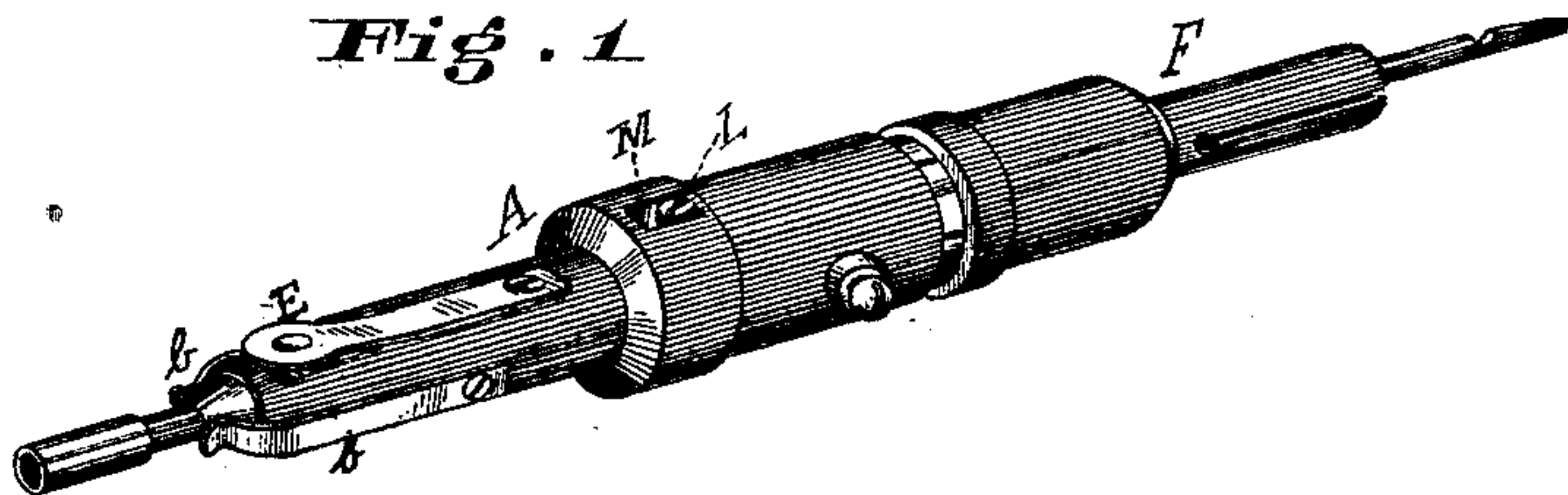


A. MCG. DENHAM.  
Dental Plugger.

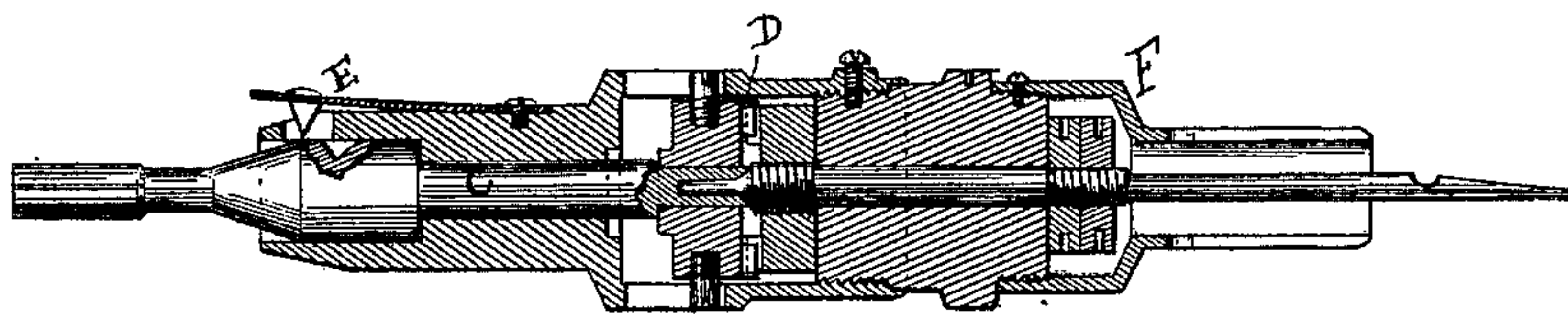
No. 229,809.

Patented July 13, 1880.

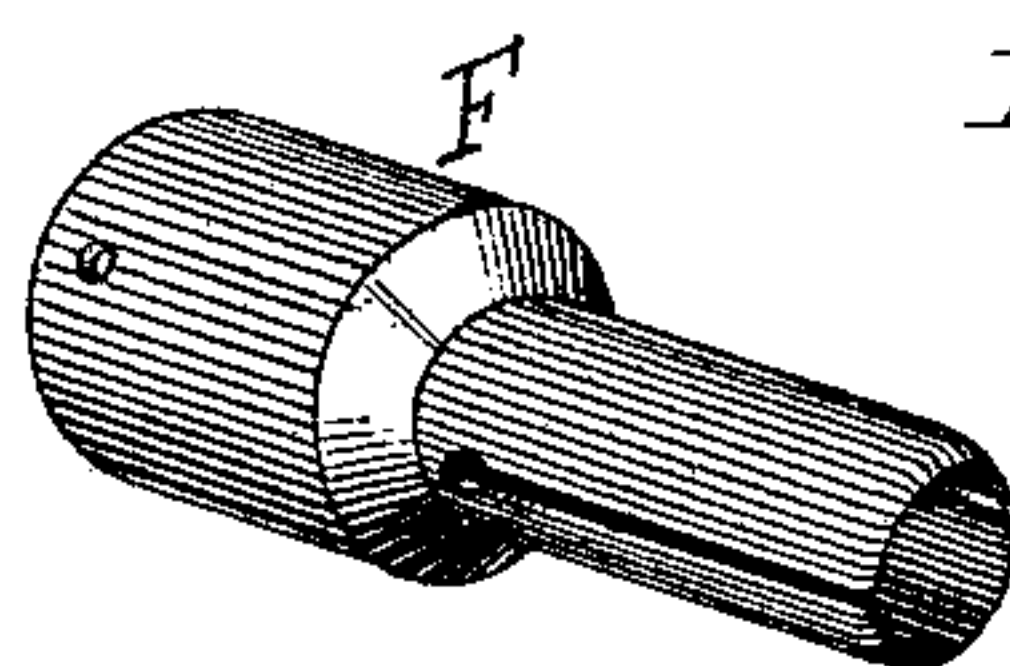
*Fig. 1*



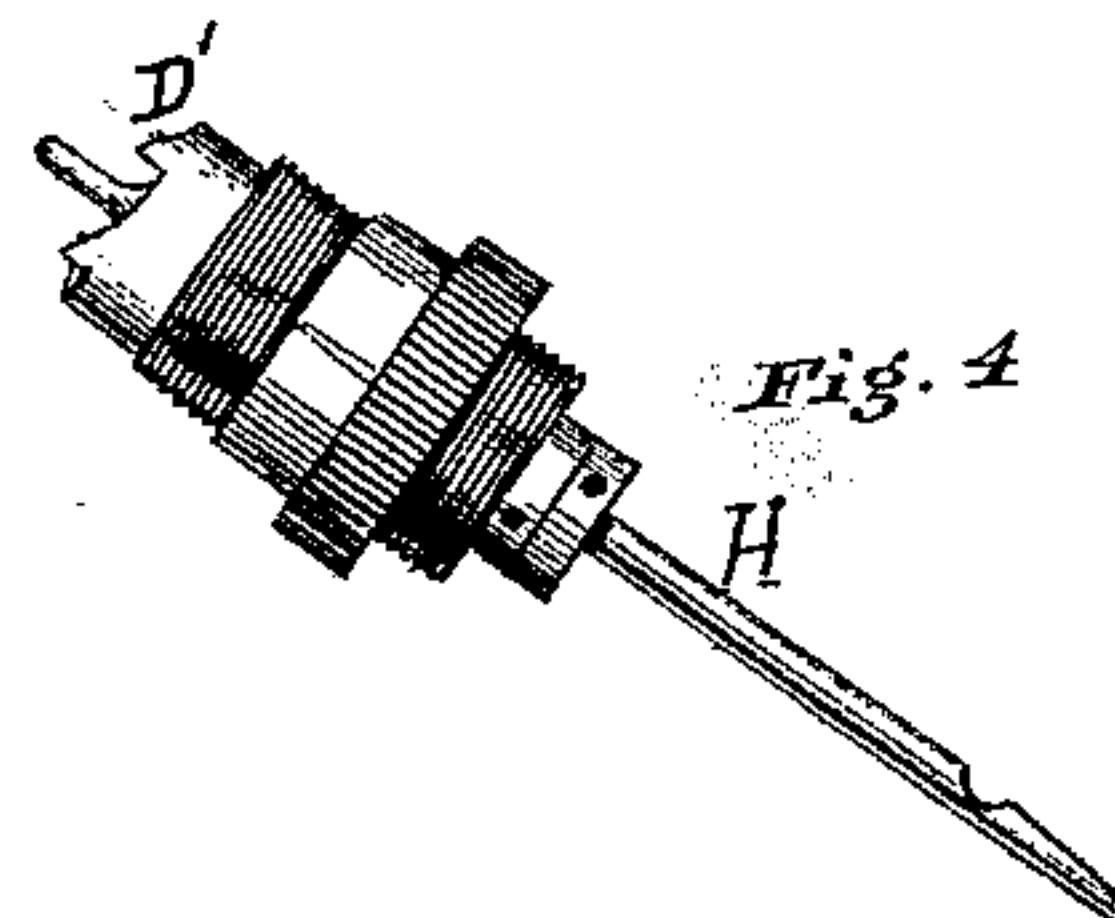
*Fig. 2*



*Fig. 3*



*Fig. 4*



Attests  
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*Alexander M-G. Denham*  
*by his Attorney, H. J. Featon.*



# UNITED STATES PATENT OFFICE.

ALEXANDER MCG. DENHAM, OF PHILADELPHIA, PENNSYLVANIA.

## DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 229,809, dated July 13, 1880.

Application filed June 9, 1879.

*To all whom it may concern:*

Be it known that I, ALEXANDER MCGOWAN DENHAM, of Scotland, in the Kingdom of Great Britain, at present residing in the city of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Automatic Dental Plugging-Instruments, of which the following is a specification.

My invention relates to certain improvements in automatic plugging-instruments for dental purposes, in which the point of the instrument is driven by means of a plunger operated within the casing of the instrument; and it consists in constructing the plunger or plugging shaft with a cone-shaped head, or with beveled edges extending beyond the top of the casing of the instrument, against which beveled sides are fitted the bent ends of two or more flat springs placed and fastened on the outside of the casing. The plunger receives its forward motion from the cam action of lugs on its lower end, which bear against corresponding cam-lugs on the face of a rotating stem or spindle, which, in turn, is driven by power conveyed through the flexible shaft of a dental engine.

My invention also consists in mechanism, hereinafter described, for stopping the action of the plunger or plugger shaft and spindle without stopping or disconnecting the engine.

To enable others to make and use my invention, I will proceed to describe its construction and operation, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a perspective view of the plugger; Fig. 2, a cross-section through the center of the instrument, showing the arrangement of the several parts; Figs. 3 and 4, detached views of the screw-cap covering and the rotating spindle with its cam-lugs.

The casing A of the instrument is constructed in two parts, in such manner that they may be screwed together at or about the point where the cam-lugs of the stem or spindle H and the plunger C meet, in order that the plunger may be held in place in the upper portion and the rotating stem or spindle be placed and held in position in the lower portion of the casing. The plunger is beveled at its upper end, which beveled portion projects beyond the end of the

casing, in order that the bent ends of the two or more flat springs *b b*, fastened on the outer side of the casing, may bear against it and cause the plunger to rebound after being lifted by the action of the cam-lugs of the rotating spindle.

On its lower end the plunger is provided with one or more lugs or projections, D, which fit cam-shaped lugs or projections D' on a rotating spindle, by which means a cam motion is obtained and the point of the plugger driven forward and allowed to rebound backward by the action of the springs, when and as the cam-lugs D of the spindle come in contact with, lift, and pass the lugs D of the plunger.

Motion is given to the spindle by means of any ordinary dental engine, with its flexible shaft attached to any ordinary hand-piece, in which the end H of the spindle is inserted when in operation.

The "point" of the instrument is made separate, and may be provided with a screw-thread by which it is screwed to the plunger C, and it is so made removable at pleasure to enable the operator to use points of different sizes and serrations.

The plunger is prevented from rotating within the casing by means of a set-screw, L, which is screwed into the plunger and moves up and down in a slot or groove, H, in the casing.

In order that the operator may not be obliged to stop the engine while picking up gold or filling and arranging it in the tooth with the plugger, I have provided the instrument with a device to throw the plunger out of gear by a mere pressure of the finger. This device, consisting of a simple flat spring, E, fastened to the upper portion of the outside of the casing, and having on the inside of its upper end a wedge-shaped projection, which, when pressed against the indentations in the plunger through an opening in the casing to which it is opposite, causes the plunger to rise in the casing, and lifts its lugs out of the gripe or bite of the cam-lugs of the spindle. A great advantage is also obtained from having flat springs on the outside of the casing, arranged as described, to produce the backward motion of the plunger, instead of a coiled spring depressed within the casing, as is usual in such instruments, for by the flat outside springs, which are bent and



arranged to bear against the beveled end of the plunger, I get a more powerful action, besides holding the plunger perfectly steady.

I am aware that an electro-magnetic plunger has been constructed with an external flat spring on the casing at the end thereof; but this spring is not used to cause, nor is it capable of causing, a return or reverse motion of the plunger after the forward blow is given; in fact it does not touch the plunger, but is used simply to keep the plugging-point in contact with the plunger, the old and well-known internal coiled spring being used to cause the reverse motion of the plunger.

One of the principal features of my improved mallet is the dispensing with this internal coiled spring, using instead thereof two or more external flat springs on the casing, the ends of which springs bear against the conical-shaped or beveled end of the plunger, which extends beyond the casing, as already described, by which means alone a reverse motion of the plunger is produced when its lugs are released from the cams of the rotating shaft after each forward blow.

An additional advantage secured by this mode of construction is, that the plunger is held perfectly steady between the ends of the springs, avoiding all vibration in the action of the instrument, the shaking and looseness of the plunger and point in plugging-instruments heretofore constructed and operated by means of a coiled spring being a great objection to them.

In order that the end H of the spindle may be covered and prevented from vibrating while being revolved, I have constructed a screw-cap, F, to fit on the lower casing of the instrument, the lower portion of the cap covering the end of the spindle, this lower portion

being slitted in order that it may be slipped over and tightly bind the end of any ordinary hand-piece of a dental engine, and so form a continuous case or cover. By this means the hand-piece is held firmly in the plugging-instrument, while the shaft within the hand-piece securely holds in place the end of the spindle and revolves the latter without the least vibration.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a plugging-instrument for dental purposes, a reciprocating plunger or plugger shaft with conical-shaped end or beveled sides extending beyond the casing, in combination with two or more external flat springs adjusted to bear against the beveled sides of the plunger, and serving as the sole means of causing a reverse or backward motion of the plunger after the completion of each forward movement.

2. In a mechanical plugging-instrument for dental purposes in which the point is operated by means of a plunger driven by cam-lugs on a rotating spindle, the mechanism described, consisting of the flat spring E, provided with wedge-shaped projections at its upper end, on the inner side thereof, adjusted opposite an opening in the casing of the instrument, in order that when said spring, with its projections, is pressed through said opening and against suitable indentations in the plunger, the latter will be raised out of the reach of the cam-lugs of the spindle and the action of the instrument stopped without stopping or disconnecting the engine.

ALEXANDER MCGOWAN DENHAM.

Witnesses:

H. T. FENTON,  
EDW. H. WILLIAMSON.