R. E. GRAVES.

DENTAL HANDPIECE.

APPLICATION FILED JULY 26, 1921.

1,427,286. Patented Aug. 29, 1922.

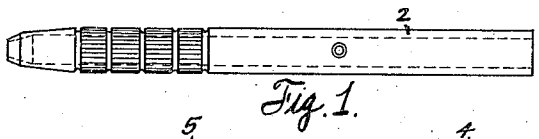


Fig. 1.



Fig. 3.

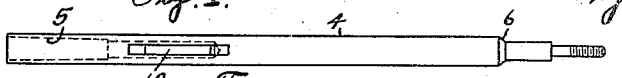


Fig. 2.

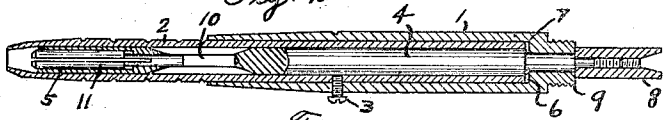


Fig. 4.

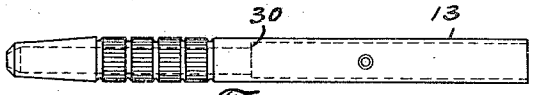


Fig. 5.

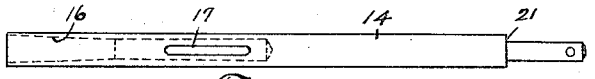


Fig. 6.

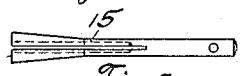


Fig. 7.

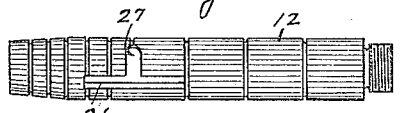


Fig. 8.

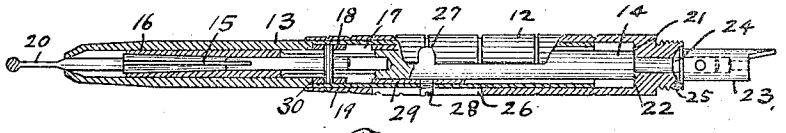


Fig. 9.

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UNITED STATES PATENT OFFICE.

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DENTAL HANDPIECE.

1,427,286. Specification of Letters Patent. Patented Aug. 29, 1922.

Application filed July 26, 1921. Serial No. 487,603.

To all whom it may concern:

Be it known that ROBERT E. GRAVES, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, has invented certain new and useful Improvements in a Dental Handpiece, of which the following is a specification.

This invention relates to new and useful improvements in a dental hand piece.

One object of the invention is to provide a dental hand piece which has been specially constructed so that the drill may be quickly and easily inserted and removed, and one which will securely hold said drill while in use.

Another object is to provide a dental hand piece which is constructed of few parts, which may be easily assembled and taken apart and which will be durable and efficient.

With the above and other objects in view this invention has particular relation to certain novel features of construction, operation and arrangement of parts an example of which is described in this specification and illustrated in the accompanying drawings, wherein:—

Figure 1 shows a side view of the inner sleeve employed.

Figure 2 shows a side view of the drive shaft.

Figure 3 shows a side view of the chuck.

Figure 4 shows a longitudinal sectional view of the assembled hand piece.

Figure 5 shows a side view of the inner sleeve of another type of hand piece.

Figure 6 shows a side view of a shaft employed in this type.

Figure 7 shows a side view of the chuck.

Figure 8 shows a side view of the outer sleeve employed and,

Figure 9 shows a longitudinal sectional view of this type of hand piece.

Referring to the drawings more specifically the outer and inner sleeves 1 and 2 are secured together by means of the set screw 3 with the shaft 4 in place. One end of this shaft has a socket 5 which has a slight outward taper, and its other end is reduced forming an annular shoulder 6 which bears against the bearing flange 7 of the outer sleeve. The reduced end extends through said flange and is threaded to receive the dog 8 formed to be clutched with the usual driving connection which is screwed onto the reduced threaded end 9 of the outer sleeve.

The shaft 4 has a lengthwise slot 10, therethrough, at the inner end of the socket 5.

The chuck 11, in use, is fitted into the socket 5 and is provided to receive the drill which is inserted therein and as it is forced inwardly it will strike the inner end of the chuck socket and wedge the chuck into the socket 5 and the drill will thereby be clamped in the chuck. Pliers are used to withdraw the drill, but should the drill become stuck the shaft may be removed and an implement inserted through the slot 10 and by its pressure against the inner end of the chuck, said chuck may be moved outwardly and the drill released from the chuck.

In the other type shown in Figures 5 to 9 inclusive, the numerals 12 and 13 designate the outer and inner sleeves and the numeral 14 designates the shaft.

The numeral 15 designates the chuck which is adapted to be inserted in the outwardly tapered socket 16 in one end of said shaft. A lengthwise slot 17 is cut through the shaft at the inner end of said socket and a chuck collar 18 is fitted around the shaft and pinned to the inner end of the chuck by means of a pin 19 which passed through said slot 17. The drill 20 is clamped by the chuck in the usual way. The opposite end of the shaft is reduced forming an annular bearing shoulder 21 which abuts against an internal annular bearing 22 into which the corresponding end of the outer sleeve, is formed. Pinned to the reduced end of the shaft there is a dog 23, which is formed with a thrust bearing 24 which seats in a bearing recess 25 in the adjacent end of the sleeve 12. The dog 23 is formed to clutch with the usual driving connection which is threaded onto the sleeve 12.

The outer sleeve 12 has a lengthwise T-slot 26, with a central notch 27 and a set screw 28 works in said slot and is screwed through the inner sleeve and into a release collar 29 which slides on the shaft 14.

When the drill is inserted in the chuck the inner sleeve is then grasped and forced further into the outer sleeve, the inner end of the inner sleeve being spaced from the bearing 22 to permit this. An inner annular shoulder 30 of the inner sleeve will engage against the chuck collar and force it

along and the pin 19 will carry the chuck inwardly in the flared socket 16 and cause the chuck to grip the drill. The set screw 28 meanwhile moves in the slot 26 and when the drill is gripped by the chuck the inner sleeve is moved outwardly and turned to lock the set screw in the notch 27.

To release the drill the set screw is unseated from said notch by suitably turning the inner sleeve and then said inner sleeve is moved outwardly carrying the release collar 29 against the chuck collar 18 and moving the chuck outwardly permitting it to expand and release the drill.

This hand piece is composed of few parts, is easily operated, easily assembled and taken apart and will not readily wear out.

What I claim is:—

1. A dental hand piece including an outer sleeve, an inner sleeve fitted into one end of the outer sleeve, and having a limited lengthwise movement relative thereto, a shaft in the inner sleeve, one end of which has a flared socket, a chuck formed to fit into said socket, a collar connected to the chuck and moveable lengthwise, on the shaft, and actuating means carried by the inner sleeve and on opposite sides of said collar whereby the chuck may be moved in either direction in the socket by a corresponding movement of the inner sleeve, and a locking device carried by one sleeve and arranged to be engaged with the other sleeve to lock them against relative lengthwise movement.

2. A dental hand piece including an outer sleeve one end of which is formed with an internal annular bearing, an inner sleeve fitted into the other end of said outer sleeve, and having a limited lengthwise movement relative thereto, a shaft one end of which is reduced and fitted through said bearing, and formed with a shoulder which works against said bearing, and the other end of which is formed with a flared socket, and a transverse slot, a chuck formed to fit into said socket, a collar having a limited lengthwise movement relative to the shaft, a pin carried by said collar and working through said slot and connected to the chuck, means carried by the inner sleeve and spaced on opposite sides from said collar and operating against the collar whereby the chuck may be moved in a direction corresponding to the movement of the inner sleeve.

3. A dental hand piece including an outer sleeve one end of which is formed with an internal annular bearing, an inner sleeve fitted onto the other end of said outer sleeve, and having a limited lengthwise movement relative thereto, a shaft one end of which is reduced and fitted through said bearing, and formed with a shoulder which works against said bearing, and the other end of which is formed with a flared socket a chuck formed to fit into said socket, a collar having a limited lengthwise movement relative to the shaft and connected to the chuck, means carried by the inner sleeve on opposite sides of said collar and spaced apart whereby the collar and chuck may be moved in a direction corresponding to the movement of the inner sleeve and a locking device carried by one sleeve and arranged to be engaged with the other sleeve to lock them against relative lengthwise movement.

4. A dental hand piece including an outer sleeve one end of which is formed with an internal annular bearing, an inner sleeve fitted into the other end of said outer sleeve, and having a limited lengthwise movement relative thereto, a shaft one end of which is reduced and fitted through said bearing, and formed with a shoulder which works against said bearing, and the other end of which is formed with a flared socket, a chuck formed to fit into said socket, a collar having a limited lengthwise movement relative to the shaft and connected to the chuck, means carried by the inner sleeve on opposite sides of said collar and spaced apart whereby the collar and chuck may be moved in a direction corresponding to the movement of the inner sleeve, the outer sleeve having a T-slot and a set screw carried by the inner sleeve, and working in said slot.

5. A dental hand piece including an outer sleeve, an inner sleeve fitted into the outer sleeve and having a limited lengthwise movement relative thereto, a shaft fitted into said inner sleeve, means connected to one end of the shaft through which said shaft may be connected to a driving means, the other end of said shaft having an outwardly tapering socket, and a transverse slot, a chuck formed to fit into said socket, a chuck collar slidable on the shaft, a pin working through said slot and connected to said chuck and collar, an annular shoulder formed within the inner sleeve on one side of said chuck collar, and a release collar fastened in said inner sleeve on the other side of said chuck collar, said shoulder and release collar being spaced from the chuck collar, on each side, to permit a limited movement of the inner sleeve independent of the chuck, said chuck collar, annular shoulder and release collar, forming means for actuating the chuck from the inner sleeve.

6. A dental hand piece including an outer sleeve, an inner sleeve fitted into the outer sleeve, and having a limited lengthwise movement relative thereto, a shaft fitted into said inner sleeve, means connected to one end of the shaft through which said shaft may be connected to a driving means, the other end of said shaft having an outwardly tapering socket, a chuck formed to fit into said socket, a chuck collar slidable on the shaft, and connected to the chuck, an annular shoulder formed within the inner sleeve on

one side of the chuck collar, a release collar within the inner sleeve on the other side of the chuck collar, said shoulder and collars forming means for moving the chuck from the inner sleeve, said shoulder and release collar being spaced apart to permit a limited movement of the inner sleeve, independent of the chuck, one of said sleeves having a T-slot formed with an intermediate lateral notch a stud threaded through the other sleeve, and also through said release collar, said stud being movable in said notch to permit the relative lengthwise movement of said sleeves, said stud when seated in said notch locking said sleeves against relative lengthwise movement.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT E. GRAVES.

Witnesses:
W. H. DUNLAY,
E. V. HARDWAY.