

(No Model.)

J. E. LOW.

DEVICE FOR FORMING DENTAL PLUGS.

No. 358,282.

Patented Feb. 22, 1887.

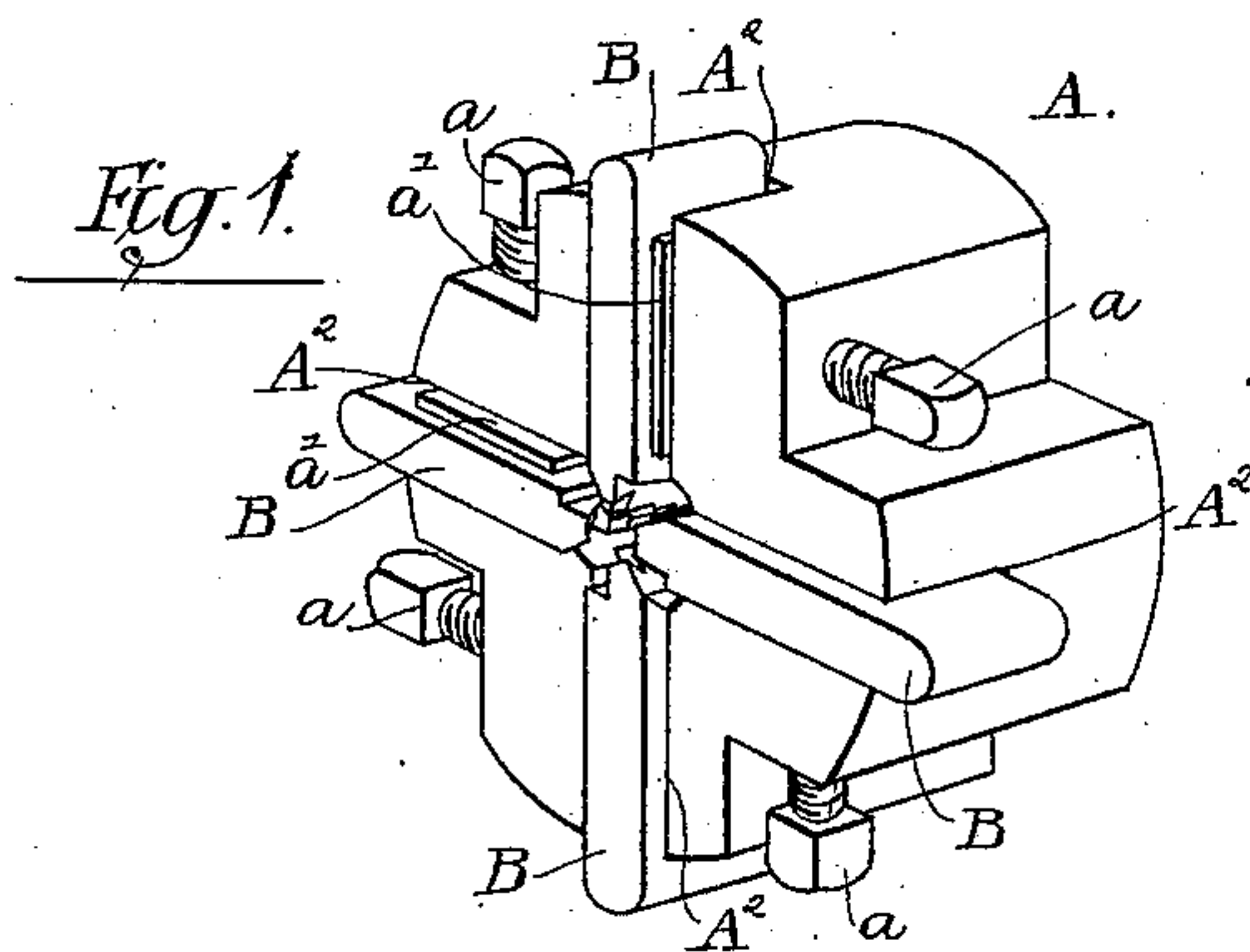


Fig. 2.

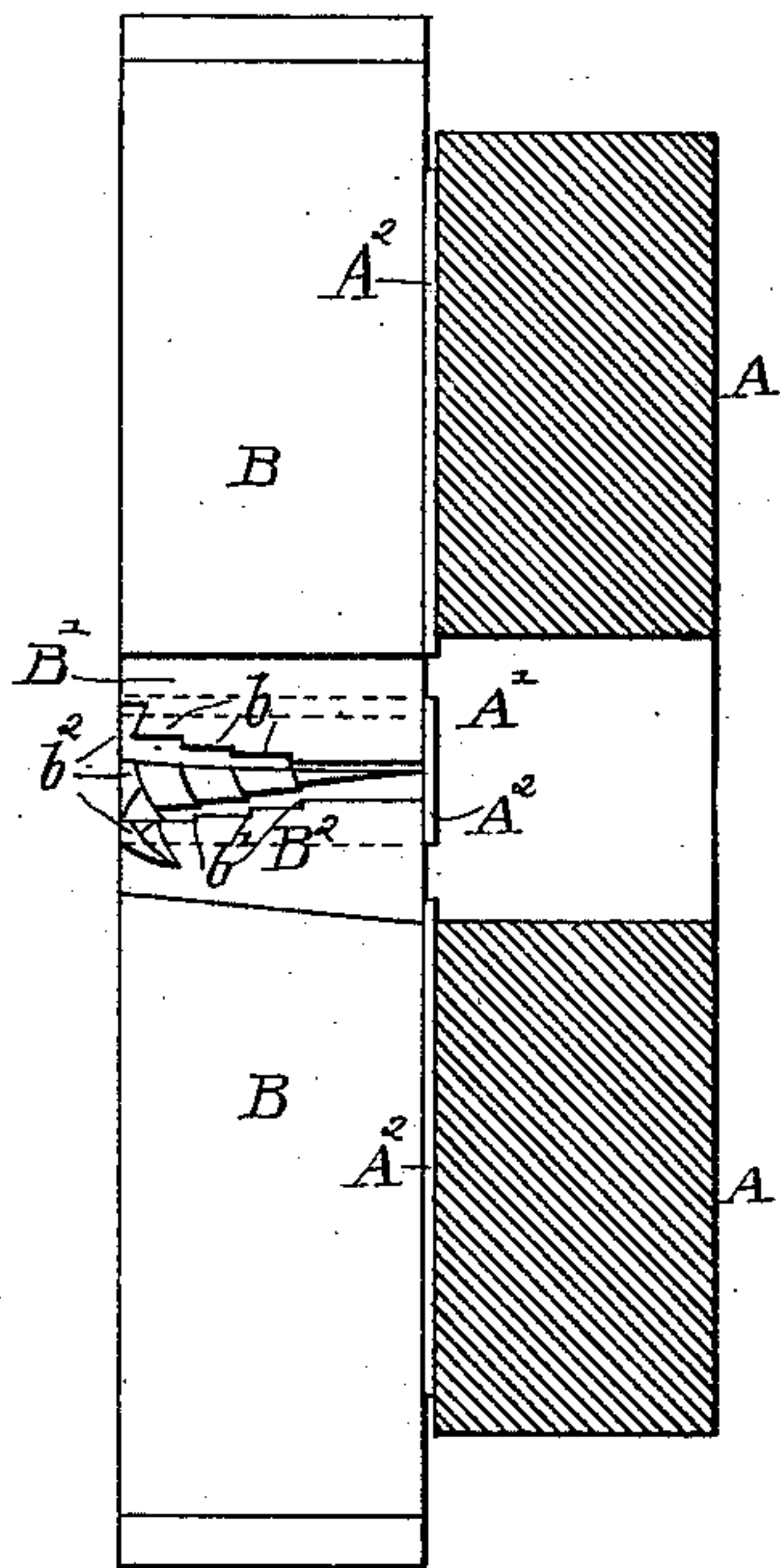


Fig. 4.

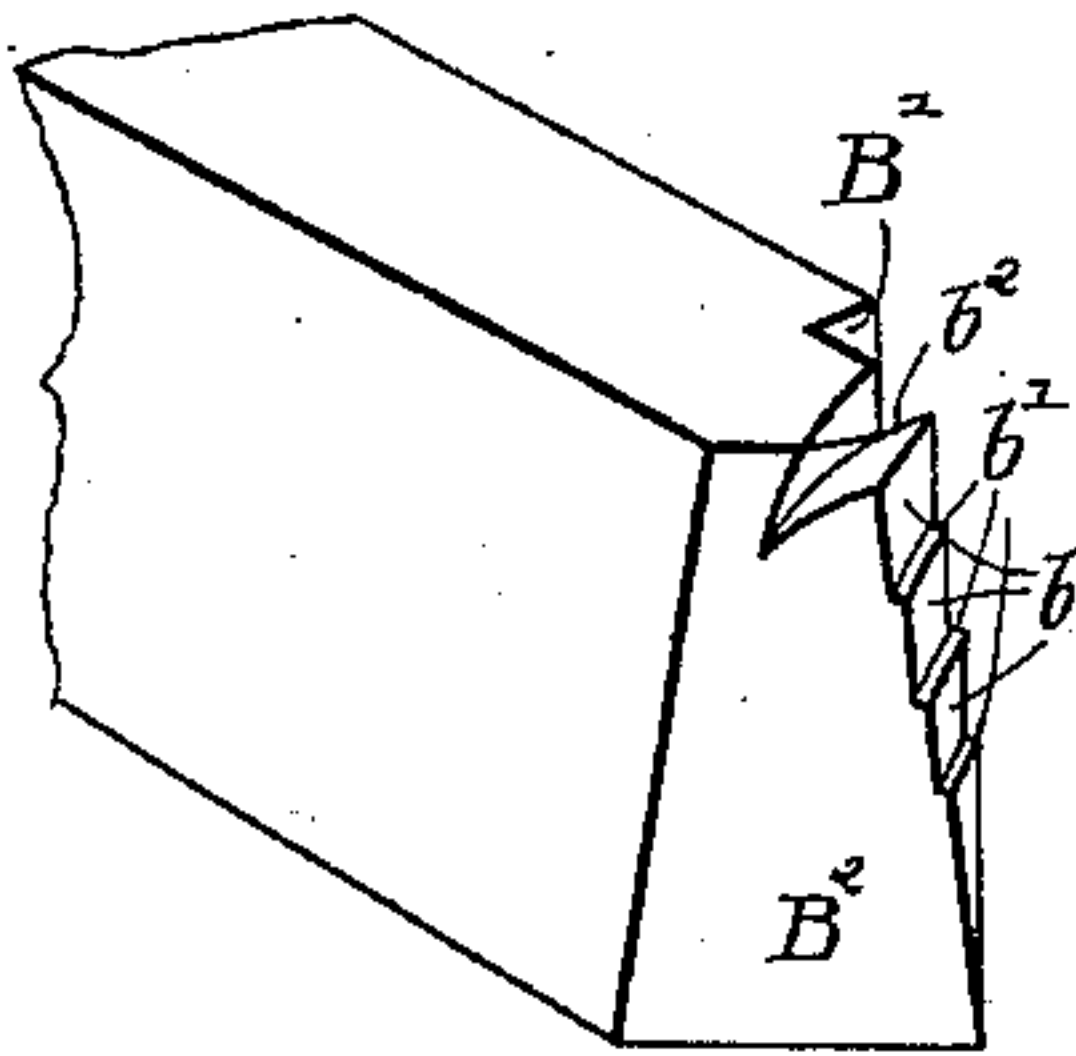


Fig. 3.

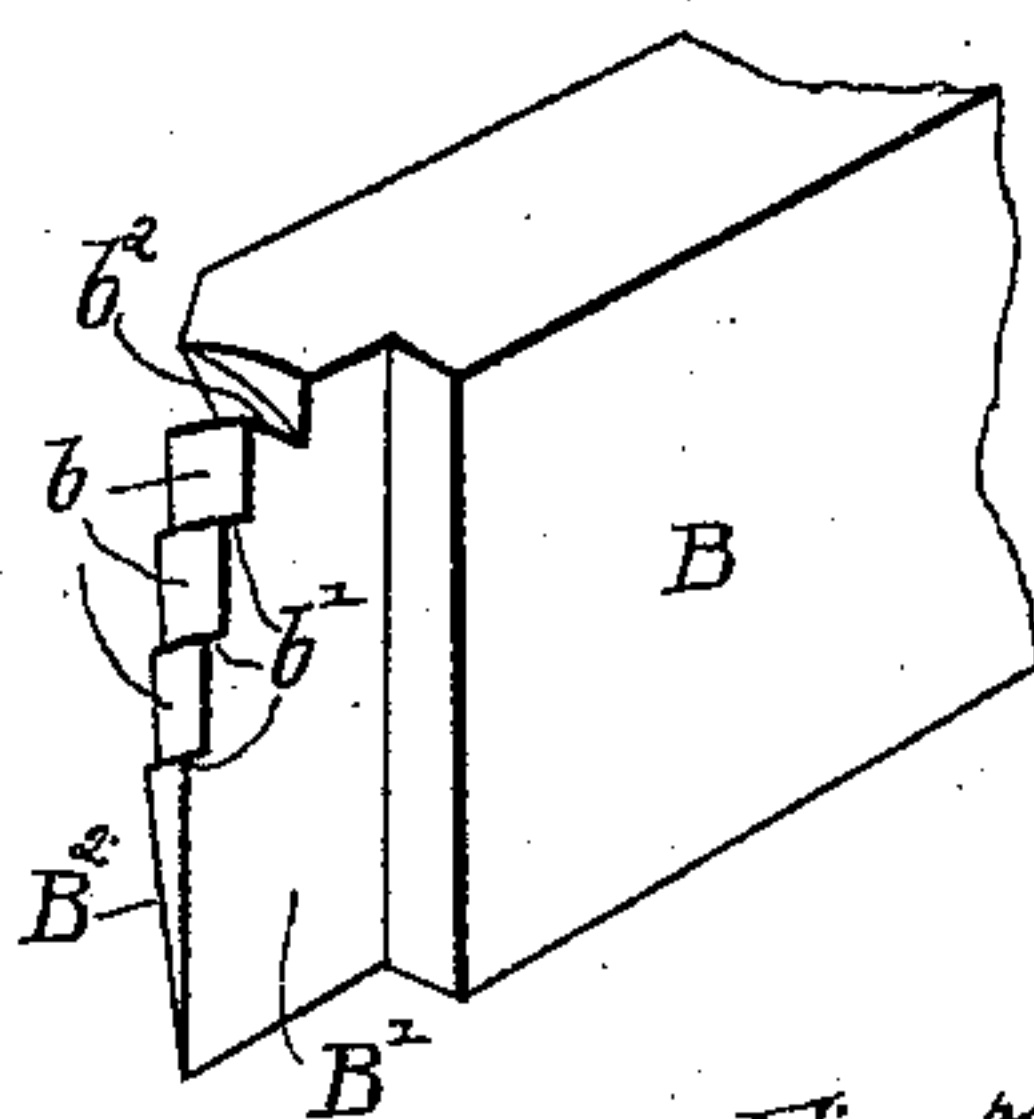


Fig. 5.

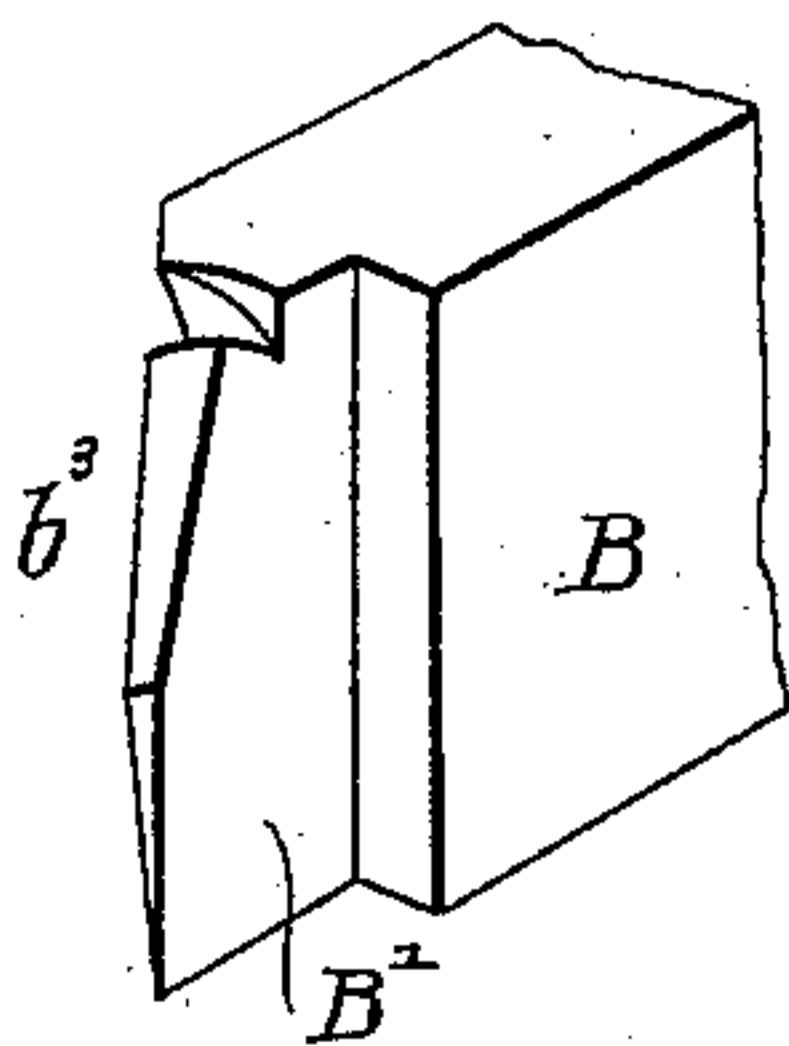


Fig. 6.

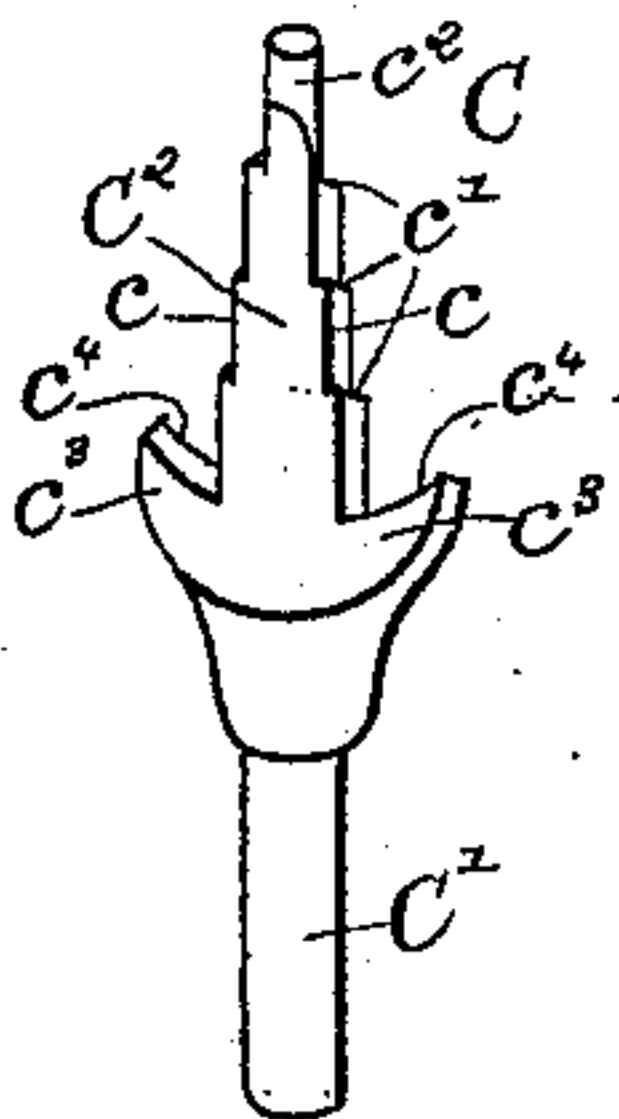


Fig. 7.

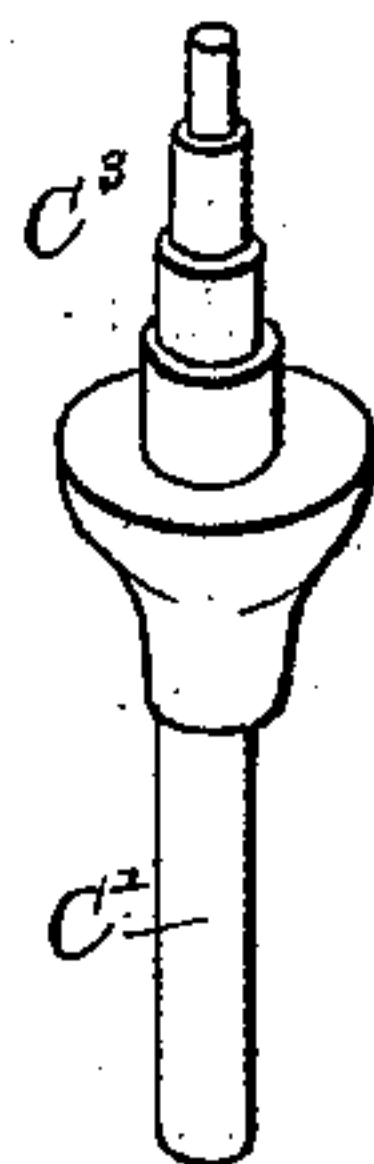


Fig. 8.

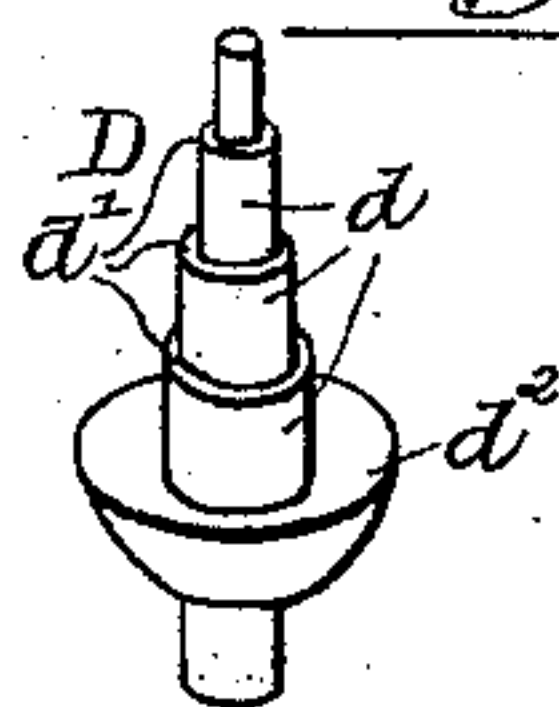


Fig. 10.

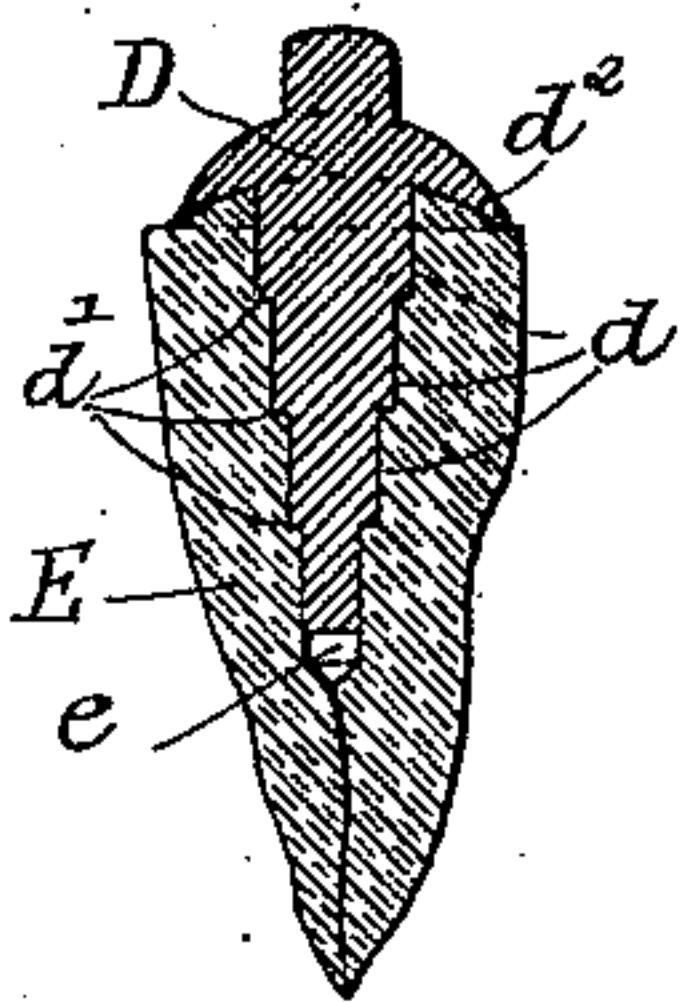
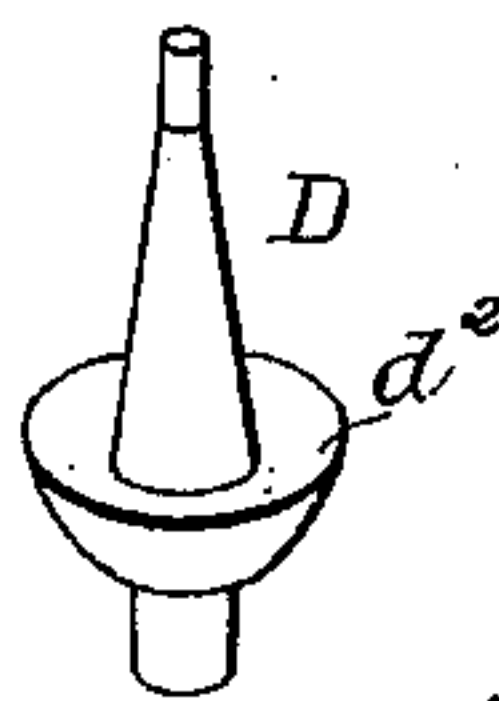


Fig. 9.



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UNITED STATES PATENT OFFICE.

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DEVICE FOR FORMING DENTAL PLUGS.

SPECIFICATION forming part of Letters Patent No. 358,282, dated February 22, 1887.

Application filed December 21, 1885. Serial No. 186,297. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. LOW, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Cutters for Forming Dental Plugs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference
10 marked thereon, which form a part of this specification.

This invention relates to tools or implements for use in dentistry, and more especially to tools employed for attaching artificial crowns
15 to natural roots in cases where metal plugs accurately fitted to recesses in the roots are employed as a means of supporting tooth-crowns thereon—as, for instance, in the manner described in a prior application for patent, Serial
20 No. 155,768, filed by me upon the 12th day of February, 1885.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

25 In the accompanying drawings is illustrated a reamer for shaping a recess in the root, and also a cutting-tool for shaping a plug, said cutting-tool being also adapted for use in constructing the reamer, whereby the said reamer
30 may be given the exact form and size required to make a recess into which a plug made by the cutting-tool will fit with exactness.

The reamer herein shown is adapted for insertion in the tool-holder of a dental engine or
35 motor of the kind commonly used by dentists, and is generally flat in form and provided with cutting-edges at its opposite sides. Said reamer, also, is provided at its advance end with an axially-arranged cylindric part
40 adapted to fit in a guide-aperture formed in the root by means of an ordinary drill preparatory to the use of the reamer in finally shaping the recess, and with an outwardly-extending cutting-edge adapted to dress off or
45 smooth the upper or outer end surface of the root to fit a flange or cap upon the plug, as will hereinafter more fully appear.

The said reamer is not herein claimed, but forms the subject of claims in another application for patent, Serial No. 199,322, filed upon
50 the 19th day of April, 1886.

The cutting-tool for forming the plug consists, generally, of a metal block or head provided with one or more radially-arranged cutters provided with cutting-edges upon their
55 inner ends, said cutting-edges being of proper shape to give the desired tapering or shouldered form to the plug. In the use of the said cutting-tool the latter may be given a rotary motion by attaching it to a lathe-spindle or otherwise, in which case the blank to be operated
60 upon will be held in a suitable non-rotating support; or the cutting-tool may be held stationary and the blank given a rotary motion—as, for instance, by being held in a lathe-
65 chuck—the tool and the blank in either case being moved or fed toward each other as the cutting progresses, as will be hereinafter more fully explained.

The invention may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a cutter-head provided with cutters adapted for forming the plugs as above set forth. Fig. 2 is an
75 axial section of the said cutter-head, showing the cutters therein in side elevation. Figs. 3 and 4 are enlarged detail perspective views of one of the cutters shown in Figs. 1 and 2, showing opposite sides of the said cutter. Fig. 5
80 is a perspective view of a cutter having a straight cutting-edge. Fig. 6 is a perspective view of a reamer for shaping the recesses in natural roots. Fig. 7 is a perspective view of a blank for forming the reamer shown in Fig. 8;
85 Fig. 8 is a perspective view of a plug formed by the cutting-tool shown in Figs. 1 and 2, and adapted for insertion in a recess or cavity made in the tooth by the tool shown in Fig. 6. Fig. 9 is a perspective view of a plug made by
90 the cutter shown in Fig. 5. Fig. 10 is a sectional view of a natural root with the plug in place therein.

A, Figs. 1 and 2, is a metal block or cutter-head provided with four radial cutters, B, having
95 upon their inner ends suitable cutting-edges, which are arranged to extend into a central opening, A', in said cutter-head.

C, Fig. 6, is a shaping tool or reamer, adapted for forming a recess of the proper size and
100 shape to receive a plug formed by the cutters B—such, for example, as is indicated by D,

Figs. 8 and 10. The said plug D is made larger at its outer than at its inner end, and in the form thereof shown in the drawings is stepped or shouldered, so as to form a series of cylindric surfaces, d , gradually decreasing in diameter from the larger to the smaller end of the plug, and a series of intermediate shoulders or steps, d' . Said plug, also, is provided with a cap or flange, d^2 , adapted to fit over the portion of end of the root adjacent to the recess therein, as clearly shown in Fig. 10, in which the plug is shown in place within the root.

The cutters B of the cutting-tool herein shown in Figs. 1 and 2 are fixed in the head A, and are adapted to operate by movement of the blank relatively to the cutter-head in the direction of their axes, or, in other words, by thrusting the blank endwise between the said cutters. The particular cutters illustrated are adapted to form a stepped or shouldered plug having a cap or flange at its large end, such as is shown in Figs. 8 and 10, and the said cutters are for this purpose provided upon their inner ends with a series of faces, b , parallel with the axis of the head, and with a series of transverse offsets or shoulders sharpened to form cutting-edges b' , which act upon the blank, as the latter is fed toward the head, to form the series of cylindric surfaces d and shoulders d' . (Shown in Fig. 8.) The said cutters B, herein shown, are also provided with outwardly-curved cutting-edges b^2 , adapted to form the inner or concave surface of the cap d^2 upon the plug, as clearly shown in the drawings.

In the particular construction illustrated the cutters B are notched or cut away at their sides at which the cutting-edges b' are formed, so as to form flat faces B' , Fig. 3, arranged approximately in planes passing through the central axis of the head, whereby the said cutting-edges are made radial to the said axis, or nearly so. The inner ends or working faces of the said cutters are, as also herein shown, narrowed to enable the cutting-edges to be brought near each other in making small plugs by beveling the sides of the cutters opposite the faces B' , as indicated at B^2 , Fig. 4, and the metal of the cutter is cut away or beveled at the rear of the cutting-edges b' , to give suitable clearance, as clearly shown in said Figs. 3 and 4.

In the particular form of the cutting-tool illustrated the cutters B are secured in radial slots A^2 in the head A by set-screws a , preferably arranged to bear at their inner ends against plates a' , placed against the sides of the cutters. Said cutters may, however, be held in the head in any other well-known or preferred manner, as may be found convenient or desirable. Fastening devices permitting the cutters to be moved radially in the head are preferred, however, in order to permit the cutters to be accurately adjusted to their work, and also to enable the plugs of different diameters to be made by the same cutters. It

is entirely obvious in this connection that the same result of giving a desired conformation to the plugs may be obtained by the use of a greater or less number of cutters than herein shown. The employment of more than one cutter is preferred, however, in order that the blank may be sustained upon several sides during the operation of cutting, and thereby prevented from springing laterally, as is obviously liable to occur by the pressure thereon of a single cutter, in case only one of the latter is used.

The cutting tool or reamer C is adapted for making or shaping a cavity or recess to receive a plug, D, such as is shown in Fig. 8, and above described. Said reamer is formed upon the end of a shank, C' , adapted for insertion in the tool-holder of a dental engine, or for attachment to any other actuating device adapted to give rotary motion thereto, and is formed with parallel flat sides or faces C^2 and provided with unsharpened edges or surfaces c and shoulders c' , sharpened to form cutting-edges, which latter operate, when the reamer is advanced into the tooth, to form a cavity having a series of cylindric surfaces, and intermediate shoulders accurately conformed to the shape of the plug D. Upon the advance end or point of the reamer C is preferably formed a cylindric prolongation or guide-pin, c^2 , adapted to enter and fit a cylindric passage formed in the natural tooth or root by a suitable drill, preparatory to the use of the reamer, as a guide for the latter as it is advanced into the root. Said reamer is also preferably provided with two lateral wings or projections, c^3 , at its larger end, or that adjacent to the shank, said projections being provided with cutting-edges c^4 , for the purpose of cutting an annular convex surface upon the top of the root adapted to fit accurately within the concave inner surface of the flange d^2 upon the plug.

A plug provided with a flange, d^2 , but differing in other respects from the shouldered plug above described, may be made by cutters constructed, generally, in the manner above stated—as, for instance, a plug like that shown in Fig. 9, having the form of a smooth cone, may be made by the use of a cutter having a straight oblique cutting-edge, b^3 , such as is illustrated in Fig. 5.

A reamer such as is above described may be conveniently made by the use of a blank such as is indicated by C^3 , Fig. 7, said blank being of the same shape as the plug D, and being formed by the use of the same cutting-tool that is used for making the plug. The blank C^3 (shown in Fig. 7) is of the form as it appears after the operation of the cutters thereon, the tool C being formed from said blank by removing the metal at opposite sides thereof, so as to form the opposite flat faces, C^2 , upon the tool. The edges c of the tool made in this manner are formed by the cylindric surfaces of the blank, and the guide-pin or prolongation c^2 is made by leaving the blank in its original cy-

lindric shape at its end portion, the cutting-edges c' c^4 being formed by properly beveling and sharpening the shoulders of the blank.

5 A plug similar to that shown in Fig. 6 is illustrated in Fig. 10 as in place within a root. A plug inserted in the recess in the root in the manner shown in said figure may be held in place by cement, and a tooth-crown may be attached to said plug by solder or otherwise—
10 as, for instance, a tooth-crown may be employed which is constructed and connected with the plug in the manner described and shown in the prior application, Serial No. 155,768, hereinbefore referred to.

15 The novel tool above described may be used with great advantage in the operation of forming plugs and fitting them to natural roots, inasmuch as the plugs may be readily and accurately formed by the said tool, and the latter
20 may be used for shaping a reamer by means of which a recess may be formed in the root adapted to accurately fit the plug.

I claim as my invention—

25 1. A cutter-head for forming plugs, having cutters provided with lateral cutting-edges conformed to the shape of the plug, and having outwardly-curved cutting-edges b^2 , adapted to form the inner or concave surface of a cap upon the plug, substantially as described.

2. A cutter-head provided with one or more 30 cutters having a series of lateral faces, b , parallel with the axis of the head, and a series of transverse offsets or shoulders sharpened to form cutting-edges d' , substantially as described.

3. A cutter-head provided with one or more 35 cutters for forming a plug, said cutters being provided with a series of lateral faces, b , parallel with the axis of the head, and with a series of transverse cutting-edges, b' , and provided, also, with outwardly-curved cutting-edges b^2 , adapted to form the inner or concave surface of the cap upon the plug, substantially as described.

4. The combination, with a cutter-head, of 45 one or more cutters movably secured in the head, said cutters being provided with a series of transverse shoulders sharpened to form cutting-edges d' , substantially as described.

In testimony that I claim the foregoing as 50 my invention I affix my signature in presence of two witnesses.

JAMES E. LOW.

Witnesses:

C. CLARENCE POOLE,
M. E. DAYTON.