(No Model.)

R. G. STANBROUGH.

ANGLE ATTACHMENT FOR DENTAL HANDPIECES.

No. 517,249. Patented Mar. 27, 1894.

Fig. 1.

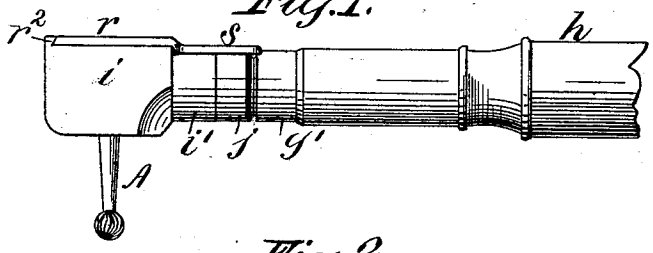


Fig. 2.

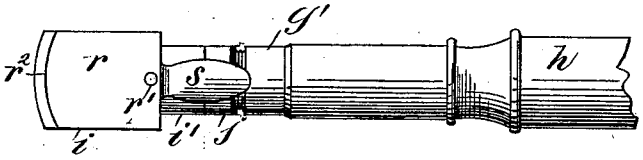


Fig. 4.

Fig. 3.

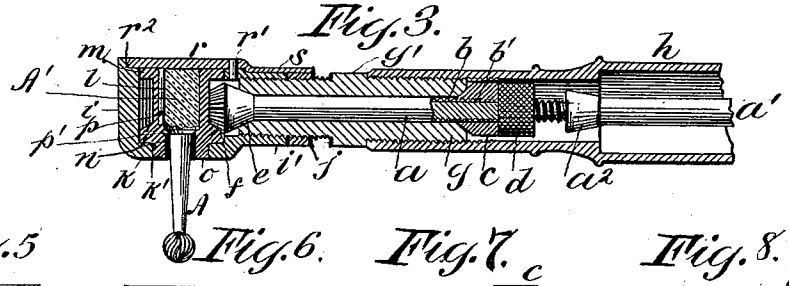


Fig. 5

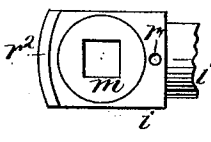


Fig. 6.

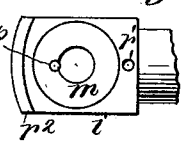


Fig. 7.

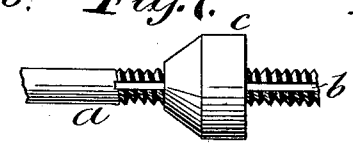


Fig. 8.

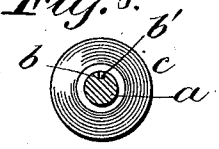


Fig. 9.

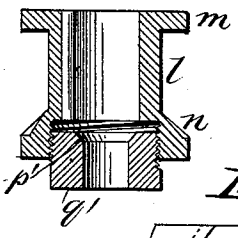


Fig. 10.

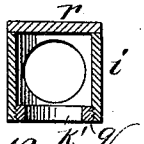


Fig. 11.

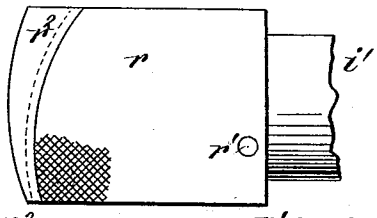


Fig. 12.

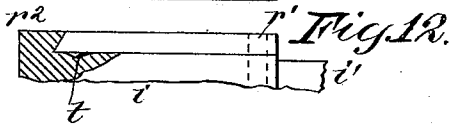


Fig. 13.

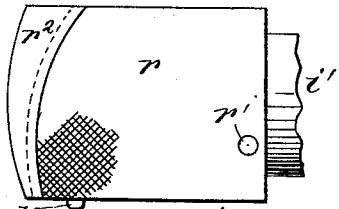
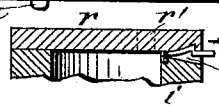


Fig. 14.



Witnesses:
D. W. Gardner.
E. V. Myers.

Inventor:
Rufus G. Stanbrough
by Munn & Co
his Atty.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RUFUS G. STANBROUGH, OF NEW YORK, N. Y.

ANGLE ATTACHMENT FOR DENTAL HANDPIECES.

SPECIFICATION forming part of Letters Patent No. 517,249, dated March 27, 1894.

Application filed February 20, 1893. Serial No. 462,949. (No model.)

To all whom it may concern:

Be it known that I, RUFUS G. STANBROUGH, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Angle Attachments for Handpieces, of which the following is a specification.

This invention relates to certain new and useful improvements in operating tools for dental use, and particularly to that class known to dentists as angle attachments, for the dental engine. Owing to the necessarily delicate construction of these angle attachments, and the rapidity with which they are driven by the dental engine, they very soon become so much worn as to be inoperative, and will not retain the operating tool or burr in place, but will frequently allow it to drop out of the tool-holder into the mouth of the patient, and thus become a source of danger, and a constant menace to the person operated upon.

The object of this invention is to furnish an angle attachment in which all the parts exposed to wear can be readily adjusted or replaced when worn, and to provide means for holding or securing the operating tool or burr in such a manner that it cannot become disengaged from the tool-holder or angle attachment, except at the will of the operator; thus freeing the person operated upon from all danger of the burr or operating tool dropping into the mouth or throat.

To these ends my said invention consists in the details of construction and in the arrangement and combination of parts, all as hereinafter more particularly described and pointed out in the claims.

Referring to the accompanying drawings illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1, is a side elevation of my improvements in position for use, and showing a fragment of the tubular handpiece on the end of the shaft of the engine. Fig. 2, is a similar top plan view. Fig. 3, is a longitudinal sectional view. Fig. 4, is a sectional view showing the position of the rear lever of the swinging plate, when said plate is closed. Figs. 5 and 6, are top plan views of the tool-holder chamber, with the swinging top plate removed, illustrating different forms of tool-holder. Figs. 7 and 8 are side and end views respectively, of details in the construction of the driving shaft. Fig. 9, is a vertical sectional view of the tool-holder, illustrating a modification in its construction. Fig. 10, is a vertical sectional view of the tool-holder chamber, illustrating a modification. Fig. 11, is a top view, and Fig. 12, a side view partly in section, illustrating one form of modification in the top swinging plate; and Fig. 13, is a top view, and Fig. 14, a sectional view of another modification in said plate.

a, a', is the driving shaft, terminating at its free extremity in the usual form of shank, (not shown,) by means of which it may be secured to the dental engine, in the ordinary manner. This shaft, is preferably made in two pieces, and suitably joined together as by soldering or screwing the one into the other; the part a, for some distance from its point of union with a', being screw threaded and longitudinally grooved as at b, Fig. 7, to receive the conical ring or collar c, and jam nut d; and the part a', is provided with the stop or shoulder a^2. It may, however, in some instances be preferable to form this shaft in one piece, and the stop a^2 may be omitted, if desired. The collar c, is provided with an internal spline b', Fig. 8, which fits within the longitudinal groove upon the shaft a, thus holding said collar in fixed relation to said shaft, and causing it to revolve therewith, and with the jam nut d. The outer end of driving shaft a, is provided with the cone-head e, carrying the beveled gear f, and said shaft passes through a tubular holder or portion g, conically recessed at both ends as shown, to afford bearings for the cone-head e, on the shaft at one end and the cone-shaped ring or collar c, at the other end. This holder g, is provided with the circumferential shoulder or stop g', while either end of said holder is screw-threaded to said shoulder, as shown. Over the screw-threads upon the inner end of holder g, is screwed the ferrule h, its rearward end, (not shown,) being made in the usual form to fit the end of the handpiece of the engine, thereby forming one of the connections between the angle attachment, and said dental engine. Over the threads at the outer

end of the holder g, is screwed the tool-holder chamber i, through its tubular extension i', and the distance which said chamber is screwed upon the holder g, may be minutely regulated by the jam nut j. As shown, the tool-holder chamber i, is interiorly hollowed out, and has the bottom walls k, provided with the central circular aperture k', affording a seat for the tubular or cylindrical tool-holder, which, as illustrated in Figs. 3 and 9, comprises the central cylindrical portion l, the flat head m, the beveled gear n, and projection o, (Fig. 3,) adapted to enter the aperture k', and be flush with the under side of bottom walls k, of the tool-holder chamber.

The tool-holder is provided with the internal feather or spline p, and its internal diameter at some point is diminished upon an incline p', (shown particularly in Fig. 9,) affording a cone-bearing for the lower end of the cone-shaped stock A', of the operating tool A, which is held in fixed position in said tool-holder by a vertical groove, engaging with the feather or spline p, as shown, described and claimed in a divisional concurrent application filed by me October 24, 1893, Serial No. 488,977.

To save expense in manufacture, and to form another point at which adjustment may be made to compensate for wear, I may core out the interior of tool-holder chamber i, of even diameter, and attach in the bottom thereof a ring q, Fig. 10, to take the place of the bottom walls k. I may also core out the interior of the tool-holder of even diameter, and secure thereto into the bottom thereof the ring q', Fig. 9, the upper end of which is beveled or tapered at p', affording an adjustable bearing for the lower end of stock A', of the operating tool A.

In Fig. 5, I have shown the tool-holder provided with a square opening to receive a stock of the operating tool, which in this case, will also be made square, and the use of the spline p, in said tool-holder, and the longitudinal groove, in the stock of the operating tool, will be dispensed with. It is also obvious that I may form the opening in said tool-holder of any irregular shape or contour, and form the stock of the operating tool of a like or similar shape.

To afford an upper thrust bearing for the end of the operating tool A, I form a cover or swinging plate for the tool-holder chamber, adapted to be locked in its closed position and securely retaining the operating tool against displacement, except at the will of the operator, and at the same time being capable of easy and rapid manipulation when it is desired to uncover the tool-holder to insert an operating tool, or to substitute one tool for another. As shown in Figs. 1, 2, 3 and 4, this upper bearing or swinging plate r, is pivoted at r', to swing in a circle and the forward portion of said plate engages in its closed position, with a dove-tailed notch or groove in a prolongation or extension i^2, of the front wall of the tool-holder chamber i. Said plate in this construction, is also provided with a rearwardly projecting lever s, of some resiliency, concaved upon its under face and adapted to conform to the contour of projection i', jam nut j, and collar g', as shown particularly in Fig. 4.

In the modification shown in Figs. 11 and 12, the plate r, is pivoted eccentrically at r'. In this construction, the lever s, is dispensed with, and the under side of said plate bears a slight projection t, near one side, adapted to engage in a corresponding depression in one of the side walls of the tool-holder chamber. The modification shown in Figs. 13 and 14, is much similar, the locking medium in this case being a flat shouldered spring u, secured at one end to the side wall of the tool-holder chamber, and its free end projecting beyond the same, and adapted to engage with an appropriate recess in the under side of plate r. Obviously, the side wall of the tool-holder chamber should be slightly recessed, as at u', to give play to the spring u.

As the parts of my device become worn in use the ring q, may be tapped farther into chamber i, the ring q', tapped farther into the tool-holder, the jam nut j, screwed closer to shoulder g', the holder g, screwed farther into the tubular projection i', on the tool-holder chamber, the ferrule h, be unscrewed from holder g, the conical ring or collar c, screwed by jam nut d, to a firmer seat in the other end of said holder g, and the ferrule h, be replaced; thus liberally compensating for any and all wear. Obviously, it may frequently be necessary to alter the adjustment at one or two points only, if the wear is slight.

The operation of my device will be apparent from the foregoing. The angle attachment is secured to the hand piece of the dental engine by means of the extension of shaft a', and ferrule h, or it may be secured to flexible shaft of the dental engine by means of what is known as a slip joint. The plate r, is swung upon its pivot sufficiently to uncover the opening in the tool-holder; an operating tool is then inserted in said tool-holder; and the plate restored to its former position, as shown, securely holding the operating tool in place. Upon giving motion to the flexible shaft, of the engine, it is, of course, communicated to the tool-holder-driving shaft a, a', and thence to the tool-holder by means of beveled gears f, and n, thereby rotating said operating tool A.

It will be readily understood from the foregoing description that when any force is applied to the end of the operating tool, it is immediately transmitted to the swinging plate r, thus relieving the burrs and chuck from all strain, and pressure, except that resulting from the rotary motion communicated to the operating tool. As the plate r, constitutes the upper bearing, all thrust is received by it,

from the impinging end of the tool, and consequently, when one tool is substituted for another, a new bearing is supplied.

What I claim as new, and desire to secure by Letters Patent, is—

1. A tubular shaft-holder having a circumferential stop or shoulder, a tool-holder, a tool-holder chamber containing the tool-holder and secured to the said shaft-holder at right angles thereto, a jam-nut to hold said tool-holder chamber in adjusted position on the shaft-holder, said jam-nut being arranged between the said shoulder and tool-holder chamber, and means for rotating the tool-holder, substantially as described.

2. In an angle attachment for dental engines, a tubular shaft-holder, a shaft passing through said holder, and having bearings therein, one of which is adjustable, a tool-holder chamber adjustably secured to said holder at right angles thereto, and provided with an adjustable bottom wall, a rotatable tool-holder in said chamber provided with an adjustable lower bearing for the operating tool, and a movable upper bearing and cover-plate for said tool-holder and its contained operating tool, all combined and arranged to operate substantially as described.

3. A tubular shaft-holder, an angular tool-holder chamber, longitudinally adjustable upon said shaft-holder and provided with an adjustable bottom wall, a tool-holder located in the said chamber, means for retaining an operating tool in said tool-holder, and a shaft passing through the shaft-holder and having a bearing at each end thereof, one of which bearings is adjustable, substantially as described.

4. In an angle attachment, a tubular shaft-holder, and a shaft having bearings therein, one of which bearings is adjustable, combined with an angular tool-holder chamber secured to said shaft-holder and longitudinally adjustable thereon, an adjustable ring forming the bottom wall of said chamber, and a tool-holder located in said chamber and adjustable therein through the medium of said ring, substantially as described.

5. A tool-holder for an angle attachment for dental engines, comprising a reduced central portion, a substantially flat head, lower beveled gear, and an adjustable downwardly projecting extension of reduced diameter affording a lower bearing for the operating tool, in combination with a tool-holder-chamber, an upper bearing for the tool, a holder for said chamber, and means to impart rotary motion to the tool-holder, substantially as described.

Signed at New York, in the county of New York and State of New York, this 17th day of February, A. D. 1893.

RUFUS G. STANBROUGH.

Witnesses:

FREDERIC CARRAGAN,

EUGENE V. MYERS.