W. G. A. BONWILL.
Dental-Pluggers.

No. 212,434. Patented Feb. 18, 1879.

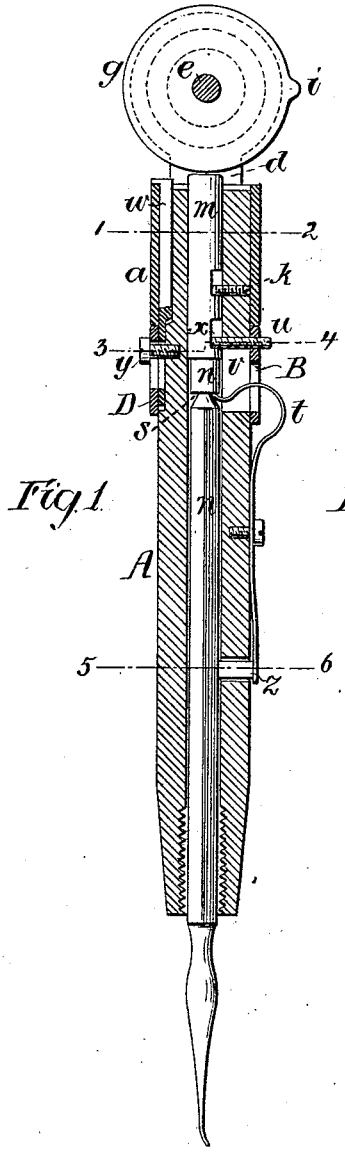


Fig. 1.

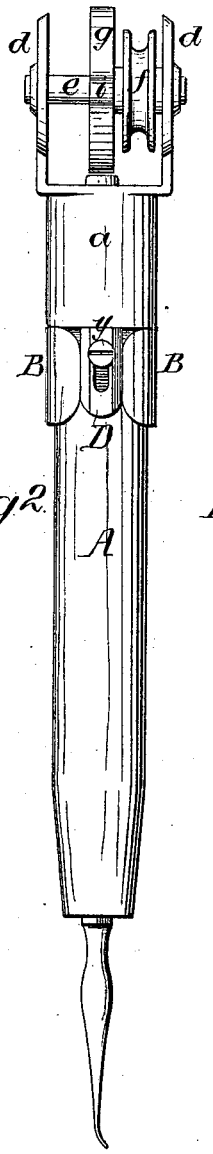


Fig. 2.

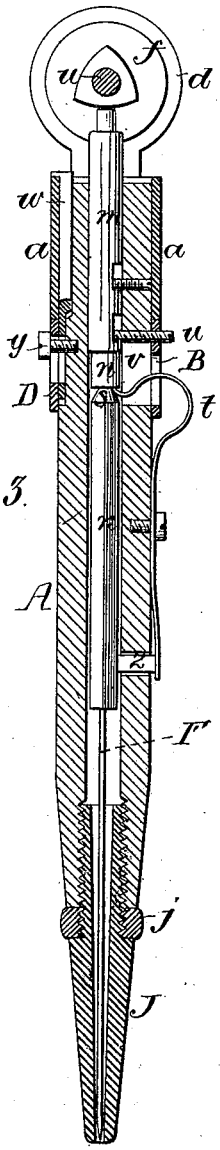


Fig. 3.

Fig. 4

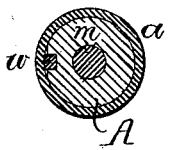


Fig. 5

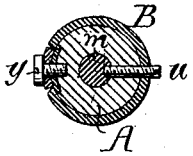
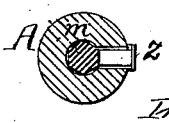


Fig. 6



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UNITED STATES PATENT OFFICE.

WILLIAM G. A. BONWILL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN DENTAL PLUGGERS.

Specification forming part of Letters Patent No. **212,434**, dated February 18, 1879; application filed November 21, 1878.

To all whom it may concern:

Be it known that I, W. G. A. BONWILL, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Dental Pluggers and analogous instruments, of which the following is a specification:

My invention relates to certain improvements in dental mallets and analogous instruments, such, for instance, as puncturing-pens, the objects of my invention being to insure a direct and positive downward blow upon the tool, to permit the hand-piece to be readily turned on its axis without twisting the belt, to permit the ready movement of the tool-stem, so as to free it from the influence of the operating-cam, to provide for the ready insertion and withdrawal of the tool, and to prevent the turning of the tool independently of the hand-piece. These objects I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of my improved instrument arranged for use as a dental mallet; Fig. 2, a side view of the same; Fig. 3, a view of the instrument arranged for use as a puncturing-pen; Fig. 4, a sectional plan on the line 1 2, Fig. 1; Fig. 5, a sectional plan on the line 3 4, Fig. 1; and Fig. 6, a sectional plan on the line 5 6, Fig. 1.

In Figs. 1, 2, 4, 5, and 6, which are views of a dental mallet constructed according to my invention, A represents the tubular body or stem of the hand-piece, which has at the upper end an adjustable sleeve, *a*, the latter having bearings *d d*, to which is adapted the driving-shaft *e*. This shaft carries a pulley, *f*, and a disk, *g*, the pulley being arranged to receive the belt from any ordinary form of dental engine, the one which I prefer to use being that patented by me on the 29th day of January, 1878.

The disk *g* has formed on its periphery a lug, *i*, which, as the disk revolves, strikes and drives downward a rod, *m*, the latter being adapted to the upper portion of a central opening in the body A of the hand-piece, and bearing at the lower end upon the upper end of the stem *n* of the tool which is being used.

In the stem *n*, near the upper end of the same, is formed a groove or recess, *s*, to which is adapted one end of a ⊃-shaped spring, *t*, the tendency of which is to force the stem *n* upward against the lower end of the rod *m*, and to maintain the upper end of the latter in the path of the lug *i*, so that it will be struck and depressed by said lug as the latter is carried round.

To a slot, *x*, in one side of the rod *m* is adapted the inner end of a screw, *u*, carried by a plate, B, which embraces the upper end of the body A of the hand-piece just below the lower edge of the sleeve *a*. The screw *u* bears upon the lower end of the slot *x*, but is free to be moved vertically in a slot, *v*, in the body A, so that upon depressing the plate B the rod *m* and tool-stem *n* will be likewise depressed, so as to be free from the action of the lug *i* on the disk *g*, the reciprocation of the tool by the latter thereupon ceasing. As soon as the plate B is released, however, the action of the spring-pin *t* on the stem *n* forces the latter and the rod *m* upward, so that they are again brought under the control of the cam.

The sleeve *a* is secured to the body A of the hand-piece by means of a bar, *w*, which is hooked at the upper edge, so as to catch on the upper edge of the sleeve, and is provided at the lower end with a detachable plate, D, in which, as well as in the lower end of the bar *w*, is formed a slot, through which passes the stem of a set-screw, *y*, by means of which the bar and plate are secured to the hand-piece. By this mode of securing the sleeve *a* in place the said sleeve is permitted to turn independently of the hand-piece A; yet the sleeve can be raised and lowered on the said hand-piece by adjusting the bar *w* and plate D, so as to regulate the distance between the upper end of the rod *m* and the periphery of the disk *g*, and thereby govern the extent and force of the movement imparted to said rod by the rotating lug or cam *i*.

As the instrument is intended to be driven by a pendent belt, the turning of the sleeve *a* and the parts carried thereby independently of the body A of the hand-piece is an important feature, as it permits the said body A to be turned on its axis without twisting the driving-belt. The accidental removal of the rod *m* is prevented by means of a set-screw, *k*,

the end of which is adapted to a slot in the rod, as shown, the vertical movement of the rod, however, not being interfered with.

I have found in practice that by arranging the tool-stem in line radially with the center of the disk *g*, and by operating the said tool-stem by means of a cam-lug on the periphery of the disk, a near approximation to the dead blow produced by my electric mallet is obtained, the revolving lug striking the rod a series of quick hammer-like blows, different in character from the pushing effect produced when the cam-disk is centered out of line with the tool-stem.

In adapting my instrument for use as a puncturing-pen I prefer to substitute the form of cam shown in Fig. 3 for that shown in Figs. 1 and 2, the tool-stem *n* in this case being replaced by a stem having a puncturing-needle, F, while the lower end of the body A of the hand-piece is provided with a nose-piece, J, which properly incloses this needle, said nose-piece being adjustable to vary the extent of projection of the needle beyond the same, and being secured in position after adjustment by means of a jam-nut, *j*.

In some cases the upper end of the stem *n* may be acted on directly by the cam without the intervention of the rod *m;* but the use of the latter is preferred.

In order to prevent the turning of the stem *n* independently of the body A, said stem is made of angular section, and on one of its flat sides bears a spring-block, *z*, adapted to a recess in the body A.

By arranging the spring *t* externally provision is afforded for the ready operation of the same, so as to permit the insertion and withdrawal of the tool-stem.

I do not desire to claim, broadly, the combination of a tool-stem held upward by a spring and depressed by a revolving hammer, as such a combination has been used prior to my invention; but

I claim as my invention—

1. The combination, in a dental plugger or analogous instrument, of the body A of the hand-piece, a rotating cam, a tool-stem, *n*, having a groove or recess, *s*, and a spring, *t*, arranged externally, as described, so as to be readily operated in order to release the tool-stem, as set forth.

2. The combination of the body A of the hand-piece, the shaft *e*, its disk *g*, having a cam-lug, *i*, formed on or firmly secured to its periphery, and the spring tool-stem guided in the hand-piece and arranged in line radially with the center of the disk *g*, whereby a positive dead blow is imparted to the tool-stem as the disk revolves, all substantially as specified.

3. The combination of the body A of the hand-piece and its tool-stem with the swiveled head or sleeve *a*, carrying the shaft *e*, with driving-pulley *f* and operating-cam, all as described.

4. The combination of the body A of the hand-piece, the sleeve *a*, the hooked and slotted bar *w*, the slotted plate D, and the set-screw *y*, as specified.

5. The combination of the body A of the hand-piece, the tool-stem *n*, the operating-cam, and the intervening rod *m*, held in place by the screw *k*, but free to move vertically to a limited extent, as set forth.

6. The combination of the body A of the hand-piece, the tool-stem *n*, having an angular section, and the spring-block *z*, as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. G. A. BONWILL.

Witnesses:
ALEX. PATTERSON,
HARRY SMITH.