

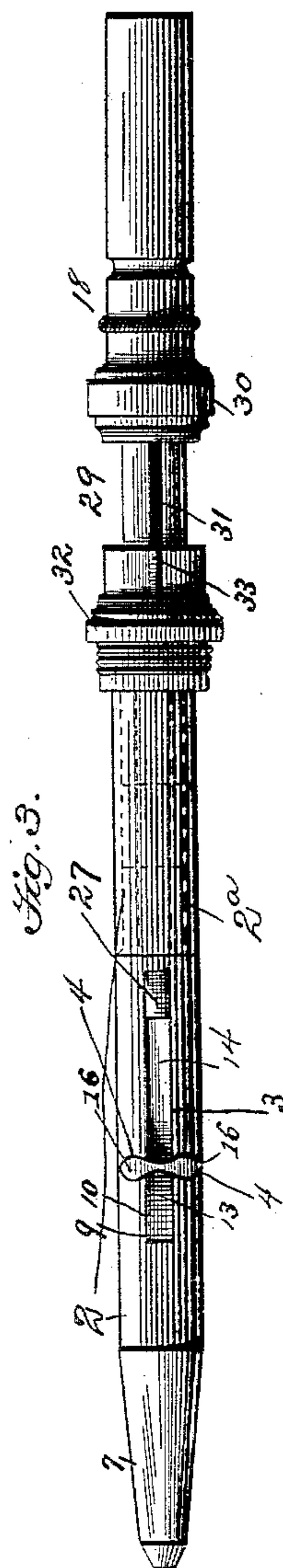
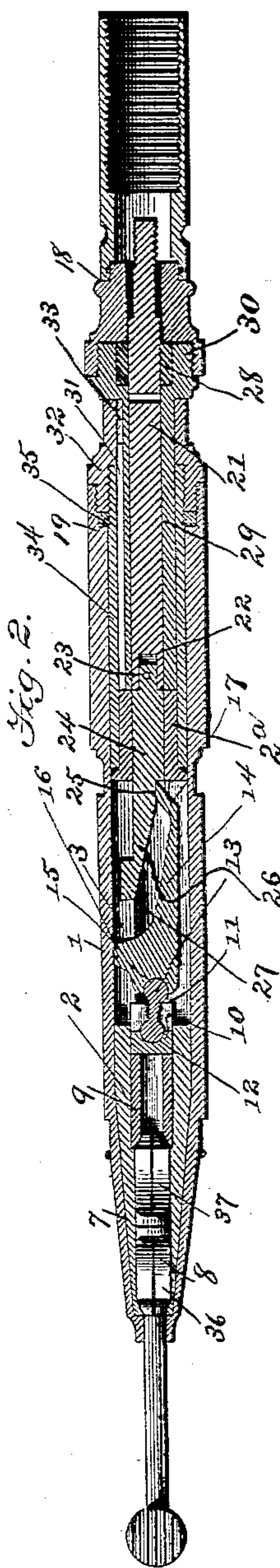
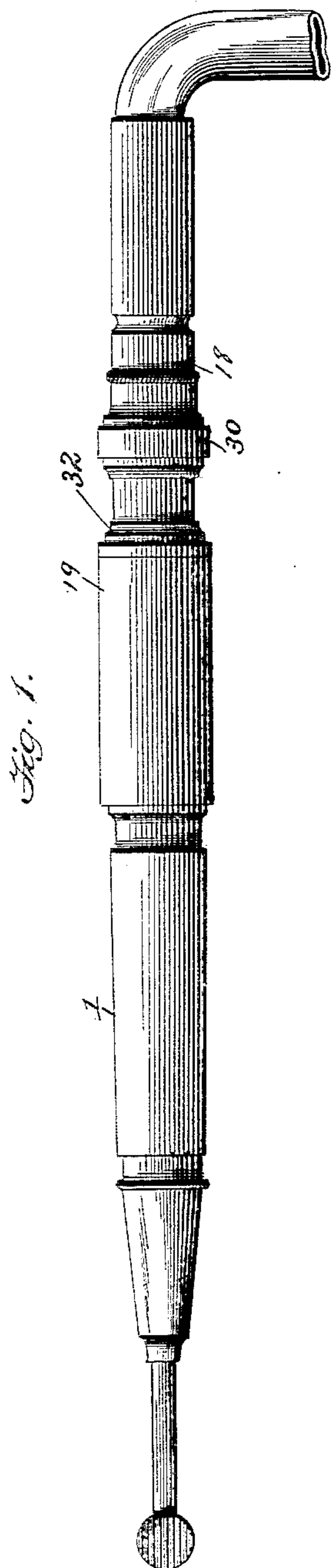
(No Model.)

2 Sheets—Sheet 1.

S. H. BROOKS.
DENTAL ENGINE HAND PIECE.

No. 504,704.

Patented Sept. 12, 1893.



Witnesses:

W. H. Darby
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Inventor:
Stephen H. Brooks
By *W. E. Aufhäuser*
Attorney.

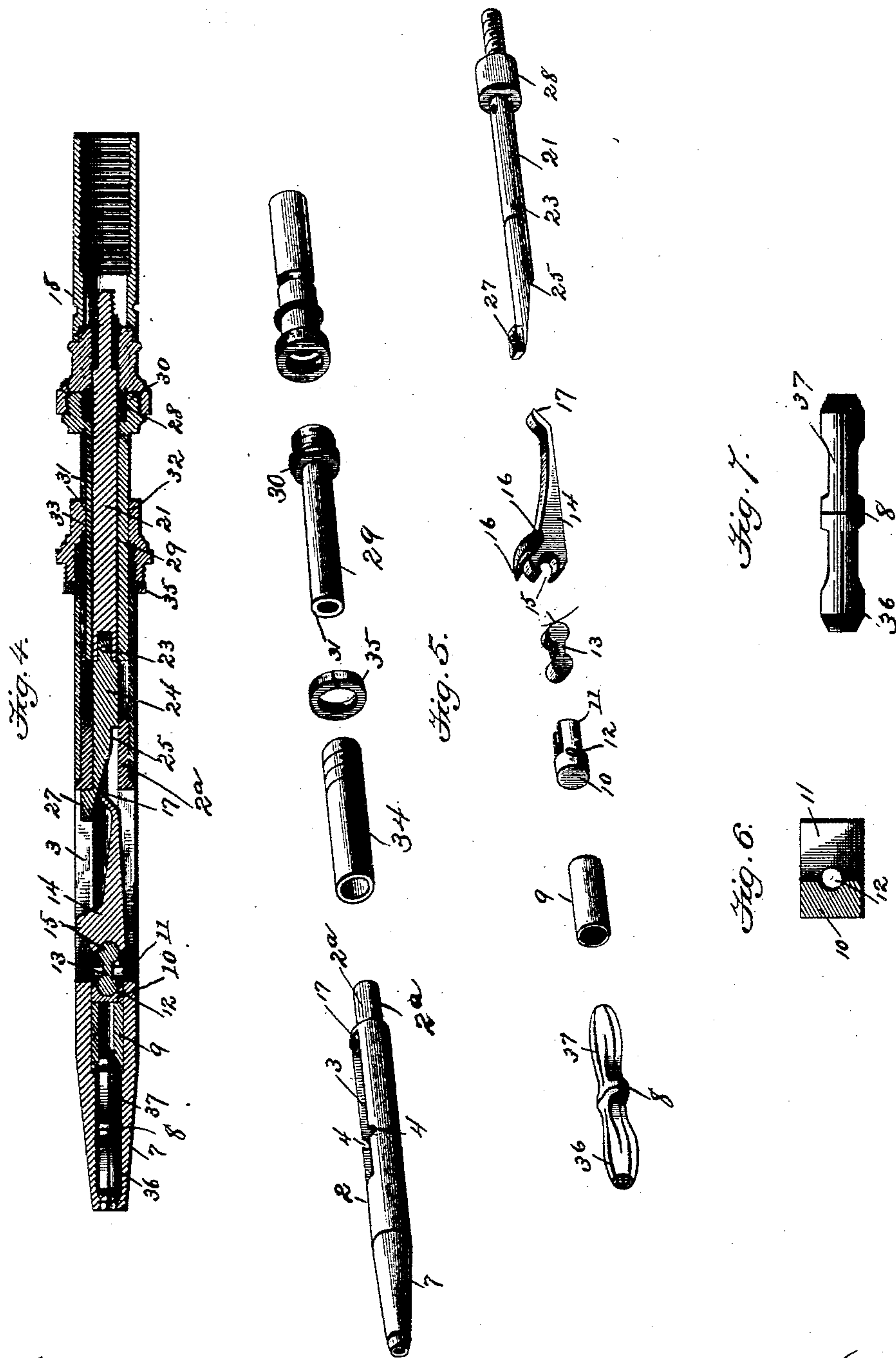
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D. Darby.

Stephen H. Brooks,
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W. E. Hughes,
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UNITED STATES PATENT OFFICE.

STEPHEN H. BROOKS, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE WILMINGTON DENTAL MANUFACTURING COMPANY, OF WILMINGTON, DELAWARE, NEW YORK, N. Y., AND PHILADELPHIA, PENNSYLVANIA.

DENTAL-ENGINE HAND-PIECE.

SPECIFICATION forming part of Letters Patent No. 504,704, dated September 12, 1893.

Application filed February 5, 1892. Serial No. 420,448. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN H. BROOKS, a citizen of the United States, and a resident of the city of Brooklyn, county of Kings, in the State of New York, have invented a certain new and useful Improvement in Dental-Engine Hand-Pieces, of which the following is a specification.

My invention has relation to dental engine hand pieces, and more particularly to that class of hand pieces in which the operator may by a single movement stop the rotation of the burr or tool without interfering with the driving power, and also unlock and disengage the mechanism which secured the said burr inside the tool holder.

In the accompanying drawings forming a part of this specification, Figure 1, is a side elevation of my improved hand piece, the tool or burr being secured in place. Fig. 2, is a sectional view of the same. Fig. 3, is a side elevation of my improved hand piece, showing the position the outer casing assumes before a tool is locked in place, or after it has been unlocked. Fig. 4, is a sectional view of the parts in the position described in Fig. 3. Fig. 5, is a perspective view of the various parts of the hand piece separated and arranged in juxtaposition. Fig. 6, is a sectional view of the saddle. Fig. 7, is a view of the chuck preferably employed in my hand piece.

In the drawings the numeral 1, indicates the outer casing of my hand piece. 2, is the inner rotary tubular shaft having a reduced end 2^a provided with a longitudinal slot 3, for a portion of its length, and having recesses 4, 4 therein, for the reception of the supporting portions of the toggle lever to be hereinafter described.

In the nose portion 7, of the inner rotary tubular shaft 2, is inserted a chuck 8, of any suitable construction. This chuck is caused to engage the shank of the tool by means of a cylindrical block 9, having a tapering recess at one end adapted to ride over the tapering jaws at the inner end of the chuck and so force the chuck forward into engagement with the nose of the tubular shell.

Adapted to operate directly against the in-

ner end of the cylindrical block 9, is a bearing 10, provided with ears 11. This bearing is adapted to slide in the hollowed portion of the rotary shaft 2, and has a concaved recess 12, in its end to receive the rounded end of one member 13, of the toggle lever. As is obvious the bearing 10 may be dispensed with by providing the block 9 at its rear portion with a concaved recess, adapted to receive the end of the member 13 of the toggle lever.

The toggle lever preferably consists of the two members 13 and 14. Both ends of the member 13, are rounded, one of said rounded ends, as already described, fitting in the concave in the bearing 10, and the other rounded end fitting in a corresponding recess 15, in the larger member 14, of said lever. Said larger member is provided with a supporting saddle 16, 16, which fits in the recesses 4, 4, of the rotary tubular shaft 2. Inwardly from said saddle the member 14, is preferably curved, and is also preferably elastic, and provided with a heel piece 17.

I will now describe what may be termed the second or rear section of my dental engine hand piece.

The rear portion 18, of said second section 19, is adapted to be connected to the covering of the flexible driving shaft 20, in any suitable manner.

Extending forwardly from said rear portion 18, is a shaft 21, the forward extremity 22, of which has a flexible connection, as at 23, with a lever 24, adapted to actuate the toggle lever 13, 14, and through the latter the chuck. The lever 24, has a shoulder 25, from where it tapers forwardly, and at its tapered end 26, is provided with a toe 27, at the side of the lever opposite the shoulder 25.

On the shaft 21, is located a collar or boss 28, which acts as a stop for a sleeve 29, which loosely slides over the said rod 21, and lever 24. Said sleeve is provided at one end with a threaded collar 30, adapted to be connected to portion 18, which is coupled to the covering of the flexible driving shaft. The sleeve 29, is provided in its outer side with a longitudinal groove 31, for a purpose to be hereinafter described.

Over the sleeve 29, I also place a short sleeve 32, threaded externally and internally and provided on its inner side with a spline 33, adapted to engage the groove 31, in the sleeve 29.

Another sleeve 34, screws into the said short sleeve 32, and is provided with adjusting means preferably consisting of a split nut 35. The external thread of the sleeve 32, is for the purpose of receiving the threaded end of the casing 1.

To secure a tool or burr in the chuck of the holder the shank of the tool is simply placed in the opening of the nose-piece, it being presumed that the parts are in their retracted positions, (see Figs. 3 and 4.) This being the case, the collar 30, of the sleeve 29, is in its rearward position, resting against the boss 28, the covering of the flexible shaft being secured to said collar and bearing against the outer end of said stop. A slight push by the fingers of the operator will move forward the collar 30, and the tool or burr is thereby caused to be rigidly clamped and held by the chuck. The operation resulting from said forward movement of the collar is as follows, the parts being assembled as shown in the longitudinal sectional view in Fig. 4:—

The forward movement of the shafting and covering and the stop 28, causes the rod 21, and lever 24, to move in the same direction, the movement of the lever being guided by the toe-piece 27, engaging the walls of the slot 3. In sliding forward the portion 26, of the lever 24, engages the heel piece 17, of the toggle member 14, thus depressing it and oscillating it on its supports 16, 16. The rocking of the member 14, causes the member 13, to straighten, and to thus force forwardly the saddle 10, and the block 9. The recessed tapered portion of the forward end of block 9, rides over the correspondingly tapered portion of the inner end of the chuck 8, forcing said chuck forward into the contracted portion of the nose, thereby clamping the tool as shown in Fig. 2. The tool is as readily released, it being merely necessary to give a slight rearward movement to the collar 30, when the resiliency of the parts will instantly allow a rearward movement of the block 9, and the opening of the chuck jaws.

Motion is imparted to the tool or burr when it is clamped by the chuck through the medium of the ordinary flexible shafting used in dental engines, the covering of the said shafting being secured to the hand piece at 18.

Experience has shown that with my new hand piece tools with smooth or any other form of shank may be instantaneously secured and rigidly held in position. I thus dispense with the expensive labor necessary in preparing special forms of shanks for dental tools.

The preferred form of chuck employed by me is that illustrated in Fig. 7. This chuck is produced as follows: I take a blank, half

the desired length of the finished chuck, and cut or ream out the superfluous metal about the center thereof, and taper one end thereof, the other end being left straight or plain. I may bore the blank either before or after the steps already mentioned. The blank is then split longitudinally in the ordinary manner. Two of the half length chucks 36 and 37, are then placed with their butt-ends together, and the entire chuck is completed. The advantages of making a chuck in this manner, and of the completed chuck are that the metal blank is much more conveniently handled; that many small pieces of material may be utilized; that the parts are not so likely to be damaged by the operation, while if one end of the chuck becomes damaged or breaks it is not necessary to discard an entire chuck, as a new end piece may be readily substituted for the damaged portion, both ends, as already intimated, being duplicates.

Among the advantages of my dental hand piece are its simplicity of construction, its non-liability to get out of order, its compactness, and the ease with which its various parts may be separated.

What I claim is—

1. A dental hand piece comprising a chuck, a block for engaging the inner end thereof and a toggle lever for operating said block, substantially as and for the purpose specified.

2. A dental hand piece comprising a chuck, a block for engaging the inner end thereof, a bearing against said block, and an oscillating toggle lever substantially as and for the purpose specified.

3. A dental hand piece comprising a chuck, a block for engaging the inner end thereof, a movable bearing abutting against said block, an oscillating toggle lever and a lever for operating said toggle lever substantially as and for the purpose specified.

4. A dental hand piece comprising a chuck, a block for engaging the inner end thereof, a toggle lever engaging the block, and a lever for operating the toggle substantially as and for the purpose specified.

5. A dental hand piece comprising a chuck, a block for engaging the inner end thereof, a toggle lever, a lever for operating the latter, a driving shaft and a flexible connection between the lever and the driving shaft substantially as and for the purpose specified.

6. A dental engine hand piece, comprising a casing, a slotted tubular rotary shaft within the casing, a toggle having bearings in said shaft, and a lever guided by the slot in said shaft, and means for operating the lever substantially as and for the purpose specified.

7. A dental engine hand piece comprising a casing, a slotted tubular shaft, a toggle lever provided with a heel piece having bearings in the slot in said shaft, a lever guided by said slot, and provided with a shoulder bearing upon the heel piece of the toggle lever substantially as and for the purpose specified.

8. A dental engine hand piece, provided
with a casing, a slotted tubular rotary shaft,
a chuck, a block adapted to engage the chuck,
a toggle lever for operating the chuck, a lever
5 in engagement with the latter, a driving shaft,
a yielding connection between the two last
mentioned elements, a grooved sleeve inclos-
ing the driving shaft and lever, a splined
sleeve fitting over the last mentioned sleeve,
10 and a sleeve 34, extending forwardly from the
spline sleeve, and means for the longitudinal

adjustment of the same, substantially as speci-
fied.

9. A chuck made of two duplicate pieces
having their butt ends in contact substan- 15
tially as and for the purpose specified.

In testimony whereof I hereunto affix my
signature in the presence of two witnesses.

STEPHEN H. BROOKS.

Witnesses:

JOSEPH H. JONES,

CHARLES E. PINSENT.