W. W. BOLLS.

DENTAL INSTRUMENT.

APPLICATION FILED OCT. 22, 1912.

1,063,109. Patented May 27, 1913.

Fig. 1.

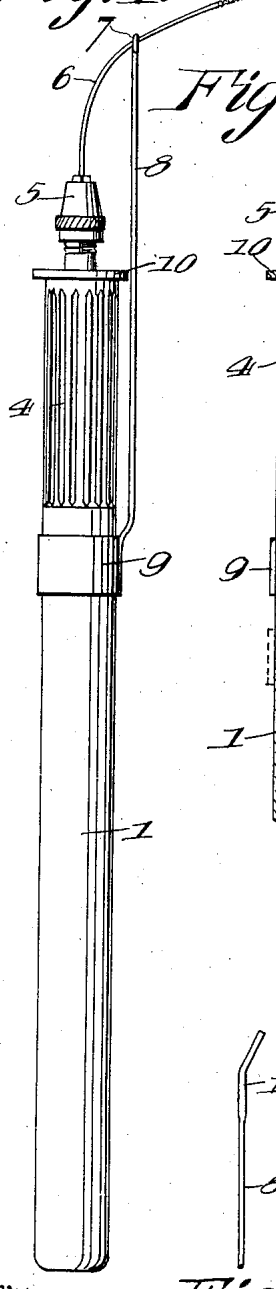

Fig. 2.

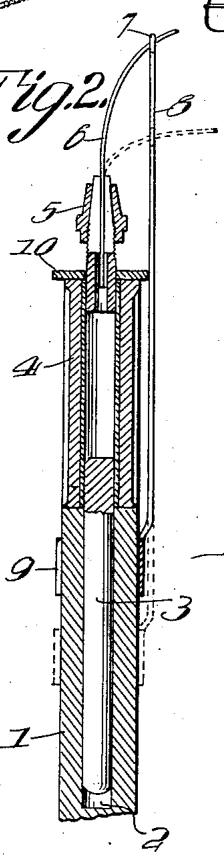

Fig. 3.

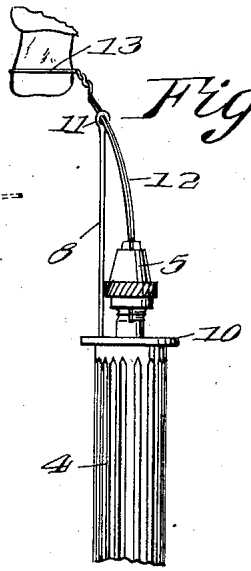

Fig. 4.

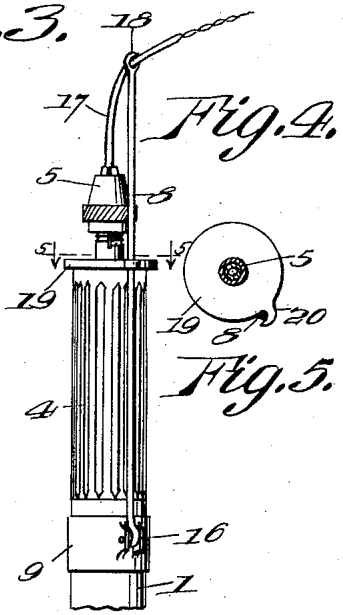

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

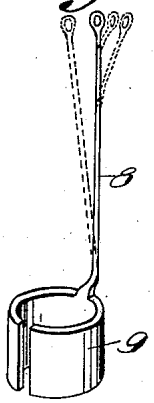

Fig. 9.

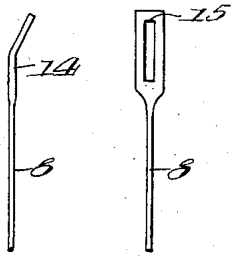

Fig. 10.

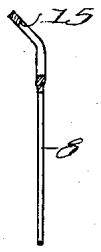

Fig. 11.

Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM W. BOLLS, OF WASHINGTON, DISTRICT OF COLUMBIA.

DENTAL INSTRUMENT.

1,063,109. Specification of Letters Patent. Patented May 27, 1913.

Application filed October 22, 1912. Serial No. 727,206.

To all whom it may concern:

Be it known that I, WILLIAM W. BOLLS, a citizen of the United States, residing at the city of Washington, in the District of Columbia, have invented new and useful Improvements in Dental Instruments, of which the following is a specification.

This invention relates to certain new and useful improvements in dental instruments and pertains more particularly to broach holders.

The object of the invention is to provide a broach holder in which the broach itself may be bent so as to assume various angles relative to the handle and may be held in such positions and rotated so as to enable removal of the nerves or cleansing of the canals of back teeth or others which, due to their location preclude the use of a straight broach.

Further the invention aims to provide a thoroughly practical and simple instrument of the type set forth in which a minimum of material and parts is necessitated, and one in which the parts may be easily and readily assembled or disconnected to permit of sterilization.

A still further object of the invention is to eliminate flexible shafts or their equivalent to effect rotation of the broach, thus not only more accurately bringing the broach under control of the operator, but also directly communicating to the dentist by the sense of feel, the operations of the broach enabling the dentist to readily determine whether the broach is effective in its work.

Still further the invention aims to provide means whereby the broach may be easily and quickly adjusted to various angular positions such as is necessitated in the treatment of teeth under different conditions; and one in which the commonly used long broach may be employed.

In the drawings: Figure 1 is a side elevation of the invention; Fig. 2 is a longitudinal fragmentary sectional view; Fig. 3 is a fragmentary side elevation showing the instrument in use when measuring teeth to be fitted with crowns; Fig. 4 is a fragmentary side elevation of a modified form of the invention; Fig. 5 is a section on the line 5—5 of Fig. 4; Fig. 6 is a fragmentary side elevation of one end of the arm shown in Figs. 3 and 4; Fig. 7 is a similar view of the arm shown in Figs. 1 and 2; Fig. 8 is a detached perspective view of the arm and its spring collar; Fig. 9 is a side elevation of a modified form of arm; and Figs. 10 and 11 are edge views of the arm illustrated in Fig. 9, showing the rectangular eyelet bent to different angular positions.

In accordance with the present invention a handle 1 is employed, the handle being formed with a longitudinal socket 2, in which the stem 3 of the broach holder proper is rotatably received. A ribbed, corrugated or knurled head 4 is rigidly secured to the stem 3 and to a chuck 5, which latter may be of any approved or desired form. The broach 6 is of the long type commonly employed and is held in the chuck 5 at its base end, the free end of the broach being engaged with an incomplete or open eye 7 that is formed on an arm 8. Arm 8 extends parallel to the handle and has its base end rigidly secured to a split spring collar 9, which latter is adjustable along the length of the handle 1 and engages with the latter as illustrated in the drawings. The collar 9 is adjustable along the length of the handle as depicted in Fig. 2 of the drawings. For the purpose of preventing contact of the arm 8 with the head 4 so as to not interfere with free rotation of the latter, a spacer member 10 of disk form is placed over the chuck 5 and seats on the outer end of the head 4 whereby the periphery of the disk will, by engagement with the arm hold the latter out of contact with the head 4.

In operation, the broach after being secured in the chuck 5 is bent and moved to enter the opening of the eye 7 and the latter when it will assume the position shown in Figs. 1 and 2 of the drawings, in which the broach intermediate its ends contacts with the eye 7 and the latter forms a stationary point which holds the free end of the broach in its angular adjustment. Various angular adjustments of the free end of the broach may be effected by varying the

position of the eye 7 relative to said broach by sliding adjustment of the collar along the length of the handle 1, or by bending the arm 8 itself as shown in dotted lines in Fig. 8 for which latter purpose the arm is made of material easily bent.

In Fig. 3 of the drawings the arm is shown provided with a complete or closed eye 11, for the purpose of allowing the ends of a looped band or strand of wire 12 to be passed through the eye and positively held against movement such as would cause it to become disengaged from the eye, the extremities of the wire 12 being secured in the chuck 5. The loop 13 is placed about a tooth, and the head 4 rotated, whereupon the wire will be twisted and the loop caused to snugly engage the tooth so as to be of the same size as the diameter of the latter. The wire is then cut and the loop straightened out and measured, the length of the loop determining the length of the gold to be cut from which a tooth crown is to be formed. The closed eye of Figs. 3 and 6 can also be used with the broach shown in Figs. 1 and 2, but an open or incomplete eye 7 is more convenient and desirable.

Figs. 9, 10, and 11 illustrate rectangular closed eyes 14 formed on the arms 8 in lieu of the eyes 7 and 11, which eyes may be readily bent intermediate their ends as shown in Figs. 10 and 11 to assume varying angular relations to the arms 8. A further advantage in this form of eye, is that, due to the sharp angle 15 which is formed by the eye 14, less bending of the arm is required than in cases where the broach engages the rounded eye 7.

In Figs. 4 and 5, the arm 8 is hinged by any approved means at 16 to the collar 9, so that the arm may be swung toward and away from the chuck 5 for use in cases where a cleaning or twisted broach 17 is employed so that the latter need only be bent to cause its free end to register with the eye 18 of arm 8 when the latter is swung to normal position, shown in Fig. 4. With use of the hinged arm, a spacer member 19 is formed with a hook 20 that is engaged with the arm 8 so as to hold the latter against movement about its hinge connection with the sleeve 9.

From the above it will be evident that the broach itself performs the function hitherto performed by the use of flexible shafting and since the latter is eliminated a direct transference of the action or operation of the broach to the hand of the user is effected.

What is claimed is:

1. In combination with a holder and means to rotate a broach independently of the holder, means carried by the holder and formed to directly engage the broach intermediate the ends of the latter to enable the free end of the broach to be rotated in a plane at an angle to the plane of the holder.

2. In combination with a holder and means to rotate a broach independently of the holder, a bendable arm carried by the holder and formed to directly engage the broach intermediate the ends of the latter to enable the free end of the broach to be rotated in a plane at an angle to the plane of the holder.

3. In combination with a holder and means to rotate a broach independently of the holder, an adjustable arm carried by the holder and formed to directly engage the broach intermediate the ends of the latter to enable the free end of the broach to be rotated in a plane at an angle to the plane of the holder.

4. In combination with a holder and means to rotate a broach independently of the holder, a bendable arm adjustably carried by the holder and having an eye to receive and directly engage the broach intermediate the ends of the latter to enable the free end of the broach to be rotated in a plane at an angle to the plane of the holder.

5. In combination with a holder and means to rotate a broach independently of the holder, a removable attachment engaged with the holder and having means to directly engage the broach intermediate the ends of the latter to enable the free end of the broach to be rotated in a plane at an angle to the plane of the holder.

6. In combination with a holder and means to rotate a broach independently of the holder, an arm having gripping means at one end adjustably connected to the holder and having an eye at its opposite end to directly engage the broach intermediate the ends of the latter to enable the free end of the broach to be rotated in a plane at an angle to the plane of the holder.

7. In combination with a holder, a rotatable chuck member carried by the holder, and means carried by the holder and formed with an eye which latter receives and directly engages the tooth engaging instrument held in the chuck.

8. In combination with a holder and means to rotate a broach independently of the holder, means carried by the holder and formed to directly engage the broach intermediate the ends of the latter to enable the free end of the broach to be rotated in a plane at an angle to the plane of the holder, and means to prevent contact of the rotating means with the broach engaging means.

9. In combination with a holder and means to rotate a broach independently of the holder, means carried by the holder and formed to directly engage the broach intermediate the ends of the latter to enable the free end of the broach to be rotated in a

plane at an angle to the plane of the holder, and a spacing disk connected to the rotating means and having its periphery disposed adjacent to the broach engaging means to prevent relative contact between the latter and the rotating means.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM W. BOLLS.

Witnesses:
ROYCE A. RUESS,
CHARLES LOWELL HOWARD.