W. W. BOLLS.

DENTAL INSTRUMENT.

APPLICATION FILED FEB. 18, 1920.

1,356,755.

Patented Oct. 26, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

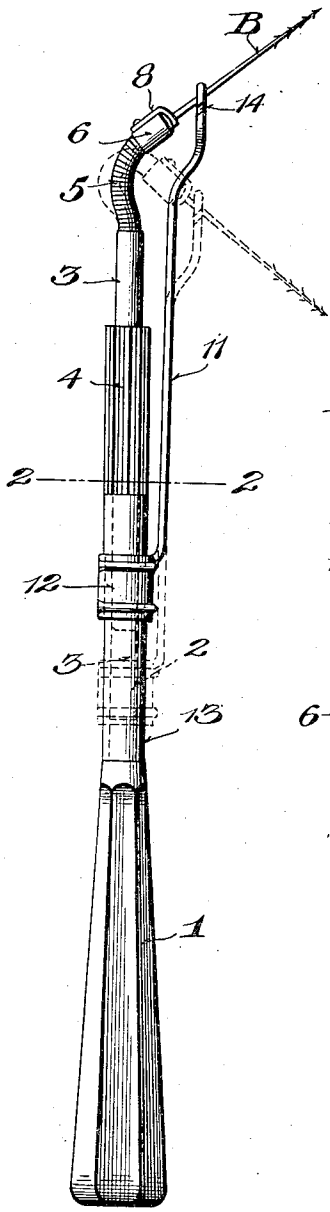


Fig. 2.

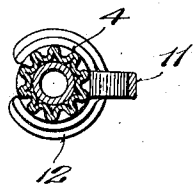


Fig. 3.

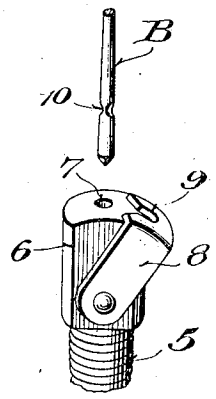
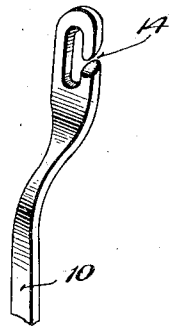


Fig. 4.



Witness

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2 SHEETS—SHEET 2.

Fig. 5.

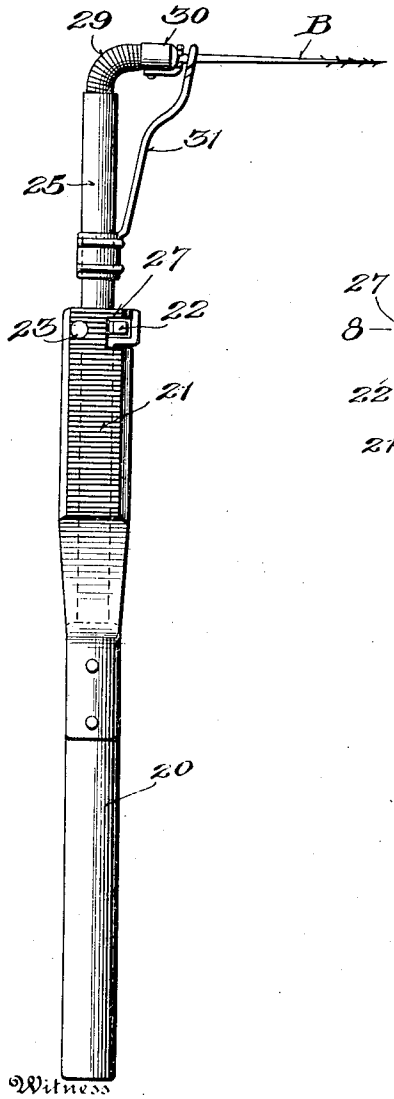


Fig. 6.

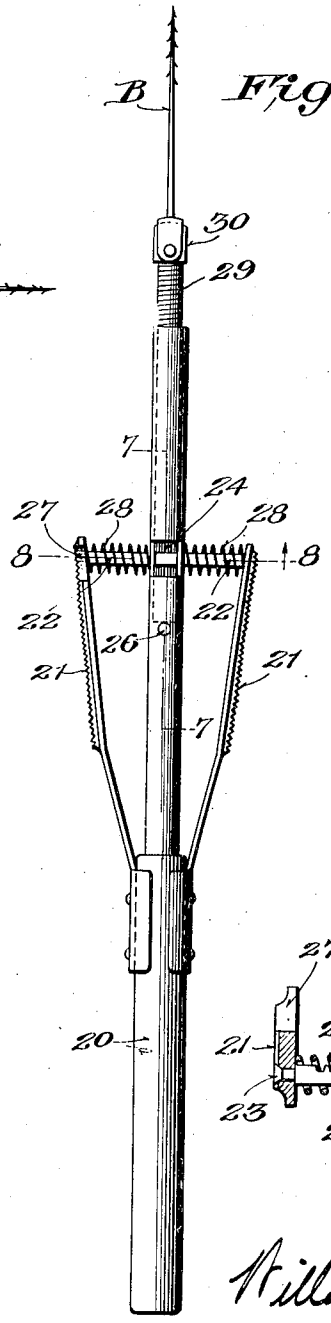


Fig. 7.

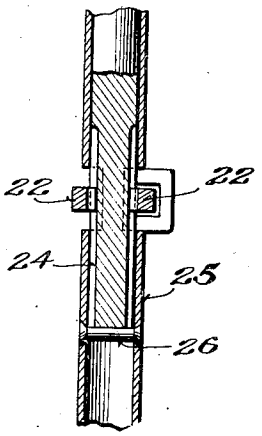
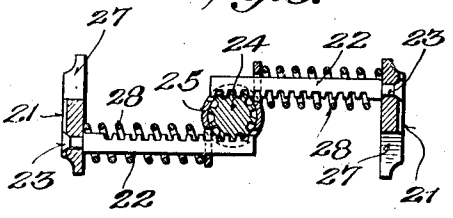


Fig. 8.



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UNITED STATES PATENT OFFICE.

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DENTAL INSTRUMENT.

1,356,755. Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed February 18, 1920. Serial No. 359,634.

To all whom it may concern:

Be it known that I, WILLIAM W. BOLLS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain 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 improvement upon Letters Patent issued to me May 27, 1913, No. 1063109.

The primary object of the invention is to provide an instrument wherein the broach is held and rotated at an angle without bodily bending or flexing of the broach, so that the latter regardless of its angular relation to the handle is at all times maintained straight throughout its entire length.

A further object of the invention is to provide an instrument which will allow all types of broaches, etc., to be used irrespective of whether same are or not capable of being flexed, and to also effect rotation of the broach in a definite and selective plane without any wabbling or eccentric movement.

Still further the invention aims to provide an instrument of the type mentioned which can be held and rotated with an under grip of the hand *i. e.*, with the hand beneath the device so that the latter can be held in a manner similar to holding of a pen or pencil in writing and positively rotated when so held.

In the drawings:—

Figure 1, is a side elevation, showing a few positions of the broach in dotted lines;

Fig. 2, is a section on line 2—2 of Fig. 1.

Fig. 3 is a detail perspective view of the chuck and a broach shank formed for reception therein:

Fig. 4 is a detail fragmentary perspective view of the arm and its eye which engages and holds the broach at the desired angle:

Fig. 5 is a side elevation of a modified form of the invention, depicting an undergrip type of instrument:

Fig. 6, is a side elevation of Fig. 5, at right angles thereto:

Fig. 7, is an enlarged sectional view on line 7—7 of Fig. 6, and

Fig. 8, is an enlarged sectional view on line 8—8 of Fig. 6.

In proceeding in accordance with the present invention, a handle 1, is employed formed with a socket 2 in which the stem 3 of the broach holder proper is rotatably received. A knurled ribbed, or roughened head 4 is secured to the stem so as to be effectively gripped by the fingers and rotated. A relatively short coil spring 5, is secured at one end to the outer end of shank 3 and at its opposite end has a chuck 6 affixed thereto. The chuck has a bore 7 in which the shank of the broach B is received and held by a pivoted L-shaped latch 8 formed with a substantially U-shaped notch 9 which engages about the oppositely notched parts 10 of the broach so as to thereby hold the latter securely within the chuck.

The arm 11 is equipped with a split spring collar 12 which frictionally grips the shank 13 of the handle 1, and has an open eye 14 receiving the broach.

In the modified form of the invention which is particularly designed for use by dentists who prefer to hold the broach similar to the holding of a pen or pencil in writing, handle 20, has a pair of depressible spring arms 21 secured at one end thereto and on opposite sides of the handle. The outer or free ends of the arms have rack bars 22 secured thereto, for example by heading as depicted at 23. The teeth of the rack mesh with the teeth of a pinion 24, the racks being disposed on opposite sides of the pinion. The pinion 24 is carried by the stem 25 of the broach holder proper, inward movement of the stem being restricted by a stop, such as pin 26, suitably secured within the handle 20. In order to allow the racks to pass the opposite spring arm 21, upon depression of such arms the latter are provided with cutaway parts 27, and for the purpose of assuring restoration to normal position of the spring arms following depression of the latter, coil springs 28, may be placed in encircling relation about the racks as depicted in Fig. 6.

The coil spring 29, chuck 30 and the arm 31, are all similar to the corresponding parts in the preferred form of the invention, excepting that the arm 31, is shorter.

In both forms of the invention it will be understood that the arms 11 or 31 can be bent by the fingers to various positions and that the stems 3 or 25, can be bodily removed by mere sliding. It will further be seen that the spring connection 5 or 29 between the chuck carrying the broach and the stem enables the dentist to ascertain by the sense

of the feel, the effectiveness of the broach operation, which latter is however more pronounced in Fig. 1, due to the fingers directly engaging the stem 3, through head 4.

The invention while described, for the purpose of illustration, in connection with a broach, is obviously not so limited, since the character of the particular tooth engaging instrument held within the chuck is immaterial. The word "broach" therefore comprehends any tooth engaging or operating tool or instrument.

What is claimed is:—

1. In combination with a handle, a stem rotatably borne by the handle, a broach holding chuck, means carried by the handle and formed to directly engage the broach between the ends of the broach to hold the latter at an angle to the handle, and a flexible connection between the stem and chuck.

2. In combination with a handle, a stem rotatably borne by the handle, a broach holding chuck, means carried by the handle and formed to directly engage the broach between the ends of the broach to hold the latter at an angle to the handle, and a coil spring secured at one end to the chuck and at its opposite end to the stem.

3. In combination with a handle and means borne thereby to hold a broach at an angle thereto by direct engagement with the broach between its ends, broach holding means, means borne by the handle to rotate the broach-holding means, and means to connect the broach holding means to said rotating means whereby to allow the broach to be disposed at varying angles to the handle while maintaining the broach straight.

4. In combination with a handle, a stem rotatably borne thereby, a pinion connected to the stem, broach holding means connected to the stem, a pair of depressible spring arms connected at one end to the handle, and racks carried by the opposite ends of the arms and meshed with opposite sides of the pinion.

5. In combination with a handle, a stem rotatably borne thereby, a pinion connected to the stem, broach holding means connected to the stem, a pair of depressible spring arms connected at one end to the handle, racks carried by the opposite ends of the arms and meshed with opposite sides of the pinion, and coil springs encircling the racks and interposed between the handle and arms for moving the latter to normal outward position.

6. In combination with a handle, a stem rotatably borne thereby, broach holding means connected to the stem, and depressible means to rotate the stem by and upon depression thereof.

7. In combination with a handle, a stem rotatably borne thereby, broach holding means connected to the stem, a depressible spring arm carried by the handle, and means operated by the arm to rotate the stem by and upon depression of said spring arm.

8. In combination with a holder, means to support and rotate a broach independently of the holder, means between the rotation means and the broach whereby the broach may be rotated while disposed at varying angles to the handle and while maintaining same bodily straight and means to directly engage the broach between its ends to hold same in angular relation to the handle.

9. In combination with a handle, a stem rotatably borne thereby, broach holding means connected to the stem, an arm borne by the handle and formed to engage the broach between its ends, a flexible connection between the stem and holding means, depressible finger operated means borne by the handle to rotate the stem, and means operated by said depressible means to engage and rotate the stem by and upon depression of said depressible means.

10. In combination with a handle, a stem rotatably borne thereby, broach holding means connected to the stem, reciprocable means carried by the handle and movable toward and away therefrom, and means actuated by said reciprocable means to engage and rotate the stem.

In testimony whereof I affix my signature.

WILLIAM W. BOLLS.