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E. A. KENYON

DRILLING MACHINE

Filed March 13, 1920

FIG. 1.

FIG. 2.

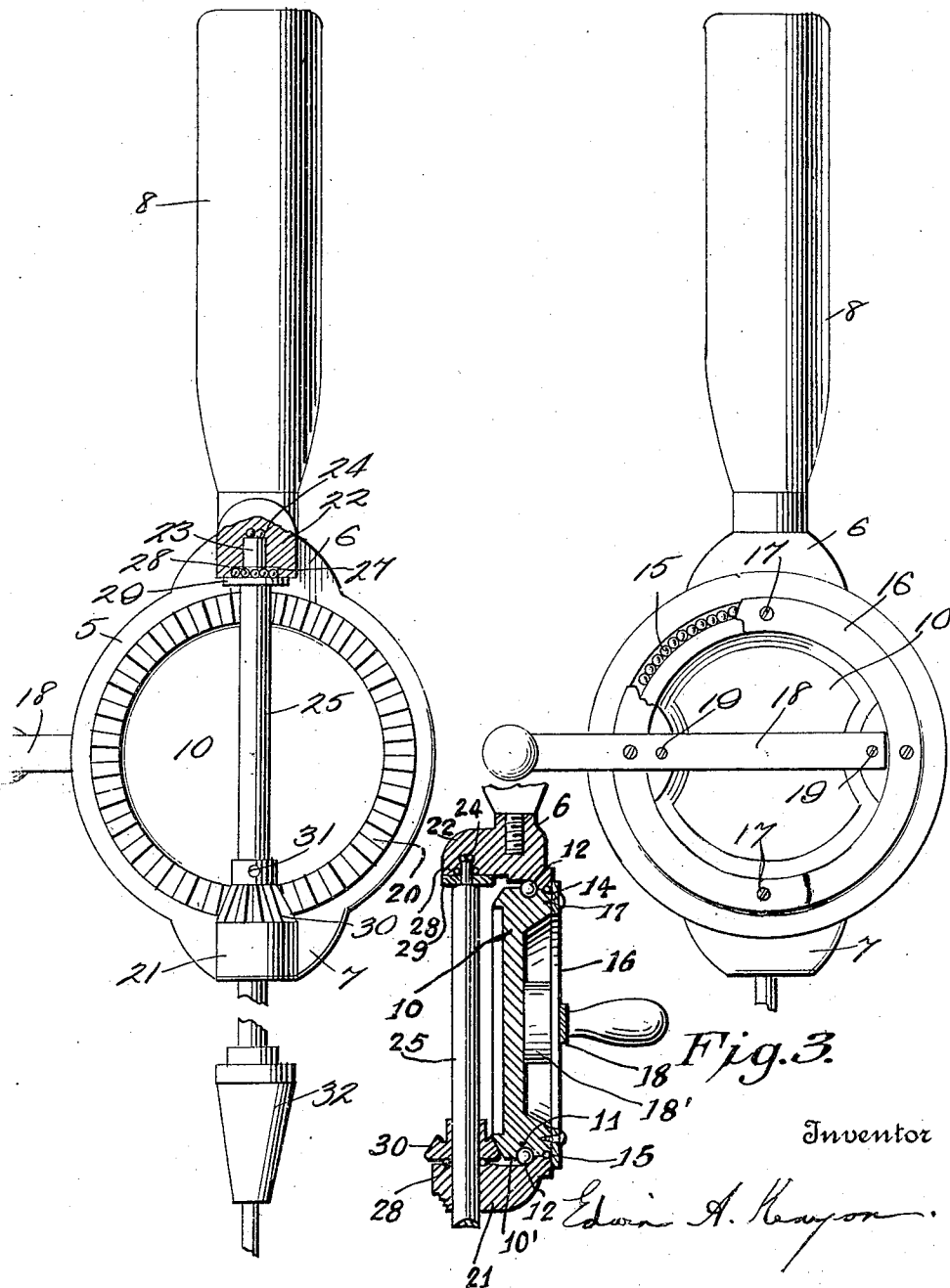


Fig. 3.

Inventor

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## UNITED STATES PATENT OFFICE.

EDWIN A. KENYON, OF HAMILTON, ONTARIO, CANADA.

## DRILLING MACHINE.

Application filed March 13, 1920. Serial No. 365,683.

*To all whom it may concern:*

Be it known that I, EDWIN A. KENYON, a subject of Great Britain, residing at Hamilton, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in a Drilling Machine, of which the following is a specification.

My invention relates to improvements in drilling machines and more particularly to hand drills operated by a gear mechanism arranged upon a suitable spindle, and has for its primary object to provide a drill, which is so constructed as to eliminate the usual vibratory movement found in drills of this conventional type, when in operation, which frequently causes the breaking of drill points and loss of power.

A further object of the invention lies in the feature of having the main drive wheel mounted to revolve within an annular frame, thus providing a rigid bearing for the wheel, so that it will at all times revolve on a true plane.

A further object of the invention resides in the novel arrangement of the parts, its simplicity in construction, efficiency in operation, and cheapness in manufacture.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a front elevation of my improved drilling machine;

Figure 2 is a rear elevation partly in section of the same, and

Figure 3 is a longitudinal sectional view thereof.

In the drawings, wherein for the purpose of illustration I have shown a preferred embodiment of my invention, the numeral 5 designates an annular frame or supporting structure having enlargements 6 and 7 which are diametrically disposed to each other. The enlargement 6 is provided with a handle 8 fixedly secured thereto and by which the frame is held in a vertical position when the drill is in operation. The inner peripheral edge of the annular frame 5 is provided with a circumferentially extending rib 9 forming spaced sections, the purpose of which will be set forth hereinafter. Fitted within the frame and adapted

to revolve therein is a drive wheel 10, the circumferential edge of which is provided with a centrally disposed groove or ball-race 11 within which are disposed the balls 12 as clearly shown in Figure 3. The side 13 of the groove 11 abuts with the rib 9 and divides the ball-race 11 from rabbet 14 within which are disposed balls 15 of smaller size than the balls 12. The face portion of the drive wheel 10 is countersunk forming an annular ridge 10' at its edge. An annular ring 16 covers the rabbet 14 being secured to the ridge 10' of the drive wheel 10 through the medium of set screws 17. Extending diametrically across the face of the drive wheel 10 and projecting slightly beyond its edge is an arm 18 which is secured to lugs 18' integral with the ridge 10' by means of screws 19 and adapted to operate it. The opposite side of the drive wheel 10 is provided with a series of beveled gear teeth 20 which surround its outer peripheral edge and project slightly above the surface of the frame 5. This method and manner of mounting the drive wheel within the frame eliminates the usual vibratory movement to which drills are subject, thus preventing to a great extent the breaking of drill points and the loss of power.

The enlargements 6 and 7 of the frame 5 are provided with outwardly projecting lugs 21 and 22 which are formed integral therewith. The lug 22 is provided with a recess 23 in the bottom of which are placed a plurality of balls 24. This recess forms a bearing for the upper end of the spindle 25 which extends downwardly across the face of the drive wheel and through the aperture 26 formed through the lug 21. Each lug is provided with an annular groove 27 which surrounds the spindle 25 and within which are disposed a series of balls 28 which are held in place by the washer 29 and the bevel-gear 30. The bevel-gear 30 is mounted on the spindle 25 adjacent the lug 21 being fixedly secured thereto by the set screw 31. The teeth of the bevel-gear 30 are adapted to mesh with the teeth 21 through the medium of which a continuous revolving movement is imparted to the spindle 25. The lower extremity of the spindle 25 is provided with a chuck 32 of any desired construction to receive different sizes and kinds of boring and drilling tools.

In use, the handle 5 is grasped by one of the operator's hands and by oscillating

the arm 18 which is attached to the drive wheel 10, a rotary motion is imparted thereto, which is transmitted to the spindle 25 through the medium of the gear teeth 20 and the bevel-gear wheel 30. Particular attention is called to the manner in which the drive wheel 10 is mounted within the frame 5, so that the said wheel will revolve on a true plane at all times. The ball-bearings disposed around the various wheels and the shaft facilitate in the operation of the drill, producing a machine which will more easily and efficiently perform its function for which it is adapted. While in the drawings the mechanism has been shown applied to a hand drill it is to be understood that the same may be used in connection with various other drilling implements.

It is to be understood that this is the preferred form of my invention and that certain changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus fully described my invention, what I claim is:—

1. In a hand drill, the combination of an annular frame, a rib dividing the inner circumference of the frame into sections, a drive wheel mounted to revolve within the frame having a pair of annular grooves which coact with said sections forming a

pair of ball races, an annular ring secured to said wheel and over-lapping the edge of said frame, diametrically opposed bearings formed integral with said frame, a spindle mounted to revolve in said bearings, a bevel gear fixed to said spindle, gear teeth formed around the peripheral edge of the drive wheel and meshing with said bevel gear, and means for imparting movement to said drive wheel.

2. In a hand drill, the combination of an annular frame, a drive wheel mounted to revolve in said frame having teeth cut from its peripheral edge, a spindle journaled in bearings formed integral with said frame, a bevel gear fixed to said spindle and meshing with the teeth of said drive wheel, a rib dividing the inner circumference of the frame into sections, said drive wheel having an annular ball race positioned on the inner side of said rib, a smaller ball race on the opposite side of said rib, an annular ring secured to said drive wheel and over-lapping the edge of the frame, and means for imparting movement to said drive wheel.

In testimony whereof, I have affixed my signature in the presence of two witnesses.

EDWIN A. KENYON.

Witnesses:

G. L. POWER,  
A. W. DAVIE.