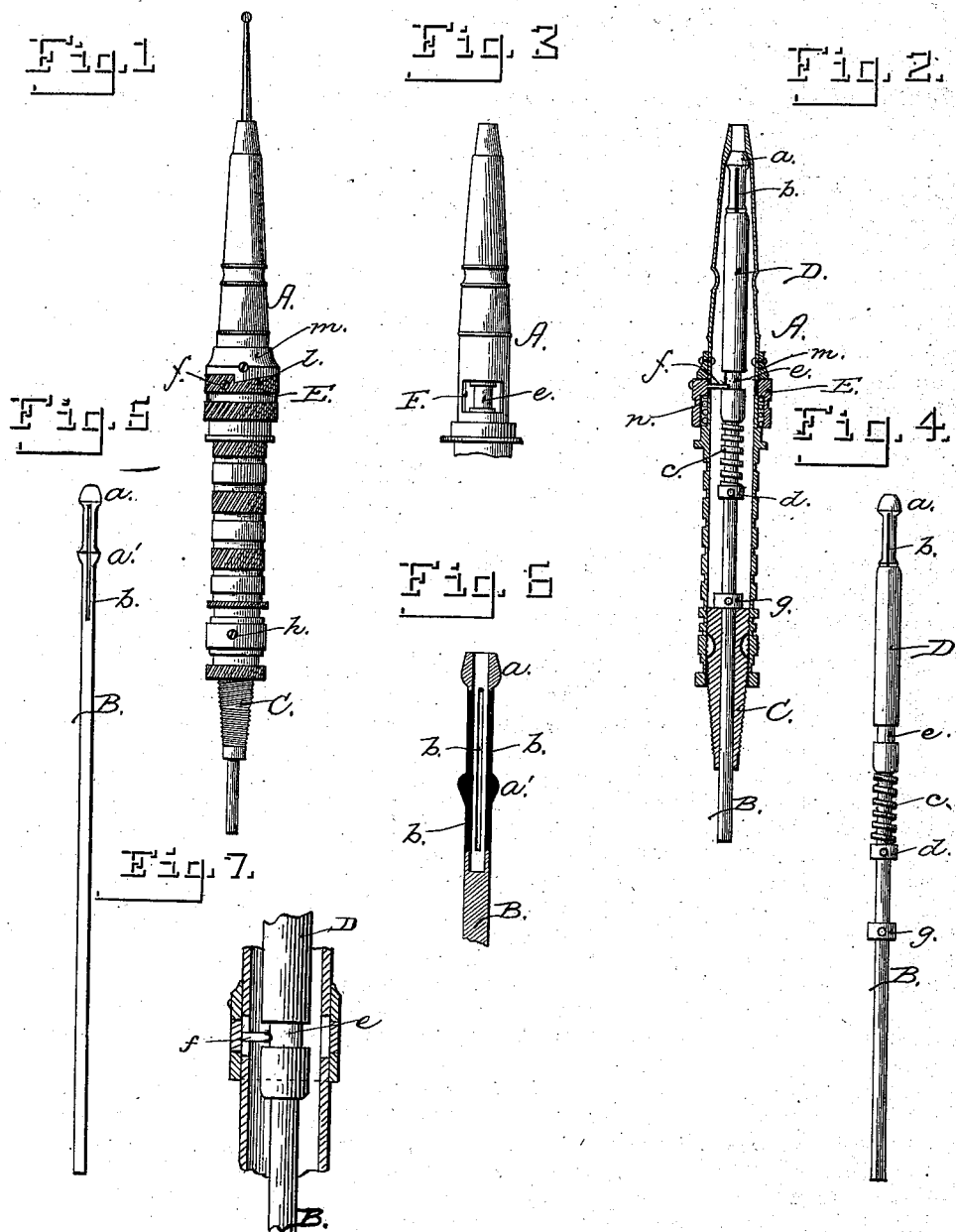


(No Model.)

W. D. WILLIAMS.
DENTAL HAND PIECE.

No. 382,672.

Patented May 8, 1888.



Witnesses.

Harry S. Bohm.
Lucas Harris.

Inventor.

Walter D. Williams,
By his Attorney,
Barber & Green.

UNITED STATES PATENT OFFICE.

WALTER DILLON WILLIAMS, OF CAMDEN, NEW JERSEY, ASSIGNOR OF ONE-HALF TO A. J. FULLMER, OF SAME PLACE.

DENTAL HAND-PIECE.

SPECIFICATION forming part of Letters Patent No. 382,672, dated May 8, 1888.

Application filed January 29, 1887. Serial No. 225,901. (No model.)

To all whom it may concern:

Be it known that I, WALTER DILLON WILLIAMS, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Dental Hand-Pieces; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in that class of dental hand-pieces which are composed of a hollow casing inclosing a spindle provided at one end with mechanism for holding burr-drills or similar tools, and connected at the opposite end to the flexible rotary shaft of a suitable dental engine for rotating said drills or tools, the object of my invention being to provide a dental hand-piece which shall be simple, accurate, and reliable, both in its construction and operation, capable of being readily manipulated to secure a drill or tool in position therein, or for the ready removal of said tool therefrom in the simplest and best possible manner.

To these ends my invention consists, essentially, of the novel details of construction and general arrangement of parts, as will be hereinafter fully described, and specifically designated in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of my complete device; Fig. 2, a vertical longitudinal section of the same; Fig. 3, a detail view of the casing; Fig. 4, a side elevation of the tool-holding spindle and its attachments; Fig. 5, a similar view of the spindle without the attachment; Fig. 6, a detail sectional view of the tool-holding mechanism of the spindle, and Fig. 7 a detail view of the cam-sleeve and inwardly-projecting lugs.

Similar letters of reference occurring on the several figures indicate like parts.

In carrying out my invention the outer casing, A, of the hand-piece is preferably of cylindrical form, tapering slightly toward the tool-holding end, and adapted to receive the

continuous spindle B, as fully shown in Fig. 2. The outer end of the spindle B is bored out a suitable depth and diameter to receive the shank of the drill or tool, and is provided with two cones, *a a'*, located a short distance apart and having their beveled surfaces projecting in opposite directions, while elongated slits *b* are provided in the sides of the spindle below the outer cone, *a*, to form flexible jaws, the said slits extending through the second cone, *a'*, as shown. The cone *a* upon the outer end of the spindle B, is adapted to rest in a corresponding-shaped bearing in the tapering end of the casing A, while the opposite rear end of the spindle is adapted to freely revolve in a bearing in a screw-threaded shoulder, C, fitting the rear of the said casing, to provide a continuous straight journal having a true revolving center to take up all lost motion.

Near the outer end of the spindle B is provided a hollow sleeve, D, which fits upon the said spindle, with its outer end impinging normally upon the beveled surface of the cone *a'*, to compress the flexible jaws together through the medium of the spiral spring *e*, arranged upon the said spindle between the base of the sleeve D and the collar *d*, also adjustably fixed upon the spindle, as fully shown in Fig. 4.

Near the lower end of the hollow sleeve D, and extending around the circumference of the same, is provided a groove or recess, *e*, for the reception therein of the lower end of a screw, *f*, which projects through the cam-sleeve E, surrounding the outer central portion of the casing A, for drawing the sleeve D downward from its contact with the split cone *a'*, to permit of the ready removal of the drill or tool from the flexible jaws, as will be hereinafter more fully referred to.

Near the lower end of the spindle and adjusted thereon by a suitable set screw is provided a collar, *g*, which bears against the inner surface of the screw-threaded shoulder C, to secure the spindle in position within the casing A in such manner that the slightest wear upon the bearings of the spindle can be readily taken up by turning the screw-threaded shoulder in the proper direction, a set-screw, *h*, projecting through the casing A, being provided for holding the said shoulder C at any desired point of adjustment. Upon two sides of the

central portion of the casing A are provided openings F, which are arranged in juxtaposition with the groove or recess *e* in the lower end of the sleeve D, as fully shown in Fig. 3. 5 Directly over the openings F is arranged a sleeve, E, which is provided upon its outer edge with a double cam, *ll'*, one on each side, while a suitable set-screw, *f*, projects through each cam into the recess *e* of the sleeve D. Fixed upon the casing A is also provided a collar, *m*, the inner edge of which conforms to and closely fits the contour of the double cam of the sleeve E, which is held normally against the said collar *m* by the action of the spiral 15 spring *n*, arranged upon the casing within a recess within said sleeve E, as fully shown in the drawings.

The construction of my improved device being as above described, the operation of inserting a tool in position therein or of removing the same therefrom is accomplished by simply giving the cam-sleeve E a partial turn from right to left, which causes the inwardly-projecting ends of the set-screws upon said 5 sleeve to draw the sleeve D downward from its engagement with the cone *a'* of the spindle and allow the flexible jaws to expand, in order that a tool may be either inserted or withdrawn. By turning the sleeve E back to its normal position the sleeve D runs up by the force of the 30 spring *c* upon the cone *a'* and compresses the flexible jaws of the spindle to hold a tool in position therein until released in the manner already stated. It will thus be seen that by a

simple turn of the cam-sleeve E any desired 35 tool may be readily removed or replaced in the hand-piece without loss of time or involving the manipulation of intricate mechanism to accomplish such a result.

Having thus described my invention, what I 40 claim as new and useful, and desire to secure by Letters Patent, is—

1. In a hand-piece for dental engines, an outer casing having openings therein and provided with a stationary outer cam-collar, and 45 a cam-sleeve engaging with said cam-collar, having inwardly-projecting lugs, and the spindle having a movable sleeve thereon, for the purposes specified, substantially as described.

2. In a hand-piece for dental engines, the 50 combination, with the hollow casing, of a tool-holding spindle having a conical outer end, and a series of jaws having conical projections thereon, an adjustable collar situated near the inner end of said spindle, a spring and sleeve 55 surrounding said spindle, a cam-sleeve having lugs projecting through openings in said casing and surrounding the same, and a screw-threaded collar situated at the end of said casing and adapted to come in contact with said 60 adjustable collar, substantially as described.

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

WALTER DILLON WILLIAMS.

Witnesses:

MARTIN V. BERGEN,
S. D. BERGEN.