J. DALTON.

HAND OPERATED DRILL.

APPLICATION FILED SEPT. 17, 1913.

1,109,516. Patented Sept. 1, 1914.

Fig. 1.

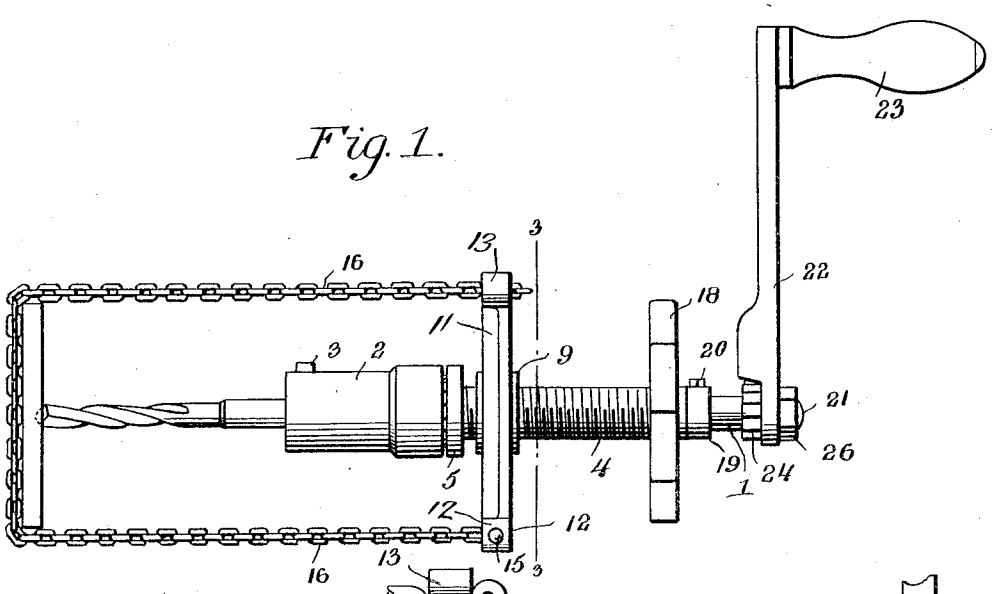


Fig. 2

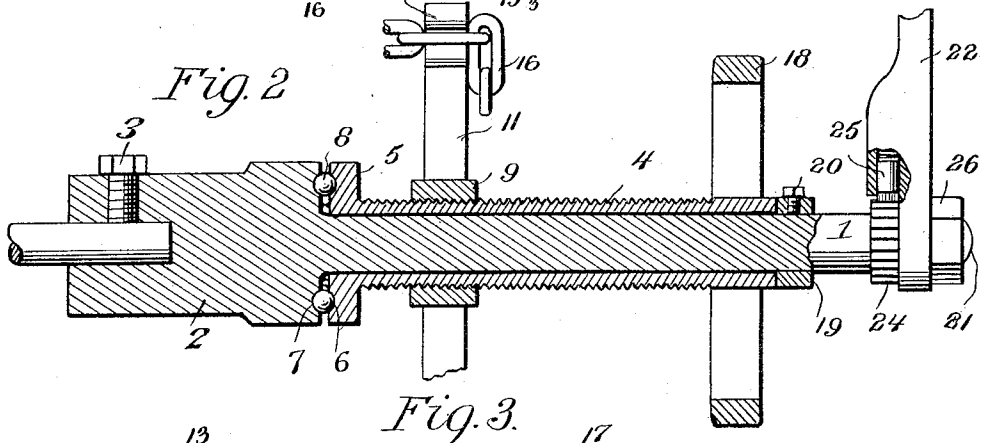
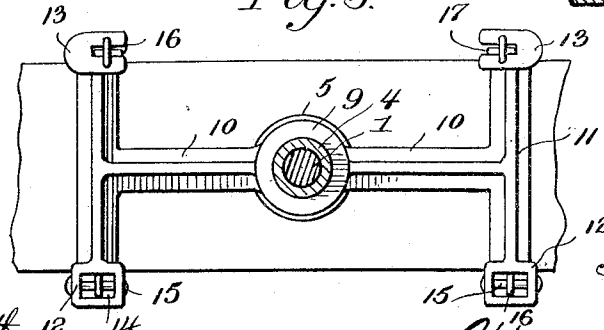


Fig. 3.



Witnesses

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HAND-OPERATED DRILL.

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To all whom it may concern:

Be it known that I, JAMES DALTON, citizen of the United States, residing at Roxbury, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Hand-Operated Drills, of which the following is a specification.

This invention relates to improvements in hand operated drills and has particular application to a portable drill of this type.

In carrying out the present invention, it is my purpose to provide a hand operated drill wherein the drill may be fed to the work with comparatively little effort on the part of the operator and wherein such feeding of the drill will be manually controlled so that the operator may, when conditions require, cause the drill to feed into the work.

It is also my purpose to provide a manually operated drill wherein the drill will be held to and caused to feed into the work through the agency of chains or other flexible elements, such chains being so arranged and correlated as to cause the drill to feed in an even and uniform manner so that the drill bits will remain true during the feeding thereof.

Furthermore, it is my purpose to provide a drill of the class described which will embrace the desired features of simplicity, efficiency and durability and which may be manufactured and marketed at a minimum expense.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter set forth in and falling within the scope of the claim.

In the accompanying drawing, Figure 1 is a view in side elevation of a drill constructed in accordance with my present invention. Fig. 2 is a longitudinal sectional view therethrough. Fig. 3 is a section on the line 3—3 of Fig. 1.

Referring now to the accompanying drawing in detail, the numeral 1 designates a shaft which may be of any suitable or desired length and fixed upon one end of this shaft is a drill receiving socket member 2 equipped with a set screw 3 movable into and out of the socket therein and adapted to hold the drill bit in proper position. Loosely surrounding the shaft 1 is a feed screw 4 having one end thereof disposed in proximity to the head of the socket member 2 and equipped with an outwardly extending annular flange 5 having the outer surface thereof formed with an annular groove 6 coöperating with a similar groove 7 formed in the confronting portions of the head of the socket member to provide a race way adapted to receive anti-friction bearing members, which members, in the present instance, are in the form of balls 8. By means of this construction, it will be seen that in the rotation of the shaft 1 motion will be imparted to the socket member 2 and the drill bit, while such shaft will rotate within and relatively to the feed screw 4, the bolt bearings 8 enabling the respective end of the feed screw 4 to bear upon the head of the socket member 2. Surrounding the feed screw 4 and threadedly engaging the same is a collar 9 provided at diametrically opposite points with outwardly extending arms 10, 10 each carrying at its outer end a cross bar 11, such bar having the opposite ends thereof formed to provide heads 12, 13. The head 12 is formed with a rectangular opening 14 through which is passed a bolt 15 and secured to such bolt is one end of a chain 16 or other flexible element, while the head 13 on the opposite end of the respective arm is formed with a recess 17 opening onto one side of the head and disposed in a plane parallel with that of the axis of the shaft 1, such recess forming, in effect, a hook adapted to receive the free end of the respective chain. In the present instance, the outer end of the feed screw 4 is equipped with a hand wheel 18 by means of which the feed screw may be rotated relatively to the shaft 1 and within the collar 9 so as to move the socket member 2 and the shaft longitudinally so as to feed the drill bit into the work. A collar 19 surrounds the shaft 1 and abuts the outer end of the feed screw 4 so as to prevent relative sliding movement of the shaft and screw, such collar being provided with a set screw 20 designed to bind against the shaft 1 in order that sliding motion of the collar along the shaft will be avoided.

In the embodiment of my invention selected for illustrative purposes, the outer end of the shaft 1 is reduced circumferentially to provide a trunnion 21 and loosely surrounding said trunnion is one end of a crank handle 22 equipped at its free end with an outwardly extending crank handle 23. Fixed to the shaft 1 adjacent to the respective end of the handle 22 is a ratchet wheel 24 and connecting such ratchet wheel

is a spring pressed dog or pawl 25 carried by the crank 22, while a nut 26 threadedly engages the outer end of the trunnion 21 and so holds the crank handle 22 thereon.

From the foregoing description taken in connection with the accompanying drawing, the construction, mode of operation and manner of employing my invention will be readily apparent. When it is desired to apply the drill to the work, the chains 16, 16 are looped about the object and the free ends thereof drawn through the recesses 17 in the heads 13 so that the pointed end of the drill bit will engage the work. The crank handle is now rotated and motion imparted to the shaft 1 through the medium of the dog 25 and the ratchet wheel 24. When it is desired to feed the drill into the work, the hand wheel 18 is rotated thereby imparting rotary motion to the feed screw 4 so that the latter moves longitudinally within the collar 9 and carries the shaft 1, socket member 2 and the drill bit toward the work. By means of the cross bars on the ends of the arms 10 carried by the collar 9 and the chains 16 disposed at the opposite sides of the axis of the drill bit, it will be seen that the drill is fed into the work in an even and uniform manner thereby maintaining the bit true during the feeding operation.

I claim:

In a drill, a shaft, a drill receiving socket in one end of said shaft, a feed screw surrounding said shaft, an anti-friction bearing between one end of said feed screw and said socket, a hand wheel upon the opposite end of said feed screw for operating the latter, a collar surrounding said screw and threadedly engaging the same, arms extending outwardly from said collar at diametrically opposite points, cross bars carried by the outer ends of said arms, heads on the opposite ends of each cross bar, one of said heads being formed with a rectangular opening, a bolt passed through the walls of said opening, the other head being formed to provide a hook, chains each having one end fixed to the bolt on the respective head of one of said arms and the other end detachably connected with the hooked head, a crank handle loosely surrounding the outer end of said shaft, and a pawl and ratchet connection between said crank handle and shaft.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES DALTON.

Witnesses:

ISABELLA DALTON,

CHARLES F. DOREY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."