Nov. 29, 1932. S. WAGNER 1,889,136

BORING MACHINE

Filed May 27, 1930

Fig. 1

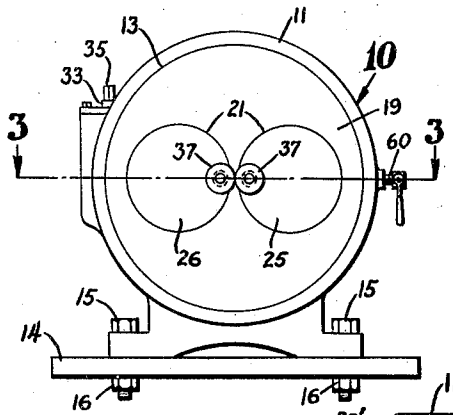


Fig. 2

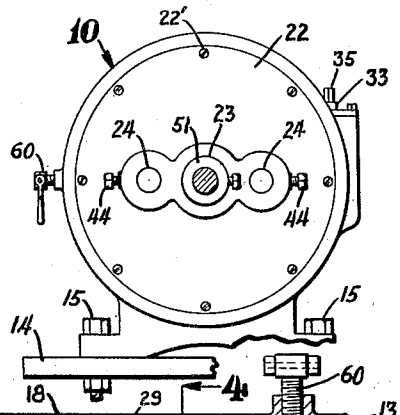


Fig. 3

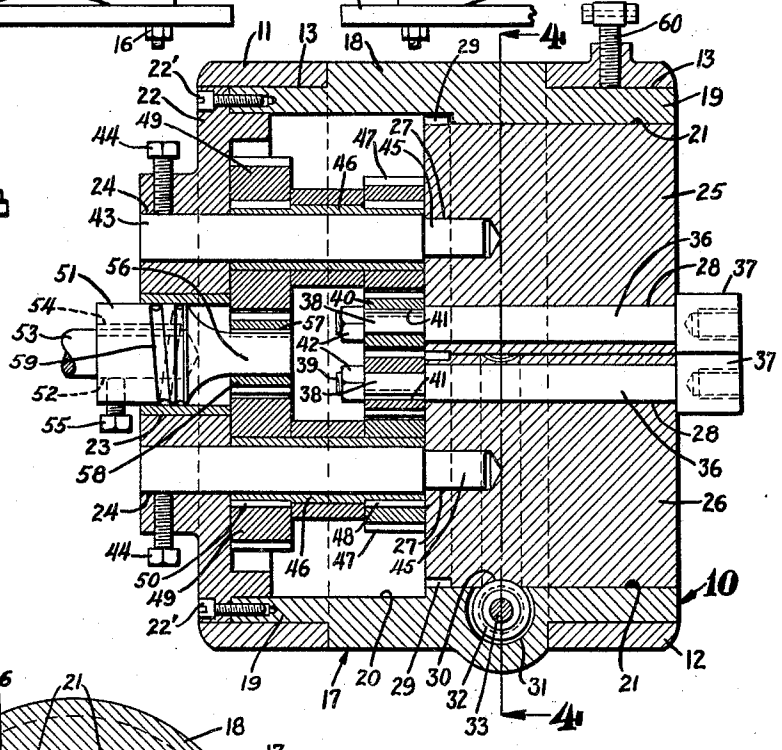
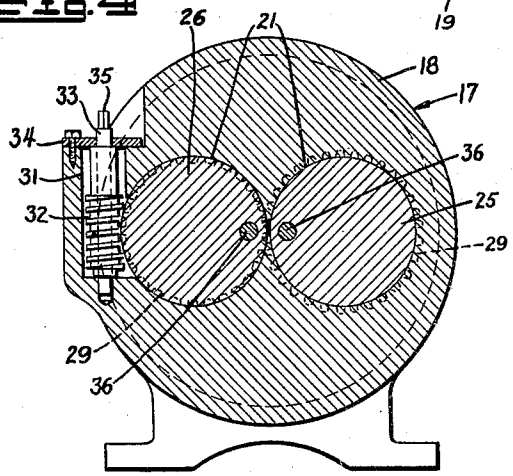


Fig. 4



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UNITED STATES PATENT OFFICE

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BORING MACHINE

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This invention relates to improvements in boring machines.

The general object of the invention is to provide an improved multiple spindle boring machine.

A further object of my invention is to provide a multiple spindle boring machine wherein the spindles are mounted in a novel manner to allow various distances between centers to be secured.

Another object of the invention is to provide a boring machine including a plurality of chucks with novel means for moving and holding the chucks.

Other objects and the advantages of this invention will be apparent from the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is a front view of my improved boring machine.

Fig. 2 is a rear view of the device.

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 1, and

Fig. 4 is a reduced section taken on line 4—4 of Fig. 3.

Referring to the drawing by reference characters I have indicated my improved boring machine generally at 10. As shown this machine includes a front support 11 and a rear support 12, each provided with coaxial cylindrical apertures 13 and each mounted on a table or base 14 and secured thereto by bolts 15 and nuts 16.

The supports 11 and 12 receive a sleeve 17 which includes a central portion 18 of approximately the same exterior diameter as that of the supports and reduced end portions 19. The reduced end portions 19 are positioned in the apertures 13 of the supports 11 and 12 and the shoulders at the juncture of the center portion 18 and the reduced ends 19 engage portions of the supports 11 and 12 to prevent longitudinal movement of the sleeve 17.

The sleeve 17 is provided with a recessed chamber at one end while the other end is closed except for a plurality of apertures 21 which communicate with the chamber and extend through the one end of the sleeve. The chamber 20 is closed by a plate or cover 22 which is secured to the sleeve by a plurality of bolts 22′ and includes a bushed central aperture 23 and a pair of axially aligned spaced apertures 24 which are coaxial with the apertures 21 in the sleeve 17.

Positioned in the sleeve aperture 21 I provide hubs 25 and 26, each of which include an axial recess 27 opening into the chamber 20 and parallel apertures 28 extending longitudinally through the hubs.

The chamber ends of the hubs 25 and 26 are provided with meshing gear teeth 29 which may extend entirely around the hubs, (as shown in Fig. 4) or they may extend only part way around if so desired. One of the hubs which is shown as the hub 26 is provided with worm gear teeth as indicated at 30 which may extend entirely around or only part way around the hub depending on the extent of the gear teeth 29.

Positioned in a recess 31 in the sleeve 17 I provide a worm pinion 32 which meshes with the worm teeth 30 on the hub 26 and is secured to a shaft 33 which extends out through a cover plate 34 where it is provided with an operating portion 35 on which a suitable handle may be positioned to rotate the worm pinion 32. When the pinion 32 is rotated it rotates the hub 26 which in turn rotates the hub 25 through the medium of the intermeshed gear teeth on the two hubs.

Positioned in the parallel apertures 28 of the hubs 25 and 26 I provide spindles 36 which include enlarged chuck heads 37 in which suitable boring tools are adapted to be positioned and reduced ends 38 which extend into the chamber 20 and are provided with threaded portions 39.

Mounted on the reduced ends 38 of the spindles 36 I provide intermeshing gears 40 which are shown as secured to the spindles by keys 41 and nuts 42 positioned on the threaded portions 39.

Positioned in the apertures 24 of the cover 22 I provide studs 43 which are adapted to be secured to the cover by set screws 44 and include reduced end portions 45 which are positioned in the recesses 27 of the hubs 25 and 26.

Rotatably mounted on the studs 43 within

the chamber 20 I provide sleeves 46 and adjacent one end of the sleeves I secure gears 47, as by keys 48. The gears 48 mesh with the gears 40. Adjacent the cover 22 I secure gears 49 to the sleeves 46 as by keys 50.

Positioned in the central bushed apertures 23 of the cover I provide a shaft socket 51 which includes a recess 52 in which the armature shaft 53 of a motor or a pulley shaft is adapted to be secured by a key 54 and a set screw 55. The opposite end of the socket is reduced as at 56 and has secured thereto, as by a key 57, a gear 58 which meshes with both of the gears 49.

The chamber 20 is preferably packed with a lubricant such as grease and the socket 51 is provided with a return groove 59 which forces grease tending to pass around the socket back into the chamber.

From the foregoing it will be apparent that when the shaft socket 51 is rotated the gear 58 will rotate each of the gears 49 which through the medium of the sleeves 46 will rotate the gears 48 and which will in turn rotate the gears 40 thereby rotating the spindles 36.

When the operator desires to move the sleeve 17 to various angles he grasps the sleeve 17 and turns the same to locate the spindles in the desired position. For retaining the sleeve 17 in an adjusted position I may provide a set screw 60 in one of the supports 12.

When the operator desires to move the spindles farther apart or closer together to vary the distance between centers he rotates the hubs 25 and 26 by means of the worm 32 as previously described.

From the foregoing description it will be apparent that I have provided a novel boring machine which is simple in construction, can be economically manufactured and which is highly efficient in use.

Having thus described my invention, I claim:

1. In a boring machine, a base, a pair of spaced supports mounted on said base, a sleeve positioned in said support, said sleeve being rotatable, means to retain said sleeve in a fixed position relative to said supports, there being a recessed chamber in said sleeve and a pair of apertures in said sleeve communicating with said chamber and extending through said sleeve, a hub rotatably journaled in each of said sleeve apertures, intermeshing gear teeth on said hubs adjacent the chamber end thereof, there being a recess in the chamber end of each of said hubs, a bore in each of said hubs, a spindle positioned in each of said bores, said spindles including chuck portions adjacent the outer face of said hubs, each of said spindles extending into said chamber and having a gear secured thereto, said gears being in mesh, a cover plate removably secured to said sleeve closing said chamber, there being a central aperture and a pair of spaced apertures in said cover, a stud positioned in each of said spaced cover apertures, means to secure said studs to said cover, said studs including reduced end portions positioned in said recesses of said hubs, a sleeve rotatably mounted on each of said studs, gears secured to said stud sleeves adjacent said hubs and meshing with said spindle gears, other gears secured to said stud sleeves adjacent said cover, a shaft positioned in said central aperture of said cover, a gear secured to said shaft, said last mentioned gear meshing with said other stud sleeve gears.

2. In a boring machine, a base, a pair of spaced apertured supports mounted on said base, a sleeve, said sleeve including reduced end portions positioned in said support apertures, said sleeve being rotatable in said supports, means to retain said sleeve in a fixed position relative to said supports, there being a recessed chamber and a pair of apertures in said sleeve communicating with said chamber and extending through said sleeve, there being a recess in said sleeve, a worm pinion positioned in said recess, worm teeth on one of said hubs, said pinion meshing with said worm teeth, means to rotate said pinion, a hub rotatably journaled in each of said sleeve apertures, intermeshing gear teeth on said hubs adjacent the chamber end thereof, there being a recess in the chamber end of each of said hubs and a bore in each of said hubs, a spindle positioned in each of said bores, said spindles including chuck portions adjacent the outer face of said hubs, each of said spindles extending into said chamber and having a gear secured thereto, said gears being in mesh, a cover plate removably secured to said sleeve to close said chamber, there being a central aperture and a pair of spaced apertures in said cover, a stud positioned in each of said spaced apertures, means to secure said studs to said cover, said studs including reduced end portions positioned in said recesses of said hubs, a sleeve rotatably mounted on each of said studs, gears secured to said stud sleeves adjacent said hubs and meshing with said spindle gears, other gears secured to said stud sleeves adjacent said cover, a shaft positioned in said central aperture of said cover, and a gear secured to said shaft, said shaft gear meshing with said other stud sleeve gears.

3. In a boring machine, a base, a pair of spaced apertured supports mounted on said base, a sleeve, said sleeve including end portions positioned rotatably in said support apertures, there being a recessed chamber and a pair of apertures in said sleeve communicating with said chamber and extending through said sleeve, there being a recess in said sleeve, a worm pinion positioned in said recess, worm teeth on one of said hubs, said pinion meshing with said worm teeth, means to rotate said pinion, a hub rotatably

journaled in each of said sleeve apertures, intermeshing gear teeth on said hubs adjacent the chamber end thereof, there being a recess in the chamber end of each of said hubs and a bore in each of said hubs, a spindle positioned in each of said bores, said spindles including chuck portions, each of said spindles extending into said chamber and having a gear secured thereto, said gears being in mesh, a cover plate to close said chamber, there being a central aperture and a pair of spaced apertures in said cover, a stud positioned in each of said spaced apertures, means to secure said studs to said cover, said studs including reduced end portions positioned in said recesses of said hubs, a sleeve rotatably mounted on each of said studs, gears secured to said stud sleeves adjacent said hubs and meshing with said spindle gears, other gears secured to said stud sleeves adjacent said cover, a shaft positioned in said central aperture of said cover, and a gear secured to said shaft, said shaft gear meshing with said other stud sleeve gears.

In testimony whereof, I hereunto affix my signature.

STEFAN WAGNER.