

C. B. GROFF,
DRILL.

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1,283,740.

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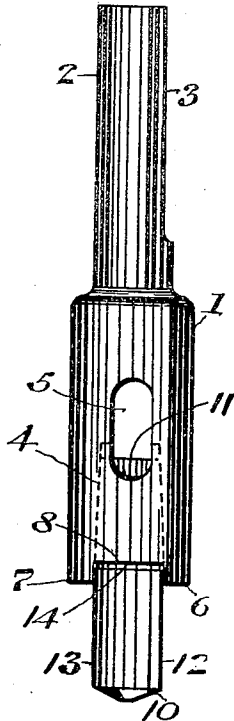


Fig. 1.

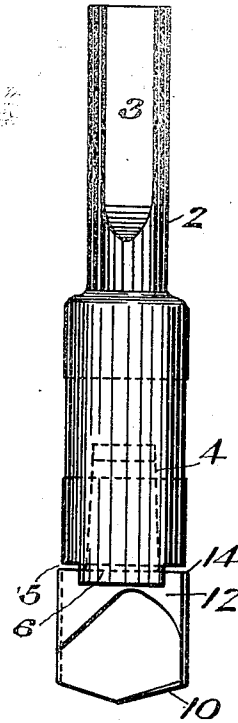


Fig. 2.



Fig. 3.

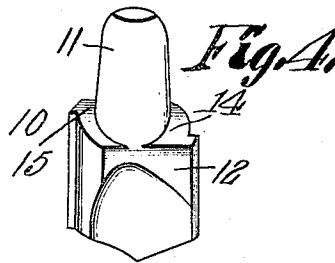


Fig. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

CLARENCE B. GROFF, OF CAMDEN, NEW JERSEY.

DRILL.

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To all whom it may concern:

Be it known that I, CLARENCE B. GROFF, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Drill, of which the following is a specification.

One object of my invention is to devise a novel tangless drill.

My invention further consists of a novel construction of a tangless drill.

It further consists of a novel construction of a flat drill having a conical shank and wherein the tang usually employed is entirely dispensed with.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown a preferred embodiment thereof which is at present preferred by me since the same has been found in actual practical use to give very advantageous results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein disclosed.

Figure 1 represents a side elevation of a drill chuck and tangless drill embodying my invention, the parts being shown in their assembled position, the drill being a right hand drill.

Fig. 2 represents a side elevation of Fig. 1. Fig. 3 represents a bottom plan view of Fig. 1.

Fig. 4 represents a perspective view of a left hand drill in detached position.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—

1 designates holding means comprising a drill socket having a straight shank 2 which is provided with one or more flats 3. The forward end of the socket 1 is provided with a tapered or conical aperture 4 therein, above which is located the laterally extending drift aperture 5 which is adapted to receive the usual type of drift for removing the drill or working tool from the drill socket 1.

6 and 7 designate forwardly extending jaws at the end of the socket 1, thereby form-

ing a slot 8, the purpose of which is to permit the use of a bit of any desired width.

10 designates a drill of novel construction, the drill in the present instance being constructed of rectangular material which is provided with a tapered or conical shank 11, it being noted that the flat sides 12 and 13 co-act with the jaws 6 and 7 to drive the drill and that the tang which is usually employed has been entirely eliminated.

The shoulders 14 and 15 may, if desired, extend any desired distance out beyond the transverse diameter of the drill socket, as will be readily apparent from Fig. 3 of the drawings. It will be seen that opposite sides of the body portion of the drill are faced off to form diametrically arranged cutting edges, or in other words, the edges of the drill, which are presented to the work in order to produce a cutting action.

My novel construction of drill socket has many features of marked advantage over the prior devices with which I am familiar, and it provides a construction adapted to be employed in conjunction with my novel drill which latter, owing to the elimination of the necessity of employing the tang on the end of the shank of the drill, permits the use of a much smaller quantity of steel in the manufacture thereof than has heretofore been possible, with consequent economy in the cost of manufacture. Furthermore the elimination of the tang drive permits the use of a much smaller shank than has heretofore been possible.

My novel construction of drill socket also permits the diameter of the socket to be less than that of the flat drill that it drives, thereby permitting the drill socket to follow through the hole bored by the flat drill.

This permits of the use of extremely short bits of such length as to allow the drill to be tempered to a degree of hardness much greater than is possible when a standard length drill is employed, it having been found by practical experience and numerous experiments that when standard length drills are hardened beyond a certain temper, they are rendered too brittle to stand the twisting action and torsional strain of heavy drilling owing to their length.

By devising a construction wherein a very short length bit may be employed my novel construction of drill may be tempered ex-

tremely hard and will stand up under drilling conditions, owing to their short length.

It will be further apparent that the drive is transmitted to the flat drill by means of the jaws on the end of the drill socket which are adapted to abut against the sides of the flat drill, thereby transmitting the torsional strain directly to the strongest part of the drill.

In so far as I am aware, I am the first in the art to devise a flat drill wherein the tang thereof has been entirely eliminated, wherein a drill of any desired width may be used, and wherein the drive is imparted directly to the flats on the body portion of the drill, and my claims to these features are to be interpreted with corresponding scope.

It will also be apparent that my novel construction of drill socket and drill forms a concrete, unitary structure which coöperates in the manner described to produce the requisite results which arise in practice.

It will also be evident that my novel construction of drill will always center itself in a reliable and accurate manner.

By the use of the circular tapered shank in connection with my novel drill socket, the drill is held in perfect alinement without the use of spring clamping jaws which when used require that a considerable length of the drill extend up into the chuck in order to bring the drill into alinement. It is obvious that by the use of the small circular taper shank shown, a construction is produced which permits the tapered shank to seat itself in the tapered socket in the drill chuck before the shoulders 14 and 15 abut themselves against the slotted portion 8.

It is apparent that the drill bit will become fixed in a rigid and accurate alinement with the center of the chuck which, as far as I am aware, has not been possible in prior constructions with which I am familiar, except when the circular taper shank was of sufficient size to permit the use of a tang at the end of the taper shank.

In other constructions with which I am familiar, in which a tang drive is required owing to the impossibility of getting a cross section of tang sufficiently strong to resist the twisting moment on the drill, it is necessary to have a long tapered shank such as is used on standard twist drills, in order to take a part of the load off of the tang by creating a friction gripping between the drill socket and a long tapered shank, in fact in practice practically the entire twisting moment is taken by the friction grip of the long tapered shank in the drill socket.

In my novel bit the only function of the tapered shank is to center the drill in accurate alinement with the work and the entire twisting moment is taken on the flat portions of the drill bit in contact with the jaws integral with my novel drill chuck and owing

to the fact that I have eliminated the necessity of any frictional contact between the tapered shank and the drill socket, I am able to use an extremely short tapered shank and thereby economy in the quantity of steel to make the bit is attained, which when made of high speed steel insures a great saving.

It will now be apparent that I have devised a novel and useful construction of a drill, which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have in the present instance shown and described a preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention as defined in the appended claims or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A drill, consisting of a rectangular shaped bar having its body portion free from twist and of greater width than thickness and provided with a round, tangless, integral shank, said shank serving only as a centering means for the drill.

2. A drill, consisting of a rectangular shaped bar having its body portion free from twist and of greater width than thickness and provided with a conical, tangless, integral shank, and having parallel driving faces adjacent said shank.

3. A drill, consisting of a rectangular shaped bar having a conical, tangless, integral shank, in combination with holding means, said drill having its body portion free from twist and of greater diameter than its holding means, the only function of said shank being to center the drill with respect to its holding means.

4. A drill, having a polygonal sided body portion, the opposite sides of which are parallel and recessed to form a cutting portion, the adjacent sides of the parallel sides being faced off to form diametrically arranged cutting portions, and a round, tangless shank extending rearwardly from the body portion.

5. A drill, having a tangless shank and a four-sided body portion, the two opposite sides at their rear end being flat to form the gripping portion, said two opposite flat sides having recesses therein and forming the cutting portions of the drill, and the other two opposite sides being rounded.

6. The combination with holding means, of a drill consisting of a polygonal shaped bar free from twist and having a shank co-operating with said holding means only to

center the drill and provided with parallel faces on its body portion coöperating with said holding means to drive the drill. driven, and having extending rearwardly from such portions a conical, tangless shank.

CLARENCE B. GROFF.

Witnesses:

H. S. FAIRBANKS,
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7. A drill consisting of an integral piece
5 of material having two opposite sides of its body portion flat and parallel to form chuck engaging portions by which the drill is

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