No. 641,006. Patented Jan. 9, 1900.

J. GEDDES.

CHUCK HANDPIECE.

(Application filed Apr. 27, 1899.)

(No Model.)

Fig. 1.

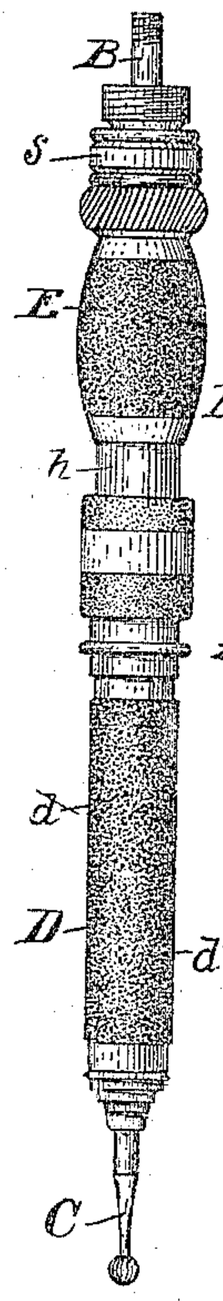


Fig. 2.

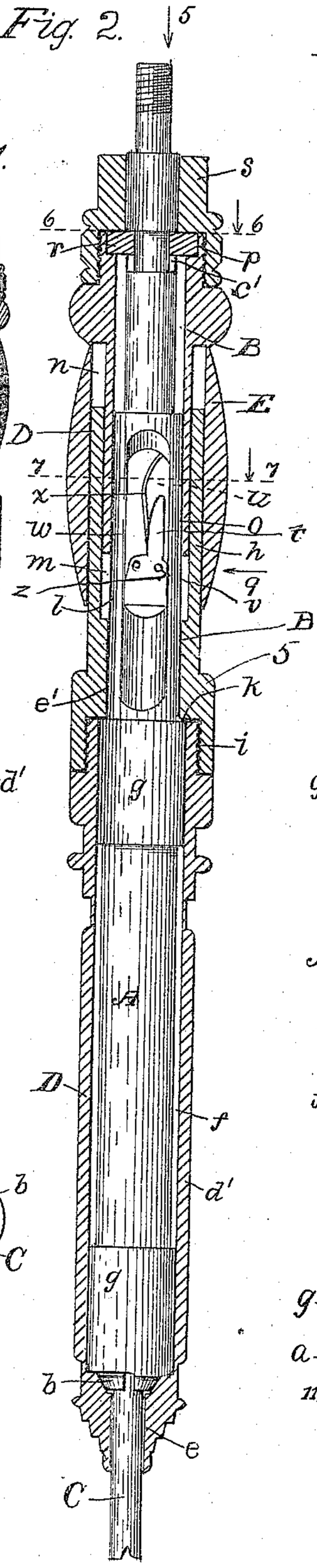


Fig. 3.

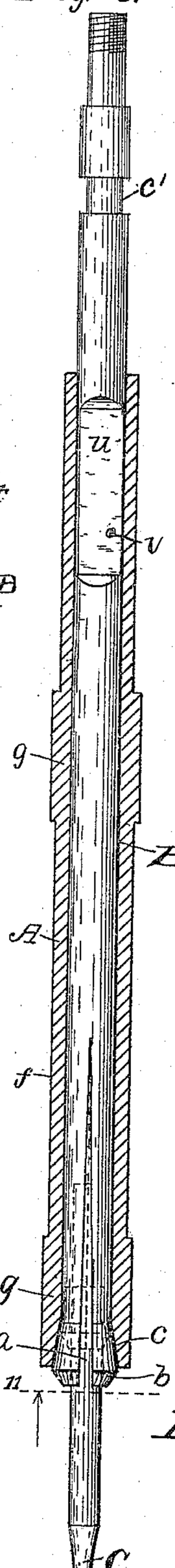


Fig. 5.

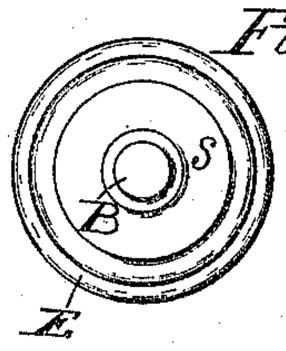


Fig. 6.

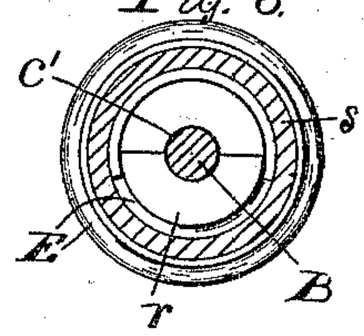


Fig. 4.

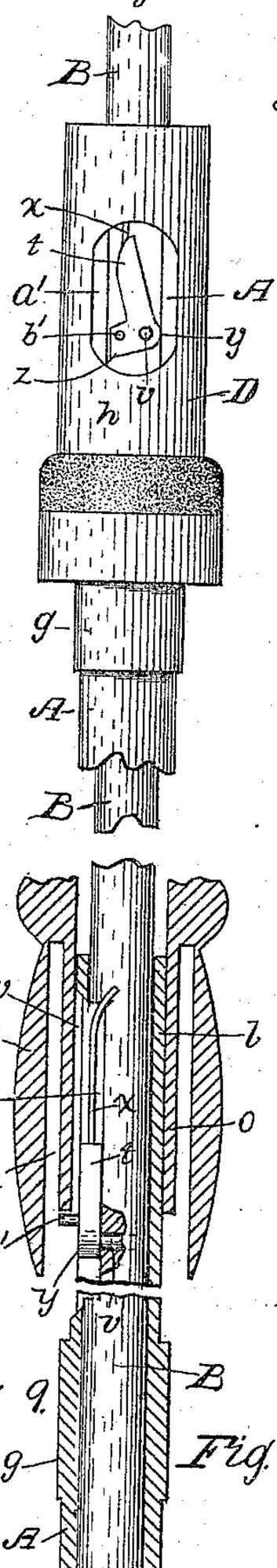


Fig. 7.

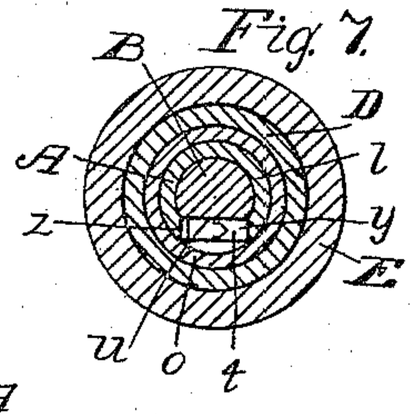
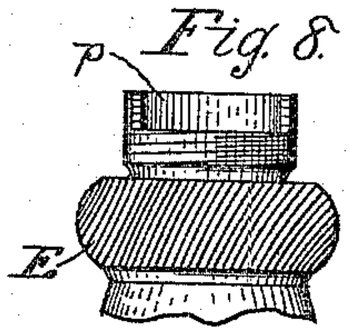


Fig. 8.



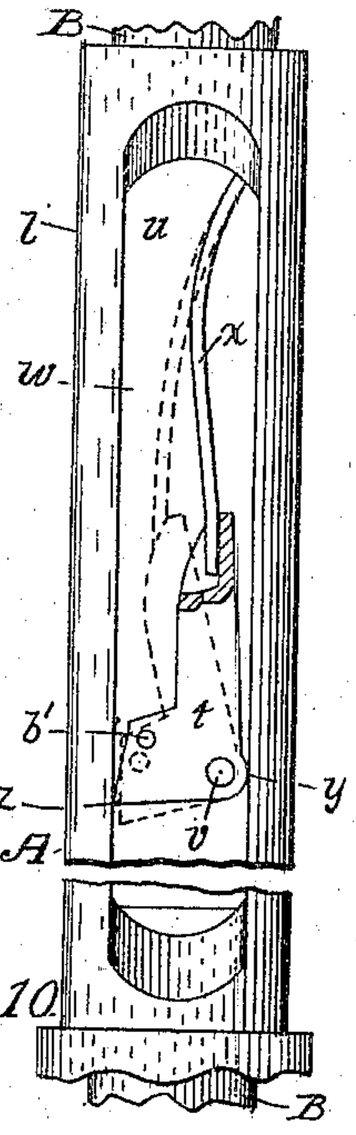


Fig. 11.

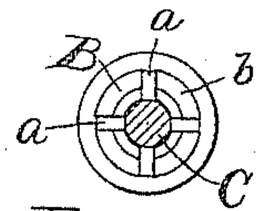


Fig. 9.

Fig. 10.

Attest:
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UNITED STATES PATENT OFFICE.

JOSEPH GEDDES, OF ROCHESTER, NEW YORK.

CHUCK-HANDPIECE.

SPECIFICATION forming part of Letters Patent No. 641,006, dated January 9, 1900.

Application filed April 27, 1899. Serial No. 714,701. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH GEDDES, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Chuck-Handpieces, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention is a chuck-handpiece for the use of dentists, and has for its object convenience of operation and simplicity of construction, also fewness of parts and adaptation for holding with equal facility burs or other tools of different sizes used in dentistry.

The invention is hereinafter fully described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 shows the device as a whole, about full working size. Fig. 2 is a longitudinal section of the spindle barrel or holder and other parts controlling the spindle. Fig. 3 is a longitudinal section of the spindle, better showing the form and operation of the chuck. Fig. 4 is an elevation of the rear part of the spindle-barrel, showing the opening therein. Fig. 5 is a rear end view of the parts, seen as indicated by arrow 5 in Fig. 2. Fig. 6 is a cross-section taken on the dotted line 6 6, Fig. 2. Fig. 7 is a cross-section taken on the dotted line 7 7 in Fig. 2. Fig. 8 is a side elevation of the rear part of the sliding head, showing the cavity for holding the divided ring. Fig. 9 shows a portion of the hollow spindle and driven spindle and associated parts, seen as indicated by arrow 9 in Fig. 2, most of the parts being longitudinally sectioned. Fig. 10 better shows the operation of the retaining-dog. Fig. 11 is an end view of the chuck, seen as indicated by arrow in Fig. 3, the tool being transversely sectioned on the dotted line at the point of the arrow. Figs. 2 to 9, inclusive, and Fig. 11 are drawn to a scale twice, and Fig. 10 to a scale four times, that of Fig. 1.

Referring to the drawings, A is a hollow spindle containing within it the driven spindle B for holding the bur or other tool C. The driven spindle is formed with a conical head *b* at its forward or operative end and divided longitudinally, as shown in Figs. 3 and 11, by cross kerfs or slits *a*. These kerfs or slits are tapered, being widest at the forward end, on account of which the head *b* may be compressed or reduced in diameter, so as to pinch or press the tool firmly when placed within it. The forward end of the hollow spindle A is formed with a conical cavity *c*, corresponding with the tapered head *b*, so that when the driven spindle is drawn longitudinally rearward within the spindle to the position indicated by dotted lines in Fig. 3 the head of the driven spindle will be compressed and so firmly hold the contained bur or tool.

D is a barrel for holding the spindle within which the latter turns. This barrel consists of a rear part or section *h* and forward part or section *d'*, joined by a screw-thread *i*, the barrel being held in the hand of the operator when in use. Portions of the surface of the barrel, as at *d*, Fig. 1, are fretted or roughened to render the operator's hold upon it more certain. The forward end of the barrel is tapered or reduced, as shown in Figs. 1 and 2, so as to be but little larger in diameter than the orifice *e*, through which the shank of the tool is passed when inserting the latter in the driven spindle.

The hollow spindle A is formed with a reduced part of chamber *f*, thus forming journals *g g*, which have bearings upon the inner walls of the section *d'* of the barrel at its rear and forward ends. The rear end of the upper journal is about even with the rear end of the section *d'* of the barrel, as appears in Fig. 2; so the rear section *h*, which is smaller in internal diameter than the section *d'*, when screwed to place upon the forward section presents a shoulder *k* to the end of the journal and prevents endwise movement of the hollow spindle A in the barrel. The section *h* has a bearing *e'* near its lower end against a reduced part *l* of the spindle A, above the rear journal *g*, above which bearing *e'* said section *h* is formed with a chamber *m*, which is counterbored, as clearly indicated in Fig. 2.

A headed sleeve E is constructed to telescope upon the rear end *h* of the barrel D, formed with a chamber *n*, in which to receive the rear end of the barrel, and an inner cylindrical thimble *o* to occupy the chamber *m*. This sleeve E is adapted to slide longitudinally with a snug fit upon the part *h* of the barrel. This sleeve is counterbored at its

upper end to form a chamber or cavity *p*, Figs. 2 and 8, in which is seated a divided ring or annular part *r*, surrounding the reduced portion of and occupying a space *c'*, formed in the driven spindle B. This construction permits of the longitudinal movement of the sliding sleeve to actuate the spindle B, while retaining the parts in their proper parallelism and preventing separation thereof. A screw-cap *s*, threaded upon the rear end of the sleeve E, bears upon the rear surface of the ring *r*, which serves to confine the latter in the chamber *p* and hold it rigidly in place. The chamber *p* is open at one side, as appears in Fig. 8, to facilitate the placing of the ring in the chamber. Now it will be understood that if the sliding sleeve E be moved longitudinally upon the barrel D the driven spindle will be correspondingly moved longitudinally within the hollow spindle and on account of the divided tapered head *b* will thus either grasp or release the tool C, as the case may be. With every longitudinal movement of the sliding sleeve the driven spindle partakes, the two parts thus moving practically as one piece.

To hold the driven spindle in position when drawn rearward to grasp the tool, I employ a dog *t*, Figs. 2, 7, 9, and 10, placed in a longitudinal cavity or depression *u*, Figs. 3 and 9, in the driven spindle. The dog is held to place by a pivot-pin *v*, extending through the body of the driven spindle, upon which it is adapted to turn in a plane parallel with the axis of the driven spindle. The reduced part *l* of the hollow spindle is likewise formed with a slot or opening *w*, Figs. 2, 4, 7, and 10, opposite and corresponding in width with the depression *u*, which opening *w* the dog occupies. A spring *x*, rigid in the driven spindle, is adapted to bear upon and control the dog. The dog is formed with a circular part or hub *y* around the pin *v*, which circular part bears at all times against one wall of the opening *w*, while its point *z* is adapted to bear against the opposite wall of said opening. The distance between the bearing-points *y* and *z* of the dog is a little greater than the width of the opening *w* in the spindle, so that when turned to the proper position the dog will bind between said walls and so temporarily lock the driven spindle and the hollow spindle rigidly together; but when the dog is turned to another position the point *z* will clear the adjacent wall of the opening and so release the driven spindle from the hollow spindle, the dog being thus adapted to either engage or clear the spindle A, as the case may be. The action of the spring is such as to hold the dog normally in the locked position.

The section *h* of the spindle-barrel is formed with an opening *a'*, Fig. 4, in a position through which to have access to the dog for inserting or removing it.

When the sliding sleeve E, with the chuck, is drawn rearward by hand to tighten the tool, the dog, actuated by its spring *x*, will automatically lock the driven spindle to the hollow spindle in the manner above stated, the tool being then firmly held by the driven spindle until released. The dog is provided with a pin *b'*, projecting beyond the outer surface of the spindle and in the way of the thimble *o* of the sliding sleeve E, and to release the tool the sleeve is pushed forward upon the barrel, causing the thimble to encounter said pin *b'*, Fig. 9, of the dog, which turns the latter downward against the action of the spring, and so freeing the dog from the spindle. It will be observed from Fig. 2 that the space *c'* of the driven spindle is somewhat longer than the thickness of the divided ring *r*, which allows for the sleeve E a slight longitudinal motion independent of the driven spindle. This is for the purpose of allowing the sleeve to move in advance of the driven spindle and loosen the dog and so free the driven spindle from the hollow spindle before the sleeve commences to move the driven spindle.

When the sleeve E is pulled rearward for the purpose of tightening the tool, as above stated, the lower free edge of the thimble keeps just in advance of the pin *b'* as both move upward, as appears in Fig. 9, the ring *r* being against the rear shoulder of the space *c'* in the driven spindle, as appears in Fig. 2. When releasing the tool, the sleeve E frees the dog before moving the driven spindle, as above stated.

A great variety of burs and other tools C are used in dental work the shafts or shanks of which vary in diameter, and this holding driven spindle is designed to receive and hold any and all of the different sizes with equal facility.

The rear ends of the driven spindle and of the screw-cap *s* are threaded, as appears in Fig. 1, for the purpose of attaching the device to the driving mechanism ordinarily used by dentists for the purpose.

What I claim as my invention is—

1. A chuck-handpiece for dental work, consisting of a barrel or case, in combination with a hollow spindle in the barrel or case, and a chuck-spindle within the hollow spindle, means for moving the chuck-spindle longitudinally in the hollow spindle and locking means within the chuck-spindle engaged by the spindle-moving means, substantially as specified.

2. The combination, in a chuck-handpiece, of a holding-barrel, and a hollow spindle in the barrel, and a chuck-spindle within the spindle, adapted to move longitudinally therein, the chuck-spindle being formed with a divided tapered or conical head, and the spindle having a conical chamber to receive the head and means pivotally mounted on the chuck-spindle to be engaged by the chuck-spindle-moving device and constructed to lock and unlock the hollow and chuck spindles, substantially as specified.

3. A device of the kind described, having a hollow barrel or inclosing case composed of two parts joined, said parts having different

internal diameters forming an internal shoulder, and a hollow spindle within the barrel or case bearing against its inner walls, the spindle having parts of different diameters and a shoulder to meet the shoulder of the barrel or case and chuck-spindle within the hollow spindle and means carried thereby for locking the two spindles together, substantially as and for the purpose specified.

4. A device of the kind described, having a hollow case or barrel, and a hollow spindle in said case or barrel, the latter being internally chambered, in combination with a sleeve or cover for the end of the barrel, mounted to slide thereon, and formed with a part to close over the barrel and a part to enter within the barrel, said sleeve adapted, when moved, to operate mechanism within the hollow spindle, substantially as shown and described.

5. A device of the kind described, having a holding barrel or case and a hollow spindle adapted to turn in the barrel or case, and a chuck-spindle in the hollow spindle, and a headed sleeve adapted to cover the end of the barrel and slide longitudinally thereon, in combination with a cap for the sleeve, and a part held by the sleeve and the cap and embracing a reduced portion of the chuck-spindle to engage the chuck-spindle whereby the latter will partake of the longitudinal motions of the sleeve upon the barrel, substantially as and for the purpose specified.

6. A device such as described, having a holding barrel or case, a hollow spindle in the barrel, and a chuck-spindle in the hollow spindle, and a sleeve adapted to cover the end of the barrel and slide longitudinally thereon, in combination with a cap for the sleeve, and a part held by the sleeve and in the recess in the cap to engage the chuck-spindle to move the latter, the sleeve having a slight longitudinal motion independent of the chuck-spindle said sleeve by its independent movement adapted to operate locking mechanism for the chuck and hollow spindles, substantially as and for the purpose set forth.

7. A device of the kind described, having a barrel, and a hollow spindle in the barrel adapted to turn therein, in combination with a chuck-spindle therein adapted to move longitudinally in the spindle, and means pivotally mounted on the chuck-spindle to engage the wall of the hollow spindle to lock the two together for causing the spindle and the chuck to turn together, substantially as shown and described.

8. A device of the kind described, having, in combination with a barrel, a hollow spindle in the barrel, a chuck-spindle therein, the chuck-spindle being provided with a dog and the hollow spindle formed with an opening opposite the dog, the latter being adapted to engage the hollow spindle, and a sliding sleeve disposed to operate said dog substantially as and for the purpose specified.

9. A device of the kind described, having, in combination with a barrel, a hollow spindle in the barrel, a chuck-spindle therein, the chuck-spindle being provided with a dog, and the hollow spindle formed with an opening opposite the dog, the latter occupying said opening and adapted to bear against both walls of said opening and a sleeve mounted to slide upon the barrel and hollow spindle and to engage means on the dog to operate same, substantially as shown and described.

10. A device of the kind described, having, in combination with a barrel, a hollow spindle-barrel, a chuck in the spindle therein, the chuck-spindle being provided with a dog, and the hollow spindle formed with an opening opposite the dog, the latter occupying said opening and held to turn upon a pivot in the chuck-spindle, and having a circular part in contact with a wall of said opening, and a point or edge adapted to either engage or clear the opposite wall of the opening, and a spring to normally hold the dog to engage simultaneously both walls of the opening and means movable over both the hollow spindle and the barrel for engaging means on the said dog to actuate same, substantially as and for the purpose specified.

11. A device of the kind described, having, in combination with a barrel, a hollow spindle in the barrel, a chuck-spindle in the hollow spindle, the chuck-spindle being provided with a dog, and the hollow spindle formed with an opening opposite the dog, the latter occupying said opening and adapted to bear against both walls thereof, and a pin projecting radially without said opening, and a sliding sleeve for the barrel, adapted to engage said pin, substantially as specified.

12. A device of the kind described, having, in combination with a barrel, a hollow spindle in the barrel, a chuck-spindle therein, the chuck-spindle being provided with a dog, and the hollow spindle formed with an opening opposite the dog, the barrel having an opening opposite the opening in the spindle, means on the dog projecting through said opening and means movable over the barrel and hollow spindle for engaging said means to actuate the dog, substantially as shown and described.

In witness whereof I have hereunto set my hand, this 25th day of March, 1899, in the presence of two subscribing witnesses.

JOSEPH GEDDES.

Witnesses:

ENOS B. WHITMORE,

M. L. WINSTON.