

No. 800,981.

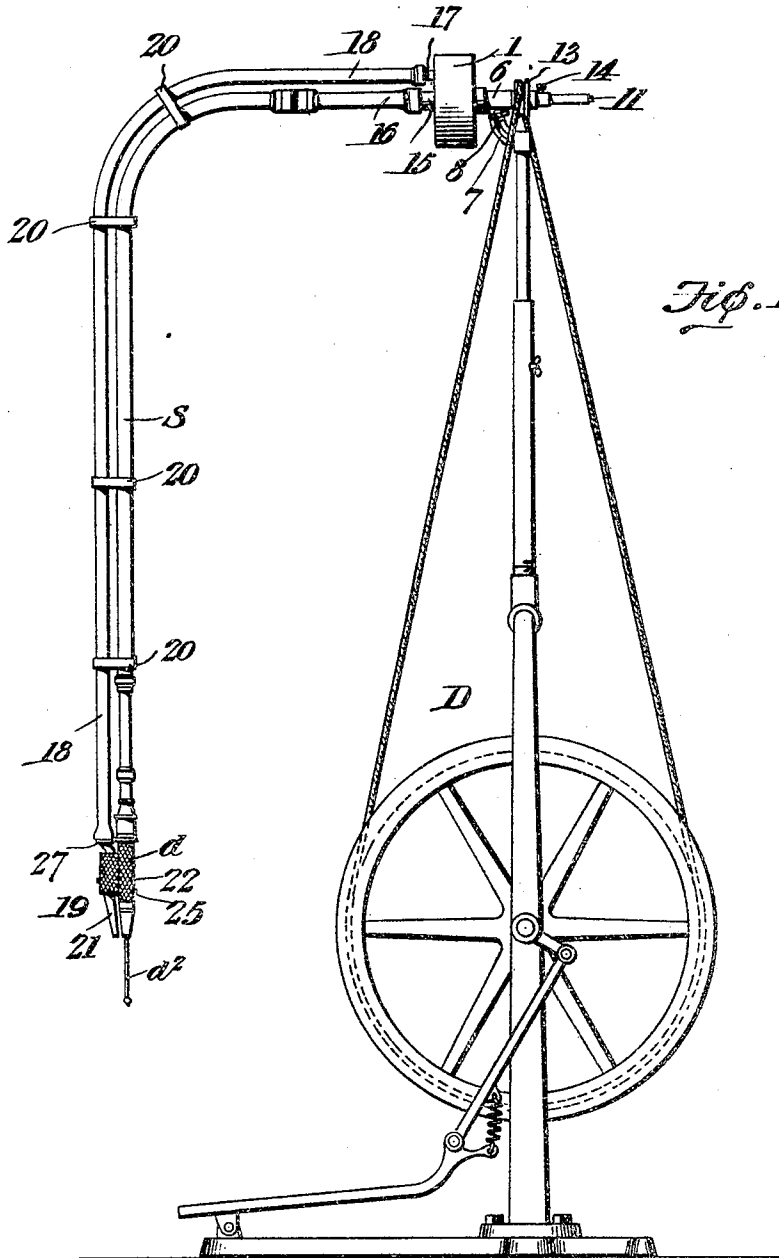
PATENTED OCT. 3, 1905.

J. W. BUCHANAN.

AIR BLAST ATTACHMENT FOR DENTAL ENGINES.

APPLICATION FILED OCT. 29, 1904.

2 SHEETS—SHEET 1.



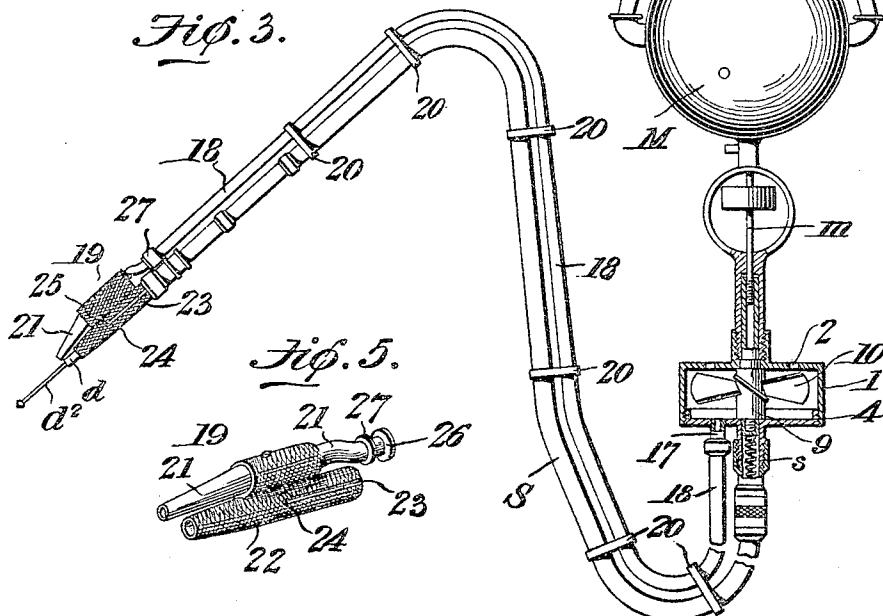
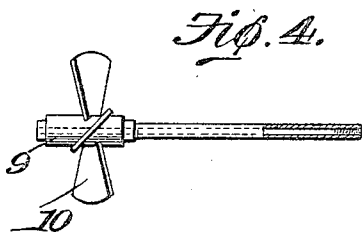
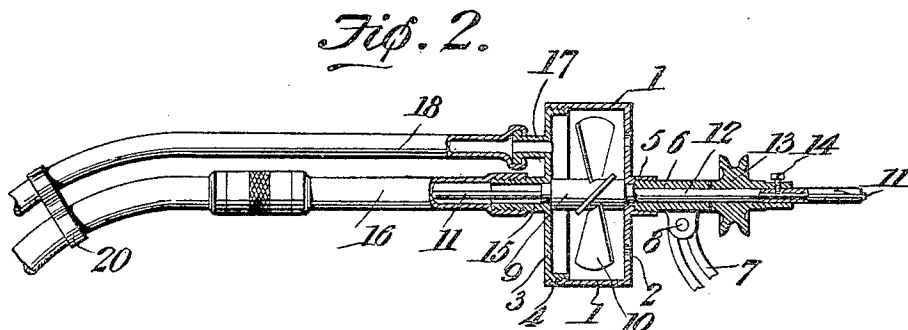
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

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## AIR-BLAST ATTACHMENT FOR DENTAL ENGINES.

No. 800,981.

Specification of Letters Patent.

Patented Oct. 3, 1905.

Application filed October 29, 1904. Serial No. 230,553.

*To all whom it may concern:*

Be it known that I, JAMES W. BUCHANAN, a citizen of the United States, residing at Savannah, in the county of Chatham and State of Georgia, have invented a new and useful Air-Blast Attachment for Dental Engines, of which the following is a specification.

This invention relates to air-blast attachments for dental engines.

The object of the invention is to improve the construction of such attachments and to render them readily applicable to drill structures already in use without requiring any change in the structural arrangements of the latter.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of an air-blast attachment for dental engines, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, there are illustrated two forms of embodiment of the invention each capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof.

In the drawings, Figure 1 is a view in elevation of an ordinary dental engine exhibiting the device of the present invention applied thereto. Fig. 2 is a sectional detail view, on an enlarged scale, through the fan-casing shown in Fig. 1. Fig. 3 is a detail view, partly in section, exhibiting the fan-casing combined with an electric motor. Fig. 4 is a detached detail view of the form of fan used in connection with the embodiment of the invention exhibited in Fig. 3. Fig. 5 is a perspective detail view of the nozzle, showing the manner in which it is connected with the drill-stock.

Referring to the drawings, D designates an ordinary dental engine,  $d$  the drill-stock, and S the sheave incasing the flexible shaft  $s$ . (Shown in Fig. 3.) These parts may be of the usual or any preferred construction, and therefore need no detailed description.

The gist of the present invention resides in the novel form of fan attachment for supplying air at or near the point of a drill, thus to remove the chips and dust from the tooth being drilled as rapidly as made. This at-

tachment, as shown in the form of embodiment of the invention exhibited in Figs. 1 and 2, comprises a shell or casing 1, having its rear side provided with air-inlet openings 2 and its front 3 connected with the shell by a threaded connection at 4. This shell is provided at its rear with a tubular internally-threaded extension 5, that is screwed upon an ordinary shaft-bearing 6, which, as usual, is adjustable to various angles, a slotted arm 7 and thumb-nut 8 being provided for this purpose. Mounted within the shell is a fan comprising a hub 9 and a plurality of blades 10, the hub having its terminal reduced to fit in bearings formed in the front and rear walls, as clearly shown in Fig. 2. To the forward end of the hub is secured the rigid extension 11 of the flexible shaft, the rear end of the hub being provided with an extension 12, which fits in the bearing 6 and has secured to it the drive-sheave 13, the latter being secured to the fan extension 12 and the shaft 11 by a thumb bolt or screw 14, that passes through the hub of the sheave through the extension 12 and bites into the shaft 11. The front end or side of the shell is provided with a threaded boss 15, upon which is secured the end of the shaft-sheave 16, as clearly shown in Fig. 2. The front of the casing, which, as before stated, is removable, is provided with a second tubular boss 17, to which is connected one end of a flexible pipe 18, the other end of which carries the blower-nozzle 19. (Clearly shown in Fig. 5.) The pipe 18 is held combined with the sheave S through the medium of clamps or bands 20, of which there are shown, in this instance, four, although this number may be increased if found necessary or desirable.

The blower-nozzle 19, to which reference has been made, comprises a tube 21, that is preferably tapered at one end and is disposed contiguous to the drill  $d$ , and a sheath or collar 22, which is adapted to fit upon the outer end of the drill-stock and to be held combined therewith through the medium of an angle-slot 23, the locking portion 24 of the slot being designed to engage with a pin or stud 25, carried by the drill-stock. The rear end of the tube is provided with a flange 26, by which it is held combined with the tube 18 and with a stop-flange 27 in the nature of a disk, which is provided for the purpose of preventing the tube being pushed too far up upon the tube 21.

It will be seen from the description thus far given that when the sheave 13 is driven in the usual manner the fan will be rotated, and

through it the shaft which actuates the drill  
 $d^2$ . As the fan rotates air is drawn in through  
the inlets 2 and forced out through the tube  
18 and out through the nozzle and into the  
5 tooth in a plane approximately parallel with  
the drill, so that the dust and chips resulting  
from the drilling will be removed as rapidly  
as made. It will also be noted that the appli-  
cation of this invention to an ordinary dental  
10 drill will require no change in its structural  
arrangement, all the parts utilized in connect-  
ing the attachment with the drill being pres-  
ent in ordinary forms of drills in common use.

In the form of embodiment of the invention  
15 shown in Figs. 3 and 4 the only difference  
is that the fan-shank is screwed directly to  
the spindle  $m$  of a motor  $M$ , which may be  
any one of the overhead or suspended motors  
in common use, and therefore needs no detail  
20 description. When the spindle  $m$  is driven,  
motion is imparted to the fan-shank and thence  
to the flexible shaft  $s$  and from the latter to  
the drill, as usual.

In both forms of the invention when it is  
25 not desired to employ the blast attachment  
the nozzle will be removed from the drill-stock  
and the pipe 18 from the tubular boss 17; but,  
if preferred, the attachment may remain at  
all times combined with the drill mechanism.

30 It will be seen from the foregoing descrip-  
tion that although the improvements herein  
disclosed are simple in character they will  
in a ready and thoroughly-practical manner  
secure the objects designed and that the drill-  
35 ing out of teeth will be facilitated and the cut  
or drilled matter will be removed as formed.

Having thus described the invention, what  
is claimed is—

1. In a dental engine, a drill-operating shaft,  
a fan driven thereby, a casing housing the fan, 40  
and a discharge-nozzle communicating with  
the casing.

2. In a dental engine, the combination with  
a drill-operating shaft, of a fan carried there-  
by, a casing housing the fan, and a discharge- 45  
nozzle in communication with the casing.

3. In a dental engine, the combination with  
the shaft-bearing, of a casing secured there-  
to, a fan arranged in the casing and having a  
hollow shank projecting through the bearing, 50  
a sheave mounted upon the shank, a drill-op-  
erating shaft projecting through the shank,  
and means for connecting the sheave, shank  
and operating-shaft.

4. In a dental engine, the combination with 55  
the shaft-bearing, of a casing rigid therewith,  
a fan arranged within the casing and having  
a shank projecting through the bearing, a  
sheave mounted upon the shank, a drill-oper-  
ating shaft projecting through the shank, 60  
means for clamping the sheave, the shank and  
shaft together, a blast-nozzle combined with  
the drill-stock, and a connection between the  
casing and the nozzle.

In testimony that I claim the foregoing as 65  
my own I have hereto affixed my signature in  
the presence of two witnesses.

JAMES W. BUCHANAN.

Witnesses:

FRED A. CLER,  
THOMAS F. KEARNS.