

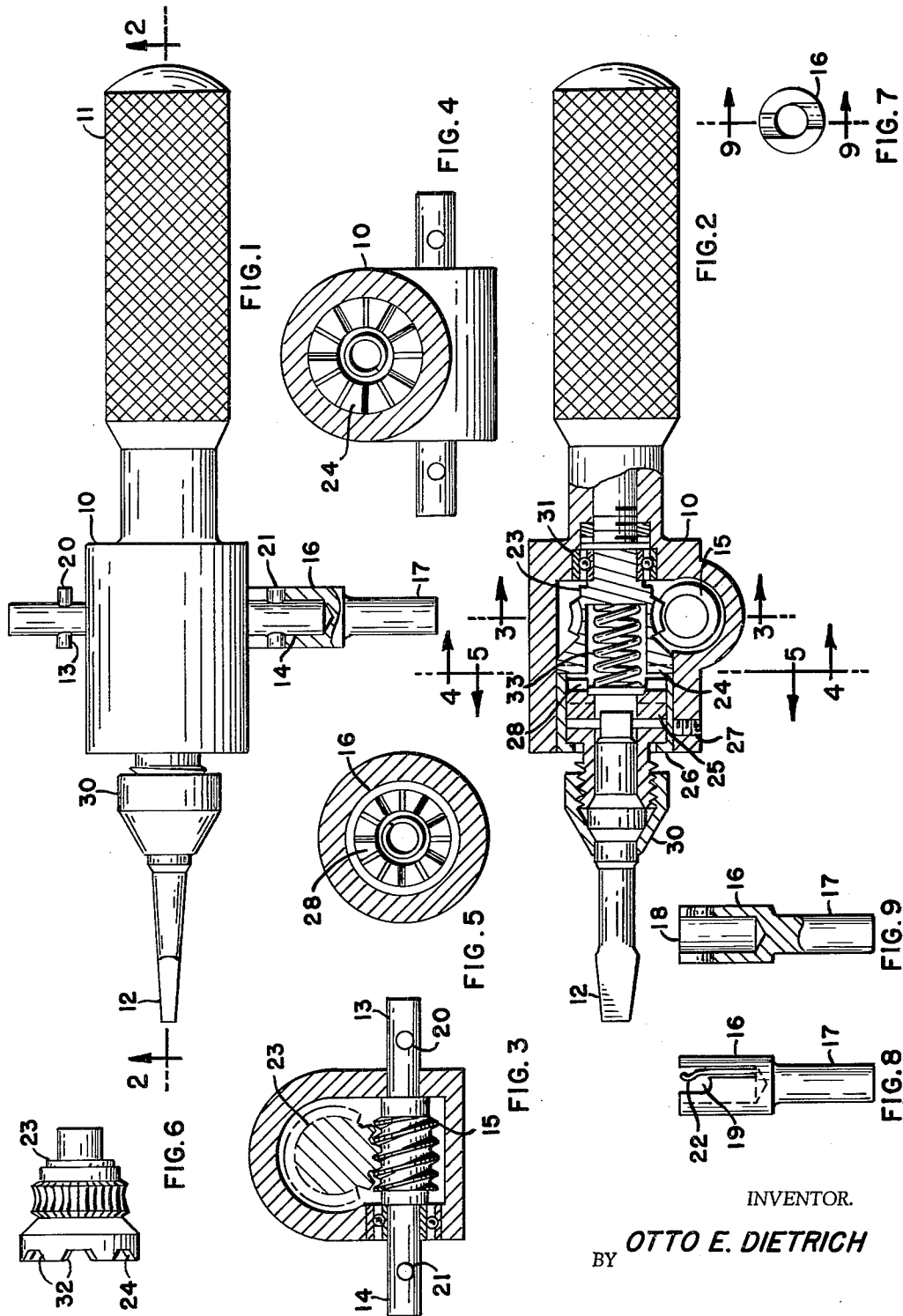
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TOOL DRIVER ATTACHMENT

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TOOL DRIVER ATTACHMENT

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Original application Aug. 4, 1959, Ser. No. 831,530, now Patent No. 3,004,569, dated Oct. 17, 1961. Divided and this application Sept. 11, 1961, Ser. No. 137,312 2 Claims. (Cl. 74-425)

This invention relates to tool driver attachments and particularly to attachments to be driven by a small portable electric drill and like sources of power. This is a division of my application entitled Power Driven Screw Driver, filed Aug. 4, 1959, Ser. No. 831,530, now Patent No. 3,004,569.

It is an object of this invention to provide an improved tool driver attachment which is simple in construction, with the axis of rotation of the tool being angularly disposed with respect to the axis of rotation of the source of rotary power.

It is a further object of this invention to provide an improved tool driver attachment so that the torque of the driven tool can be controlled by the amount of pressure the operator applies.

Another object is to provide a tool driver attachment which employs worm gearing to greatly reduce the speed in a single step and at the same time increase the torque of the driven tool.

Additional features and advantages of the invention will be found by referring to the drawings in which:

FIG. 1 is a top plan view of the tool driver attachment, the driven tool shown here as a screw driver bit, however the tool could as well be a socket wrench, a drill bit, etc.

FIG. 2 is a sectional view of the attachment taken along line 2-2 of FIG. 1.

FIG. 3 is a sectional view showing the driving worm and the driven worm gear setup, taken along line 3-3 of FIG. 2.

FIG. 4 is a sectional view taken along line 4-4 of FIG. 2.

FIG. 5 is a sectional view taken along line 5-5 of FIG. 2 and is the same section as FIG. 4 except the view is in the opposite direction. This shows the end view of the jaw portion of the clutch of the worm gear.

FIG. 6 is a detail view of the worm gear showing the clutch section.

FIG. 7 is an end view of the drive socket used to couple the tool driver attachment to a source of power.

FIG. 8 illustrates a side view of the socket shown in FIG. 7.

FIG. 9 is a partially sectional view of the socket taken along line 9-9 of FIG. 7 and FIG. 8.

The tool driver attachment as shown in FIG. 1 has a hollow body 10 to which is attached the knurled handle 11. The body and handle extend symmetrically along a common longitudinal axis indicated in FIG. 1 as line 2-2.

The driven tool 12 shown in FIG. 1 as a screw driver bit, is fastened in the chuck which is driven by the worm gearing within the body 10. The two extensions 13 and 14 are the ends of the driven shaft on which is the worm 15. These extensions and worm are shown more clearly in FIG. 3. The drive socket 16 is shown in FIGS. 7, 8, 9 and also FIG. 1. It is fastened in the chuck of an electric drill by the shaft end portion 17 and then slipped over one of the extensions 13 or 14 to drive the attachment. Shown in FIG. 9 is a drilled hole 18 to receive the extensions 13 or 14 and in FIG. 8 the groove 19 for the pins 20 or 21. Also shown in FIG. 8 is a leaf spring formed from the socket 16, with a detent portion at 22. As the socket is slipped over the extension 13 or 14 the

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pin 20 or 21 is retained in the groove 19 by the detent effect of the leaf spring.

In FIG. 2 is shown the complete drive mechanism in cross section. The driving worm 15 is enmeshed with the driven worm gear 23. At 24 is shown the clutch jaw section of this worm gear. The chuck portion of the drive mechanism is shown at 25 and is supported and retained in the body 10 by the sleeve 26, which is locked in place by the set screw 27.

The chuck 25 has a clutch jaw section shown at 28 in FIG. 2 and FIG. 5, which mates with the clutch section 24 of the worm 23. These clutch jaws are preferably made with their mating edges at a slight angle as shown at 32 in FIG. 6 so the clutch will be forced apart or disengaged under pressure. The torque of the tool is then determined by the amount of pressure the operator applies to the handle to keep the clutch from disengaging. A pin 29 is provided in chuck 25 for driving the bit 12 or whatever tool is being used. The lock nut 30 fastens the tool to the chuck. A ball bearing 31 supports the worm gear and also serves as a thrust bearing.

To operate this attachment, a tool such as the screw driver bit 12, is slipped in the chuck and the nut 30 is tightened to fasten the bit in place. The drive socket 16 is clamped in the chuck of a drill, if this is the power source being used, and the socket slipped over the extension 13 or 14, depending on the direction the tool should turn. The extension 13 or 14 can be clamped directly in the chuck of a drill if this is desirable, the drive socket being used when it is necessary to frequently reverse the direction of the tool while in use. Then as the drill is rotating under power, the screw driver bit will not rotate because the spring 33 has the clutch disengaged, however when the operator places the bit in the slot of a screw and applies pressure to the handle 11, the spring force is overcome and the bit rotates. As the screw tightens, the pressure on the clutch becomes greater and will slip out of engagement, if the pressure on the handle is not great enough to prevent this. This clutch action is a safety feature to prevent the head of the screw from breaking. To drive the screw in tighter the operator applies more pressure to the handle.

What I claim is:

1. A tool driver attachment for coupling a unidirectional source of rotary power to a tool to be driven thereby, comprising:

a hollow body having a longitudinal axis,
a driving worm rotatably mounted in said body transversely thereto,
drivable extensions attached to each end of said worm and extending outwardly from said body,
each of said extensions adapted to be coupled to said source of rotary power,
a worm gear rotatably mounted in said body on said longitudinal axis and meshing with said worm,
a chuck for engaging a tool rotatably and axially slidably retained in said body,
clutch jaws on each of said worm gear and
said chuck complementarily shaped for mating engagement,
and spring means interposed between said chuck and said worm gear for normally urging said clutch jaws apart, whereby said chuck can be rotated in either direction by a source of rotary power which is capable of rotating in only one direction.

2. A tool driver attachment as defined in claim 1, including a transverse driving pin secured to each of said extensions, a drive socket adapted on one end to be connected to said power source, and on the other end adapted to be slipped over one of said extensions, a slot in said socket to receive said driving pin, and a detent

formed on said socket for engaging said driving pin to secure the socket to the extension.

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