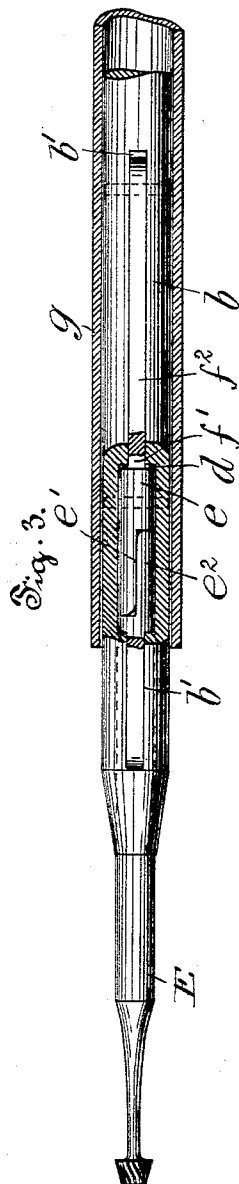
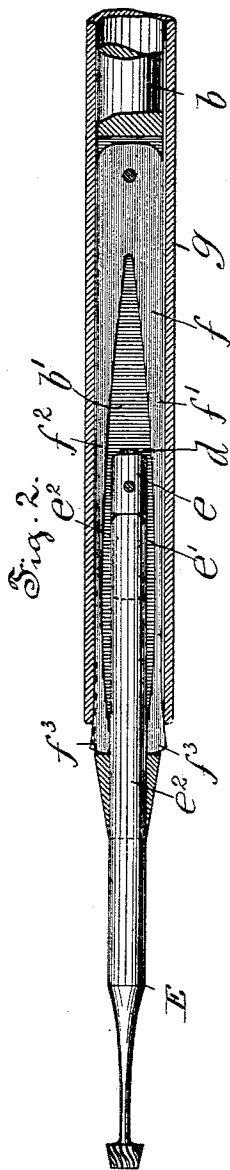
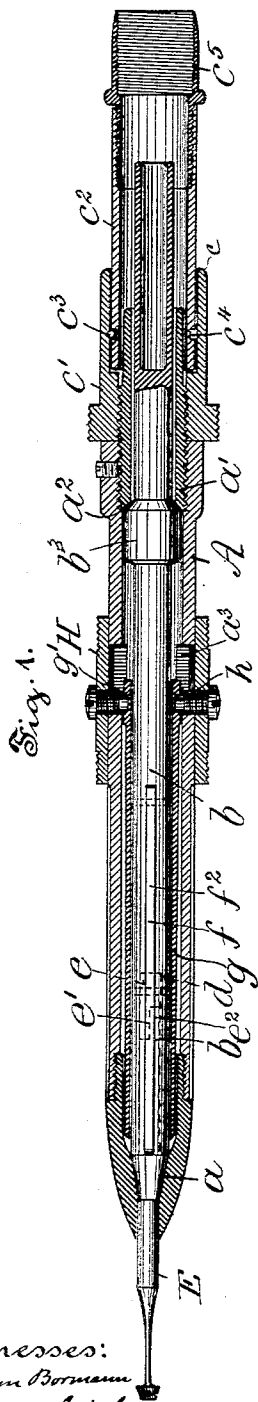


(No Model.)

W. M. SPEAKMAN.  
HANDPIECE FOR DENTAL ENGINES.

No. 476,496.

Patented June 7, 1892.



Witnesses:  
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att'y.

# UNITED STATES PATENT OFFICE.

WILLIAM M. SPEAKMAN, OF PHILADELPHIA, PENNSYLVANIA.

## HANDPIECE FOR DENTAL ENGINES.

SPECIFICATION forming part of Letters Patent No. 476,496, dated June 7, 1892.

Application filed February 23, 1892. Serial No. 422,365. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM M. SPEAKMAN, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Handpieces for Dental Engines, of which the following is a specification.

The principal objects of my present invention are, first, to provide a handpiece for dental engines with simple, compact, efficient, and comparatively inexpensive chuck mechanism by which an operating-tool may be conveniently and rapidly locked to and unlocked from the tool-spindle, and, second, to construct and arrange the parts of the chuck mechanism for operation in such manner that the tool is retained in the handpiece by means of movable jaws and is compelled to rotate with the tool-spindle through the instrumentality of a scarf-joint connection.

My invention consists of the improvements in a handpiece for a dental engine, hereinafter described and claimed.

The nature and objects of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a longitudinal central section of a handpiece for a dental engine embodying features of my invention. Fig. 2 is a similar view of the tool-spindle, showing my improved chuck mechanism; and Fig. 3 is a central section of the tool-spindle and its accessories, taken on a plane at right angles to the intercepting plane of Fig. 2.

In the drawings, A is the exterior casing, provided at its front end with a bearing *a* and having a screw-bushing *a'* inserted into its rear end. The tool-spindle *b* is journaled in the bearings *a* and *a'* and held against end-play by means of a collar *b'*, supported in the bearing *a'* of the bushing *a'*. This bushing *a'* may be adjusted in the casing A in order to compensate for wear of the spindle *b* and its bearings.

*c* is a two-part coupling having the respective members *c'* and *c''* thereof connected together by a feather *c'''*, working in a groove *c''''*.

The member *c'* of this coupling is screwed onto the bushing *a'*, and the member *c''* thereof is provided with a nipple *c'''*, adapted for connection with the driving-shaft of a dental engine, (not shown,) so that the member *c''* of the coupling may be rotated independently of the member *c'* and of the casing A. The rear end of the spindle *b* is also connected with the driving-shaft of a dental engine and is rotated thereby. The front end of the spindle *b* is bored out axially, as at *d*, to form a cylindrical chamber for the reception of an operating-tool E and a key *e*, hereinafter more fully described. The front portion of the spindle *b* is also provided with a longitudinal slit or slot *b'*, that extends through the walls of the cylindrical chamber *d*, but does not extend to the outer end of the spindle, so that the extreme outer end of the spindle is tubular and runs in the bearings *a*. The key *e* is inserted into the tubular chamber *d* through the tubular end of the spindle *b* and is riveted to place therein in a position intermediate of the two ends of the slot *b'*. The key *e* is provided with a scarfed, offset, halved, or notched extremity, as at *e'*, that constitutes one member of a scarf-joint. The end of the shank *e''* of the tool E is also offset, scarfed, halved, or notched and forms the other member of the scarf-joint, the object of which is to couple the tool and tool-spindle together in such manner that they are constrained to rotate together like one piece and are nevertheless susceptible of being rapidly disconnected.

Although the above-described scarf-joint causes the tool-spindle to positively drive the operating-tool, still it is necessary to provide means for retaining the tool in position for insuring the proper engagement of the scarf-joint. The result is attained by means of a fork *f*, fitted into and riveted in the slot *b'* in such manner that the respective tines *f'* and *f''* thereof straddle the key *e* and extend forward into position, forming jaws *f'''* for engaging and disengaging the shank *e''* of the tool E. These jaws *f'''* extend a short distance beyond the coupling of the shank of the tool with the key *e* and are adapted to pass through the slot *b'* and grasp the tool-shank just in

rear of the journal-bearing of the spindle, whereby the tool is held from longitudinal displacement.

$g$  is a sheath mounted upon the spindle  $b$  and afforded a range of end-play thereon, so that when the sheath  $g$  is pushed toward the left in the drawings the jaws  $f^3$  are engaged by the forward portion of the sheath and caused to grasp and firmly hold the tool  $E$  against end-play, Fig. 2, it being understood that the tool is rotated by the tool-spindle through the instrumentality of the scarf-joint hereinbefore described. When the sheath  $g$  is pushed toward the right, Fig. 3 in the drawings, the jaws  $f^3$  are separated by reason of their own resiliency, and thus release the tool  $E$ , so that it may be removed and replaced by other tools.  $H$  is a sleeve afforded a range of end-play on the casing  $A$  and connected with the sheath  $g$  through the instrumentality of screw-pins  $h$ , working in slots  $a^3$  in the casing  $A$  and engaging an annular groove  $g'$ , formed upon the rear end of the sheath  $g$ , so that the sheath is afforded freedom of rotary motion and may be shifted by means of the sleeve  $H$ .

The mode of operation of the hereinbefore-described handpiece for a dental engine is as follows: A tool is inserted into the tubular extremity of the spindle  $b$  in such manner that the scarfed end  $e^2$  of the shank of the tool engages the corresponding portion  $e'$  of the key  $e$ , whereupon the sleeve  $H$  is shifted forward—that is, toward the left in the drawings. This motion of the sleeve  $H$  causes the sheath  $g$  to be moved in a similar direction, thus causing the jaws  $f^3$  to engage the shank of the tool and prevent it from being accidentally or otherwise shifted endwise out of engagement with the key  $e$ . When the spindle  $b$  is rotated, the tool  $E$  and sheath  $g$  are also rotated, and the scarf-joint between the tool and spindle prevents the latter from slipping or lagging behind the spindle and the jaws  $f^3$  and sheath  $g$  prevent the members of the scarf-joint from being drawn apart. To remove the tool  $E$ , the jaws  $f^3$  are released by the simple operation of shifting the sleeve  $H$  backward—that is, toward the right in the drawings, whereupon the tool may be lifted

or dropped out of the handpiece. Another tool may then be inserted into the same in the manner hereinbefore explained.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A dental-engine handpiece provided with a revoluble spindle having a slotted and tubular extremity, a key secured in the tubular portion of the spindle, a forked plate mounted in the slotted portion of the spindle and provided with tines forming jaws, a tool having a shank adapted to be locked by the key, and means for clamping the jaws, substantially as and for the purposes set forth.

2. A dental-engine handpiece provided with a revoluble tubular and slotted spindle, a key secured in the tubular portion of the spindle, a forked plate mounted in the slotted portion of the spindle and provided with tines forming jaws, a tool having a shank adapted to be inserted into said spindle and held therein by the jaws, a sheath movable endwise on said spindle and adapted to engage said jaws, and a sliding sleeve accessible from the exterior of the handpiece and connected with said sheath, substantially as and for the purposes set forth.

3. A dental-engine handpiece provided with a tubular and slotted tool-spindle, a tool inserted into the tubular end of the spindle, a key fixed in the tubular end of the spindle and engaging the extremity of the shank of the tool, a forked plate mounted in the slotted portion of the spindle and provided with tines forming jaws for engaging the shank of the tool, a revoluble sheath adapted to operate said jaws and provided with an annular groove, a sleeve mounted on the main casing of the handpiece and afforded a range of end-play, and a feather attached to said sleeve and engaging the annular groove of the sheath, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WM. M. SPEAKMAN.

Witnesses:

THOMAS M. SMITH,  
RICHARD C. MAXWELL.