J. W. GILBERT.

TOOL-CARRIERS FOR DENTAL ENGINES.

No. 186,471. Patented Jan. 23, 1877.

Fig. 1.

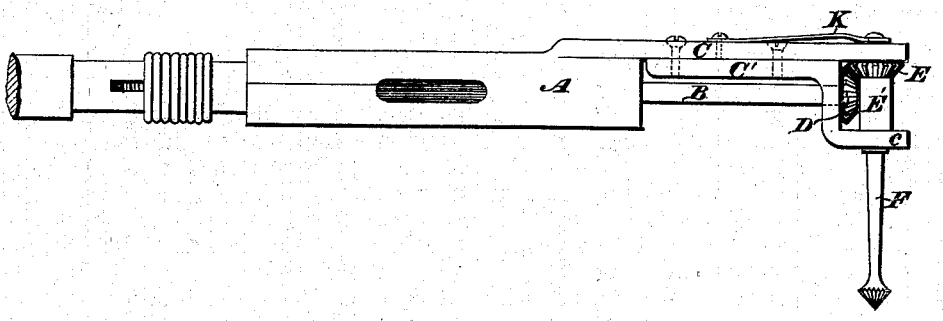


Fig. 2.

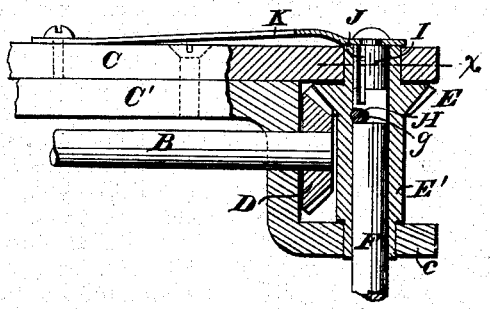


Fig 4.

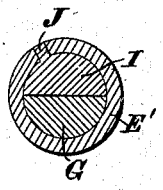


Fig 6

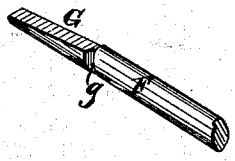


Fig. 3.

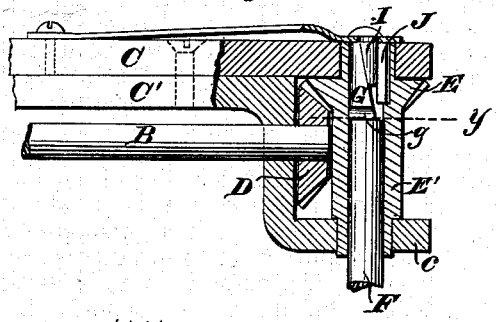
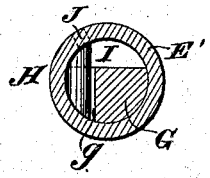


Fig 5.



WITNESSES

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INVENTOR.

John W Gilbert.

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UNITED STATES PATENT OFFICE.

JOHN W. GILBERT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SAMUEL S. WHITE, OF SAME PLACE.

IMPROVEMENT IN TOOL-CARRIERS FOR DENTAL ENGINES.

Specification forming part of Letters Patent No. **186,471**, dated January 23, 1877; application filed December 11, 1875.

To all whom it may concern:

Be it known that I, JOHN W. GILBERT, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Tool-Carriers for Hand-Pieces of Dental Engines, of which the following is a specification:

My invention relates to a tool-carrier attachment for hand-pieces of dental engines of that class known as "angle attachments," adapted for the support of burrs, disks, drills, and other revolving tools; and my object, mainly, is to secure a positive lock for the tool in its holder or socket in the carrier, while admitting of the ready separation and connection of the tool and holder.

The subject-matter claimed will hereinafter specifically be set forth.

In the accompanying drawings, which show my improvements on enlarged scales, Figure 1 is a plan or longitudinal view; Fig. 2, a sectional view of the outer end of the tool-carrier or support, the gearing for rotating the tool, and the tool-holder and locking devices; Fig. 3, a similar view, showing the tool-holder and fastening devices in a different position from that represented in Fig. 2; Fig. 4, a transverse section through the tool-holder, the tool-shank, and locking device on the line *x* of Fig. 2; Fig. 5, a similar section on the line *y* of Fig. 3, showing the locking-pin of the tool-holder; Fig. 6, a view, in perspective, of the interlocking end of the tool-shank.

A tubular support or attachment, A, adapted to be fitted on the hand-piece of a dental engine, is provided with suitable bearings for a driving-spindle, B, rotated in any suitable well-known way—such, for instance, as by the ordinary flexible shaft of a dental engine, with which it may be connected by interlocking or detachable fastenings, as usual.

A supporting frame or carrier, for a rotary tool-holder, projects outward from the outer end of the hand-piece attachment A. The carrier is shown as composed of two sections, C C′, united by screws, so as to be detachable one from the other, the main section C being formed with or rigidly secured to the support A. The removable section C′ is bent or formed with an outward turn near its outer end, as shown, and terminates in an arm, *c*, parallel with and opposite to the outer end of the straight main section C, thus forming a fork at the outer end of the carrier. The spindle B rotates in a bearing, near its outer end, in the bend of the carrier-section C′, and has keyed to its end a pinion, D, which rotates in the space between the ends of the carrier-sections. This pinion gears with a corresponding pinion, E, fixed on or formed with a pipe-box bearing or sleeve, E′, rotating in bearings in the forked end of the carrier; the shoulders near the ends of the sleeve prevent endwise movement. This sleeve constitutes a tool-holder or socket into which fits a tool-shank, F, which is formed, as shown, with a wedge-shaped end, G, a shoulder, and a transverse groove, *g*, such as shown in Letters Patent of the United States, No. 151,614, granted William R. Nutz, on the 2d day of June, 1874, and in Letters Patent of the United States granted me December 29, 1874, No. 158,170. The groove *g* in the tool-shank interlocks with a pin, H, inserted tangentially in the bore of the tool-holder, as fully described and shown in the above-mentioned Letters Patent.

To secure the tool-shank in place in the carrier, and to guard against its accidental withdrawal from the tool holder or socket, in such manner as to admit of the ready removal of the tool when desired, I employ a locking-clutch, consisting of a tapering or wedge shaped plug or plunger, I, and a feather or spline, J, extending beyond the end of the plug. The clutch is mounted so as to revolve freely in a spring-arm, K, secured to the carrier by a screw or otherwise, preferably in such manner as to admit of the removal of the arm. The clutch has an endwise movement in the end of the tool-holder E′, and its plug interlocks with the wedge-shaped end of the tool-shank, while the feather interlocks with the tool-holder in a longitudinal slot in the wall or shell of which the feather enters, so that the tool-holder, tool, and clutch revolve together when connected. By extending the feather beyond the wedge of the clutch it enters the slot in the socket before the wedge enters the end of the socket, and thus serves as a guide for the clutch, insuring the

entering of the wedge in the proper relation, relatively to the tool-holder and tool-shank, and, moreover, admitting of connecting and disconnecting the tool shank and holder without entirely withdrawing the feather from the socket, thus leaving it always in position to act as a guide to insure the proper connection of the parts. The flexing of the spring-arm K allows of the withdrawal and insertion of the clutch.

The slot in the tool-socket, for the reception of the feather J of the clutch, is arranged in line with or behind the pin H, so as to admit of the insertion of the tool-shank in the socket without obstruction from the feather.

As the shank of the tool is inserted in the socket its end comes in contact with the end of the wedge-shaped plug of the clutch, and moves the clutch a sufficient distance to allow the engagement of the groove of the shank with the pin H. The pressure of the spring K then forces up the clutch to prevent accidental withdrawal of the shank.

By detaching the sections of the carrier one from the other the tool-holder, gearing, and driving-spindle may be removed.

I have described the locking-pin H as tangential to the bore of the tool-holder, which construction I prefer; but obviously a radial pin or stud, projecting partially into the bore, might be used, with a corresponding alteration in the locking devices of the tool-shank and clutch.

The attachment hereinbefore described, with the exception of the combination of the spline or feather J, with the locking-wedge and tool-socket, is, to the best of my knowledge and belief, the invention of Eli T. Starr, of Philadelphia, Pennsylvania, and is not therefore claimed by me.

I claim as of my invention—

The combination in a right-angle attachment, substantially as hereinbefore set forth, of the tool-holder, the pin inserted in the bore thereof, the grooved tool-shank having a flattened end, and the sliding plug and feather J interlocking with the tool shank and holder, whereby accidental withdrawal of the tool is prevented.

In testimony whereof I have hereunto subscribed my name.

JOHN W. GILBERT.

Witnesses:
J. A. B. WILLIAMS,
A. P. ROOT.