Aug. 13, 1929. S. O. BERVEN 1,724,250

MULTIPLE DRILL HEAD

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Fig. 1.

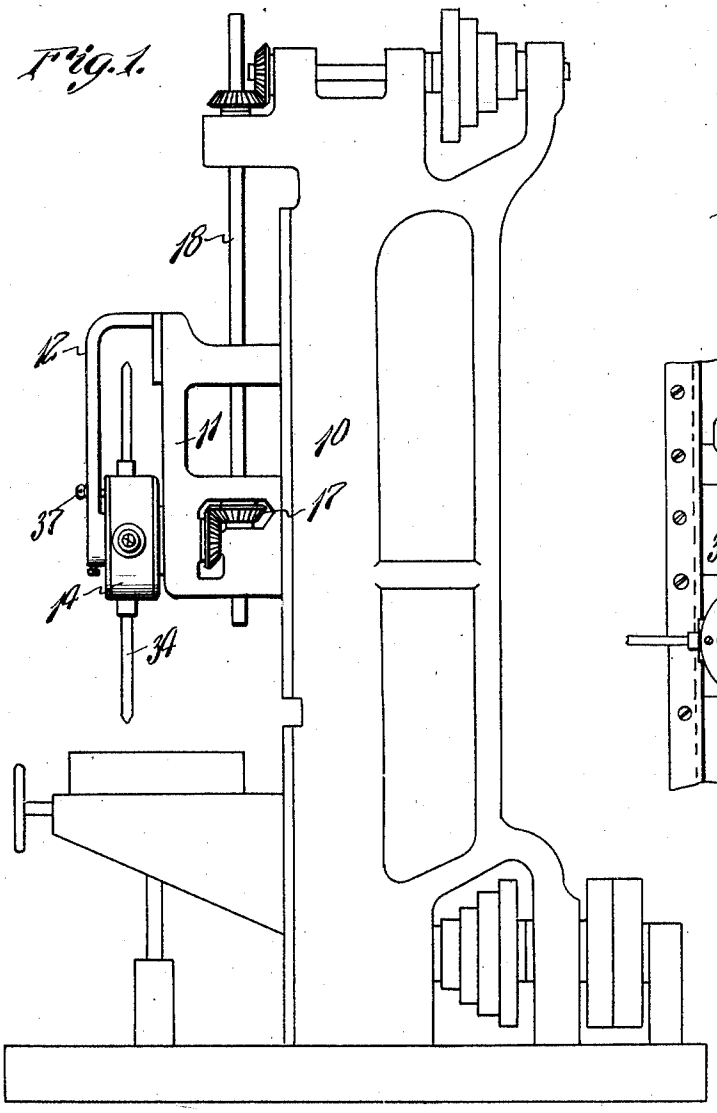


Fig. 2.

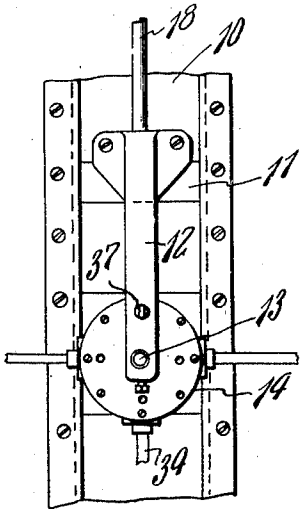
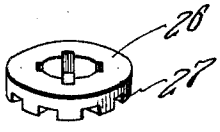


Fig. 7.



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Fig. 3.

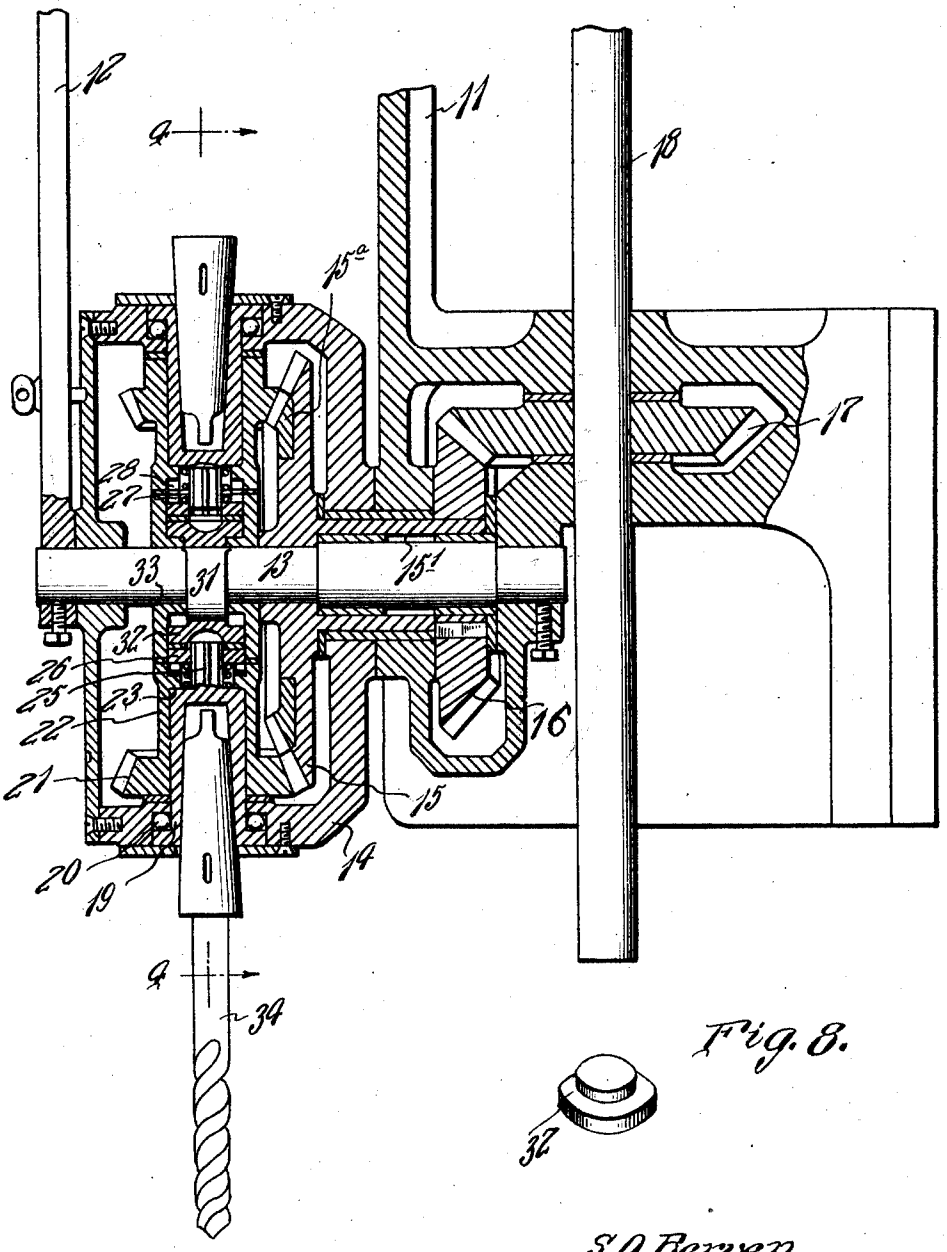


Fig. 8.

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Fig. 4.

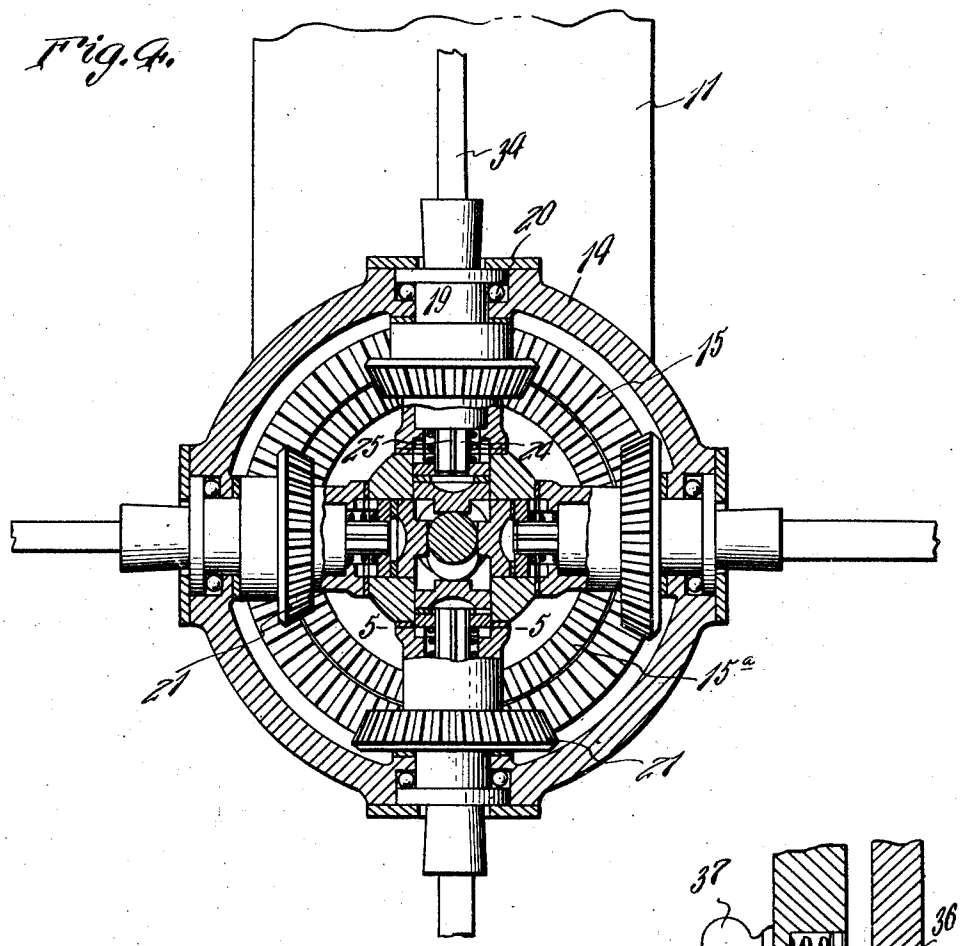
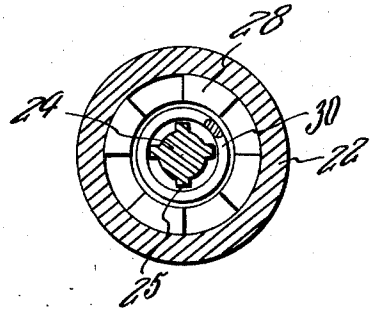


Fig. 5.



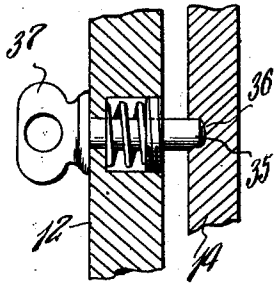


Fig. 6.

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UNITED STATES PATENT OFFICE.

SIGURD O. BERVEN, OF SEATTLE, WASHINGTON.

MULTIPLE-DRILL HEAD.

Application filed May 17, 1924. Serial No. 714,121.

This invention relates to improvements in drilling machines and has for an object the provision of a machine which includes a drill head capable of holding a number of drill bits and mounted so that any of the bits may be easily and quickly positioned for use.

Another object of the invention is the provision of means whereby the positioning of a drill bit will automatically connect the same with the operating mechanism of the machine and leave the remaining bits free, so that only the particular bit desired for use will be operated.

Another object of the invention is the provision of a multiple drill head which is simple in construction, positive in operation and which may be readily attached to a drilling machine so as to convert the latter from a single to a multiple bit machine.

With the above and other objects in view the accompanying drawings show one of the novel ways of construction to be fully described, illustrated in the accompanying drawings and pointed out in the appended claim.

In the drawings:—

Figure 1 is a side elevation of a drilling machine constructed in accordance with the invention.

Figure 2 is a fragmentary front view of the same.

Figure 3 is an enlarged detail sectional view through the drill head and the adjacent portion of the drilling machine.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a detail horizontal section taken on the line 5—5 of Figure 4.

Figure 6 is an enlarged fragmentary sectional view showing a manner of holding the drill head in adjusted position.

Figure 7 is a detail perspective view of one of the movable clutch members.

Figure 8 is a detail perspective view of one of the clutch engaging disks.

Referring to the drawings in detail wherein like characters of reference denote corresponding parts, the reference character 10 indicates a drilling machine to which the invention is shown as applied. This machine may be of any suitable type and includes a frame 11 from which extends an arm 12, the latter being secured to the frame by any suitable means and providing a bearing for one end of a cam shaft 13.

The casing 14 of the improved drill head is mounted upon the shaft 13, the latter extending through the casing and having mounted thereon for free rotation a gear 15. This gear carries a sleeve 15′ which extends through the machine frame and has secured thereon a gear 16, the latter being driven by a gear 17 which is mounted upon a vertically disposed shaft 18. This last mentioned shaft forms a part of an ordinary drilling machine and is driven in any suitable manner.

The casing 14 of the drill head may be of any suitable shape, the one shown being cylindrical, while carried by and extending into this casing is a number of chucks 19. While four of these chucks are illustrated, this number may be varied as desired. The chucks are preferably rotatably mounted within the casing upon anti-friction bearings 20 and have loosely mounted thereon beveled gears 21 which are engaged and driven by the gear 15. The gear 15 may be of sectional formation and may include an outer section 15 and an inner section 15ª, the latter having a less number of teeth than the outer section so as to obtain a change of speed to enable each chuck to be driven at a different rate of speed. The gears 21 are of similar construction and each includes a hollow hub or sleeve 22 which receives its particular chuck 19, a shoulder 23 being provided upon the inside of the sleeve 22 for engagement with a shoulder at the inner end of the chuck.

Extending from the inner end of each of the chucks 19 is a stem 24 which is provided with longitudinally disposed ribs 25, while mounted for sliding movement upon this stem 24 is one member 26 of a clutch. This member is provided with spaced teeth 27 which are adapted to engage teeth 28 provided within the end of each of the sleeves 22 and as the clutch 26 is provided with notches 29 which receive the ribs 25, the chuck and its particular gear 21 will be locked together when the teeth 27 and 28 of the clutch are in engaged position.

Surrounding the stems 24 are springs 30, the latter acting to force the teeth 27 and 28 apart so that the gears 21 will be free to rotate upon the chucks and in order to engage these teeth and lock the gears and chucks together, the shaft 13 is provided

with a cam 31 which always extends downward. This cam engages a number of clutch disks 32 which operate in a yoke 33 rotatable upon the shaft 13, the said disks bearing against the clutch members 26 so that the lowermost chuck will be locked to its gear 22 by reason of the position of the cam 31, while the springs of the remaining clutch members will act to free the remaining chucks. Thus only the drill bit desired for use will be operated. The drill bits are indicated at 34.

In order to hold the drill head in adjusted position, the arm 12 is provided with a spring actuated plunger 35, the latter being adapted to enter any one of a number of sockets 36, one of which is provided for each chuck. The plunger has secured thereto an operating knob 37.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claim.

Having described the invention what is claimed is:—

In a drilling machine, a stationary shaft, a multiple drill head including a casing mounted for rotation on the shaft, a beveled gear loosely mounted on the shaft, means for driving said gear, a plurality of chucks carried by and extending into said casing, and rotatably supported thereby, a beveled gear carried by each chuck and meshing with the aforementioned gear, the first mentioned gear including a section whereby each chuck may be driven at a different rate of speed, each of the gears carried by each chuck including a sleeve receiving said chucks, spaced teeth formed on the inner end of each sleeve, a stem projecting from the inner ends of said chucks and provided with spaced ribs, a clutch member slidably mounted on the stem and provided with spaced teeth adapted to engage the teeth formed on said sleeve, said clutch being further provided with notches to receive said ribs so that the chuck and its particular bevel gear will be locked together when the clutch is in engaged position, a spring surrounding each stem and functioning to separate the clutch member from the particular sleeve at a proper time thereby permitting the chuck to rotate, a cam carried by said shaft and clutch disks arranged to engage the said clutch members and actuated by said cam when said chucks are called into use.

In testimony whereof I affix my signature.

SIGURD O. BERVEN.