H. A. WHITESIDE.

DENTAL DRILL.

APPLICATION FILED JUNE 30, 1909.

1,189,184.

Patented June 27, 1916.

2 SHEETS—SHEET 1.

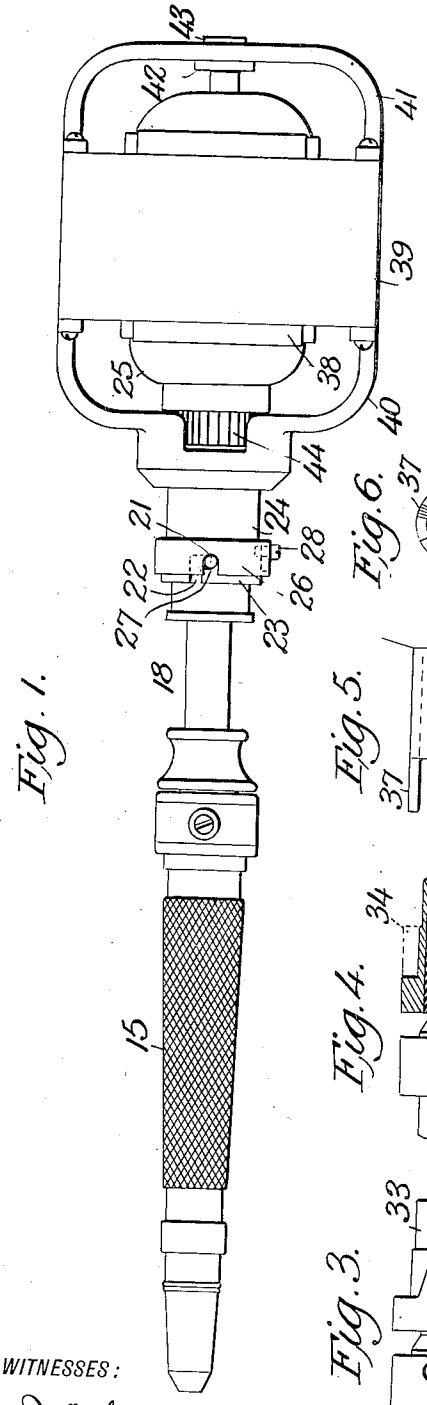


Fig. 1.

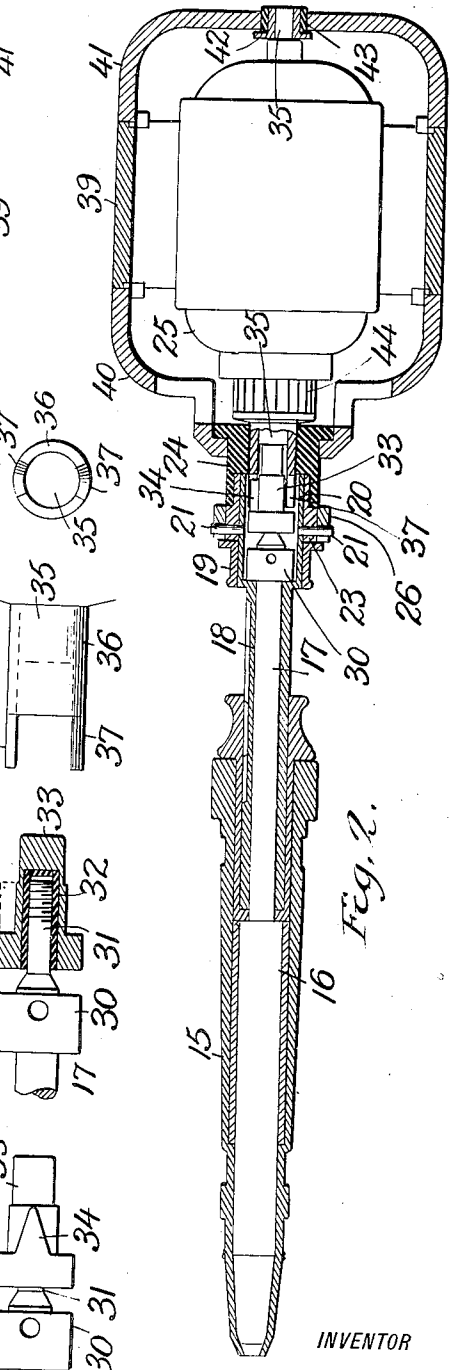


Fig. 2.

Fig. 6.

Fig. 5.

Fig. 4.

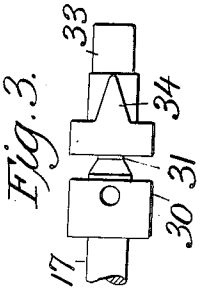


Fig. 3.

WITNESSES:

James F. Duhamel

F. W. Winans

INVENTOR

Howard A. Whiteside,

BY

A. O. Rosell,

ATTORNEY

H. A. WHITESIDE.

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2 SHEETS—SHEET 2.

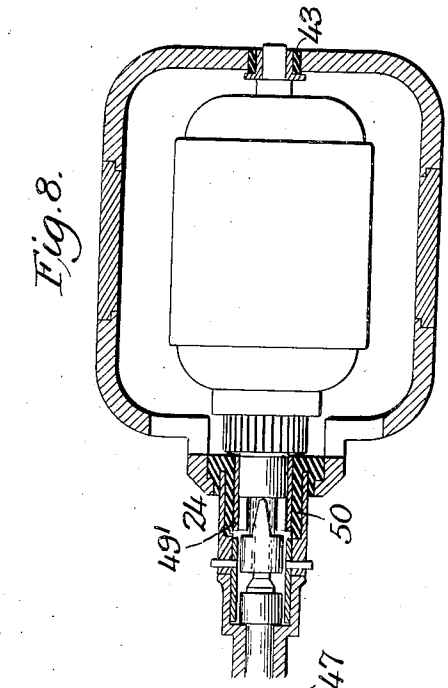


Fig. 8.

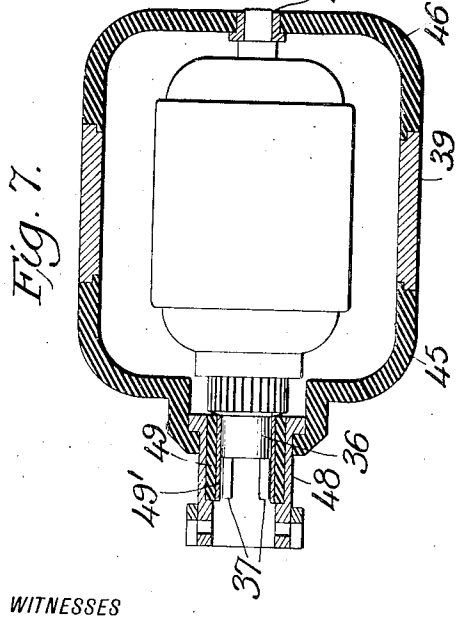


Fig. 7.

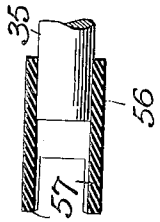


Fig. 12.

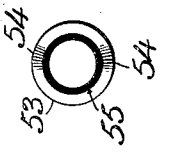


Fig. 11.

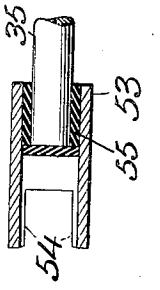


Fig. 10.

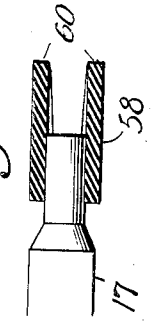


Fig. 14.

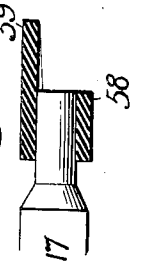


Fig. 13.

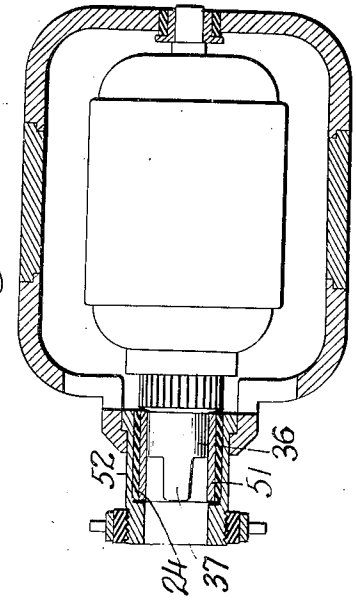


Fig. 9.

WITNESSES

James P. Dunham.

F. W. Wimmer

INVENTOR

Howard A. Whiteside.

BY

C. A. O. Rosell,

ATTORNEY

UNITED STATES PATENT OFFICE.

HOWARD A. WHITESIDE, OF NEW YORK, N. Y.

DENTAL DRILL.

1,189,184. Specification of Letters Patent. Patented June 27, 1916.

Application filed June 30, 1909. Serial No. 505,170.

To all whom it may concern:

Be it known that I, HOWARL A. WHITESIDE, a citizen of the United States, and resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Dental Drills, of which the following is a specification.

This invention relates to electrically driven dental drills and more especially to that class in which the motor for rotating the same is carried directly by the handle for the drill and all of the moving parts of the device are inclosed and the object of the invention is to insulate the drill and its handle so that the current will not pass into or through them, all as will be more fully described in the following specification, set forth in the claims, and illustrated in the drawings, where:

Figure 1 is a side view of the drill and motor. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a detail view of the head of the shaft. Fig. 4 is a sectional view of the same. Fig. 5 is a side view of the driving dog. Fig. 6 is a face view of the same. Figs. 7, 8, 9, 10, 11, 12, 13 and 14 are views of certain modified forms and details which will be referred to later.

The drill employed in this invention is of the usual type and consists of a tubular hand piece or holder 15 containing the drill chuck 16 at the outer end of a shaft 17 carried within a grooved tube 18 and rotated by the motor. The tube 18 is provided with a head 19 with a hollow extension 20 with radial pins 21, which are adapted to operate in bayonet joints consisting of L shaped slots 22 in a metal ring 23 at the outer end of a non-conductive bearing 24 for the shaft of the armature 25 of the motor. Upon the ring 23 slides a locking ring 26 with slots 27 for the reception of the pins 21 after they have been passed to the inner ends of the slots 22 and after the pins have been so located, the ring 26 is slipped forward preventing the pins from being turned on the axis of the shaft 17 and consequently leaving the slots 22. There are two slots for the pins on diametrically opposite sides of the bearing 24 and the movement of the ring 26 is regulated by a set screw 28 secured to the inner ring 23 and playing in a slot in the ring 26.

The shaft 17 has a head 30 at one of its ends and from the same extends a threaded stem 31, best shown in Fig. 4, on which is screwed the insulating bushing 32 of a thimble 33 with a nose 34 on one side. The outer end of the armature shaft 35 carries a sleeve 36 with projecting dogs 37 which when the shaft rotates, one or the other will engage the nose 34 and impart a rotary movement to the shaft 17, its chuck and the drill.

The motor consists of the armature 25 and field magnets 38, the latter being carried by a casing 39 while the shaft of the armature is journaled in yokes 40 and 41 at each end of the casing, the yoke 40 carrying the non-conductive bearing 24 and the yoke 41 having a bearing sleeve 42 insulated by means of the bushing 43. The commutator 44 is provided with the necessary brushes and the motor has the required binding posts and electrical connections for the current which may be supplied from any desired source.

With this construction the motor and its operating parts are completely insulated from the drill handle and holder and the current is confined to the motor only and is prevented from passing to the tool itself as the bearing 24 completely insulates the armature and its shaft, while the thimble 33, which is engaged by parts of the shaft, is completely insulated from the tool and handle.

In carrying out this invention, it has been found possible to so modify the construction of the device that other arrangements of the parts may be provided for so as to accomplish the same results and one of these modified arrangements is shown in Fig. 7 where the yokes 45 and 46 are made of some non-conductive material such as hard rubber or vulcanized fiber and fastened to the casing 39 at each end, the yoke 46 having a hard metal bearing 47 for the armature shaft and the front yoke 45 carries a sleeve 48 for the bayonet joint, the armature shaft at the front end bearing in a bushing 49 of insulating material and hard metal lining 49′.

Fig. 8 shows a motor frame and yokes constructed of metal as in the first form and having an insulating bushing 43 at the rear end for the hard metal bearing 42, and while the usual insulating bearing 24 is provided for the front yoke, it has around its outer surface a steel sleeve 50 and an inte-

rior sleeve of phosphor bronze 49′ as a bearing for the armature shaft.

The modified form shown in Fig. 9 provides for a metallic frame and yokes with an insulated bearing for the armature shaft in the rear yoke while the front yoke carries a fiber or rubber bushing 24 having in its bore a hard metal sleeve 51 and on the outside of the bushing is a steel sleeve 52 with the locking means for the tool.

Figs. 10 and 11, show the sleeve 53 with dogs 54 carried by the armature shaft 35 but insulated from the same by a non-conductive sleeve 55, which is a modification of the construction of the end of shaft 17 and its thimble 33. Another modification of this construction is shown in Fig. 12 where the sleeve 56 and dogs 57 are made of insulating material and render the bushing 32 unnecessary.

Figs. 13 and 14 show how the insulating bushing 32 may be dispensed with by making the sleeve 58 and nose 59 of rubber or fiber and in one piece and screwing or otherwise attaching the sleeve to the shaft 17. Two noses 60 may project from the sleeve as shown in Fig. 14 to engage the dogs on the motor shaft.

It is obvious that other arrangements of insulations for the various parts may be resorted to and included within the scope of the claims.

What I claim is:

1. In a dental device, the combination of an electric motor, a frame with bearing yokes, insulation between the rotor and the yokes, a handle connected to the shaft at one of the yokes, a tool carrier in the handle, an insulated head on the tool carrier, and insulation between the handle and the yoke.

2. In a dental device, the combination of an electric motor, a shaft, insulated bearings in which the shaft is supported, a hollow handle, a joint to connect the same to the shaft, insulating means between the yoke and handle, a tool holder in the handle, and an insulated connection between the tool holder and the shaft.

3. In a dental device, the combination of an electric motor, yokes supporting the latter, insulating bushings for the same, an insulating sleeve carried by the front yoke, a hollow tool handle jointed to the shaft, a tool carrier in the handle, a sleeve of insulation between the shaft and the tool carrier, and an insulated thimble at the end of the carrier adapted to be connected with the shaft and rotated with it.

4. In a dental device, the combination of an electric motor, a frame with bearing yokes, a shaft, insulated bearings for the shaft, a hollow handle attached to the shaft at the yoke and insulated from the same, a tool carrier, an insulated head with a nose at the end of the tool carrier, and dogs at the end of the shaft to engage the nose.

Signed at New York in the county of New York and State of N. Y. this 28th day of June A. D. 1909.

HOWARD A. WHITESIDE.

Witnesses:
C. A. O. Rosell,
H. W. Faulkner.