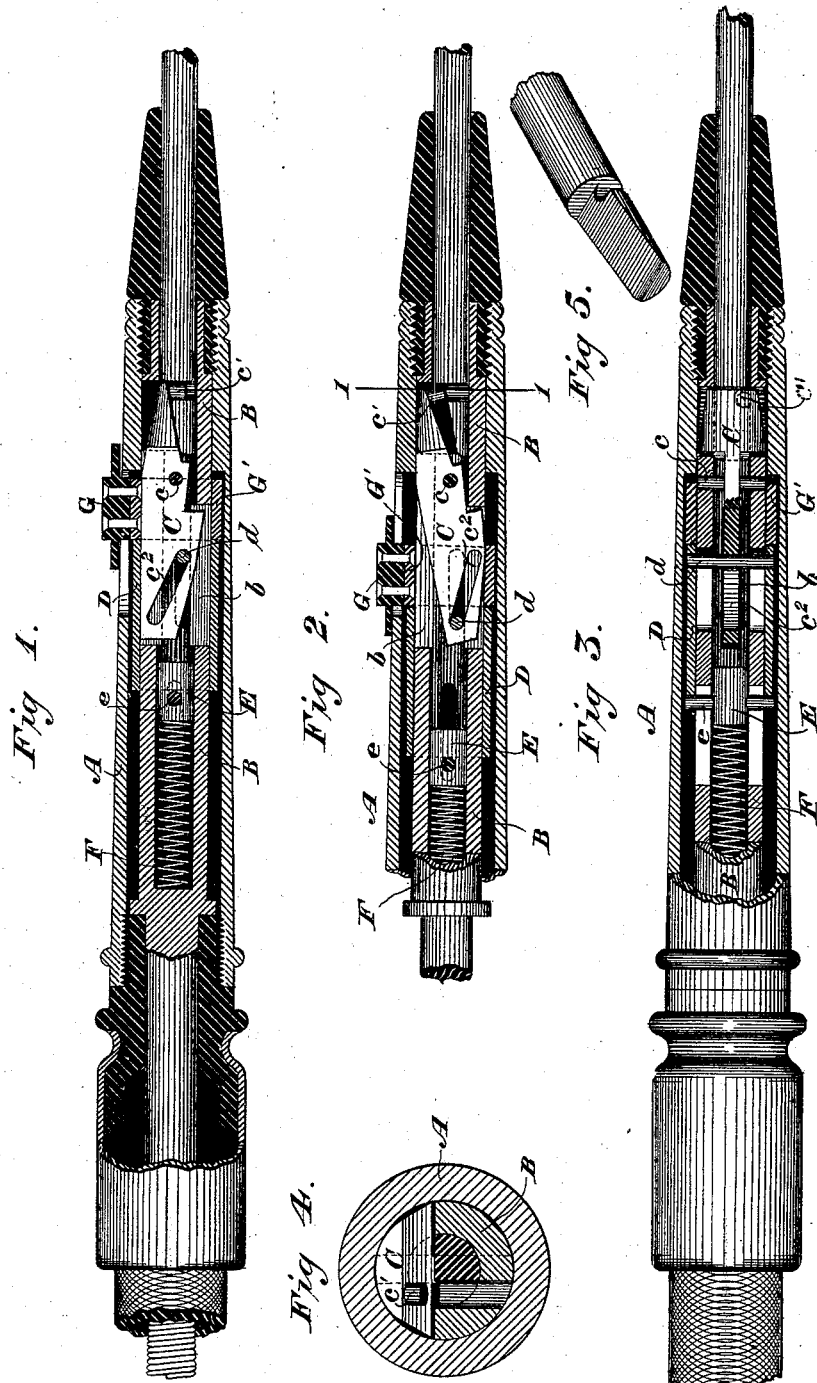


E. T. STARR.
Dental-Engine Hand-Pieces.

No. 203,298.

Patented May 7, 1878.



WITNESSES

Wm A Stinkle
Geo W Breck

INVENTOR

Eli T Starr
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UNITED STATES PATENT OFFICE.

ELI T. STARR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SAMUEL S. WHITE, OF SAME PLACE.

IMPROVEMENT IN DENTAL-ENGINE HAND-PIECES.

Specification forming part of Letters Patent No. 203,298, dated May 7, 1878; application filed December 14, 1877.

To all whom it may concern:

Be it known that I, ELI T. STARR, of the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Dental-Engine Hand-Pieces, of which the following is a specification:

My invention relates to an improvement in the tool-locking mechanism carried by the rotary chuck or holder of a dental-engine hand-piece.

Its object is to enable the tool or implement to be readily inserted in the chuck or holder, or removed therefrom, and yet be held securely therein while in operation, which ends I attain by means of a slotted pivoted positively-operated latch or catch of peculiar construction, adapted to engage with the groove or recessed shank of the tool.

The subject-matter claimed hereinafter specifically will be designated.

In the accompanying drawings, Figure 1 is a longitudinal central section through my improved hand-piece and tool-locking mechanism, showing a tool as locked in the socket of the chuck or holder; Fig. 2, a similar view, showing the catch as raised or retracted out of engagement with the tool-shank to enable the tool to be removed or replaced; Fig. 3, a similar view through a portion of the hand-piece, at right angles to Figs. 1 and 2; Fig. 4, a transverse section through the device on the line 1 1 of Fig. 2, looking toward the latch; and Fig. 5, a perspective view of a portion of the tool-shank, with its flattened end and transverse groove as adapted to the organization of the locking mechanism exhibited in the other figures.

The casing A is preferably composed of sections, and in suitable bearings therein is mounted a rotary chuck or holder, B, socketed at its forward end for the reception of a tool-shank, as usual. The inner swiveling section of the casing and rear end of the chuck are shown, in this instance, as respectively connected to the flexible non-rotating sheath and flexible driving-shaft of the well-known S. S. White dental engine. The socketed end of the chuck is slotted longitudinally at *b* for the reception of a pivoted locking-latch, C. This latch is rocked upon its pivot *e*, to release its hooked

end or locking-lug *c*¹ from or engage it with the tool-shank, by means of an endwise-moving sleeve or thimble, D, mounted upon and revolving with the chuck, carrying a pin, *d*, working in longitudinal slots in the wall of the chuck, to permit free endwise movement of the thimble, the pin *d* passing through and working in a slot, *c*², formed in the portion of the latch back of its pivot, the slot running from near the bottom edge of the latch diagonally upward toward its rear upper corner, as clearly shown in Figs. 1 and 2.

A plug or block, E, provided with a transverse pin, *e*, working through a slot in the walls of the chuck, is acted upon by a coiled spring, F, interposed between it and the rear wall of the socket, the tension of the spring being always exerted to throw the plug forward. The ends of the pin *e* project a short distance beyond the slot in which it works, and, being in contact with the sleeve D, forces it outward, causing its pin *d* to ride in the diagonal groove of the latch C, lifting its rear end and depressing its front end or locking-lug, owing to the action of the pin upon the inclined edge of the slot. The locking-lug is thus normally kept in contact with the tool-shank inserted in the chuck.

To rock the catch upon its pivot to retract or release its lug or hook from contact or engagement with the tool-shank, I mount upon the outside of the casing a finger-piece or slide, G, provided with a feather or portion working in a longitudinal slot in the casing, and firmly connected upon the inside thereof with a ring or annulus, G', loosely fitting and capable of endwise movement upon the chuck, but not of revolution therewith. This ring G' is located immediately in front of the sleeve D, and in contact with it, so that when a backward movement of the finger-piece takes place the thimble or sleeve is positively retracted, causing its pin *d* to travel on the rear inclined edge of the slot, (opposite to that operated upon when the thimble is moving forward under the impulse of the spring F,) rocking the latch upon its pivot, and positively raising or retracting its hook end out of engagement with the shank of the tool. As soon as released the thimble and finger-piece are thrown

forward by the action of the spring F and the front or locking end of the catch depressed, as before mentioned.

It will be obvious that a lug projecting from the finger-piece through the slot in the casing might be substituted in place of the ring or annulus with which the finger-piece is shown as connected; but I prefer the construction described. Even the finger-piece itself might be dispensed with entirely, and the thimble or sleeve actuated through a slot in the casing by the nail of the operator in a well-known way in this class of implements.

I have shown the forward end of the locking-latch as wedge-shaped or inclined, to correspond with the wedge-shaped or flattened end of the tool-shank, and the locking-lug as located on one side of the longitudinal axis of the catch, to adapt it to engage with the transverse groove of the tool-shank, by which means I am enabled to dispense with the usual lug or pin projecting into the bore of the tool-holder, to engage with and prevent lateral movement of the tool in the socket, the inclined surface of the latch performing that function in the organization and construction shown.

Other advantages possessed by my improvement will readily be understood by those skilled in the art.

In operation, the thimble is retracted by the finger-piece to elevate the catch, and the tool inserted and locked when in proper position by releasing the thimble, which is thrown forward by its spring, thus engaging the lug of the latch with the transverse groove of the tool-shank, and locking it securely against longitudinal or lateral movement independent of the chuck, but leaving it free to turn therewith.

I am aware that catches composed of spring

metal have been employed in dental-engine hand-pieces to lock a tool in a rotary chuck, and do not claim such a device. Neither do I broadly claim herein a stiff pivoted latch connected with a controlling-sleeve, whereby it is adapted to be positively operated and rocked upon its pivot to release or engage a tool-shank, as that is the invention of Woodbury S. How, of Cincinnati, Ohio, and is fully described in a pending application filed by him for Letters Patent of the United States on or about August 3, 1877.

I claim as my invention—

1. In the hand-piece of a dental engine, a locking-latch constructed, substantially as hereinbefore set forth, with a locking-lug, an inclined slot, and a pivot, on which the latch is rocked by means of the inclined slot, to engage or disengage the lug and tool-shank.

2. The combination, substantially as hereinbefore set forth, of the tool-chuck, the pivoted slotted latch mounted therein, the end-wise-moving thimble mounted on the chuck, to operate said latch, and a spring keeping the thimble thrown normally forward, to depress the front end of the latch.

3. The combination, substantially as hereinbefore set forth, of the casing, the chuck, the pivoted slotted latch, the thimble operating the latch, the spring acting upon the thimble to keep it normally thrust forward, and the finger-piece operating through a slot in the casing upon the thimble, to retract the latch from engagement with the tool-shank.

In testimony whereof I have hereunto subscribed my name.

ELI T. STARR.

Witnesses:

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