

No. 823,150.

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C. L. ALEXANDER.
DENTAL HANDPIECE.
APPLICATION FILED FEB. 11, 1905.

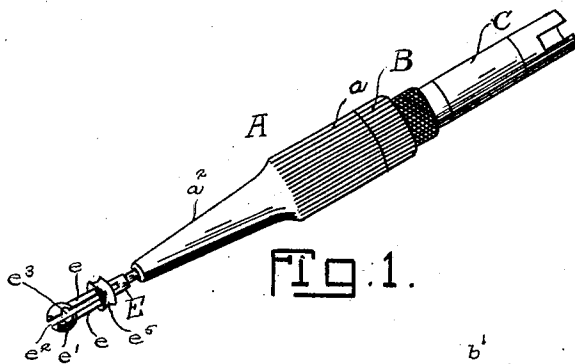


Fig. 1.

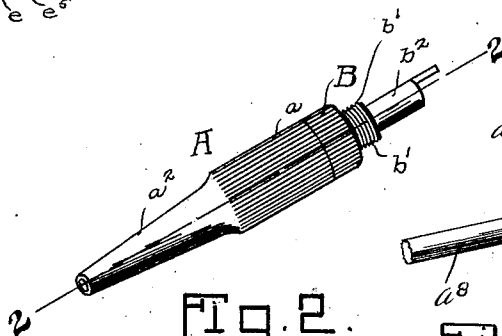


Fig. 2.

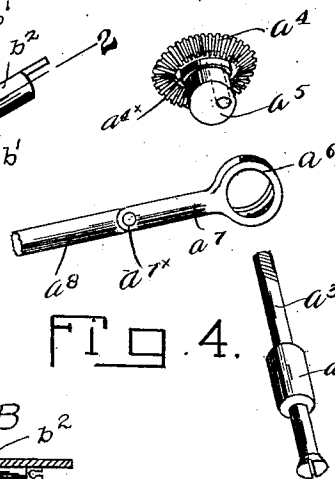


Fig. 4.

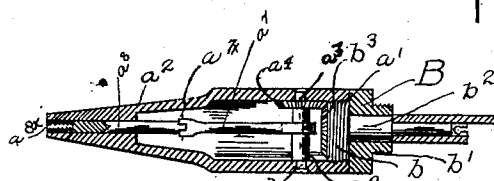


Fig. 3.



Fig. 6.



Fig. 5.

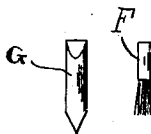


Fig. 7.

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DENTAL HANDPIECE.

No. 823,150.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES L. ALEXANDER, a citizen of the United States, residing at Charlotte, in the county of Mecklenberg and State of North Carolina, have invented certain new and useful Improvements in Dental Handpieces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is generally to provide an improved dental-engine handpiece, which shall be simple in construction and exceedingly efficient in operation.

More specifically, the object is to secure a more positive movement and a shorter throw of the reciprocating part of my device than have heretofore been possible, the positive movement and very short throw being absolutely essential for perfect and successful work when the device is used as a dentist's plugger or polisher.

A further object is so to economize space by the peculiar construction and assemblage of the parts of my device that the handpiece may be of minimum size, and therefore be of shape and size most convenient and easy to handle, thus facilitating dental work performed thereby and permitting the surgeon to operate with utmost celerity and despatch.

A further object is so to construct the holder attached to the reciprocating part that it may carry various kinds of dental "points" for scraping, plugging, &c., or carry an auxiliary or supplemental holder, which latter is peculiarly constructed to hold a dentist's brush or an orange-wood "point" or the like, either in a plane parallel to the length of the supplemental holder or at an angle thereto.

With these objects in view the invention consists in the novel construction, combination, and arrangement of parts of my device, as hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of my handpiece with the usual slip-joint connection or tubular housing secured on the handpiece at the right-hand end, the supplemental holder being also shown as secured in operative position on the left-hand end. Fig. 2 is a perspective view of my handpiece without the supplemental holder and the slip-joint connection and showing as screwed into the barrel member

the part carrying the shaft which connects up with the motive power. (Not shown.) Fig. 3 is a central longitudinal section of the parts of the device shown in Fig. 2. Fig. 4 is a collective detail view of certain parts of my invention. Fig. 5 is a detail view of the supplemental holder with a brush in place therein. Fig. 6 is a detail collective view of two dental points for use with the handpiece. Fig. 7 is a detail collective view of a brush and an orange-wood point adapted for use with the supplemental holder.

Referring to the drawings, A designates the hollow barrel member of my handpiece, formed, preferably, with the tubular exteriorly-corrugated portion *a* at its end, internally threaded, as at *a'*, and with the tapering portion *a²*, having a smooth periphery. A shaft-pin *a³*, transversely mounted in the bore of portion *a*, carries a small gear-wheel *a⁴*, having a stub-shaft *a^{4x}*, on which is formed an eccentric cam *a⁵*, surrounding which is an eccentric-strap *a⁶*, formed on an eccentric-rod *a⁷*, having a joint connection *a^{7x}* with a reciprocating rod *a⁸*, having a hollowed-out threaded end portion *a^{8x}*, a washer *a⁹* being also carried by the shaft-pin to prevent all possibility of the eccentric-strap formed on the end of the eccentric-rod from slipping off the eccentric cam.

B represents a ring carrying a shaft *b²*, which connects up directly with the motive power, (not shown,) the shaft being mounted in the ring for free rotary movement and having at one end an integral pinion *b³*, which when the ring B is screwed into the barrel portion A meshes with the gear *a⁴*, imparting motion to the latter. The ring B is exteriorly threaded, as at *b*, at one end for engagement with the threads *a'* of the barrel portion in connecting up the barrel portion and ring B, and also exteriorly threaded, as at *b'*, at the other end.

C is the usual slip-joint connection, comprising a hollow tubular housing for the end of the shaft *b²*, adapted to be connected with the motive power (not shown) and may be formed in the usual manner for engagement with the threads *b'* on the end of ring B.

The rod *a⁸* serves as a holder for various kinds of dental points or tools, such as shown at D D', Fig. 6, provided with exteriorly-threaded ends *d d'*, engaging the threads *a^{8x}* of rod *a⁷* in screwing the tools or points into the hollowed-out end of rod *a⁸*.

E represents a supplemental holder, a portion of which is bifurcated, forming two spring prongs or forks *e e*, the prongs at the forward end being formed into a head *e'*, provided with an end perforation *e²* and with side or transverse perforations *e³*, the end of the supplemental holder being exteriorly threaded at *e⁴* for engagement with the threads *a^{8x}* of rod *a⁸* in screwing the supplemental holder into the hollowed-out end of the rod. A sliding adjusting-collar *e⁵* embraces the prongs *e e*, by which the distance therebetween may be diminished or increased at will by moving such collar forward or backward. When it is desired to use a brush or an orange-wood point with the handpiece, the brush F (see Figs. 5 and 7) is either placed in the end opening *e²* (so that it will lie in a plane parallel with the length of the supplemental holder) or in one of the side openings *e³* (so that it will be at an angle to the supplemental holder, as shown in Fig. 5,) and the sliding collar *e⁵* pushed forward on the prongs *e e* until the prongs firmly grasp and hold the brush. By placing the brush or the orange-wood point in the supplemental holder at an angle thereto, which is a novel feature of my invention, the advantage is obtained over prior constructions of being able to get at all points on the teeth within the mouth of the patient when the handpiece is in use.

The operation will be obvious. When the instrument is to be used as a scraper, polisher, or plugger, the appropriate tool, such as D or D' or the like, is screwed in the threaded end of reciprocating rod *a⁸*, ring B screwed into tubular portion *a*, which places pinion *b³* on end of rotary shaft *b²* in mesh with gear-wheel *a⁴* in the bore of tubular portion *a*, tubular housing C screwed on ring B, and shaft *b²* connected up with the motive power, (in the usual manner,) whereupon shaft *b²* is rapidly revolved, integral pinion *b³* revolving therewith, said pinion being in mesh with gear-wheel *a⁴*, imparting rotary motion thereto, moving eccentric cam *a⁵*, formed on stub-shaft *a^{4x}* of gear-wheel, thus raising and lowering the eccentric-strap *a⁶*, surrounding the eccentric cam, and giving to eccentric plunger-rod *a⁷*, connected to the eccentric-strap, the desired slight throw necessary for perfect dental work.

When the instrument is to be used in connection with an orange-wood point or a brush, the auxiliary or supplemental holder E is utilized, which holder is screwed into the threaded end of rod *a⁸* and a brush F or orange-wood point G placed either in the end opening *e²* or a side opening *e³*, sliding collar *e⁵* adjusted so that prongs *e e* firmly clamp the brush or orange-wood point, and the remaining parts of the device connected up as above explained.

It will be observed that by the peculiar as-

semblage of the parts of my device I have accomplished one important object of my invention—namely, compactness—and that by the shape and small size of the device I am enabled to manipulate it with a maximum of ease and celerity, thus necessarily and materially reducing the time necessary to operate on the teeth under treatment.

It will also be observed that by sinking or supporting both ends of the shaft-pin *a³* in the walls of the tubular housing *a* the life of the instrument is materially lengthened, and also that the principle of an eccentric gearing gives a more positive movement and a very much shorter throw than are possible with any other construction.

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

1. In a dental handpiece, a hollow barrel member carrying interiorly and transversely of the bore thereof a shaft-pin; a gear-wheel supported by the shaft-pin and provided with a stub-shaft having thereon an eccentric cam; an eccentric-rod within the barrel member and having formed on its end an eccentric-strap surrounding the eccentric cam; a reciprocatory rod pivotally connected to the eccentric-rod; and a removable ring member connected to the barrel member at one end thereof, said ring member carrying a rotatable shaft having at one end a pinion in mesh with the gear-wheel.

2. In a dental handpiece, a hollow barrel member carrying interiorly and transversely of the bore thereof a shaft-pin; a gear-wheel supported by the shaft-pin and provided with a stub-shaft having thereon an eccentric cam; an eccentric-rod within the barrel member and having formed on its end an eccentric-strap surrounding the eccentric cam; a reciprocatory rod pivotally connected to the eccentric-rod; a supplemental holder removably carried by the reciprocatory rod and constructed to hold a brush or the like; and a ring member carried by the barrel member at one end thereof and carrying a rotatable shaft having at one end a pinion in mesh with the gear-wheel.

3. In a dental handpiece, a hollow barrel member carrying interiorly and transversely of the bore thereof a shaft-pin; a gear-wheel, supported by the shaft-pin, and provided with a stub-shaft having thereon an eccentric cam; an eccentric-rod within the barrel member and having formed on its end an eccentric-strap surrounding the eccentric cam; a reciprocatory rod pivotally connected to the eccentric-rod; a supplemental holder removably carried by the reciprocatory rod and constructed to hold a brush or the like, and comprising a bifurcated portion having a head at the extreme end, such head being provided with perforations; and a ring member connected to the barrel member at one

end thereof and carrying a rotatable shaft having at one end a pinion in mesh with the gear-wheel.

4. In a dental handpiece, a hollow barrel member carrying interiorly and transversely of the bore thereof a shaft-pin; a gear-wheel supported by the shaft-pin, and provided with a stub-shaft having thereon an eccentric cam; an eccentric-rod within the barrel member and having formed on its end an eccentric-strap surrounding the eccentric cam; a reciprocatory rod pivotally connected to the eccentric-rod; a supplemental holder removably carried by the reciprocatory rod

and constructed to hold a brush or the like; a ring member connected to the barrel member at one end thereof and carrying a rotatable shaft having at one end a pinion in mesh with the gear-wheel; and a hollow, open-ended, tubular housing member for said shaft, removably connected to one end of the ring member.

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

CHARLES L. ALEXANDER.

Witnesses:

E. S. PEGRAM,
JOHN F. ORR.