

No. 608,150.

Patented July 26, 1898.

A. BUSH.
DENTAL PLUGGER.

(Application filed Nov. 11, 1896.)

(No Model.)

Fig. 1,

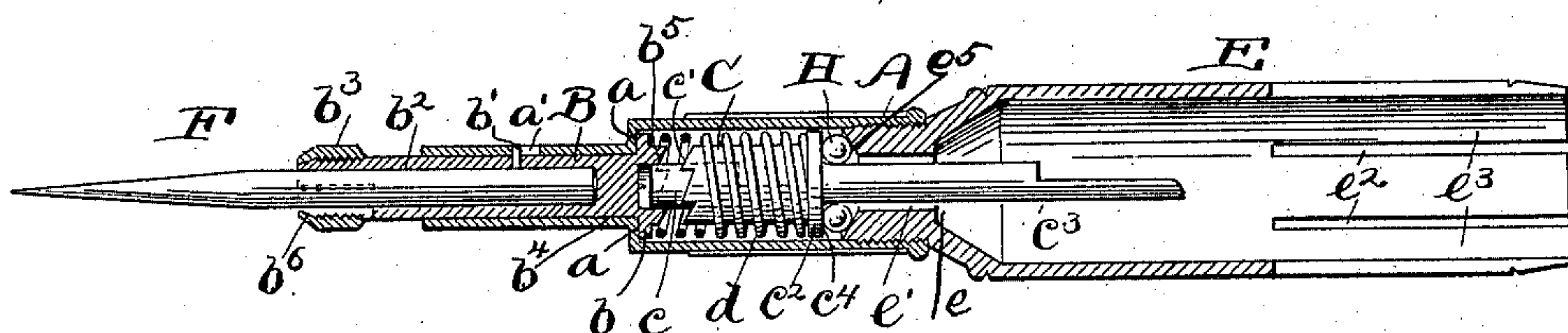


Fig. 5,

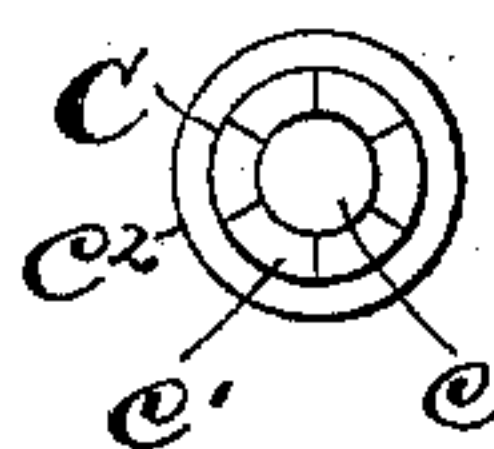


Fig. 4,

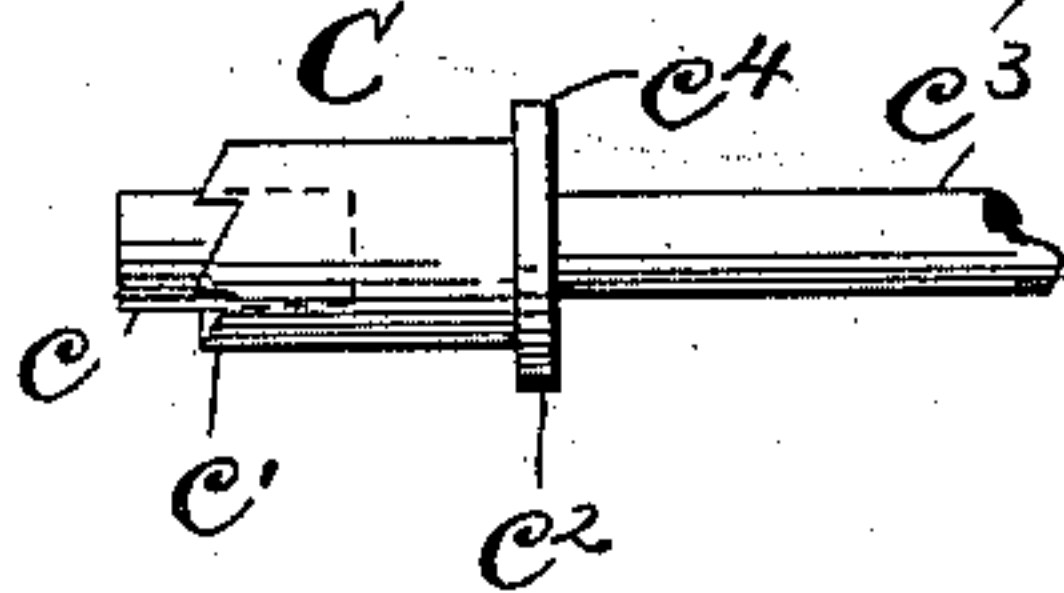


Fig. 2,

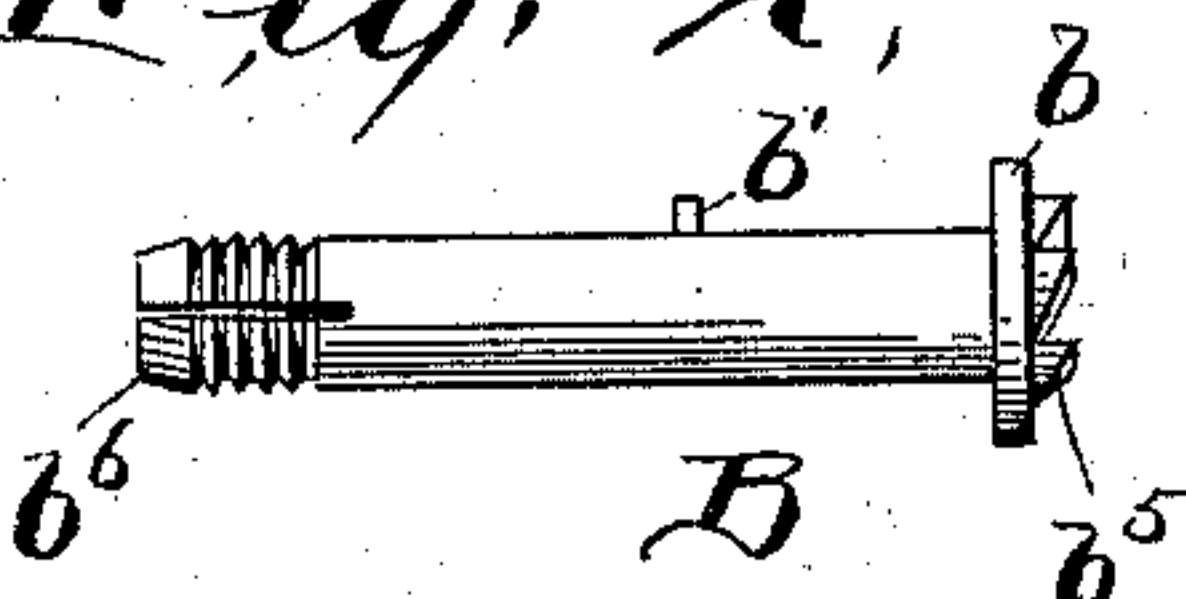
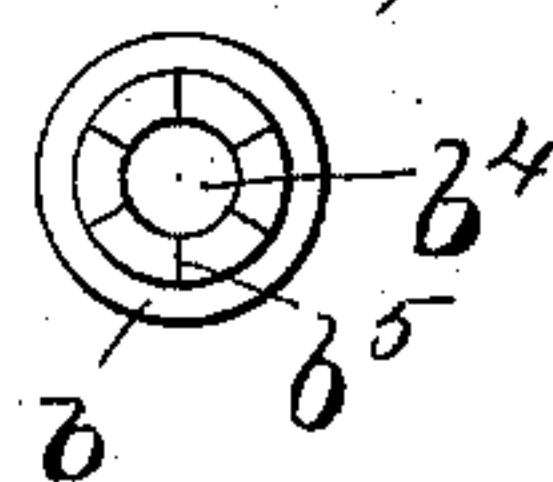


Fig. 3,



Witnesses.

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UNITED STATES PATENT OFFICE.

ALDEN BUSH, OF ELYRIA, OHIO.

DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 608,150, dated July 26, 1898.

Application filed November 11, 1896. Serial No. 611,754. (No model.)

To all whom it may concern:

Be it known that I, ALDEN BUSH, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Dental Pluggers; and I do hereby declare the following to be a full, clear and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved dental plugger adapted to be connected to and operated by the flexible shaft of the dental engine to the end that a quick succession of blows shall be delivered against the filling in the dental cavity by the plugging-tool connected with the instrument.

The object of the invention is to provide a simple and effective device of this character which may be easily manipulated by the operator to properly regulate the force of the blows, which will not be clumsy to handle, and which may be quickly connected with the engine-shaft without removing the handpiece from said shaft.

The invention consists in the construction and combination of parts hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a longitudinal sectional view of my improved plugging instrument. Fig. 2 is a detailed view of the tool-holding plunger. Fig. 3 is an end view of said plunger. Fig. 4 is a detached view of the revoluble hammer. Fig. 5 is an end view of said hammer.

Referring to the parts by letters, A represents a tubular casing which contains the movable parts and serves as the handpiece of the instrument.

B represents a tool-holding plunger which projects from the lower end of the casing A. On the end of this plunger there is an annular flange *b*, which lies above an annular shoulder *a* within the casing. This plunger is prevented from revolving by a pin *b'*, which projects from its side into a longitudinal slot *a'* in the casing. A longitudinal hole *b²* is formed in the outer end of the plunger to receive the plugging-tool F. The walls sur-

rounding this hole are slotted and externally threaded, and its extreme end *b⁶* is beveled. A nut *b³* screws onto this end of the plunger. The outer end of the hole in the nut is contracted, whereby the screwing of said nut onto the plunger contracts the slotted walls of the plunger and thereby clasps the tool firmly therein. C represents a revoluble hammer which is mounted in said casing. On its lower end is an axial pin or end *c* of comparatively small diameter, which is adapted to enter a corresponding socket *b⁴* in the adjacent end of the plunger. The blow of the hammer is delivered by the end of this pin striking the bottom of said socket. On the lower end of this hammer is an annular row of cam-teeth *c'*, which are adapted to engage with a similar row of cam-teeth *b⁵* on the adjacent end of the plunger. An annular flange *c²* is formed upon the hammer and a light coil-spring *d* surrounds the hammer and exerts endwise pressure against said flange *c²* and the flange *b* on the plunger, whereby said hammer and plunger are normally held as far apart as the construction permits. On the upper end of the hammer is a stem *c³*, which projects out of the casing A and is adapted to be connected with the dental-engine shaft.

The top of the casing must be closed by a cap or plug of some sort, so as to form a thrust-bearing *e⁵* for the hammer, and in the construction shown this plug *e* is the lower end of the tubular casing E, which is adapted to contain the ordinary handpiece of the dental engine. This plug, which has an axial hole *e'*, through which the stem *c³* passes, is screwed into the top of the casing A. Between its inner end, the thrust-bearing, and the annular shoulder *c⁴* on the hammer and around the stem *c³* thereof a ball-raceway is formed which contains the balls H. This ball-bearing diminishes the friction of the revolving hammer at the point where in the operation of the device the friction is the greatest.

The case E being rigidly connected with the casing A becomes a part of the handpiece of the instrument. It is of such size that it may entirely inclose the ordinary handpiece

of a dental engine. Its outer edge is slotted, as shown at e^2 , and the tongues e^3 , formed by said slotting, exert a greater or less spring-pressure upon the engine-handpiece, whereby
5 said handpiece is prevented from revolving within said case E.

The necessary connections having been made between the dental-engine shaft and the stem of the hammer, the instrument is
10 operated as follows: The operator places the end of the tool F against the filling to be compacted and presses thereon with greater or less force, but with sufficient force to cause the relative movement of the casing A and
15 plunger B against the force of the spring D, whereby the cam-teeth on the plunger and hammer, respectively, are caused to contact with each other. The revolution of the hammer and the engagement of the cam-surfaces
20 of the teeth c' b^5 cause the hammer C, and with it the casing A, to be moved away from the filling, this movement taking place in opposition to the pressure from the operator's hand. When the straight edges of said cam-teeth permit such action, the pressure from
25 the hand of the operator moves the casing A, and with it the hammer, toward the filling; thereby causing the pin c to strike more or less violently the end of the plunger B. The
30 force of this blow is determined by the pressure from the operator's hand. It will be noticed that the blow is not due to the action of the spring. It is due to the force exerted by the operator. The hammer is moved by
35 the cams against said force, and then when this action of the cams suddenly ceases the pressure of the operator's hand forces the hammer against the plunger. This action is very rapid, and by means of the described
40 mechanism the operator delivers blow after blow upon the end of the plunger for an indefinite period and with a rapidity many times greater than he could deliver without the assistance of substantially the mechanism described. The rapidity with which these
45 blows are delivered is increased by making the number of cam-teeth c' one less or greater than the number of corresponding teeth b^5 .

I wish to call particular attention to the
50 fact that until the plunger is moved inward by the described pressure from the operator the revolution of the hammer produces absolutely no effect upon the plunger, the spring D holding the plunger and hammer so far
55 apart that the cam-teeth on these parts do not engage with each other.

Having described my invention, I claim—

1. In a dental plugger, in combination, a tubular casing having near one end an offset
60 forming an internal annular shoulder a , a plunger working through said end having on its inner end, first, an annular shoulder b and, second, a row of cam-teeth, a plug secured in and closing the other end of said casing and
65 forming an internal annular bearing e^5 , a ro-

tatable hammer in said casing having, first, a reduced end which extends out through said plug and, second, an annular row of cam-teeth on its inner end and, third, an annular
70 external flange c^2 above its inner end, and a coil-spring surrounding the inner end of said hammer and thrusting against said flange and the inner end of the plunger, said hammer and plunger having on their proximate ends,
75 respectively, a striking-pin and a surface with which it engages, substantially as and for the purpose specified.

2. In a dental plugger, the combination of the casing having an offset near one end forming an internal annular shoulder a , a
80 plug secured in and closing the other end of said casing and forming an annular bearing e^5 , a longitudinally-movable tool-holding plunger which projects through the first-named end of the casing and has an annular
85 flange b above said shoulder, and an annular row of cam-teeth on its inner end, with a rotatable hammer adapted to be driven by a projection extending through the plug, said
90 hammer having inside the casing an annular shoulder c^4 , and having teeth on its inner end, and a coiled spring surrounding the hammer and bearing against the flange b and the shoulder c^4 and thereby tending to separate
95 the plunger and hammer, said plug receiving the thrust caused by an inward pressure on the tool, substantially as described.

3. In a dental plugger, the combination of a casing having an offset forming an internal
100 shoulder, and a plug which closes the other end; a longitudinally-movable tool-holding plunger which projects through one end of the casing and has a flange which lies above said shoulder, a rotatable hammer which is
105 mounted in said casing and has a reduced stem which projects through said plug, a set of balls confined within the casing around said stem and between the thrust-bearing plug and end of the hammer, cam-surfaces on the
110 adjacent ends of said hammer and plunger, and a spring exerting its force to move the hammer upward against said balls, and the plunger downward, substantially as and for the purpose specified.

4. In a dental plugger, the combination of
115 a casing A, a tool-holding plunger B longitudinally movable through one end of the casing, a case E which screws into the opposite end of said casing, which case is adapted to receive the handpiece of a dental engine,
120 means for holding said handpiece therein, a rotatable hammer C mounted in casing A, having a reduced stem which projects into case E, a ball-raceway in casing A between the hammer and end of case E, balls therein,
125 cams on the adjacent faces of the hammer and plunger and a spring d exerting its force to separate the adjacent faces of said hammer and plunger, substantially as and for the purpose specified.

5. In a dental plugger, the combination of
a casing A, a tool-holding plunger B having
on its inner end an annular row of cam-teeth,
a rotatable hammer C mounted in the casing
5 and having on its inner end a pin c and an
annular row of cam-teeth, and a spring d,
which exerts its force to move the hammer
and plunger in opposite directions, and there-

by separate the two annular rows of cam-teeth,
substantially as and for the purpose specified. 10
In testimony whereof I affix my signature
in presence of two witnesses.

ALDEN BUSH.

Witnesses:

E. L. THURSTON,
E. B. GILCHRIST.