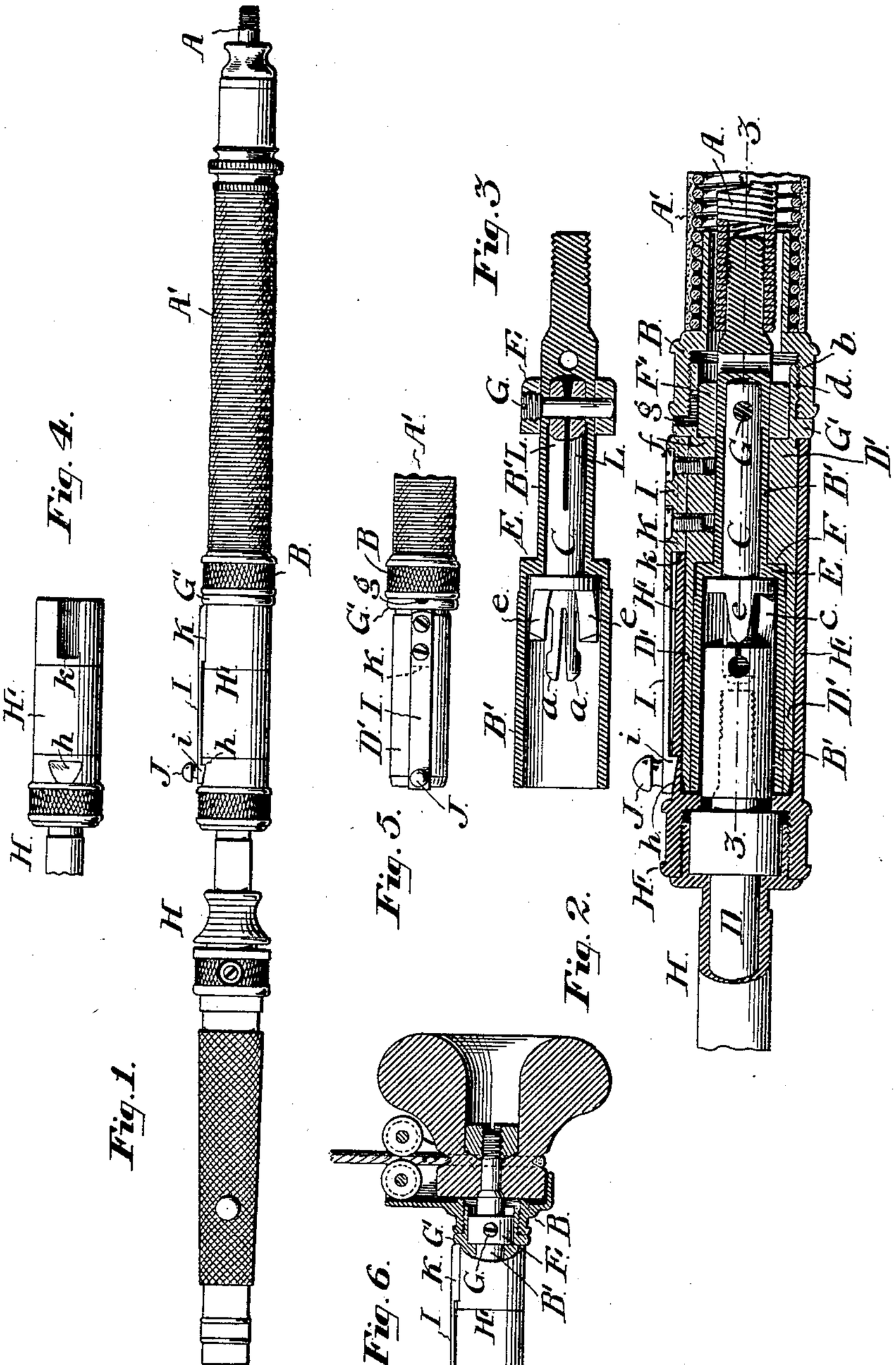
(No Model.)

A. W. BROWNE.

ATTACHMENT FOR DENTAL ENGINE HAND PIECES.

No. 434,698. Patented Aug. 19, 1890.



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ATTACHMENT FOR DENTAL-ENGINE HAND-PIECES.

SPECIFICATION forming part of Letters Patent No. 434,698, dated August 19, 1890.

Application filed March 6, 1890. Serial No. 342,859. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. BROWNE, of Prince's Bay, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Attachments for Dental-Engine Hand-Pieces, of which the following is a specification.

My invention relates to certain improvements, as hereinafter claimed, applicable to that class of hand-piece attachments for dental engines in which the hand-piece casings and tool-carrying spindles may readily be secured to and detached from the supporting and driving connections thereof; and my object, mainly, is to improve that type of this class of attachments shown in United States Letters Patent No. 326,942, granted to my assignee September 29, 1885.

In the accompanying drawings, in which my improvements are shown as organized for use in connection with a dental engine from which the power is applied either by way of a flexible driving-shaft or by an endless cord, Figure 1 is a longitudinal view showing the hand-piece and its attachments with a section of the driving-shaft provided with its sleeve or cover. Fig. 2 shows on an enlarged scale a view, partly in longitudinal central section, of those features embodying my improvements. Fig. 3 shows, also on an enlarged scale, a view partly in longitudinal section on the line 3 3 of Fig. 2, representing the driving-spindle and connections thereof. Fig. 4 is a longitudinal view showing in part the hand-piece casing detached; and Fig. 5 is a similar view showing the supporting-sleeve to which the hand-piece is connected and a portion of the covered driving-shaft. Fig. 6 is a longitudinal view, partly in section, showing a modification whereby a pulley driven by an endless cord is employed to actuate the tool-carrying spindle.

The flexible driving-shaft A, a portion only of which is shown, is provided with the loose sleeve or cover A′, and is driven by connection with a dental engine in any usual well-known way. The sleeve of the driving-shaft connects, as usual, with the rear end of a short coupling-sleeve B, with which the hand-piece has supporting-connection at its rear. A tubular stiff section or prolongation B′ of the driving-shaft has suitable connection at its rear with the flexible portion of this shaft. The driving-spindle C, by connection with which the tool-carrying spindle D is actuated, is mounted within the tubular stiff section of the driving-shaft, and this section has a long bearing in a supporting-sleeve D′, which at its rear end is detachably connected with the sleeve B, with which the cover of the driving-shaft is connected. Screw-threads *b* and *d* serve to make the connection between sleeves B and D′.

A suitable connection between the driving-spindle C and tool-carrying spindle D consists of a slip-joint coupling—such as shown in the before-mentioned patent, No. 326,942—in which, at the rear end of the tool-carrying spindle, there is provided a beveled projection or lug *c*, extending rearwardly from one side of the spindle, to project between beveled lugs *e è*, projecting forwardly from opposite sides of the front end of the driving-spindle. The driving-spindle is provided between its lugs *e e* with a forwardly-extending split pin constituting two spring jaws or fingers *a a* for entering a socket at the rear end of the tool-carrying spindle. These spring-fingers are free to yield laterally in any direction to a slight extent, and by their tendency to spread when confined in their socket a steady connection between the parts, preventing rattling, is attained, while a slight lateral yield or flexure of the joint-connection between the tool-spindle and the driving-spindle is allowed, for a purpose farther on to be explained.

The tubular stiff section B′ of the driving-shaft is secured in proper position in its long bearing in the supporting-sleeve D′ as follows: The outer or front portion of the tubular stiff section B′ is of larger diameter than its rear portion to fit the correspondingly-enlarged bearing provided in its supporting-sleeve, abutting shoulders E and F being thus formed upon the parts B′ and D′, respectively. In rear of the shoulders E F a collar F′ is detachably secured to the tubular stiff section of the driving-shaft and bears against a

shoulder *f* of the supporting-sleeve. Endwise movement of the tubular shaft-section B′ in its bearing is thus prevented. A screw-pin G, which may be inserted in place and removed by way of a hole *g* in the supporting-sleeve, serves to engage the collar F′ with the tubular shaft-section B′. This pin G also serves, as farther on described, to connect the driving-spindle and tubular section of the driving-shaft. The supporting-sleeve is provided with a shoulder G′, against which the coupling-sleeve B abuts. The front and rear casing-sections of the hand-piece are detachably connected with each other, and the hand-piece removably connected with the supporting-sleeve D′, as next to be described. The outer section H of the hand-piece casing is connected with the rear or inner section H′ thereof by screwing into it as usual, and the tool-carrying spindle has bearing in the outer section in the ordinary way. A spring-latch I, attached at its rear end to the supporting-sleeve by screws, is provided with a shoulder *i* at its outer end to engage a shoulder *h*, formed by a recess in the outer surface of the rear section of the hand-piece near its front end. A rib K on the under side of the heel end of the latch enters a slot *k* at the inner end of the rear section of the hand-piece casing, thus preventing turning movement of the hand-piece and avoiding wear of the engaging-shoulders of the latch and hand-piece. A finger-knob J serves as a means for lifting the latch out of engagement with the hand-piece when the hand-piece is to be detached. The under surface of the outer end of the spring-latch in advance of its shoulder is inclined to permit the hand-piece to be readily slipped upon the supporting-sleeve. The rear end of the hand-piece abuts against the shoulder G′ of the supporting-sleeve.

The driving-spindle C is fitted loosely in the tubular section of the driving-shaft and allowed free lateral play to a slight extent in all directions therein, in order to avoid imperfections in operation heretofore sometimes resulting from the failure to have the bearing for the stiff section of the driving-shaft in true alignment with the bearing for the tool-carrying spindle. As shown by Figs. 2 and 3, the tubular stiff section of the driving-shaft is connected with the driving-spindle by a compensating joint formed by the pin G passing loosely through the split rear end of the driving-spindle and through the stiff section of the driving-shaft. The tendency of the forks L L of the driving-spindle to spread apart makes a steady connection between the spindle and driving-shaft section, while the yield of these forks and their loose connection with their pivot-pin provide for lateral play of the driving-spindle in the loosely-surrounding tubular shaft-section. The before-described connection between the driving-spindle and tool-carrying spindle is such, it will be obvious, as not to interfere with this self-adjustment of the driving-spindle. It will further be seen that by my improvements a long bearing is provided for the stiff section of the driving-shaft, thus insuring steadiness in action, and that the long supporting-sleeve is embraced by the sectional hand-piece for a sufficient portion of its length to make a firm, steady connection between the parts, insuring their alignment.

Obviously, instead of employing a flexible driving-shaft, the tool-carrying spindle may be actuated by way of a pulley secured to the tubular stiff section B′ of the driving-shaft and driven by a cord, as shown in Fig. 6.

I claim as my invention—

1. The combination of the supporting-sleeve, the sectional hand-piece sliding on and off the supporting-sleeve outside thereof and provided with the slot at its rear end and with the recess forming an external shoulder in advance of said slot, and the spring-latch having the shouldered free end outside the hand-piece for engagement with the shouldered recess therein, and projecting at its heel end through the hand-piece slot and secured to the supporting-sleeve, substantially as and for the purpose set forth.

2. The combination of the supporting-sleeve, the sectional hand-piece detachably connected therewith, the tubular stiff section of the driving-shaft having bearing in the supporting-sleeve, the driving-spindle loosely fitted in said tubular stiff section, and the compensating joint connecting the driving-spindle with the tubular stiff section of the driving-shaft, substantially as and for the purpose set forth.

3. The combination of the supporting-sleeve, the sectional hand-piece detachably connected therewith, the tubular stiff section of the driving-shaft having bearing in the supporting-sleeve, the driving-spindle loosely fitted in said tubular stiff section, the compensating joint connecting the driving-spindle with the tubular stiff section of the driving-shaft, the tool-carrying spindle, and the slip-joint connection between said spindle and the driving-spindle, substantially as and for the purpose set forth.

4. The combination of the tubular stiff section of the driving-shaft, the driving-spindle loosely fitted therein, and the compensating joint connecting the spindle and driving-shaft section, substantially as and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name.

ARTHUR W. BROWNE.

Witnesses:
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