No. 670,543. Patented Mar. 26, 1901.

H. PAULSON.

DRILL.

(Application filed Mar. 9, 1900.)

(No Model.)

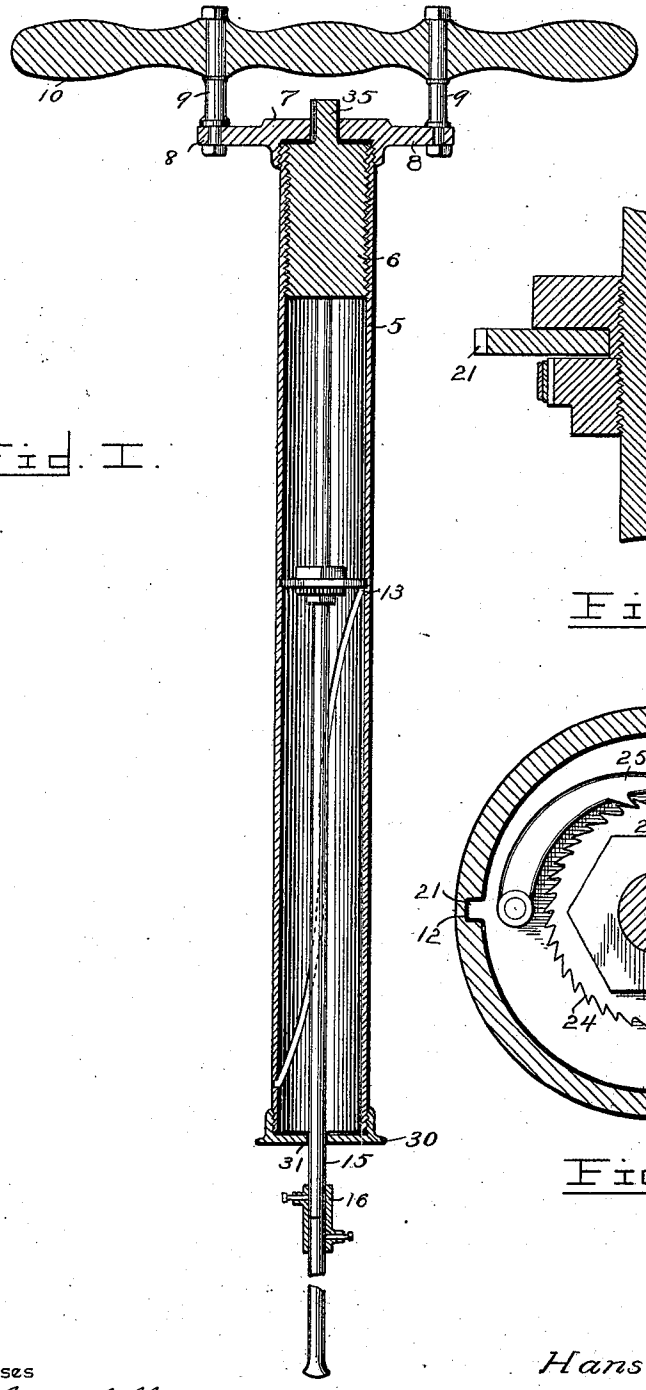


Fig. 1.

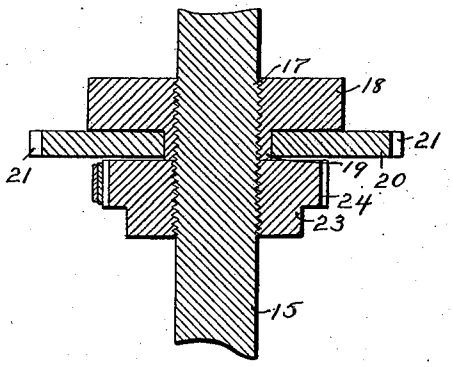


Fig. 2.

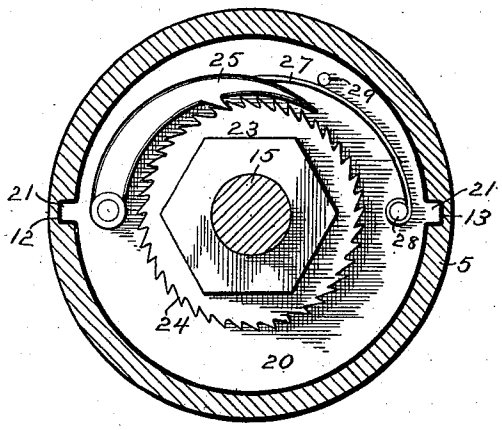


Fig. 3.

Witnesses
F. G. Campbell
Geo. H. Chandlee.

Hans Paulson Inventor
By his Attorneys,
C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HANS PAULSON, OF TACOMA, WASHINGTON, ASSIGNOR OF ONE-HALF TO HERMAN KLABER, OF SAME PLACE.

DRILL.

SPECIFICATION forming part of Letters Patent No. 670,543, dated March 26, 1901.

Application filed March 9, 1900. Serial No. 8,053. (No model.)

To all whom it may concern:

Be it known that I, HANS PAULSON, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented a new and useful Drill, of which the following is a specification.

This invention relates to drills in general, and more particularly to hand-drills, although the principles involved may be employed in connection with power-drills, as will be readily understood.

The object of the invention is to provide a construction including a drill-shaft and hammer so connected that when the hammer is reciprocated with respect to the shaft it will first deliver a blow to the shaft to drive the drill and will then shift the drill rotatably, ready for a second stroke.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a view, partly in section and partly in elevation, showing the hammer resting upon the upper end of the drill-shaft. Fig. 2 is an enlarged section showing a portion of the drill-shaft and the guide-fingers and ratchet mechanism thereon. Fig. 3 is a section on line 3 3 of Fig. 1 looking upwardly.

Referring now to the drawings, the present drill comprises a tubular body portion 5, having its upper end interiorly threaded for engagement by the threads of a hammer-head 6, while the exterior of the upper end of the body is also threaded for engagement by the interior threads of a collar 7, having radially-extending lugs 8. Through these lugs 8 are formed perforations which receive bolts 9, which engage a handle 10. This handle 10 is disposed above and radially of the tubular body and is held spaced from the lugs 8 by flanges upon the bolts, which engage the lugs and the handle.

In the inner face of the tubular body portion are cut two helical channels or grooves 12 and 13, which extend throughout the length of the body portion and through the lower end thereof at diametrically opposite points. In connection with this tubular body portion there is employed a rotatable drill-shaft 15, the lower end of which is provided with a socket 16 of any preferred construction, and which socket is adapted to receive and hold a drill. The drill-shaft is disposed within the tubular body 5 and in a position to be engaged at its upper end by the hammer-head 6. In order to retain the drill-shaft in the proper position concentric with the tubular body and to shift the shaft rotatably after each stroke of the hammer, the central portion of the drill-shaft is enlarged and threaded, as shown at 17. Upon this threaded portion 17 is engaged a collar comprising a major upper portion 18 and a minor lower portion 19, both of which are cylindrical. Upon the minor portion 19 is rotatably mounted a disk 20, having lugs 21 extending radially therefrom at diametrically opposite points of its periphery, and which lugs engage the grooves 12 and 13, respectively, the diameter of the disk being such as to cause it to fit snugly within the tubular body.

Below the collar upon the drill-shaft is disposed a disk 23, having a peripheral ratchet 24, this ratchet-disk lying closely against the end of the minor portion 19 of the collar to hold the disk 20 thereon. The disk 23 has its lower portion reduced and formed cross-sectionally angular for the reception of a wrench in the application and removal of the ratchet-disk.

In order to lock the disk 20 to move with the drill-shaft in one direction and permit the drill-shaft to move freely thereof in an opposite direction, a pawl 25 is pivoted upon the disk 20 in a position to engage the ratchet-teeth 24 of disk 23, and to hold the ratchet yieldably in this engagement a spring-finger 27 is engaged at one end with a pin 28 upon the disk 20 and is then passed between a second pin 29 and the pawl, with its extremity resting against the pawl, as illustrated.

A cap 30 is engaged with the lower end of the tubular body 5, and this cap has a central perforation 31, which receives the drill-shaft and acts as a guide therefor to maintain the lower portion concentric with the body.

With this construction after a drill has been engaged with the lower end of the drill-shaft the point of the drill is rested upon a rock or other body to be operated upon and the handle is grasped. The body is then

raised, and as it ascends the lugs 21 move downwardly through the slots or grooves 12 and 13 and are caused to progress helically of the body. At this time the pawl 25 engages the teeth 21 of the ratchet-disk 20, and this helical movement of the disk with respect to the body 5 imparts rotary motion to the drill-shaft, as will be understood. This rotary motion will continue until the body has been raised to the proper height. When the body 5 is then lowered, it will cause a reverse movement of the disk 20; but with this movement the ratchet 25 will ride freely over the ratchet-teeth, and the drill-shaft will have no movement due to the frictional engagement of the drill with the body operated upon. By moving the body downwardly with a quick motion a sharp stroke or blow will be delivered by the hammer-head 6 upon the upper end of the drill-shaft, and this blow will be imparted to the drill to drive it.

It will of course be understood that the body may be raised to any height within certain limits and may be lowered with such speed as will secure the best results under different circumstances.

In the manufacture of the drill the specific construction shown may be altered and any suitable materials and proportions may be used for the various parts without departing from the spirit of the invention.

It will be noted that the collar 7 is in the form of a cap for the upper end of the body 5 and that this cap has a central perforation, through which an axial stem 35 of the hammer-head 6 extends. This stem has flattened sides, as shown, for the reception of a wrench. In practice the hammer-head is first screwed into the body 5, and the cap 7 is then screwed into place, after which a wrench is engaged with the stem 35, and it is backed up until the head rests against the cap. In this arrangement the jar of the hammer-head and of the cap and parts carried thereby is delivered directly to the drill-shaft, and strain upon the threads is prevented.

What is claimed is—

1. A drill comprising a tubular casing having interior helical grooves, a drill-shaft passed into the casing axially thereof and with respect to which the casing is reciprocatory, a hammer-head carried by the casing for engagement with the drill-shaft to drive the drill when the casing is moved in one direction, a disk mounted upon the drill-shaft and having lugs engaged with the grooves of the casing, and ratchet connections between the disk and shaft, whereby the shaft will be rotated step by step upon return movement of the casing after striking a blow.

2. A drill comprising a tubular casing having interior threads, a hammer-head inserted in the casing and engaged with said threads, said head having a cross-sectionally angular stem projecting beyond the end of the casing, a cap having threaded engagement with the exterior of the casing and having an opening through which the stem of the hammer-head projects, whereby a wrench may be engaged with the stem to back the head against the cap and jam the parts to prevent unscrewing, handles connected with the cap, a drill-shaft slidably disposed within the casing for engagement by the hammer-head as the casing is moved in one direction with respect to the shaft, and connections between the shaft and casing to rotate the shaft upon return movement of the casing.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HANS PAULSON.

Witnesses:
H. B. RITZ,
MABEL MCGUIGAN.