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B. S. BROWN, DEC'D.
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DENTAL TOOL HOLDER OR CLUTCH.
APPLICATION FILED DEC. 9, 1903.

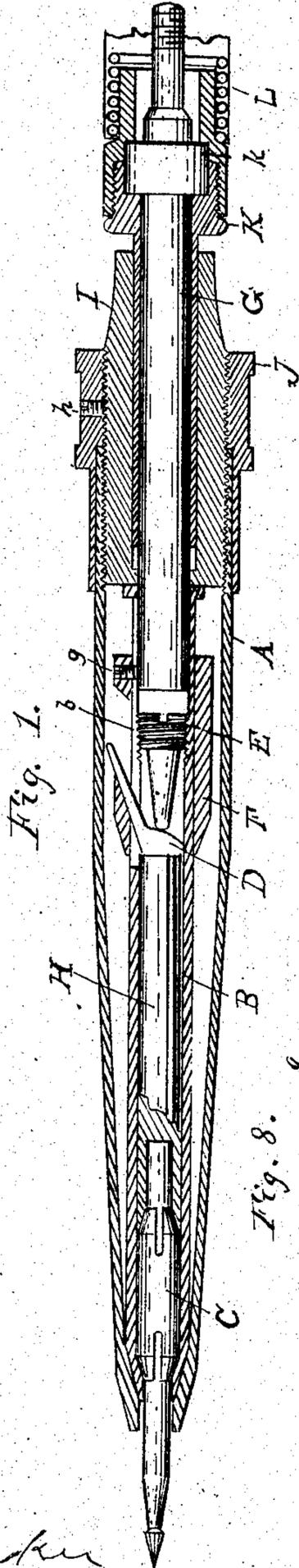
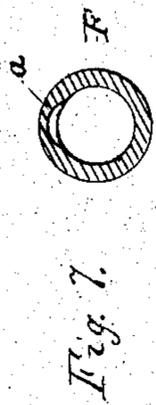
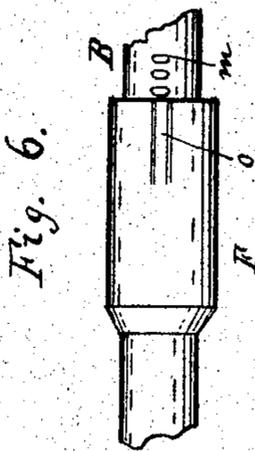
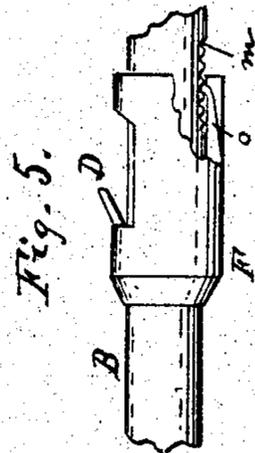
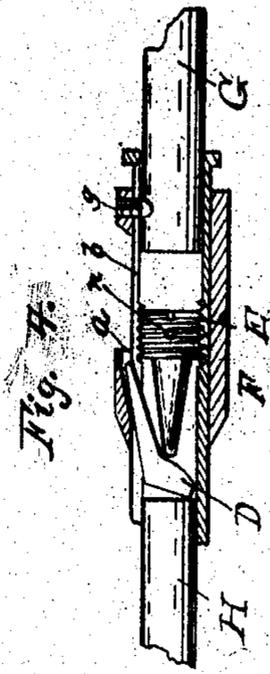


Fig. 3.

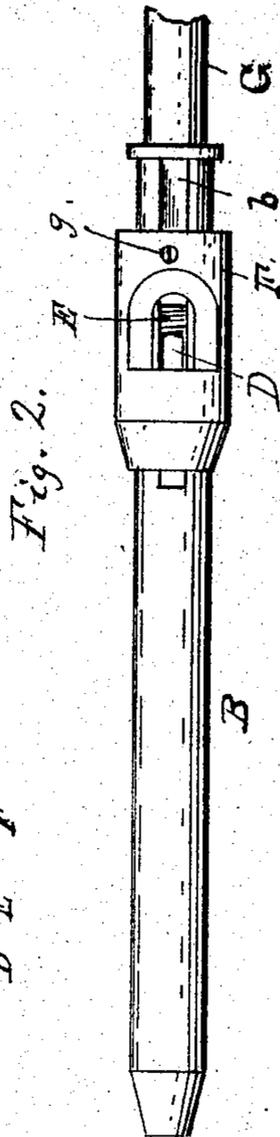
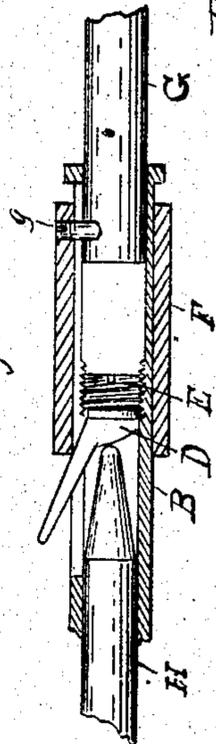


Fig. 8.



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UNITED STATES PATENT OFFICE.

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DENTAL TOOL HOLDER OR CLUTCH.

No. 816,069.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed December 9, 1903. Serial No. 184,506.

To all whom it may concern:

Be it known that I, BENONI S. BROWN, of the village of Onset, in the county of Plymouth and State of Massachusetts, have invented a new Dental Tool Holder or Clutch, of which the following is a specification.

My invention relates to clutching devices applicable to different purposes, and is intended to hold or clamp cylindrical tools or other objects or to perform a similar office in various mechanical devices.

In this specification and attached drawings the invention is shown as applied to a dental tool holder or handpiece in which burs, drills, &c., can be held while the handpiece-spindle is revolved by the power from a dental engine.

This invention belongs to that class of devices wherein a split and elastic hollow cylinder or chuck is compressed upon the tool or other cylindrical object which is held by the friction thus created.

Figure 1 is a view partly in section of a dental handpiece. Fig. 2 is a view of the rotatable shaft and mechanism for operating the compression-lever. Fig. 3 is a view of split chuck; Fig. 4, a view of a part of the shaft in section with a portion of the operating mechanism in the position after compressing the chuck. Fig. 5 is a modified form of shaft and sleeve with device to prevent disengagement of clutch; Fig. 6, another view of same modification; Fig. 7, a cross-section of sleeve, taken through dotted line *i i*, Fig. 2. Fig. 8 shows lever reversed.

The case A, with a beveled socket at the nose or forward end to receive end of shaft B, is internally screw-threaded at its rear end to receive a bearing-block I, which supports the rear end of the shaft. The shaft B is adapted to rotate in the case A, is beveled at its forward end to fit into a corresponding bearing in the case, is slotted *a b* to receive the lever D and the screw *g*, and the rear end bears in or against the block I.

The split chuck C is coned at both ends and fits into the shaft B, one end in a tapered socket of the shaft, the other in a corresponding socket in the follower H, which is immediately behind the chuck and in front of the lever D, which works in the slot *b* and abuts against the adjustable fulcrum E, which is threaded and adapted to turn and move forward and backward in the threaded portion

of the shaft B and is slotted at its rear end to receive a screw-driver and may have several holes bored diametrically through to receive a small rod or needle for turning it, although these holes are not necessary, the adjustment by the screw-driver sufficing. This adjustment is for taking up wear and primarily to regulate the position of the sleeve F relative to the lever D, which it operates. The adjusting-screw E, having transverse holes, is applicable to other forms of clutching devices contained in a hollow shaft or stem. The forward pressure of the screw E, acting against the heel of the lever D, throws up the arm of the lever to the desired degree necessary for contact with the channel or groove *a* in the sleeve F. The proper position of the lever and screw is obtained by first inserting a tool-shank in the chuck C and turning the adjusting-screw E so that when the sleeve F is pulled backward to a position approximately about half its throw the tool will be held firmly, as shown in Fig. 4.

The sleeve F slides on the shaft B, is cut away, as shown, thereby forming a slot to make room for the lever D, and at its front end has an inclined recess *a*, adapted to receive the lever-arm.

A sliding rod G enters the rear of the shaft B, has a boss *k*, and is adapted to connect at its rear end with the cable of a dental engine, and united to the sleeve F by a screw *g*, which passes through the sleeve F, the slot *b* in the shaft B, and enters the rod G, thereby securing the rotation of the shaft when the engine-cable is turned, while allowing the rod and attached sleeve to be moved forward and backward.

The bearing-block I is screw-threaded and has an adjustable ring J on the outside, secured by a set-screw *h*, said ring regulating the depth that the block enters the case A.

A sleeve K, adapted to slide within the block I, is enlarged and threaded at its rear end to connect with the outer sheath L, covering the flexible shaft of a dental engine, is recessed at this part to receive the boss *k* of the rod G, and acts as a bearing for the latter. When the sheath L is screwed to the bushing K, it secures the boss *k* from endwise movement therein, but allows it to rotate freely, so that the endwise motion of both sheath and bushing will be imparted to the rod G and the connected clutch mechanisms.

The modified form of sleeve and shaft is shown in Figs. 5, 6. The shaft B has corrugations *m* for a short distance opposite the slot *b*. The sleeve F is split, as shown, to form a narrow tongue *o*, which is turned up at the end to form a projection or tooth *w*, which engages with the notches *m*, the elasticity of the metal allowing the tongue a slight movement. The object of this construction is to insure against the accidental loosening of the clutch; but it is not absolutely necessary, because the friction between the sleeve F and the arm of the lever is sufficient under ordinary conditions to retain the parts in position.

The action of the instrument is as follows: The position of the parts is supposed to be as shown in Fig. 1. A tool *r* is inserted. The part K and attached sheath L are now pulled rearward. This causes the rod G and attached sleeve F to make a similar movement, thereby crowding the arm of the lever D downward or toward the center of the shaft B. Acting against the fulcrum E, the lever forces the follower H forward and against the beveled chuck C, whose ends are thereby compressed and contracted upon the tool *r*. An opposite movement releases the pressure on the lever D and follower H, allowing the chuck C to open by its own elasticity and release its hold upon the tool.

I do not confine myself to the particular form of chuck or arrangement of chuck, lever, and sleeve here shown. A single split chuck or chuck and follower combined may be used. So, also, the position of the lever and sleeve can be reversed without changing the principle of my invention. In that case a forward motion of the sleeve closes the chuck. An opposite movement releases it, as shown in Fig. 8, where the rear end of the follower H is tapered to make room for the lever-arm and the fulcrum E is shorter than in the first plan.

I claim—

1. In a dental tool-holder, a hollow shaft carrying an endwise-movable tool-holding chuck, a lever, a lengthwise-movable connection between the chuck and the lever, an adjustable screw-fulcrum for the lever adapted to move lengthwise in the shaft and means to operate the lever.

2. In a dental tool-holder a hollow shaft carrying an endwise-movable tool-holding chuck, a lever, a lengthwise-movable connection between the chuck and the lever, an adjustable screw-fulcrum for the lever adapted to move lengthwise in the shaft and a sleeve adapted to slide lengthwise on the outside of

the shaft, in contact with and for the purpose of actuating the lever, substantially as set forth.

3. In a dental tool-holder a hollow shaft carrying an endwise-movable tool-holding chuck, a lever, a lengthwise-movable connection between the chuck and the lever, an adjustable screw-fulcrum for the lever adapted to move lengthwise in the shaft and having holes in its periphery for the purpose described, and means to operate the lever.

4. In a dental tool-holder the combination of a hollow shaft slotted for a portion of its length a tool-holding chuck mounted therein, a sleeve adapted to slide longitudinally on the outside of the shaft, operative connections between the tool-chuck and the sliding sleeve, a rod in the rearward part of the shaft adapted to slide lengthwise therein and connected with the sleeve whereby the motion of said rod will actuate the sleeve and connected mechanism.

5. In a dental tool-holder the combination of a shaft slotted for a portion of its length and containing a tool-holding chuck, a lever, a lengthwise-movable connection between the chuck and the lever, a sleeve adapted to slide lengthwise on the outside of the shaft in contact with and for the purpose of actuating the lever, and a rod in the rearward part of the shaft adapted to slide lengthwise therein and connected with the sleeve, whereby the motion of said rod will move the sleeve and connected mechanism.

6. In a dental tool-holder the combination of a hollow shaft slotted for a portion of its length, an endwise-movable tool-holding chuck, a lever, a lengthwise-movable connection between the chuck and the lever, all contained within the shaft, a sleeve adapted to slide lengthwise on the outside of the shaft in contact with and for the purpose of actuating the lever, said sleeve having a longitudinal slot in its periphery to receive the lever-arm.

7. The combination of a hollow shaft having transverse grooves in a portion of its periphery and a longitudinal slot, with an endwise-movable tool-clutching device inside and a sleeve on the outside of the shaft and means for operatively connecting the sleeve with the clutching device, said sleeve having an elastic tongue or spring adapted to engage with the grooves on the shaft for the purpose set forth and described.

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Witnesses:

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