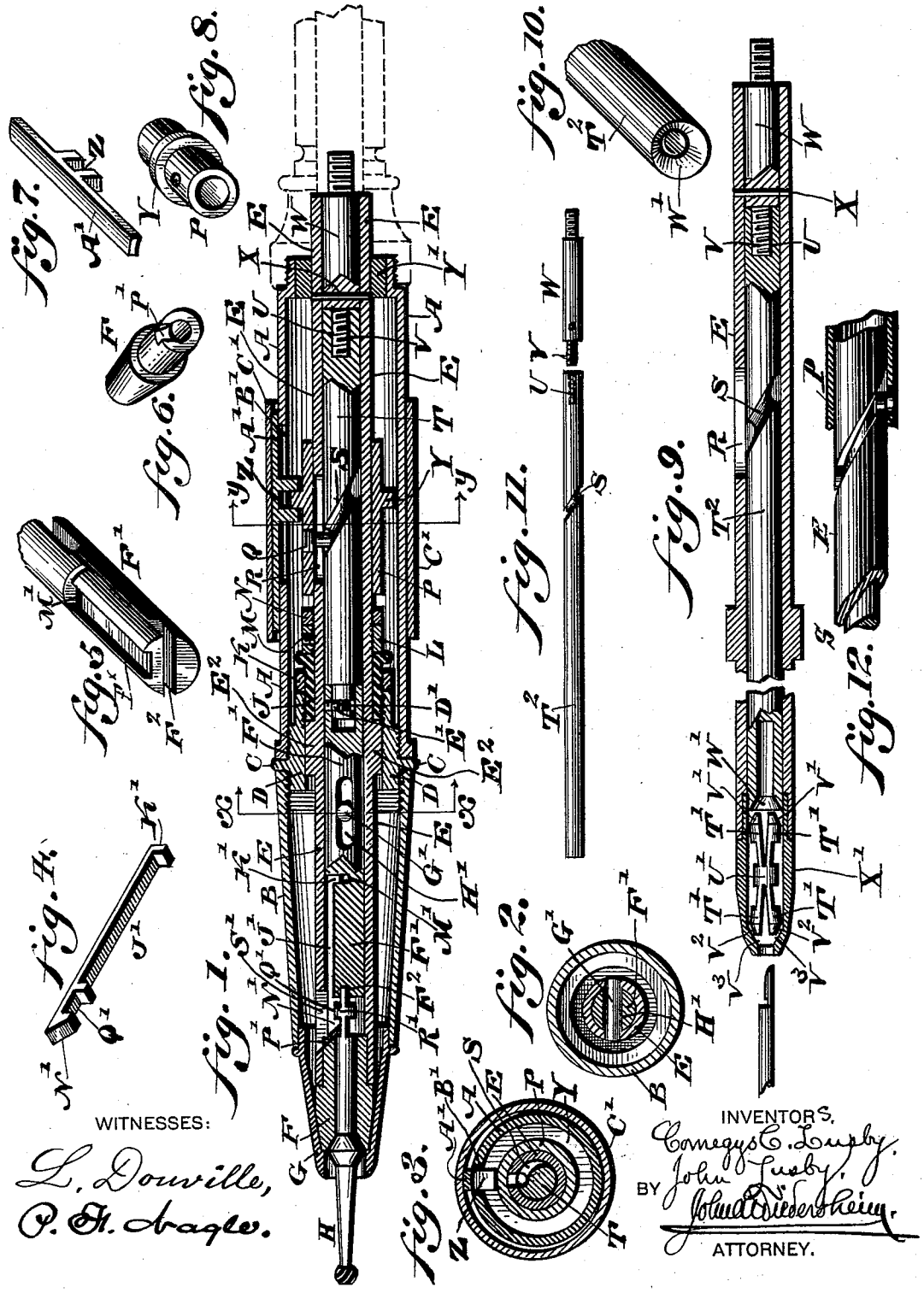
(No Model.)

C. C. & J. LUSBY.

DENTAL HANDPIECE.

No. 583,625. Patented June 1, 1897.



WITNESSES:

L. Douville,

P. H. Drayer.

INVENTORS.

Conneys C. Lusby.

John Lusby.

BY John A. Wiedersheim.

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

COMEGYS C. LUSBY AND JOHN LUSBY, OF PHILADELPHIA, PENNSYLVANIA.

DENTAL HANDPIECE.

SPECIFICATION forming part of Letters Patent No. 583,625, dated June 1, 1897.

Application filed September 25, 1895. Serial No. 563,652. (No model.)

To all whom it may concern:

Be it known that we, COMEGYS C. LUSBY and JOHN LUSBY, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Dental Handpieces, which improvement is fully set forth in the following specification and accompanying drawings.

Our invention consists of a dental handpiece in which provision is made for holding or releasing the bur, instrument, or tool by the action of a spiral groove in the plunger of the piece, said groove receiving a pin or stud to which motions are imparted by an exterior slide which may be engaged by the fingers of the operator, provision being also made for imparting longitudinal motions to said plunger by the action of a screw, pin, or nipple on which said plunger is caused to turn.

It also consists of the novel construction of other parts and details, as will be hereinafter set forth.

Figure 1 represents a longitudinal section of a dental handpiece embodying our invention. Fig. 2 represents a transverse section thereof on line *x x*, Fig. 1. Fig. 3 represents a transverse section on line *y y*, Fig. 1. Fig. 4 represents a perspective view of a latch which engages with the bur employed. Fig. 5 represents a perspective view of a portion of the stem with which said latch and bur engage. Fig. 6 represents a perspective view of a plug employed in the nose of the handpiece. Figs. 7 and 8 represent perspective views of the plate and collar employed for imparting rotation to the plunger of the handpiece. Fig. 9 represents a longitudinal section of a modification on a reduced scale. Fig. 10 represents a perspective view of a detail portion thereof on an enlarged scale. Fig. 11 represents a side elevation of a portion of Fig. 9 removed, on a reduced scale. Fig. 12 represents a side elevation of a modification.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A and B designate sections of the casing of a handpiece embodying our invention. Interposed between the opposite adjacent ends of said sections is a flange C, which projects radially from the collar D, to which said sections are screwed, said collar D embracing a portion of the hollow spindle E, the forward end of which is firmly secured to the tubular plug F, which is freely fitted within the nose G of the handpiece and receives a portion of the bur H. A portion of the interior surface of the collar D is threaded for engagement of the ring J, which freely encircles the contiguous portion of the spindle E and has on its exterior the nut K, which is adapted to tighten against the end of the collar D for holding the latter firmly and stationary in position. The end of the ring J has abutting against it the washer L, which is connected with the spindle E by the screw M and further held on said spindle by the nut N, which engages with said sleeve and jams against said washer.

P designates a sliding collar which freely embraces the contiguous portion of said spindle E and carries the inwardly-projecting stud Q, which passes freely through the slot R in said spindle E and enters the spiral groove S in the plunger T, which is located within the spindle E and is thereby adapted to receive both rotary and longitudinal motions therein. The rear end of said plunger has a threaded opening U to receive the threaded nipple V, which projects forward from the plug W, to which the shaft of the engine is connected, said plug being inclosed by the adjacent portion of the spindle E and connected therewith by the pin X or other suitable means, so that while said plug imparts rotation from the engine or power to the spindle it receives no longitudinal motion, like the plunger T. On the outer periphery of the collar P is a circumferential flange Y, which is freely engaged by the bifurcation Z on the plate A′, said bifurcation passing freely through the slot B′ in the exterior casing A.

The plate A′ is firmly held by the slide or sliding sleeve C′, which freely embraces the adjacent portion of the section A of the casing and is adapted to be engaged by the fingers of the operator, whereby motion may be communicated to the plate A′, the bifurcation Z, the flange Y, the collar P, and stud Q, which latter, playing in the spiral groove S of the plunger T, as has been stated, im-

parts rotary motion to the said plunger. As the rear end of the latter turns on the screw-nipple V, owing to the threaded opening U in said plunger, forward or backward longitudinal motions are imparted to the plunger according to the direction in which the finger-piece or slide C′ is moved.

The forward end of the plunger has a neck D′ formed therein, the same receiving the pin or stud E′, which projects inwardly from the wall of the hollow end of the stem F′, which is located within the spindle E, said hollow end freely receiving the neck and adjacent portion of the end of the plunger, said stem F′ being connected with the spindle E by means of the pin G′, which is attached to said spindle and passes freely through the slot H′ in said stem, it being evident that longitudinal motions may be imparted to said stem by said plunger.

In the forward end of the stem F′ is a recess F^2, which is designed to receive and interlock the rear end of the shank of the bur or tool, said end being squared or angular.

J′ designates a latch, the rear end of which has a lip K′, which is adapted to enter and interlock with the recess M′ in the stem F′. The forward end of said latch has a nose N′, which is adapted to enter the inclined recess P′ in the rear end of the tubular plug F and ride on the inclined wall thereof. The side of the stem F′ is provided with a longitudinal recess $F^{\times}$, in which the main portion or body of the latch is seated, so as to prevent lateral movement or play of the same.

On the latch, rearward of the nose N′, is a bifurcation Q′, which is adapted to embrace the shoulder R′ on the shank of the bur, near the inner end thereof.

In the wall of the spindle E, adjacent to the nose N′ and bifurcation Q′, is a slot S′ to receive the relative end of the latch when thrown back by the forward motion of said latch, in which case said nose rides on the inclined face of the recess P′, which it does when the stem F′ is advanced in order to release the bur when the latter is to be removed, it being noticed that the latch J′ is elastic in its nature, and that when the stem F′ is withdrawn or moved backward the latch returns to its normal position and is pressed inwardly by the contiguous wall of the spindle E, so that the bur will be held in the handpiece.

The operation is as follows: The tool being in the position shown in Fig. 1, power is transmitted to the plug W and rotary motion accordingly imparted to the spindle E, with the attached washer L and nut N, the collar P, with flange Y and stud Q, the plunger T, the stem F′, the latch J, and the bur. When it is desired to remove the bur from the handpiece, the slide is moved, in the present case, to the right. The plate A′ follows the motion and carries the collar P with it, whereby the stud Q plays in the spiral groove S, and consequently rotates the plunger T, so that the latter turns on the nipple V and slides to the left. The stem F′ is likewise moved to the left, whereby the latch J′ is raised and removed from the shoulder R′ of the bur, when the latter may be displaced from the piece. When the bur is inserted and the slide is moved in reverse direction, the plunger is returned or directed to the right, and with it the stem F′ and latch J′, the latter then moving into engagement with the shoulder R′ of the bur, so that said bur is firmly locked in the handpiece. The rear end of the piece has the bushing Y′ secured to the section A of the casing, the same freely encircling the spindle E and being formed of metal that forms a hard bearing for the said spindle, which rotates therein. The plug F is also formed of a metal that forms a hard bearing for said plug on the nose of the casing, the same being true of the collar D, it forming a hard bearing for the spindle E at the raised portion E^2, against which latter the ring J abuts, it being also noticed that owing to the nut N provision is made for adjusting the plug F in the nose G when the same becomes worn, so that lost motion will be prevented.

In Figs. 9, 10, and 11 we show a modification in which a clutch in lieu of the latch is employed, the same consisting of the jaws T′, which project in opposite directions from the tubular head U′, the outer ends of said jaws being beveled, as at V′ V^2, the beveled ends V′ being adapted to be closed by the conical opening W′ on the plunger T^2, while the conical ends V^2 ride against the conical walls V^3 on the inner faces of the nose X′, which is connected with the hollow spindle E, within which is the plunger T^2, as clearly shown in said Fig. 9. When the jaws are in the position shown in Fig. 9, the shank of the bur or instrument may be passed into the nose and through the jaws and tubular head, whereupon, when the plunger T^2 is advanced, the jaws T′ will be closed, and as both jaws are advanced by said plunger the jaws T′ are also closed, so as to cause the bur or instrument to be tightly clamped, it being evident that when the plunger T^2 is withdrawn both sets of jaws open, so as to release their hold on the bur.

In Fig. 12 we show a spindle having a spiral groove or slot therein, and a pin connected with the slide or sliding sleeve and passing through said groove into the plunger within said spindle, whereby when the sliding sleeve is operated the pin working in the spiral groove rotates the plunger and the attached screw imparts the forward or backward motion to said plunger, so as to operate the latch or chuck for releasing or holding the bur or tool, as the case may be.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a dental handpiece, a plunger within the casing provided with a spiral groove on the periphery thereof, a sliding piece provided with a stud which freely enters said

groove, a threaded nipple within the casing adapted to engage with said plunger, and means for operating said piece, whereby the plunger may be rotated and receive longitudinal motions.

2. In a dental handpiece, a casing with a longitudinal slot therein, a rotatable hollow spindle within said casing having a longitudinal slot therein, a plunger within said spindle having a spiral groove on its surface, a sliding piece on said spindle provided with a stud, the latter passing through said slot and freely engaging said groove, a sliding sleeve on the casing engaging said sliding piece, a stem attached to said plunger, means for securing a tool or bur to said stem, and a plug having a threaded nipple which is engaged by said plunger.

3. In a dental handpiece, a casing with a longitudinal slot therein, a rotatable hollow spindle within said casing having a slot therein, a plunger in said spindle having a spiral groove on its surface, a plug having a threaded nipple on which said plunger is mounted, a stem connected with said plunger and having in its front end an opening to receive the end of a bur, a sliding collar on said spindle with a stud in said spiral groove, a sliding device on said casing engaging said collar, a latch on said stem provided with means for connecting it with the latter and having its forward end adapted to enter a slot in an adjacent part of the spindle, and a tubular plug in the forward end of the handpiece having an inclined recess in which the beveled nose of the latch rides.

4. In a dental handpiece, a casing with a longitudinal slot therein, a sleeve embracing said casing, a plate connected with said sleeve and having a bifurcated arm in said slot a hollow spindle with a longitudinal slot therein, a collar embracing said spindle and having a lug engaged by said bifurcated arm, a plunger in said spindle having a spiral groove thereon a pin on said collar guided in said slot in the spindle and movable in the groove of the plunger, a stem connected with said plunger, a tool connected with said stem and a plug having a threaded nipple on which said plunger is mounted.

5. In a dental handpiece, a hollow spindle, a plunger in said spindle having a spiral groove in its periphery, a plug secured in the rear end of said spindle and provided with a threaded nipple fitting in a threaded opening in the adjacent ends of said plunger, a sliding stem connected with said plunger a sliding collar on said spindle having a stud entering said spiral groove, a latch connected with said stem and adapted to engage a bur, having an end in said stem, and a sliding plate on said casing having an arm engaging a lug on said sliding collar.

COMEGYS C. LUSBY.
JOHN LUSBY.

Witnesses:
JOHN A. WIEDERSHEIM,
A. P. JENNINGS.