J. RE QUA.

Hand-Piece for Dental-Engines.

No. 199,469. Patented Jan. 22, 1878.

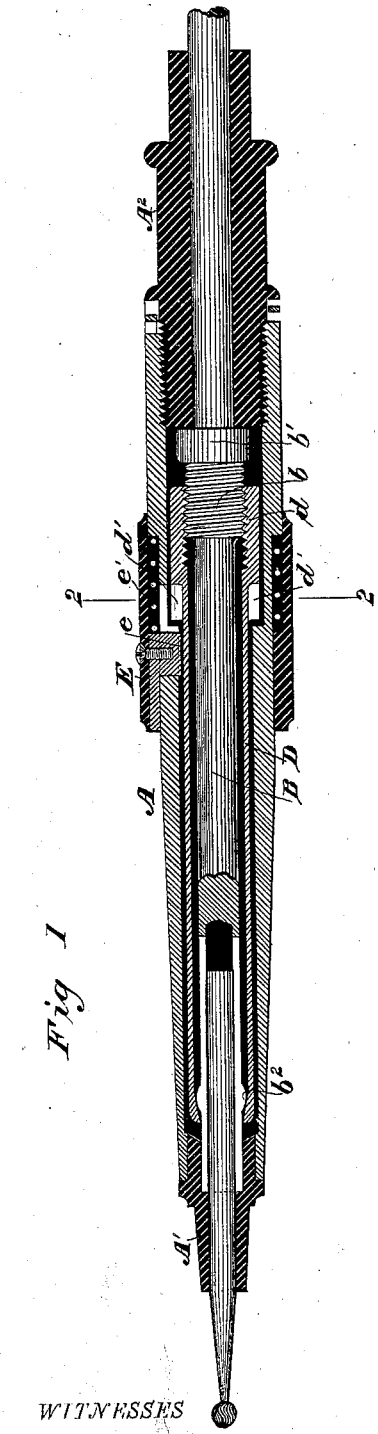

Fig 1

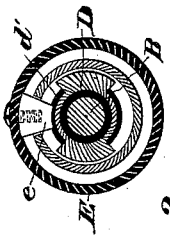

Fig 5.

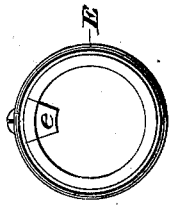

Fig 4

Fig 3.

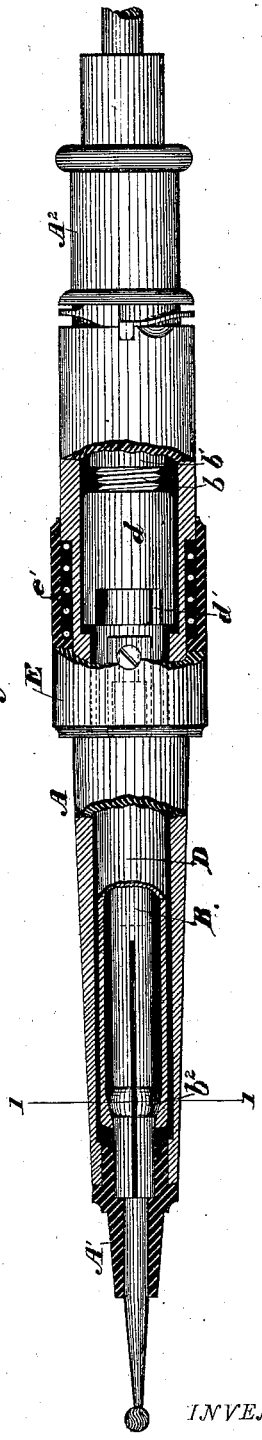

Fig 2

WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPHUS RE QUA, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN HAND-PIECES FOR DENTAL ENGINES.

Specification forming part of Letters Patent No. **199,469**, dated January 22, 1878; application filed February 17, 1877.

To all whom it may concern:

Be it known that I, JOSEPHUS RE QUA, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Hand-Pieces for Dental Engines, of which the following is a specification:

My invention relates to dental-engine hand-pieces of that class in which the shank of the operating-tool is firmly secured in the socket of a rotary chuck while in operation, but which is, at the same time, capable of being readily removed and replaced.

The object of my invention is to furnish an improved hand-piece of this description adapted firmly to secure tools having round or smooth shanks; and also to furnish a hand-piece in which the securing or releasing of the tool is done automatically by the rotation of the tool-chuck itself.

The subject-matter claimed will hereinafter specifically be designated.

In the accompanying drawings, Figure 1 represents a longitudinal central section of my improved hand-piece. Fig. 2 represents a view in elevation, partly in section, to show the construction of internal portions of the hand-piece not clearly illustrated in Fig. 1, being a view at right angles thereto; Fig. 3, a transverse section therethrough on the line 1 1 of Fig. 2; Fig. 4, an end view of the sliding ring or clutch by which the device is manipulated, detached from the hand-piece; and Fig. 5, a transverse section through the device on the line 2 2 of Fig. 1.

The casing of the hand-piece is composed, in the present instance, of a main section, A, a nib or nose, A^1, and a removable rear-end section, A^2.

A spindle or chuck, B, provided with an enlarged screw-threaded portion, *b*, and collar b^1 near its rear end, and with a socket the walls of which are split to form spring-jaws, having conical or raised portions b^2, at its front end, is mounted in the casing, and has its bearings at front in the nose A^1, and at the rear in the section A^2, whereby, when said rear section is properly adjusted against the collar b^1, endwise movement of the chuck in the casing is prevented, while its free rotation is unimpeded.

Within the casing, and surrounding the chuck or spindle, is a sleeve, D, provided with an enlarged internally-threaded head, *d*, which works upon the screw-threaded portion *b* of the spindle. The front end of the sleeve is reduced or inclined so as to work over or upon the raised or conical portion of the spring-jaws and close them together. The enlarged head of this locking or clamping sleeve is provided externally with a groove or grooves, *d'*, for the reception of a feather or spline, *e*, projecting inwardly, through a longitudinal slot in the casing, from the forward end of a sliding ring or annulus, E, working upon the periphery of section A.

A spiral spring, *e'*, inclosed within the sliding ring, keeps it normally thrust forward, with its spline out of engagement with the groove of the locking-sleeve, which sleeve is thus allowed to revolve freely with the spindle or chuck without impediment from the spline or feather.

The operation of the device is as follows: To remove a tool which has been clamped by the jaws of the socket, as shown in Figs. 1 and 2, it is necessary to draw back the sliding ring to engage its spline with the groove of the locking-sleeve, which will prevent the sleeve from rotating in connection with the spindle, with which it revolves freely when the spline is out of engagement.

The rotation of the threaded portion of the spindle in the corresponding portion of the sleeve in the proper direction causes the sleeve, as it cannot turn, to move endwise in a forward direction, and consequently relieves the raised portion of the spring clamping-jaws from the pressure of its inclined end, and allows them to open sufficiently to permit of the ready withdrawal of the tool. A reverse rotation of the spindle moves the clamping-sleeve inwardly thereon, causing its reduced or inclined end to ride upon the inclines of the spring clamping-jaws and force them together upon the shank of the tool inserted in the socket, securely locking it therein against either longitudinal or rotary movement independent of the spindle, which, being locked against endwise movement in the casing, causes the tools to run true and firm.

I am thus enabled by my improvements

firmly to secure in the chuck tools having round or smooth-surfaced shanks, as well as any of the various tools now in use, which gives my hand-piece a wide range of adaptability.

Another advantage of my improvement is that the chuck or tool-holder is inclosed entirely within the casing, leaving the front portion of the hand-piece entirely free to be grasped by the fingers of the operator, and protect the patient from any danger from the revolution of the clamp.

I am further enabled by this arrangement so to connect the sleeve and chuck by means of a clutch as automatically to unclamp and clamp the tool by the rotation of the chuck itself.

To prevent accidental separation of the rear and main sections of the casing while the hand-piece is in use, I interpose a spring-catch, *f*, between them; but I do not claim this employment of a spring catch or clutch to prevent accidental separation of the sections of a dental-engine hand-piece, as that is the invention of Eli T. Starr, of Philadelphia, Pennsylvania.

The spindle of my improved hand-piece is intended to be connected with the driving-shaft of a dental engine, and receive motion therefrom in the usual manner.

It will be obvious that the details of construction of the various parts of my improved hand-piece may be varied in well-known ways without departing from the spirit of my invention.

I am aware that holders composed of a metal tube with bulged and split ends, upon which a ring slides endwise to clamp a crayon in position, are common.

I am also aware that such a device has been used in the hand-piece of a dental engine to clamp the tool in its socket; but such clamp was outside of the casing of the hand-piece, and so situated that the clamp-ring necessarily revolved with the chuck, thus tending to form a disk or burr which might occasion serious injury to the patient; but I am not aware that previous to my invention a tool had been clamped in a revolving chuck or tool-holder by means of a clamping-sleeve inclosed within a casing, and connected with a slide controlled by the operator to lock and unlock the tool, and more especially when the engagement or disengagement of the tool is effected by moving the clamping-sleeve endwise automatically—that is, by the revolution of the tool-holder itself.

I claim as my invention—

1. The combination, in a dental-engine hand-piece, substantially as hereinbefore set forth, of the sectional casing, the rotary chuck or tool-holder mounted in bearings therein, and the clamping-sleeve movable endwise on the chuck and entirely inclosed within the casing.

2. In a dental-engine hand-piece, the combination, substantially as hereinbefore set forth, of a casing, a rotary tool-holder mounted therein, and a tool-securing device automatically operated by the rotation of the tool-holder to secure or release the tool.

3. The combination, substantially as hereinbefore set forth, of the casing, the spindle mounted therein and locked against endwise movement, the clamping-sleeve movable endwise on the spindle, and a clutch or spline to lock the clamping-sleeve against rotary movement with the spindle, while permitting it to move endwise thereon, whereby the shanks of operating-tools may be locked in or removed from the spindle-socket or chuck.

4. The combination, substantially as hereinbefore set forth, of the casing, the rear section of which is removable, the spindle provided with the collar, enlarged threaded portion, and split socketed end, the clamping-sleeve provided with the internally-threaded enlarged head, working upon the threaded portion of the spindle, and with inclined or reduced end working over the split end of the spindle, and the sliding clutch or spline adapted to engage with the clamping-sleeve.

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Witnesses:

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