(No Model.)

C. S. KELLOGG.

DENTAL HANDPIECE.

No. 552,185. Patented Dec. 31, 1895.

Fig. 1.

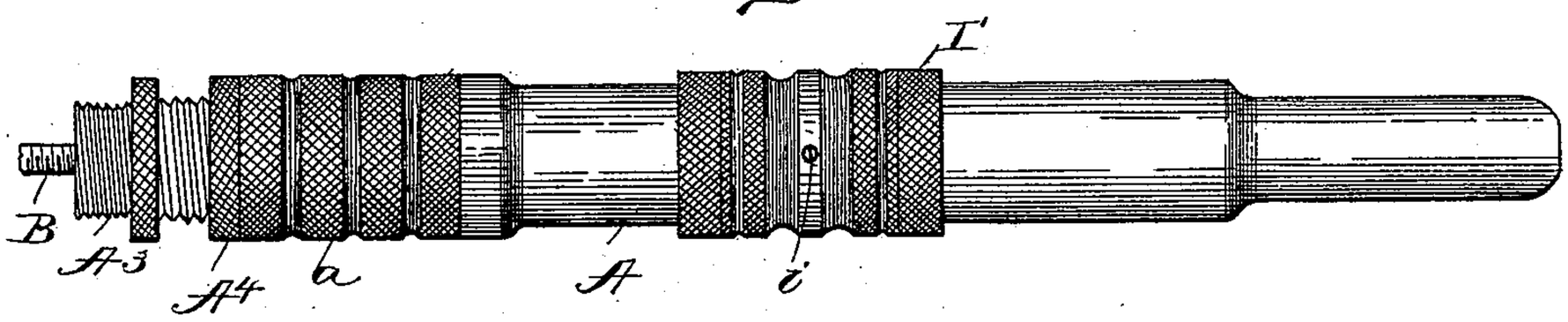


Fig. 2.

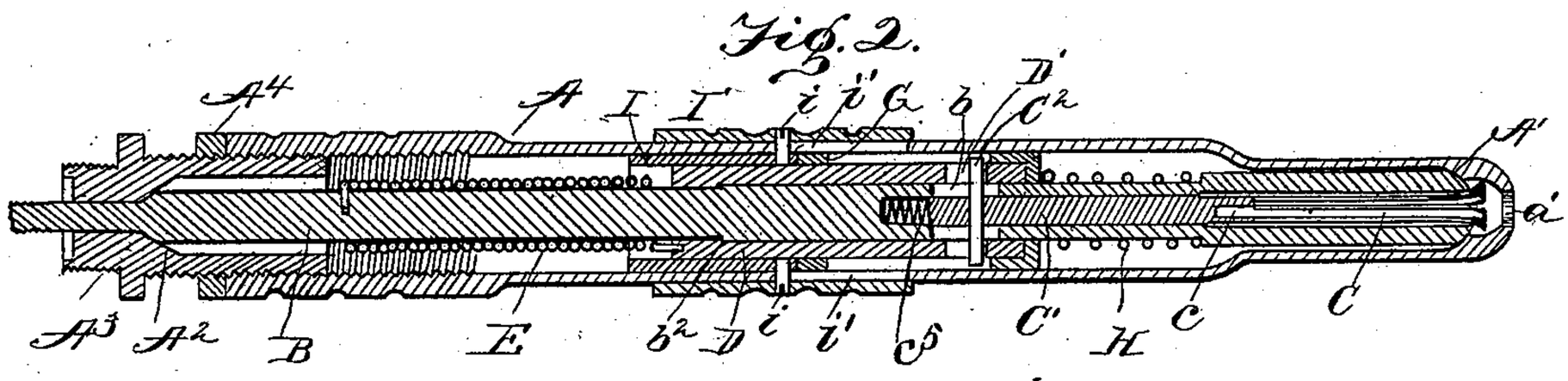


Fig. 3.

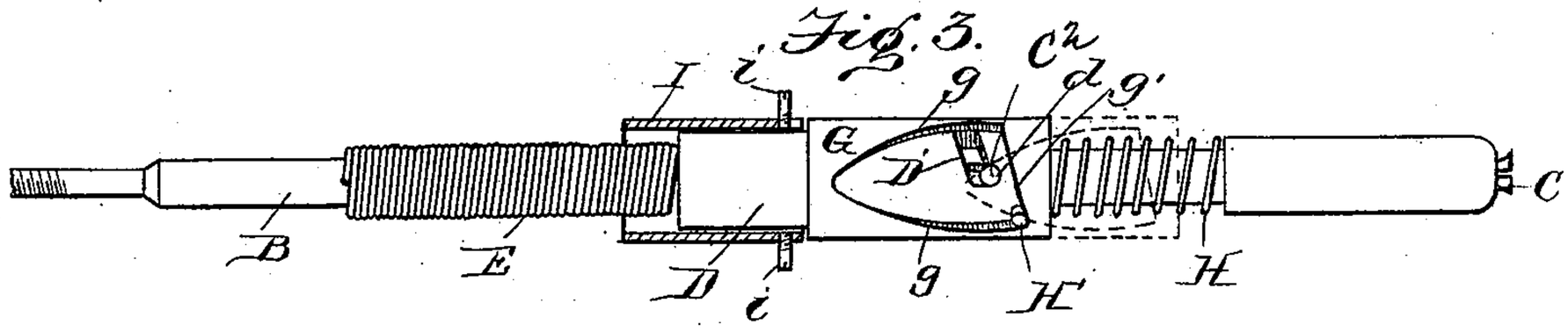


Fig. 4.

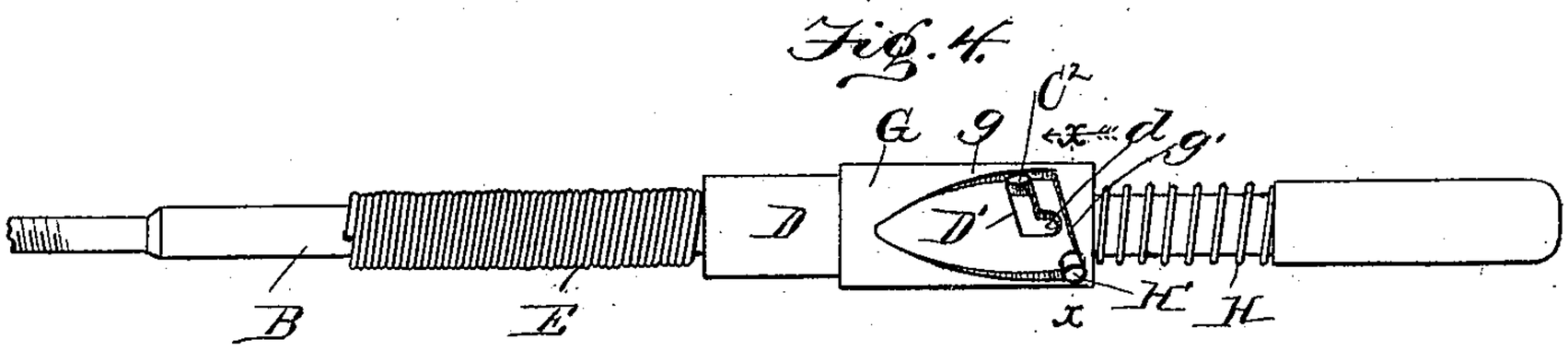
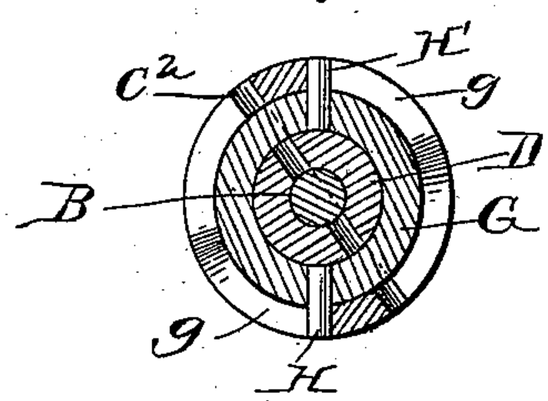


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES S. KELLOGG, OF CHICAGO, ILLINOIS.

DENTAL HANDPIECE.

SPECIFICATION forming part of Letters Patent No. 552,185, dated December 31, 1895.

Application filed April 30, 1895. Serial No. 547,697. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. KELLOGG, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Handpieces for Rotary Tools; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to devices for holding tools—such as drills, burs, &c.—and more especially such as are used in the practice of dentistry, the object of the invention being to provide a simple and efficient handpiece which will hold the tool securely without exposing any of the rotating parts and from which the tool may be released by the manipulation of a simple slide extending outside the casing.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is an elevation of a tool constructed in accordance with my invention. Fig. 2 is a longitudinal section through the same. Figs. 3 and 4 are detail elevations of the internal mechanism with the casing removed. Fig. 5 is a section on the line *x x*, looking in the direction indicated by the arrow.

Like letters of reference indicate the same parts in all the figures.

The letter A indicates the casing of the tool-holder or handpiece, preferably formed in one piece, tubular in cross-section, and of decreasing diameter toward the point, as shown. The point-section is reduced and finished on the outside as a matter of convenience in use, while knurling may be applied, as at *a*, to afford a good hand-hold. In the point of the casing I form a cone-bearing A', and at the rear end a similar bearing A^2 is formed in a perforated tail-block A^3 screwing into the casing and held in place by a jam-nut A^4, whereby the distance between the bearings may be adjusted to take up wear on the bearings. Working in these bearings is the spindle B adapted to receive its rotary motion from any suitable motor connected to the end extending out through the tail-block A^3. In order that the bearing at the rear end of the spindle may be formed on it, the bearing is preferably small and the diameter of the spindle increases in steps toward the front end, so as to form shoulders, the function of which will presently appear. The end of the casing is perforated at a' for the passage of the shank of the tool, and a deep cylindrical cavity is formed in the end of the spindle, as by boring, into which cavity the jaws C of the clutch fit and are adapted to move longitudinally after the manner of other well-known structures, wherein the jaws are pushed out to release and drawn in to grip and hold whatever is placed between them. The jaws are joined at the base by a shank C' extending still farther down into the spindle and provided with a cross-pin C^2, having its ends extended out through slots *b* in the spindle and by means of which the jaws may be given a longitudinal movement to grasp or release a tool.

If desired, a projection, such as *c*, may be formed in the jaw-shank to form a key for co-operation with a flattened or recessed portion of the tool to prevent rotation of the tool-spindle independently or the tool may be held in any well-known manner. The jaws are held forward by a small spring c^5, ready to receive a tool save when retracted, as will be presently explained.

A jaw-closing sleeve D is placed around the spindle at the base of the jaw-shank in position for the pin C^2 to enter the diagonally-placed or wedging slots D' therein, and by allowing the jaw-closing sleeve to work against the shoulder b^2 on the spindle to prevent its forward movement it will be seen that if the sleeve is turned on the spindle the effect will be to cause the pin to travel along the inclines and so draw the jaws in or allow them to advance, as the case may be.

In carrying out the scheme of my invention it is my purpose, first, to provide a mechanism whereby, when the tool is inserted in the chuck or holding-jaws, the jaws may be caused to close and grasp the tool by simply pressing in on the tool, and, secondly, to secure the release of the tool by means of a simple slide on the casing, and, if needs be, without stopping the rotation of the spindle.

To carry out the first idea, the wedging-slots D′ in the jaw-closing sleeve are provided at one end with retaining-shoulders *d* for the pin, preferably by forming a recess in a direction longitudinally of the spindle and toward the front end, and when the pin is seated in these recesses, as in Fig. 3, the sleeve cannot turn, but when the pin is pushed back, as by a tool being thrust into the jaws, the sleeve is free to turn. For the purpose of turning the sleeve on the spindle and so drawing the jaws in to grasp the tool when the latter has been thrust in so as to disengage the pin, as just described, a coil-spring E is placed around the spindle in rear of the sleeve and the ends of the spring are connected respectively to the spindle and sleeve. The spring tends to turn the sleeve from the position indicated in Fig. 3, when the jaws are open, to the position indicated in Fig. 4, when the pin is drawn back, by the wedging-slot and the jaws closed.

To carry out the second idea mentioned it is only necessary to provide a means for returning the pin to the position shown in Fig. 3, and to accomplish this I provide a second or resetting-sleeve G, mounted on the sleeve D and held in the position shown in full lines by the spring H. This resetting-sleeve G is provided with oppositely-arranged inclines *g*, preferably formed by the walls of a wedge-shape slot or opening having an inclined forward end *g′*, and on the exterior of the jaw-closing sleeve within this opening and in position to co-operate with one of the inclines there are studs or pins H′. The projecting ends of the jaw-controlling pin C^2 extend out into position to co-operate with the other incline, and the result is that when said resetting-sleeve is pushed up to the position indicated by the dotted lines, Fig. 3, the pin C^2 is drawn over and seated behind its retaining-shoulder, as in said Fig. 3. When the resetting-sleeve is released, its spring returns it to normal position, the necessary slight retrograde rotation being secured by the pins H′ striking the inclined forward end *g′*. A sliding sleeve or slide I is located immediately adjacent to the sleeve G, in position to force it up, as indicated in dotted lines, and this sliding sleeve or slide I is connected through the medium of screws or pins *i* passing through slots *i′* in the casing with an external slide I′. From this construction it follows that while the spindle and attached parts may rotate freely, yet the resetting or releasing sleeve may be moved to release the tool at any time by a simple forward push on the external slide I′.

The device, it will be noted, dispenses entirely with the necessity of setting up the jaws by means of a screw. There are no external rotating parts—a most decided advantage in the class of work for which the device is particularly adapted and where it is of the utmost importance to hold the casing firmly at a point very near the tool. The tool is held with greater power by reason of the wedging action of the slot in the jaw-closing sleeve, and this gripping-power may be varied by changing the angle of the slot, as will be readily understood.

While I have described the tool as having a closing-slot and slot or spring for opening the jaws, it will be understood that in the preferred construction the parts are duplicated on diametrically-opposite sides of the tool.

Having thus described my invention, what I claim as new is—

1. In a hand piece for rotary tools, the combination with the rotary spindle and the tool holding jaws, of a rotary jaw-closing sleeve on the spindle having a wedging slot therein, and a pin or projection, cooperating with said slot, and controlling the opening and closing of the tool holding jaws; substantially as described.

2. In a hand piece for rotary tools, the combination with the rotary spindle and the longitudinally movable tool holding jaws, of a jaw closing sleeve on the spindle and having a wedging slot therein, a pin or projection controlling the tool holding jaws carried by the shank of the jaws and cooperating with said slot and a spring cooperating with the sleeve for turning the latter to close the jaws; substantially as described.

3. In a hand piece for rotary tools, the combination with the rotary spindle and the longitudinally movable tool holding jaws, of a jaw closing sleeve on the spindle having a wedging slot therein, a pin or projection controlling the jaws carried by the shank of the jaws and working in said slot, a spring for moving the sleeve to close the jaws and a retainer for holding the jaws open against the action of said spring; substantially as described.

4. In a hand piece for rotary tools, the combination with the rotary spindle and the longitudinally movable tool holding jaws, of a jaw closing sleeve on the spindle having a wedging slot therein with a retaining shoulder or catch, a longitudinally movable pin or projection controlling the jaws carried by the shank of the jaws and working in said slot and cooperating with the shoulder or catch and a spring for moving the sleeve to close the jaws when the pin is disengaged from the shoulder by a longitudinal movement; substantially as described.

5. In a hand piece for rotary tools the combination with the rotary spindle, the longitudinally movable tool holding jaws, a jaw closing sleeve on the spindle having a wedging slot therein and a pin or projection controlling the jaws working in said slot, of a resetting sleeve cooperating with the jaw closing sleeve and pin or projection to open the jaws; substantially as described.

6. In a hand piece for rotary tools, the combination with the rotary spindle, the longitudinally movable tool holding jaws, a jaw closing sleeve on the spindle having a wedg-

ing slot therein, a pin or projection controlling the jaws working in said slot and a spring for moving the sleeve to close the jaws, of a resetting sleeve cooperating with the jaw closing sleeve and pin or projection to open the jaws; substantially as described.

7. In a hand piece for rotary tools, the combination with the rotary spindle, the longitudinally movable tool holding jaws, a jaw closing sleeve on the spindle having a wedging slot therein, and a pin or projection controlling the jaws working in said slot, of a longitudinally movable resetting sleeve having an incline at its forward end cooperating with the pin or projection to open the jaws; substantially as described.

8. In a hand piece for rotary tools, the combination with the rotary spindle, the longitudinally movable tool holding jaws, a jaw closing sleeve on the spindle having a wedging slot therein and a pin or projection controlling the jaws working in said slot, of a longitudinally movable resetting sleeve having oppositely arranged inclines, one of which cooperates with the jaw controlling pin or projection and a pin or projection on the jaw closing sleeve with which the other incline cooperates; substantially as described.

9. In a hand piece for rotary tools, the combination with the rotary spindle, the longitudinally movable tool holding jaws, a jaw closing sleeve on the spindle having a wedging slot therein and a pin or projection controlling the jaws working in said slot and carried by the shank of said jaws, of a longitudinally movable spring pressed resetting sleeve having an opening into which the jaw controlling pin projects, said opening having inclined or converging sides and an inclined forward end, and a pin on the jaw closing sleeve projecting into said opening and seating in the angle between one of the sides and forward end when the sleeve is returned to normal position under the influence of its spring; substantially as described.

10. In a hand piece for rotary tools, the combination with the casing, a rotary spindle journaled therein, longitudinally movable tool gripping jaws carried by the spindle and a sleeve having a cam slot and a jaw controlling pin working therein, of a resetting sleeve rotating with the spindle, and a non-rotary longitudinally movable sleeve cooperating therewith mounted on the casing; substantially as described.

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