

(No Model.)

E. T. STARR.

DENTAL ENGINE ANGLE ATTACHMENT.

No. 307,686.

Patented Nov. 4, 1884.

Fig. 1.

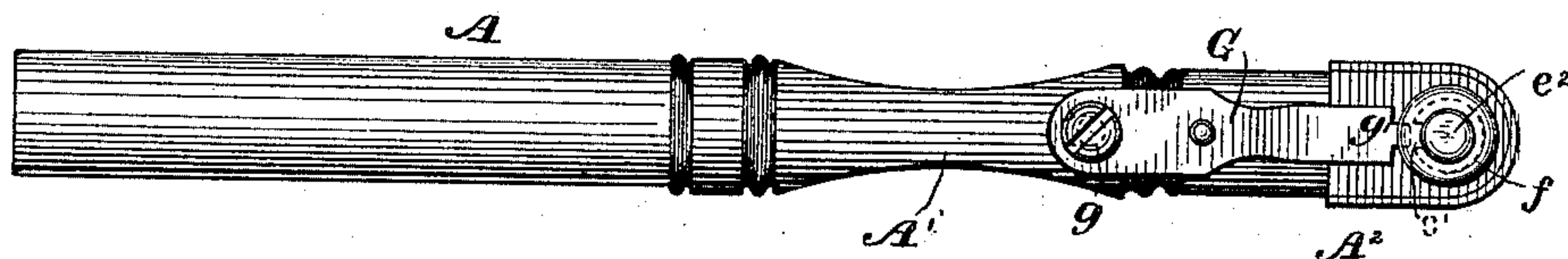


Fig. 2.

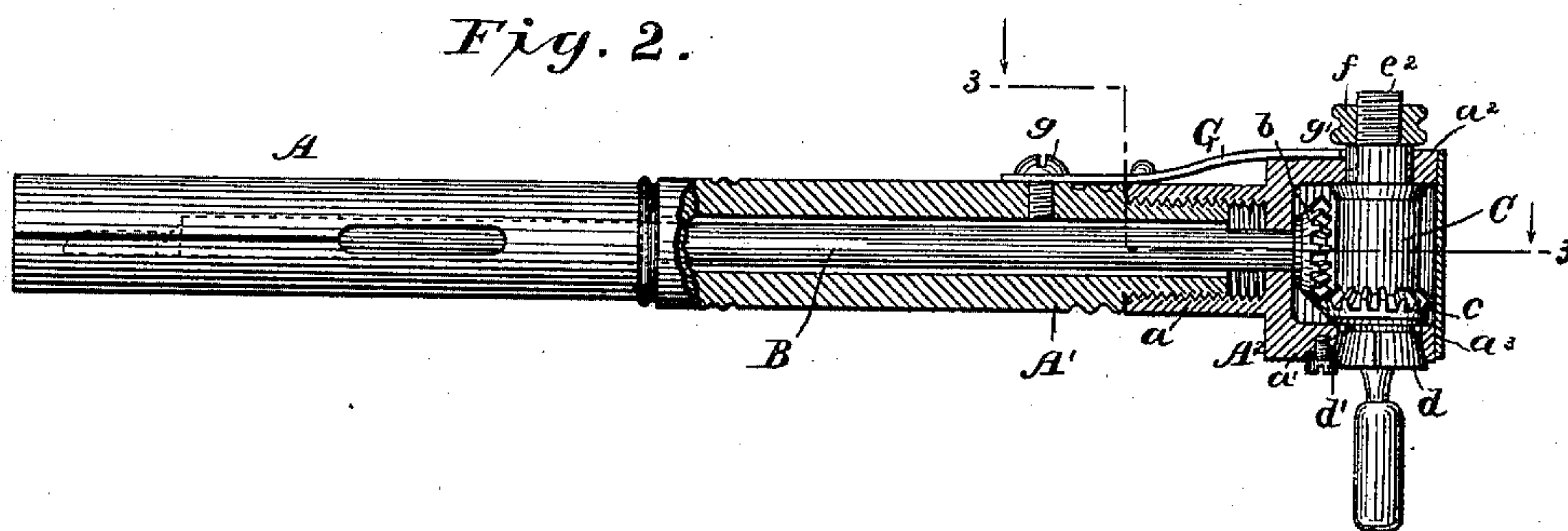


Fig. 3.

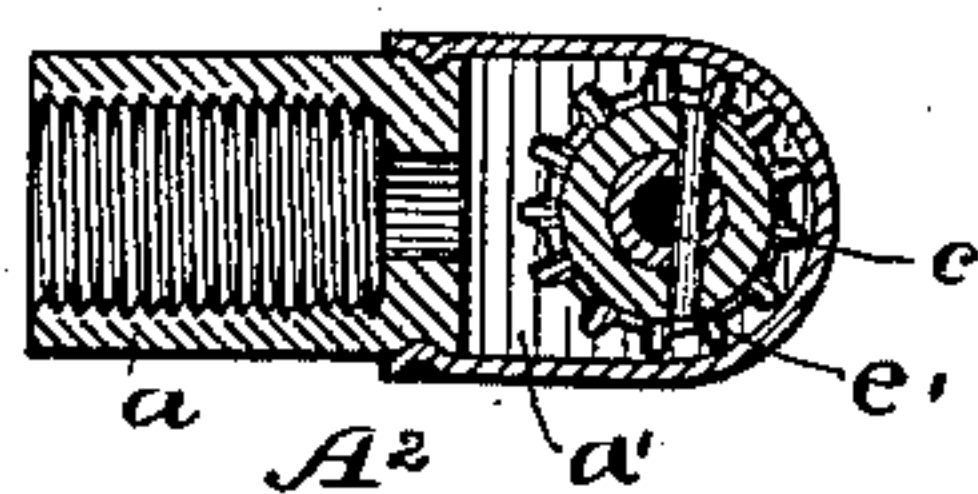


Fig. 4.

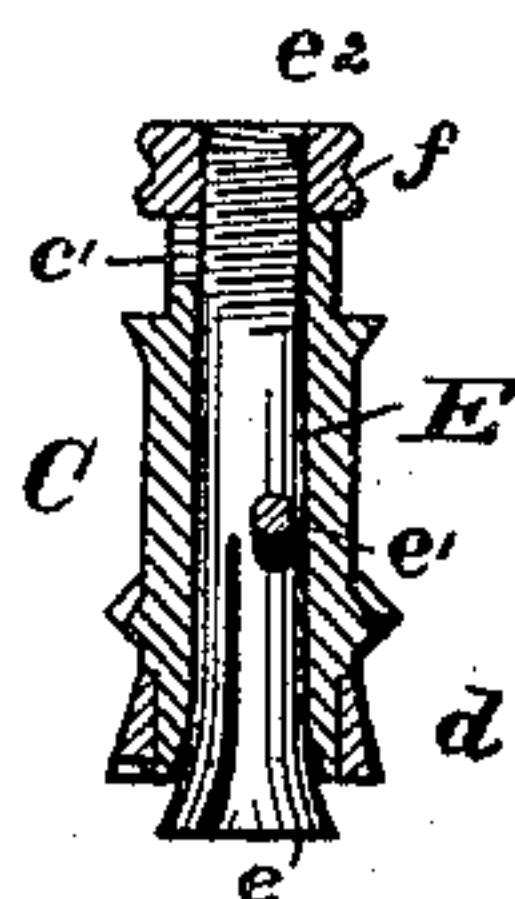
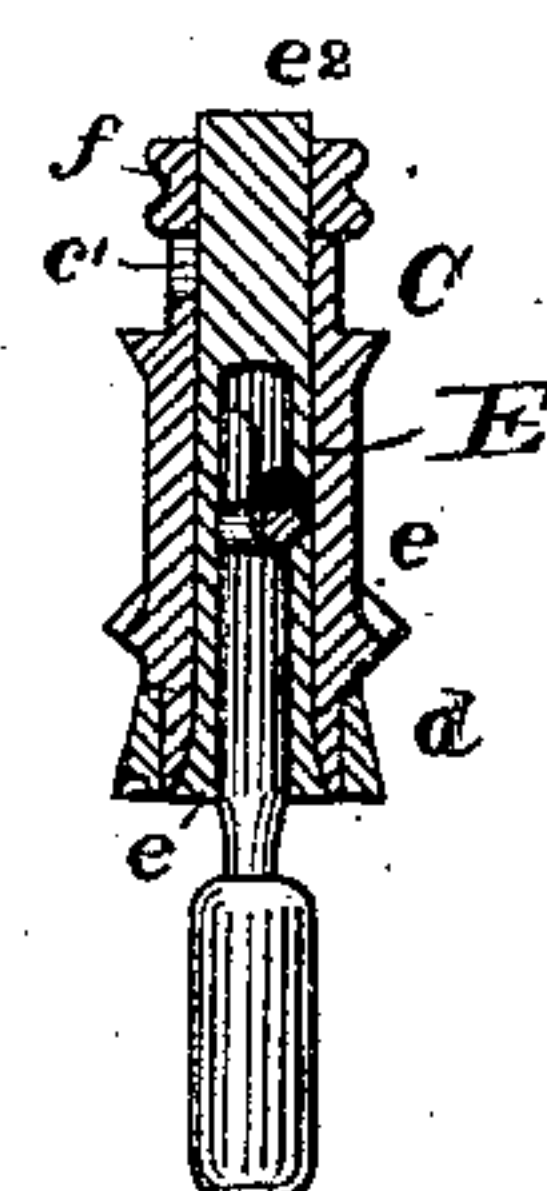


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

ELI T. STARR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE S. S. WHITE DENTAL MANUFACTURING COMPANY, OF SAME PLACE.

DENTAL-ENGINE ANGLE ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 307,686, dated November 4, 1884.

Application filed June 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, ELI T. STARR, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Angle Attachments for Dental Engines, of which the following is a specification.

My invention relates to angle attachments for dental engines—that is, to attachments to the hand-pieces of such engines—whereby an operating-tool may be driven at an angle to the longitudinal line of the hand-piece, so as to reach cavities and parts of the teeth difficult or impossible of access to a tool driven in the longitudinal line of the hand-piece, as by the chuck or tool-holder thereof.

The objects of my improvements are to improve the construction of such attachments and render them more efficient.

The subject-matter claimed is particularly pointed out at the close of the specification.

In the accompanying drawings I have shown all my improvements as embodied in one attachment in the best way now known to me; but I wish it distinctly understood that some of my improvements may be used without the others, and in attachments differing from that shown herein.

In said drawings, Figure 1 is a plan or top view of the attachment. Fig. 2 is a side elevation thereof, partly in section. Fig. 3 is a horizontal section through the attachment on the lines 3 3 of Fig. 2. Fig. 4 is a view of the tool-holder and tool locking and driving part of the attachment, the split chuck thereof being in elevation; and Fig. 5 is a vertical section through said parts.

The attachment is provided with a barrel or tube, A, preferably a split tube, as usual, adapted to be fitted over the front end of a dental-engine hand-piece in the common manner, so that the chuck or tool-holder of said hand-piece will receive the driving end of the driving-shaft B of the attachment and rotate said driving-shaft when the engine is in motion. Said driving-shaft B has preferably a long bearing in a tubular extension, A', of the split barrel or tube A, and a front bearing in the stock or head A² of the attachment. The front end of said driving-shaft B terminates in or has rigidly affixed thereto a beveled gear-

wheel, b, which meshes with and drives a corresponding bevel gear-wheel, c, rigidly connected with the tool-holder or spindle C of the attachment, whereby said tool-holder is given a rapid revolving motion when the driving-shaft B is being driven. Said stock or head A² is preferably detachably connected with the bearing or tubular extension A' by means of screw-threads, as clearly shown, and said stock or head preferably consists of a screw-threaded socketed portion, a, and a forked end, a', in which fork the tool-holder C has its bearings, and, as stated, is capable of being rapidly rotated. The upper bearing of said tool-holder C is preferably, though not necessarily, a plain bearing formed in the upper plate or side, a², of the stock or head of the attachment, while the lower bearing is preferably formed in an adjustable collar or block, d, fitted in the lower side or plate, a³, of said stock or head. Said collar or block d receives the lower end of the revolving tool-holder C to give it a bearing, and it is tapered on its outer circumference to fit a correspondingly-tapered or cone seat in said stock or head. As wear of the tool-holder C or of its bearings takes place, the collar d is adjusted to take up the wear or compensate for it, the adjustment being preferably effected by means of a set-screw, d'. The tool-holder C is of course provided with suitable shoulders within the fork of the head or stock A², to prevent endwise movement and to insure steady rotation. Said tool-holder C is tubular and is fitted with a tubular split chuck, E, the lower split end of which has a tapered enlargement, e, to correspond to a tapered mouth or seat in the end of the tool-holder. The split chuck E extends through the tubular tool-holder C, and is given endwise movement within said tool-holder in order to permit its split end, or the members thereof, to be compressed or expanded accordingly as the enlarged tapered end e is drawn in or released from its cone-seat in the tool-holder; but the chuck is locked from rotation independently of said tool-holder, preferably by means of a crosswise or tangential pin, e', passing through the tool-holder and through a longitudinal slot in the split chuck. The end e² of the split chuck E opposite its socketed split end e is screw-threaded and projects

through and beyond the upper end of the tool-holder, and is fitted with a screw-nut, *f*, whereby, by screwing up or loosening said nut, the chuck is compacted or expanded, as the case
5 may be, the endwise movement of the chuck in the tool-holder being permitted by means of a slot therein, through which the pin *e'* passes, as before described.

In order to hold the tool-holder and chuck
10 contained therein from rotation when the adjusting-nut *f* is being manipulated, I have provided a sliding plate, *G*, held to the attachment by means of a screw, *g*, passing through a longitudinal slot in said plate. The front
15 end of the plate *G* is provided with a tooth or locking end, *g'*, and the side of the tool-holder at its upper end is recessed or cut away, as at *c'*, to receive said tooth *g'* of the plate *G*, whereby, when the plate is moved forward to
20 engage the tool-holder, said holder will be held from rotation, and consequently the adjusting-nut may be readily manipulated.

By the above organization I have provided a superior angle attachment. The parts are
25 compact, and the tools may be readily inserted in the chuck and firmly locked therein to be driven, while capable of being readily released to permit of the removal of the tool or the rapid interchange of the operating-tools,
30 many of which are required by the dentist in conducting dental operations. When the nut *f* is loosened, the split end of the chuck is permitted to expand. The driving end of the tool is thus capable of being readily inserted
35 in said chuck, while a turn or two of the nut draws the cone or tapered end of the chuck into its seat in the tool-holder and compresses the split members of the chuck upon the tool-shank, whereby the tool is rigidly clamped
40 and may be firmly driven in operation. From what has been said, also, wear of the parts may be compensated for or taken up, so as to insure the steady rotation of the tools.

I prefer to employ operating-tools having a
45 flattened and grooved driving end, as shown in Fig. 5, for instance, which is a common form of tool; and in this case the cross-pin *e'* engages the cross-groove of the tool-shank and

forms a rigid driving-connection and an additional security against the withdrawal of the
50 tool in operation.

In Fig. 5 the tool-holder and chuck are shown in section, with the tool inserted and clamped therein; but where a tool is employed
55 having a flattened and grooved driving end the tool will be first inserted in the chuck with the flattened end passing beyond the cross-pin *e'*, and will then be turned to engage said pin with the cross-groove in the shank.

Further elaboration of my improvements
60 seems to be unnecessary.

I do not claim in this application any of the features of invention common to this case and my prior application filed June 16, 1884, No.
135,006.
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The subject-matter of this application is confined to that specifically set forth in the following claims.

I claim herein—

1. The combination, with the tubular tool-
70 holder and external bevel-gear, by which said tool-holder is driven, of a tubular split chuck contained within said tool-holder, and adapted to receive, clamp, and hold an operating-tool, substantially as described.
75

2. The combination, with the stock or head and tubular tool-holder having a gear-wheel connected therewith to drive it, of a split
80 chuck contained within said tool-holder and connected therewith by a slot-and-pin connection, substantially as described.

3. The combination of a tubular tool-holder, a split chuck contained therein, and a slot-and-pin connection between said tool-holder and chuck, connecting them together, while
85 permitting endwise movement of the chuck in said holder, and said pin also constituting a driving-connection to engage the shank of the operating-tool, substantially as described.

In testimony whereof I have hereunto sub-
90 scribed my name.

ELI T. STARR.

Witnesses:

W. R. POTTER,
ALBERT P. ROOT.