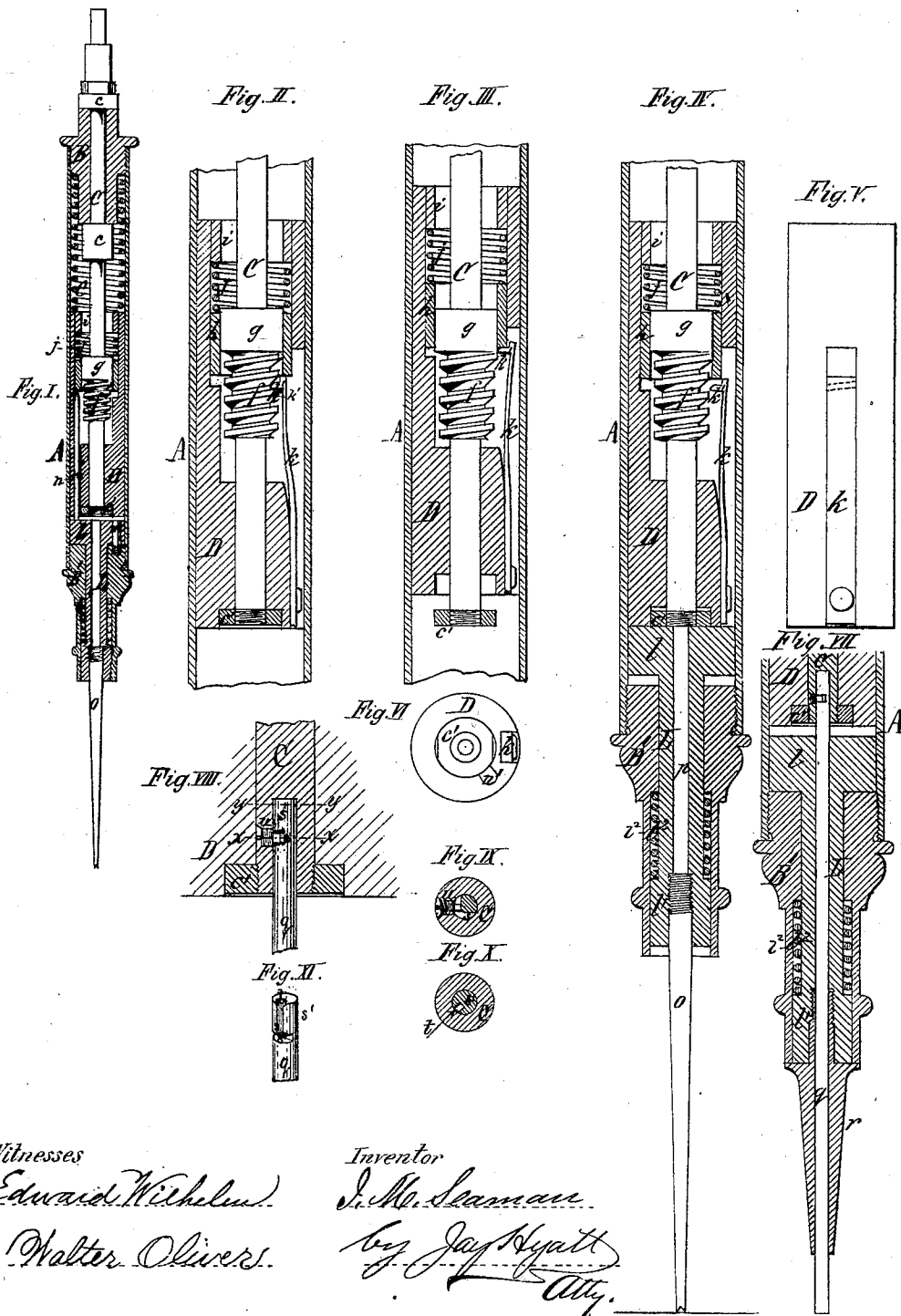


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Improvement in Combined Dental-Pluggers and Burring-Tools.

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IMPROVEMENT IN COMBINED DENTAL PLUGGERS AND BURNING-TOOLS.

Specification forming part of Letters Patent No. 131,123, dated September 3, 1872.

SPECIFICATION.

I, IRVING M. SEAMAN, of the city of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Combined Dental Plugger and Burring-Tool, of which the following is a specification:

My invention consists, first, in the combination, with the revolving shaft and hammer of a dental plugger, of a screw formed on said shaft, and terminating in a cylindrical enlargement, and a spring-tooth attached to said hammer and engaging with said screw, so that the hammer is elevated by the rotation of the latter until the spring-tooth runs out upon the cylindrical enlargement, when the hammer is disconnected from the screw, and the blow struck; second, in the combination of a loose sleeve or collar, fitting on the cylindrical enlargement, and held down in contact with the spring-tooth by a spiral spring, so as to lock said tooth in its outer position when it runs out upon the cylindrical enlargement, thereby preventing the same from re-engaging with the screw during the downward movement of the hammer; third, in the combination, with the plugger-shaft, spring-tooth of the hammer, and the locking-spring sleeve, of a throat-pin or wire, attached to the plugger-spindle for disengaging said sleeve from the spring-tooth, so as to permit the latter to re-engage with the screw of the plugger-shaft, and elevate the hammer; fourth, in the combination, in a dental plugger, of a revolving shaft, provided with a tool-socket in its end, a hollow plugger-spindle, an outer locking-sleeve, and a burring-tool, passing through the sleeve-spindle, and engaging in the socket of the shaft, to adapt the plugger to be used as a drill; fifth, in the combination, with the lower end piece of the case and the hollow plugger-spindle, of a sleeve or collar, screwing into said spindle and against said end piece, so as to lock the spindle in its lower position, and prevent any receding movement thereof, thereby rendering the mechanism for raising the hammer in operation while using the plugger as a drill; sixth, in the combination, with the lower end piece of the case of the instrument and hammer, of the plugger-spindle, held down by a suitable spring, and provided with a guide-

pin and wire for preventing the spindle and hammer from turning.

In the accompanying drawing, Figure I is a sectional elevation of my improved instrument when used as a plugger. Fig. II is a sectional view on an enlarged scale of the hammer and operating parts when in their lowest position. Fig. III is a similar view, with the hammer raised. Fig. IV is a sectional view on an enlarged scale of the lower portion of the instrument, showing the hammer in the act of striking the blow. Fig. V is an enlarged elevation of the hammer. Fig. VI is a bottom-plan view thereof. Fig. VII is a sectional view on an enlarged scale of the lower portion of the instrument, showing the same adapted to be used as a drill. Fig. VIII is an enlarged sectional elevation of the device for securing the drill in the revolving shaft. Figs. IX and X are cross-sections on lines *x x* and *y y*, Fig. 1, respectively. Fig. XI is a perspective view of the upper end of the drill-tool.

Like letters designate like parts in each of the figures.

A is the cylindrical case of the instrument, and B B' two plugs, screwing into the upper and lower ends thereof, respectively. The upper plug is provided with an axial bore, through which the shaft C passes, which latter is held against longitudinal movement therein by two collars, *e*, arranged in contact with the end of the plug B. The shaft C is connected at the upper end with any of the well-known devices used for driving dental burring-tools. D is the cylindrical hammer, fitting snugly in the case A, so as to be capable of longitudinal movement therein; and *e*, a spiral spring, arranged between the hammer and the screw-plug B, so as to press the former downward. The shaft C extends through the hammer D, and is provided at its lower end with a screw-nut, *c'*, arranged in a recess or countersink in the end of the hammer, which recess exceeds slightly in depth the height of the nut *c'*. *f* is a screw, formed on the shaft C within the hammer D. It is, preferably, made of greater diameter than the shaft, and terminates at its upper end, or runs out into a cylindrical enlargement, *g*, the diameter of which exceeds that of the screw *f*. *h* is a loose sleeve or collar, fitting on the en-

largement *g*, and in a concentric recess formed in the upper portion of the hammer. *i* is a fixed sleeve, secured in the upper portion of said recess, and serving as an abutment for a spiral spring, *j*, arranged between the sleeves *i* and *h*, for the purpose of pressing the latter downward. The hammer *D* is recessed or cut out around and below the screw *f* and enlargement *g*, so as to enable it to move vertically on the shaft *C*. *k* is the spring-arm, arranged in a longitudinal groove or recess in the hammer, and secured to the latter at its lower end. *k'* is a tooth, arranged near its upper end on the inner side. It forms part of a screw-thread, and engages with the screw *f*, as shown in Fig. II, the upper face of the thread of the latter being made rectangular or downwardly-inclining to give the tooth *k'* a firm hold on the screw. The loose sleeve *h* is held in contact with the end of the spring-arm by the spiral spring *j*. *L* is the plugger-spindle, fitting in an axial bore provided in the lower screw-plug *B'*. It is constructed with a head, *l*, fitting in the case *A*, and an enlarged lower portion, *l'*, fitting in a corresponding enlargement of the socket of the plug *B'*. *l''* is a spiral spring, arranged in the socket of the latter above the enlargement of the spindle *L*; it tends to hold the latter down with its head *l* in contact with the plug *B'* and away from the hammer *D*. *m* is a guide-pin projecting from the plug *B'* into the head of the spindle *L* to prevent rotation of the latter. *n* is a wire secured in the head *l* of the spindle and projecting upwardly through a hole, *n'*, in the hammer to within a short distance from the loose sleeve *h*, as clearly shown in Fig. I, for a purpose hereinafter to be explained. The spindle *L* is provided at its lower end with a screw-socket for the reception of the plugger-point *o*.

The operation of this part of my improvements is as follows: When the instrument is in its normal position, as shown in Fig. I, the spindle *L* is in its lowest position and the spring-toothed arm *k k'* locked in its outer position by the spring-sleeve *h* so that the revolution of the shaft *C* has no effect whatever upon the hammer. The plugger-point *o*, inserted in the screw-socket of the spindle *L*, being placed upon the tooth, and a slight pressure applied thereto, the spring *l''* is raised in its socket, compressing the spring *l''*, so as to bring the head *l* within striking distance of the hammer, as shown in Fig. IV. By this receding movement of the spring *l''* the wire *n*, attached thereto, raises the spring-sleeve *h* so as to release the spring-tooth *k k'*, which latter engages with the screw *f*. The engagement of the tooth *k'* with the screw *f* causes the hammer to be elevated, compressing the spring *e* until the tooth reaches the point at which the screw *f* runs out upon the enlargement *g*, as shown in Fig. III. In this position the tooth has been moved outwardly far enough to allow the spring-sleeve *h* to descend and engage between the end of the spring *k* and the enlargement *g*, resting against the tooth *k'*,

and retaining the spring *k* in its outward position. The hammer being thus disconnected from the screw *f* is forced down by the reaction of the spring *e* upon the head *l* of the spindle *L*. As the hammer strikes the plugger-spindle the loose sleeve *h* comes in contact with the wire *n* and is arrested in its movement thereby, or raised relatively, so as to become disengaged from the spring-hook *k k'*, when the tooth *k'* re-engages with the screw *f* and the operation is repeated. It is evident that when no pressure is applied to the plugger-point the spindle is not raised within striking distance of the hammer and the last blow is received by the nut *e'*. The wire *n* not being raised sufficiently to disengage the loose sleeve *h* from the spring *k* the tooth *k'* cannot re-engage with the screw *f* and the hammer cannot be elevated again. The rotation of the shaft *C* consequently has no further effect upon the hammer, which is very desirable in handling and applying the instrument.

The instrument is adapted to be used as a burring-tool in the following manner: *p* is an axial bore provided in the spindle *L* for the passage of the drill *q*, and *r* is a guide-sleeve provided with a similar axial bore and screwing into the socket of the spindle *L*, so as to bear with its shoulder against the end of the plug *B'*, as shown in Fig. VII, whereby the spindle *L* is locked in its lower position and longitudinal movement of the same prevented when pressure is applied thereto. The upper end of the drill *q* fits in a socket formed in the lower portion of the shaft *C* and is secured therein against accidental disengagement in the following manner: The end of the drill is provided with a recess or notch, *s*, the shape of which is clearly represented in Fig. IX, leaving a head, *s'*, above the same, which is provided with a vertical groove, *t*, leading from the end of the drill to the recess *s*, as shown in Figs. IX, X, and XI. *u* is a screw arranged in the shaft *C* so as to project with its reduced end into the tool-socket and recess *s*. In inserting the drill the groove *t* is made to coincide with the end of the screw *u*, when the drill is readily inserted. By turning the drill in its socket a solid portion of the head *s'* of the same is made to engage over the end of the screw *u* so as to prevent disengagement of the drill, and the former brought in contact with one or the other shoulder of said recess, as shown in Fig. IX, according to the direction in which the drill is turned, whereby the movement of the shaft is transmitted to the drill. The screw-sleeve *r*, locking the plugger-spindle in its lowest position, the operation of the instrument in this condition is consequently confined to the rotation of the shaft and drill, as in any ordinary burring-instrument.

Claims.

1. The combination, with the revolving shaft and hammer, of a dental-plugger, of the screw

f, enlargement *g*, and spring-tooth *k k'*, substantially as and for the purpose hereinbefore set forth.

2. The combination, with the hammer provided with the spring-tooth *k k'* and plugger-shaft provided with the screw *f* and enlargement *g*, of the loose sleeve *h* and spring *j*, substantially as and for the purpose hereinbefore set forth.

3. The combination, with the plugger-shaft *C*, sleeve *h*, spring *j*, and spring-tooth *k k'*, of the disengaging-pin *n*, substantially as hereinbefore set forth.

4. The combination, in a dental-plugger, of a revolving shaft provided with a tool-socket, a hollow plugger-spindle, a locking-sleeve, *r*,

and a burring-tool which passes from the shaft through said hollow spindle and locking-sleeve, in the latter of which it has an outer bearing, substantially as hereinbefore set forth.

5. The combination, with the screw-plug *B'*, hollow plugger-spindle *L*, and burring-tool, of the locking-sleeve *r*, substantially as hereinbefore set forth.

6. The combination with the case, end piece *B'*, plugger-spindle, and hammer, of the spring *l'*, guide-pin *m*, and wire *n*, substantially as hereinbefore set forth.

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