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MULTIPLE PURPOSE PORTABLE TOOL

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MULTIPLE PURPOSE PORTABLE TOOL

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This invention relates to a multiple purpose portable tool and has as its primary object the provision of an improved mechanism for driving rotary tools, such as abrading wheels, drills, sharpeners and other rotating mechanisms.

An additional object of the invention is the provision of a device of this character having means whereby a plurality of rotating tools or other similar articles may be simultaneously driven from a single source.

Still another object of the invention is the provision of a device of this character wherein a tool attachment may be secured to a driving mechanism in a plurality of select angular positions.

Still another object of this invention is the provision of such a device which may be readily transported from place to place and secured to a working surface in either vertical or horizontal position as desired.

A still further object of the invention resides in the provision of an apparatus of this sort which may be either manually or power driven.

An additional object of the invention is the provision of such a multiple purpose tool which is sturdy and durable in construction, reliable and efficient in operation, and relatively simple and inexpensive to manufacture and assemble, which further adapts itself to the ready selection and attachment of a large number of operating tools.

Still other objects reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter, and disclosed in the accompanying drawings wherein are shown preferred embodiments of this inventive concept.

In the drawings:
Figure 1 is a plan view of one form of device embodying features of the instant invention.
Figure 2 is a side elevational view, partially broken away, of the device of Figure 1.
Figure 3 is a sectional view taken substantially along the line 3—3 of Figure 1 as viewed in the direction indicated by the arrows.
Figure 4 is a sectional view taken substantially along the line 4—4 of Figure 2 as viewed in the direction indicated by the arrows.
Figure 5 is a fragmentary sectional view taken substantially along the line 2—2 of Figure 5 as viewed in the direction indicated by the arrows.
Figure 6 is an enlarged fragmentary sectional view taken substantially along the line 6—6 of Figure 4 as viewed in the direction indicated by the arrows.
Figure 7 is an enlarged fragmentary sectional view taken substantially along the line 7—7 of Fig. 1 as viewed in the direction indicated by the arrows.
Figure 8 is a plan view, partially in section of the construction of Figure 1 showing one of the uses of the device and an attachment therefor.
Figure 9 is a plan view similar to Figure 8, but showing the parts in a different position of adjustment, and certain additional operating elements shown in association with the device.
Figure 10 is an enlarged sectional view taken substantially along the line 10—10 of Fig. 9 as viewed in the direction indicated by the arrows.
Figure 11 is an enlarged sectional view taken substantially along the line 11—11 of Figure 9 as viewed in the direction indicated by the arrows, and
Figure 12 is a plan view of the device showing still further modification in the arrangement of elements and auxiliary parts employed therewith.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Having reference now to the drawings in detail, there is generally indicated at 20 a gear box or housing, preferably circular, shown as, but which may be elliptical or of other desired shape which includes a removable front plate 21 and a peripheral wall 22, the plate 21 being attached to the wall 22 as by means of suitable screws 23 or the like, which engage threaded bosses 24 positioned interiorly of the casing (see Fig. 3). The casing also includes a rear wall 25, from which projects a tubular boss 26, within which is located a shaft 27 mounted in suitable bushings 28. The outer end of shaft 27 is threaded as at 29 and engages interiorly of a threaded bore centrally located in the hub 30 of an operating handle which includes a shank 31 and a hand gripping member 32 rotatably mounted on a spindle 33 extending laterally of the shank 31. Obviously rotation of the handle or hand grip 32 will thus occasion rotation of the shaft 37. While in this modification there has been shown a manual operating handle, it is to be understood that the handle is removable, and any suitable power drive may be associated with the threaded end 29 of the drive shaft 27.

The end of shaft 27 interiorly of casing 20 is fixedly secured in any desired manner to a drive gear 35, which is in mesh with a plurality of driven gears 36 (in the illustrative embodiment) each of which is keyed or other wise suitably secured to a shaft 37 which is mounted for rotation in a suitable bushing 38 which extends outwardly through a tubular boss 39 carried by front plate 21, each shaft 37 terminating in a threaded extremity 40 adapted for the reception of a suitable implement to be rotated. It is noted that the three driven shafts of the illustrative embodiment of the invention are spaced about the surface of the casing 20, and that a greater or lesser number of driven gears and associated shafts may be employed if desired.

The casing 20 has secured to one portion of the periphery of the wall 22 a U-shaped clamping bracket generally indicated at 45, one leg 46 of which is adapted to be suitably secured as by welding 47 (see Fig. 2) to the peripheral wall 22 of the casing. The bight 48 of the U extends in a plane parallel to the plane of boss 26, to encircle the end of a support S, as indicated in Figure 2. The other leg 49 of the clamp 45 is provided with a boss 50 having internally threaded bore through which extends the bolt 51 having a head 52 and a cross piece 53 to afford a finger grip. The inner end of the bolt 51 terminates in a clamping head 54 which is adapted to compress the support S between the inner side of leg 46 and head 54.

The peripheral wall 2 of casing 20 is also provided with an aperture 55 at a point diametrically opposed to clamping member 45, through which opening a bolt 56 extends outwardly, and accommodates a wing nut 57, for a purpose to be more fully pointed out hereinafter.

A tool driving attachment, generally indicated at 60 is provided and comprises an elongated tubular shaeit 61, within which is rotatably mounted a shaft 62. The
shaft 62 has removably attached, at one end a ring gear 63, which is adapted, when the attachment is employed to mesh with a corresponding ring gear 64 which is keyed or otherwise suitably secured to the end of a selected one of driven shafts 37, and which may be secured as by means of a locking nut 65. The sleeve 61 is provided with a bracket 66 extending at right angles to the length of the sleeve, which terminates in a collar 67 which is adapted to seat about an adjacent sleeve 39, to provide support and alignment for the holder 60. An arm 68 is also secured to sleeve 61, and extends outwardly therefrom to a point adjacent the peripheral wall 22 of casing 20, at which point it is provided with an angularly disposed portion 69. The portion 69 overtops wall 22, and is provided with a slot 70 adapted to engage about pin 56, in which position it is clamped by wing nut 57, thus securing the unit 60 in aligned operative position relative to the casing 20. The outer end of the rotatable shaft 62 is threaded, as at 71, and is adapted for the positioning thereon of a suitable tool or other implement.

The sleeve 61 has positioned adjacent its outer end, a lug 72, through which extends a transverse bore 73, perpendicular to the central bore of sleeve 61, for a purpose to be more fully described hereinafter.

Figure 8 discloses one of the many uses to which the instant invention may be applied, and shows an abrasive wheel 75 having an internal sleeve 76 which is threaded to engage the threaded end 71 of shaft 62. The abrasive wheel 75 has a V-shaped outer face as indicated at 76, and is adapted for engagement with the edges of the teeth T of a sickle bar B, which may be sharpened in the conventional manner. Obviously other suitable types of abrasive wheels may be substituted for the wheel 75 and employed in other usages.

A further application of an operating device is shown in Figures 9, 10 and 11. Here a drill chuck 80 of conventional design and having an internally threaded bore 81 is adapted to be threaded on the threaded end portion 71 of shaft 62. A drill 82 is secured in the drill chuck in any desired manner, and may be applied to a piece of work W, as shown in Figure 9. In this modification, while the drill chuck 80 and drill 82 may be utilized alone against a fixed piece of work, it has been found desirable to support the work on a movable lever L which is pivoted as at T to a vertical work support S. An operating handle 83 which includes a shank portion 84 and a handle member 85 is pivoted on a pivot pin 86 which extends through the bore 73 of lug 72, the portion of handle 83 beyond pivot 86 comprising a hook member 87, about which may be secured a chain 88 which surrounds the work supporting lever L, the arrangement being such that downward pressure on handle portion 85 will serve to bias work supporting lever L and its associated work W upwardly against the drill, in such manner that the work rather than the drill is moved.

Figure 12 discloses the still further use of the device, wherein the casing 20 is supported vertically on a support S by means of the clamp 45, and a pulley 90 is threadedly engaged or otherwise securely on one of shafts 37. The pulley 90 is connected by belt 91 to the drive pulley 22 of an electric motor 93 or similar power source which is adapted to be bolted, as by means of bolts 94 to the work support. It will be understood that in this modification any of the driven shafts 37 may serve as a drive shaft. When so employed the removable handle may be removed from the threaded end 29 of shaft 27, or if desired may be left thereon, but not utilized.

A work holder, including a disc 95 having projecting prongs 96 may be threaded on the threaded end 71 of shaft 62 for rotatably mounting a piece of work adapted to be operated upon as by a lathe. When so employed the extended portion of the support not shown in Fig. 12 may carry a conventional tool rest, and a conventional tail stock.

While there has been hereinbefore shown and described a variety of applications and usages for the device of the instant invention, it will be understood that it may readily be adapted to other uses not shown. For example the apparatus may be employed to turn any rotary mechanism, such as a barbecue spit, a flexible shaft, a propeller, or any tool or implement to be rotated.

It will thus be seen that there is herein provided an improved multiple purpose tool holder which accomplishes all of the objects of the invention and others, including many advantages of great practical utility, and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made of the embodiments shown and described, it is to be understood that all matter heretofore is to be interpreted merely as illustrative and not in a limiting sense.

What is claimed is:

1. In a device of the character described, in combination, a gear casing, a central drive gear therein, a drive shaft for said drive gear extending out of said casing, a plurality of driven gears spaced about and in mesh with said drive gear, a driven shaft extending from each driven gear out of said casing, a bevel gear carried by one of said driven shafts, and a tool operator mounted on said casing, said tool operator comprising a sleeve, a shaft rotatable in said sleeve, a bevel gear carried by one end of said shaft in mesh with said first mentioned bevel gear, and tool holding means carried by the other end of said shaft.

2. The structure of claim 1 wherein a plurality of bosses are carried by said casing and a drive shaft extends through each boss and said sleeve is provided with a supporting bracket having a bore adapted to engage around one of said bosses.

3. The structure of claim 2 wherein a second boss having a bore extending transversely to the bore of said first mentioned bracket is also carried by said sleeve.

4. The structure of claim 3 wherein said sleeve carries a supporting arm and said casing carries a bolt and wing nut adapted releasably to engage said supporting arm.

5. The structure of claim 3 wherein a pivot is mounted in the bore of said second boss and a lever is mounted in said pivot.

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