(Model.)

A. WEBER.

DENTAL HAND PIECE.

No. 261,794. Patented July 25, 1882.

Fig: 1.

Fig: 2.

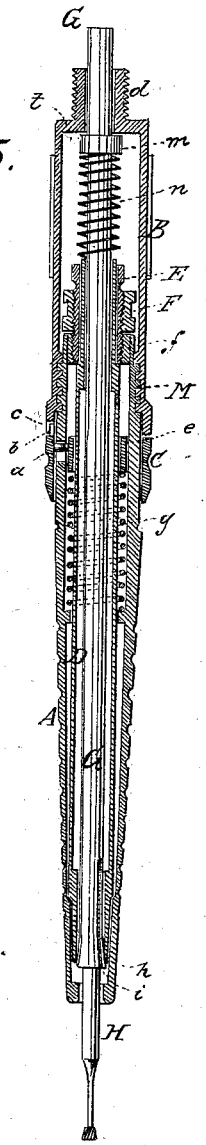


Fig: 3

Fig: 4.

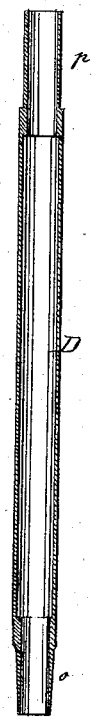


Fig: 5.

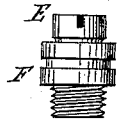
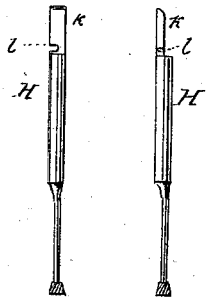


Fig: 6.



WITNESSES:

S. C. Parker
L. Rieger

INVENTOR:

August Weber

BY Thos a Macauley

ATTORNEY

UNITED STATES PATENT OFFICE.

AUGUST WEBER, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO GEORGE E. HODGE, OF SAME PLACE.

DENTAL HAND-PIECE.

SPECIFICATION forming part of Letters Patent No. 261,794, dated July 25, 1882.

Application filed October 7, 1879. Renewed January 26, 1882. (Model.)

To all whom it may concern:

Be it known that I, AUGUST WEBER, of the city, county, and State of New York, have invented certain new and useful Improvements in Dental Hand-Pieces, of which the following, with the accompanying drawings, is a specification.

Similar letters refer to like parts.

My invention relates to dental hand-pieces or tool-holders in which tools of various kinds are frequently changed; and it consists of the parts hereinafter more fully described, my object being to provide a simple, accurate, and practical instrument which shall be free from defects found in others of its kind.

In the drawings, Figure 1 is a side elevation. Fig. 2 is a longitudinal central section through the line *x x*. Fig. 3 is a side elevation, partly in section, of the chuck or tool-holder. Fig. 4 is a longitudinal section of the hollow spindle. Fig. 5 is a detail elevation of the detachable bearing; Fig. 6, views at right angles to each other of drills, showing the flat and notched parts.

A is an outer casing of cylindrical form, with a slight taper, which contains the devices constituting the tool-holder, having an inner nut and an outer screw at its rear end, and provided with a chamber or recess containing a spring, *g*, and ring *e*. The chamber or recess is formed by inserting and securing in any desirable way a threaded bush in the rear end of the casing A after the spring *g* and ring *e* are placed within the chamber.

B is a hollow cap or end piece, provided with an internal screw of large pitch to fit the external screw on the outer casing, A. It has a notch, *c*, cut into its threaded end, into which a projection, *b*, from the sleeve C fits to prevent its rotation and stop its longitudinal advance beyond a given distance, so as to leave a space between its internal shoulder, *t*, and a collar, *m*, on the rear end of the tool-holder G. The cap B is also provided with a screw, *d*, on its rear end, to which is attached the casing of a flexible rotary shaft of a dental engine, which is attached to the solid spindle G at its rear end, S, giving it rotary motion.

C is a sleeve mounted on the rear end of the case A, having a projection, *b*, and connected to the ring *e* within the chamber by a screw, *a*, which passes through a slot cut in the casing A of sufficient length to determine its longitudinal traverse on the casing A, and to prevent its rotation, that it may lock the cap B and regulate its traverse in relation to the collar *m* of the spindle G, as a space must be left between the shoulder *t* of the cap B and the collar *m* of the spindle G sufficient to compensate for any variation in the thickness of the shanks of the various tools held in the chuck, and also to permit a free and unimpeded movement of the spindle. A shank of slightly less diameter would allow the collar *m* to be carried farther back in the cap and come nearer the shoulder *t* of the cap than one of slightly greater diameter.

D is a hollow spindle, provided at its lower end with a taper or conical bearing, *o*, fitting into a corresponding bearing in the lower end of the casing A, the other end, *p*, having a straight bearing and of less diameter than the body of the spindle, so as to leave a shoulder to abut against the detachable bearing, which is screwed into the rear end of the casing A at *f*. E is this detachable bearing, provided with a screw having a slotted head and fitted into the rear end of the chamber A. In this detachable bearing the hollow spindle revolves.

F is a lock-nut on the screw E, for the purpose of fixing the position of the screw E in relation to the shoulder of the hollow spindle D to prevent end-play, and to compensate for any wear by continued use.

G is a spindle provided at one end with a collar, *m*, which receives the force of a spiral spring, *n*, fitting loosely on it, the other end of the spring resting on the rear end of the hollow spindle D, which projects beyond the bearing E a sufficient distance for that purpose. The lower end of the spindle G is bored out a given depth and diameter to receive the tool. It is also split to form flexible jaws *v*, capable of receiving tools of varying diameters, and at its extreme lower end it is externally conical, as shown at *h*. One of the flexible jaws has a pin, *j*, projecting inward for the purpose of locking the tool to prevent it from turning in

the socket or jaws, and to prevent the tool being drawn out against the force of the spring on the flexible jaws. The pin acts also as a stop to prevent the tool going beyond a given distance in the chuck.

H are burr drills or tools, showing the notch *l* cut in the part *k*, and which fits the pin *j* of the socket or chuck.

The hollow spindle D is placed in the outer casing, A, the conical bearing *o* fitting into a corresponding bearing in the front end of the casing A. The detachable bearing E is screwed into the rear end of the case A, the end P of the hollow spindle D resting in it. The spindle G is passed through the hollow spindle D, the split end entering at *p*. The cap-piece B is screwed on the main case A until the projecting piece *b* of the sleeve C snaps into the notch *c* of the cap B and locks it. The several parts of the hand-piece being put together, as described, and shown in Fig. 2, the operation is as follows:

When it is desired to place a tool in the holder, with the left hand pull the sleeve C to the left and turn the cap B with the right hand and from the operator. This causes the cap B to travel forward on the screw M of the casing A, and brings the shoulder of the cap B against the collar *m* of the holder G, pressing the split jaws holding the tool from contact with the lower end of the hollow spindle D. The flexible jaws will then expand, and pressure on the tool ceases. It may then be turned out of contact with the pin *j* and withdrawn.

When it is desired to insert a tool, the sleeve C and cap B being in the position left when the tool was withdrawn, all that is necessary to be done is to insert the tool in the now open flexible jaws of the holder, turn its notch *l* on the pin *j*, and turn the cap-piece B toward the operator. This causes the cap B to travel backward on the screw M a sufficient distance to allow the spring *n* to force the spindle G back and bring the conical flexible jaws into the lower end of the spindle D and grasp the tool with the force of the spring *n*, acting on the cones *h*, thus securely holding the tool for use.

It will be readily seen that the parts A, C, D, and G, when assembled as described, form a complete hand-piece without the cap B, as the tool may be taken out by pressure on the rear end of the spindle G, thus relieving the flexible jaws of pressure, when a tool can be withdrawn or inserted, the cap-piece B being merely a cover for the rear end of the other parts and a device to force forward the spindle-chuck G, that the pressure on the jaws may be released.

I am aware that a hollow spindle containing a tool-holder having flexible jaws, with a spring to actuate the flexible tool-holder, have been used heretofore; and I do not therefore claim broadly such instrumentalities.

What I claim is—

1. In a dental hand-piece, the combination of the spindle G, having a shoulder, *m*, cap B, having a shoulder, *t*, and notch *c*, with the sleeve C and spring *g*, substantially as and for the purpose described.

2. In a dental hand-piece, the combination of the casing A, having an internal screw-thread, *f*, and an external screw-thread, M, the cap B, having the shoulder *t* and notch *c*, and screw-threaded to engage the casing-threads M, the ring C, having a projection, *b*, to engage the notch *c*, the spring *g*, connected with said ring, the spindle G, having one end slit and provided with means to engage a dental tool, the shoulder *m* on said spindle, the hollow shouldered spindle D, adapted to compress the slitted end of the spindle G, the adjusting and locking devices E F, and the spring *n*, all constructed and arranged to operate substantially as described.

AUGUST WEBER.

Witnesses:
D. C. PARKER,
C. RIEGER.