acting levers are provided for urging the strap into gripping relation with a cylindrical shank of a stud having flat sides and which is adapted to receive a socket of a socket wrench set.

The object of this invention is, therefore, to provide means for forming a socket wrench without enlarging a socket retaining portion at one end.

Another object of the invention is to provide a socket wrench having a stud rotatably mounted in one end and in which toggle acting levers are provided in the handle for urging the elements of the head into frictional gripping relation with the cylindrical shank of the stud.

A further object of the invention is to provide a toggle acting socket wrench in which the wrench is of a simple and economical construction.

With these and other objects and advantages in view, the invention embodies an elongated tubular handle, a head having a longitudinally disposed centrally positioned bore extended inwardly from one end and a transversely disposed bore providing a strap on the opposite end frictionally held in one end of the handle, a nut threaded in the opposite end of the handle, a pin extended through the longitudinally disposed bore of the head, a stud having a cylindrical shank rotatably mounted in the transversely disposed bore of the head, a cylindrical block slidably mounted in the handle and positioned to engage the pin, a rod having a bifurcated end mounted in the opposite end of the handle and positioned to engage the nut threaded therein, and a toggle lever extended through the bifurcated end of the rod pivotally connected thereto and positioned to extend through a slot in the handle whereby upon pressing an extended end of the lever toward the handle a pin in the head urges the strap portion of the

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head into gripping relation with the cylindrical shank of the stud.

Other features and advantages of the invention will appear from the following description, taken in connection with the drawing, wherein:

Figure 1 is a side elevational view of the improved socket wrench.

Figure 2 is also an elevational view looking from a point positioned at a right angle from that of the view shown in Figure 1.

Figure 3 is a longitudinal section through the wrench taken on line 3—3 of Figure 2.

Figure 4 is an end elevational view of the wrench looking toward the end on which the handle is positioned.

Referring now to the drawing, wherein like reference characters denote corresponding parts, the improved wrench of this invention includes a tubular handle 10, a strap providing a head 11 at one end of the handle, a base 12 having a longitudinally disposed bore 13 therein mounted in the end of the handle and on which the head 11 is carried, a sliding block 14 in the handle and positioned to engage a pin 15 in the bore 13, a plug 16 threaded in the end of the handle opposite to that in which the base 12 is positioned, a rod 17 having a bifurcated end 18 also positioned in the handle and a lever 19 pivotally connected to the end 18 of the rod 17 with a pin 20 and having a handle 21 extended therefrom.

The head 11, which is carried on the end of the base 12, is formed with a bore 22 in a cylindrical section with a notch 23 extended inwardly to a point 24 from the outer surface at one side and with a longitudinally disposed slot 25 extended from the bore 22 to a point 26, at which point it joins a transversely disposed slot 27 thereby weakening a portion of the head at one side so that pressure of the pin 15 against the surface at the far side of the slot 27 forces the material of the strap into gripping relation with a cylindrical shank 28 of a stud 29 extended from one side of the wrench.

The stud 29 is provided with a collar 30 and the stud is retained in position with a head 31 of a pin 32 that is frictionally held in an opening 33 in the shank.

To change the wrench from right hand to left hand, the pin 32 is withdrawn by forcing the head 31 outwardly and the position of the shank 28 is reversed whereby the stud 29 extends from the side of the wrench opposite to that shown in Figure 2, and with the stud in this position, the pin 32 is returned to the opening 33 which will be positioned in the opposite side.

The handle 10 is provided with an elongated slot 34 that extends from a point 35 to a point 36 and the lever 19 extends through the slot, as shown in Figure 3.

The small end of the lever 19 is provided with an arcuate surface 37 and the meeting end of the block 14 is provided with a similar surface, as indicated by the numeral 38, whereby the end of the lever is free to slide against the end of the block. The opposite end of the lever is provided with a similar arcuate surface 39 that is positioned to coact with an arcuate surface 40 at the base of a block 41 in the bifurcated end 18. The inner edge of the lever 19 is provided with a projection 42 that limits outward movement of the lever.

Although the rod 17 and lever 19 may be pivotally connected by suitable means, it is preferred to use a rivet with the ends peened or riveted over to fill countersunk sections at the ends of an opening in which the rivet or pin is positioned. The end of the rod 17 opposite to the end pivotally connected to the lever 19 is provided with an arcuate surface 43 that is positioned to extend into a concave recess 44 in the end of the plug 16. The opposite end of the plug is provided with a screw driver slot, as indicated by the numeral 45.

The base 12, at the opposite end of the handle, is se-

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cured in the handle by friction, however, it will be understood that a section 46 of the base may be sweat or brazed in the end of the handle or secured therein by other suitable means.

With the parts formed as illustrated and described, sockets, such as conventional sockets or socket wrenches, may be placed on the stud 29 and with the socket positioned over heads of bolts, or nuts threaded on bolts or the like, the handle 21 of the lever 19 may be pressed inwardly as the handle is moved, such as in a clockwise direction, and upon pressing the handle 21 inwardly the block 14 forces the pin 15 against the portion of the strap at the lower side of the head 11 whereby the head is urged into gripping relation with the shank 28 of the stud 29. By this means, the stud, with a socket thereon, may be rotated through a comparatively small angle, the handle 21 released whereby the wrench is adapted to be returned and the operation repeated. With the comparatively small head 11, the wrench is adapted to be used for tightening and removing nuts, cap screws, bolts and the like in which the operating area is limited.

It will be understood that modifications, within the scope of the appended claims, may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. A friction gripping wrench comprising an elongated handle, a substantially cylindrical portion providing a head at one end of the handle, said head having a bore therethrough providing a relatively thin wall, said wrench having a recess extended inwardly from one side and positioned between the head and handle a cylindrical shank having a stud with flat sides extended from one end mounted in the bore of the head and positioned with the stud extended from one side thereof, and operating means coacting with the handle for elastically deforming one side of the head to frictionally grip said shank of the stud.

2. A friction gripping wrench comprising an elongated handle, a substantially cylindrical portion providing a head at one end of the handle, said head having a bore therethrough providing a relatively thin wall, said wrench having a recess extended inwardly from one side and positioned between the head and handle a cylindrical shank having a stud with flat sides extended from one end mounted in the bore of the head and positioned with the stud extended from one side thereof, and toggle acting levers coacting with the handle for elastically deforming one side of the head to frictionally grip said shank of the stud.

3. A friction gripping wrench comprising an elongated handle, a substantially cylindrical portion providing a head at one end of the handle, said head having a bore therethrough providing a relatively thin wall, said wrench having a recess extended inwardly from one side and positioned between the head and handle a cylindrical shank having a stud with flat sides extended from one end mounted in the bore of the head and positioned with the stud extended from one side thereof, toggle acting levers coacting with the handle for elastically deforming one side of the head to frictionally grip said shank of the stud, and means for adjusting the toggle acting levers.

4. In a friction gripping wrench, the combination which comprises an elongated tubular handle having a slot in one side, a base having a longitudinally disposed bore extended inwardly from one end, and a transversely disposed bore extended through the opposite end and providing a thin-walled head, said base being mounted in one end of the tubular handle with the end in which the longitudinally disposed bore is positioned extending into the handle, a pin slidably mounted in the longitudinally disposed bore of the base and positioned to engage a portion of the thin-walled head and elastically deform the same, a cylindrical block slidably mounted in the handle and positioned to engage an end of said pin, a stud hav-

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ing flat sides on one end and a cylindrical shank on the other mounted in the head and positioned with the cylindrical shank in the transversely disposed bore of the head, a plug threaded in the end of the handle opposite to that in which the head is positioned, a lever having a handle extended therefrom extended through the slot of the tubular handle and positioned to engage the end of the sliding cylindrical block opposite to that adapted to engage the pin, and a rod mounted in the handle, pivotally connected to the lever extended through the slot of the handle and positioned to engage the plug threaded in the end of the handle.

5. In a friction gripping wrench, the combination which comprises an elongated tubular handle having a slot in one side, a base having a longitudinally disposed bore extended inwardly from one end, and a transversely disposed bore extended through the opposite end and providing a thin-walled head, said base being mounted in one end of the tubular handle with the end in which the longitudinally disposed bore is positioned extending into the handle, a pin slidably mounted in the longitudinally disposed bore of the base and positioned to engage a portion of the thin-walled head and elastically deform the same, a cylindrical block slidably mounted in the handle and positioned to engage an end of said pin, a stud having flat sides on one end and a cylindrical shank on the other mounted in the head and positioned with the cylindrical shank in the transversely disposed bore of the head, a plug threaded in the end of the handle opposite to that in which the head is positioned, a lever having a handle extended therefrom extended through the slot of the tubular handle and positioned to engage the end of the sliding cylindrical block opposite to that adapted to engage the pin, and a rod mounted in the handle, pivotally connected to the lever extended through the slot of the handle and positioned to engage the plug threaded in the end of the handle, said parts being positioned whereby inward movement of the handle extended from the lever moves the pivotal connection of the rod to the lever toward a plane extended through the axis of the pivotal connection extending the length of the parts and actuating the head to clamp the cylindrical shank of the stud therein.

6. In a friction gripping wrench, the combination which comprises an elongated tubular handle having a slot in one side, a base having a longitudinally disposed bore extended inwardly from one end, and a transversely disposed bore extended through the opposite end and providing a thin-walled head, said base being mounted in one end of the tubular handle with the end in which the longitudinally disposed bore is positioned extending into the handle, a pin slidably mounted in the longitudinally disposed bore of the base and positioned to engage a portion of the thin-walled head and elastically deform the same, a cylindrical block slidably mounted in the handle and positioned to engage an end of said pin, a stud having flat sides on one end and a cylindrical shank on the other mounted in the head and positioned with the cylindrical shank in the transversely disposed bore of the head, a plug threaded in the end of the handle opposite to that in which the head is positioned, a lever having a handle extended therefrom extended through the slot of the tubular handle and positioned to engage the end of the sliding cylindrical block opposite to that adapted to engage the pin, a rod mounted in the handle, pivotally connected to the lever extended through the slot of the handle and positioned to engage the plug threaded in the end of the handle, said parts being positioned whereby inward movement of the handle extended from the lever moves the pivotal connection of the rod to the lever toward a plane extended through the axis of the pivotal connection extending the length of the parts and actuating the head to clamp the cylindrical shank of the stud therein, and a head frictionally secured in the shank of the stud

for removably retaining the stud in the head of the wrench.

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