E. C. PECK.

ARBOR FOR SHELL TOOLS.

APPLICATION FILED MAR. 10, 1906.

906,656.

Patented Dec. 15, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

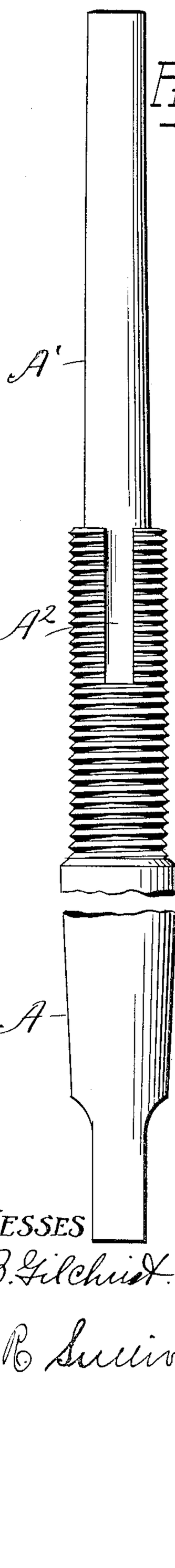


Fig. 2.

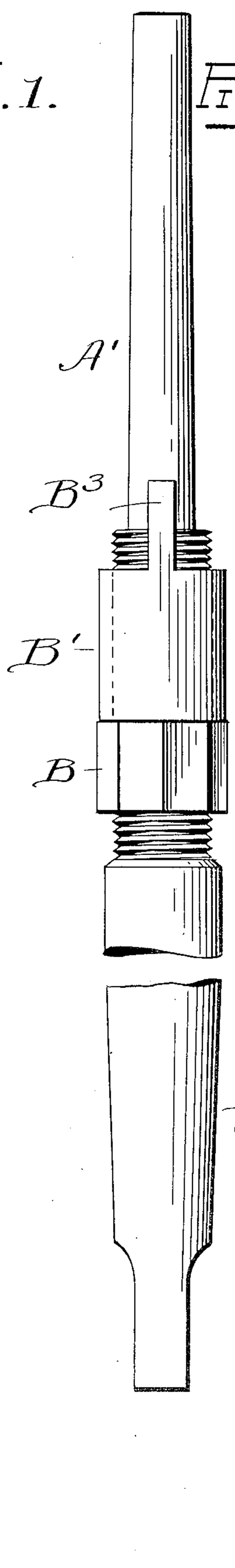
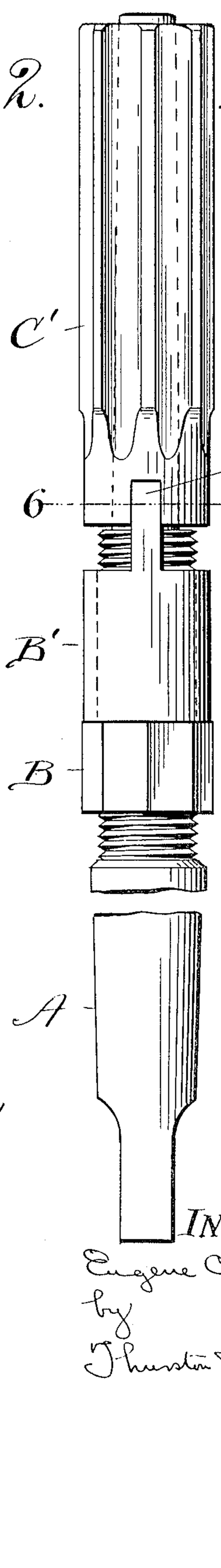


Fig. 3.



WITNESSES

E. B. Gilchrist.

H. R. Sullivan

INVENTOR

Eugene C. Peck

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2 SHEETS—SHEET 2.

Fig. 4.

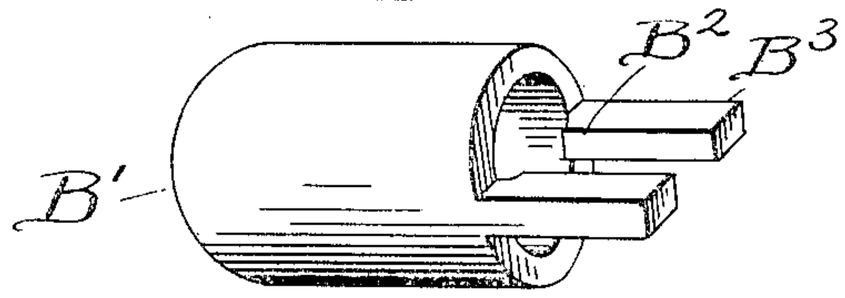


Fig. 5.

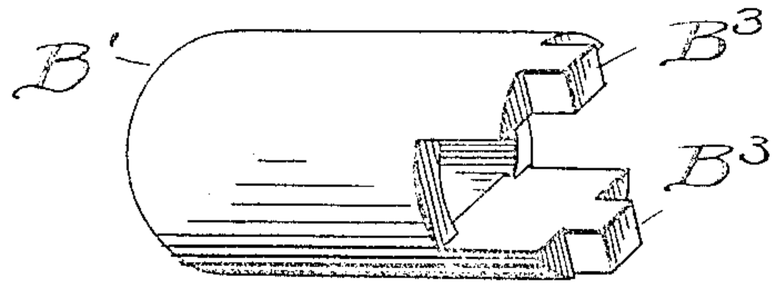


Fig. 6.

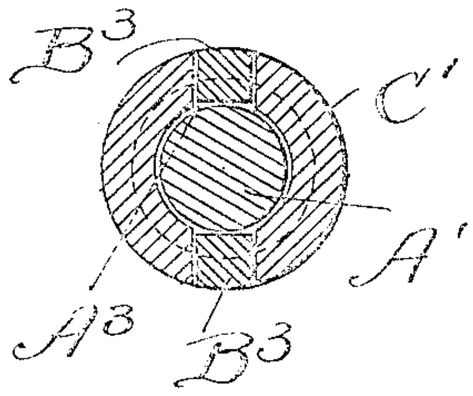


Fig. 7.

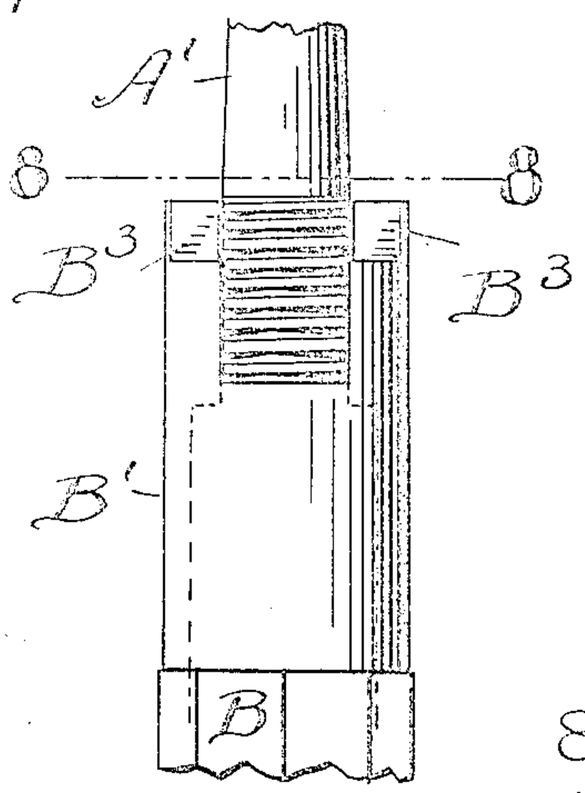
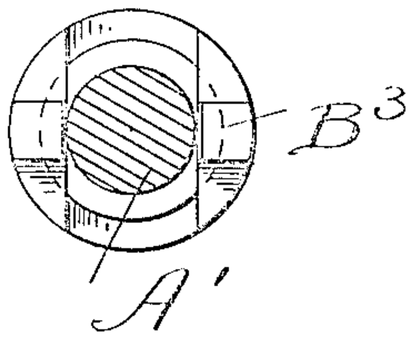


Fig. 8.



WITNESSES.

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UNITED STATES PATENT OFFICE.

EUGENE C. PECK, OF CLEVELAND, OHIO, ASSIGNOR TO THE CLEVELAND TWIST DRILL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

ARBOR FOR SHELL-TOOLS.

No. 906,656. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed March 10, 1906. Serial No. 305,218.

To all whom it may concern:

Be it known that I, EUGENE C. PECK, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Arbors for Shell-Tools, of which the following is a full, clear, and exact description.

My invention relates to arbors of that class having a stem provided with a tapered exterior adapted to receive a cutter head or other shell tool having a tapered axial bore.

The invention more particularly relates to the provision of a longitudinally adjustable non-rotatable collar adapted to engage the tool, without being secured thereto,—so that variations in fit between the tool and stem may be compensated.

The cutters used in connection with such arbors are of various sizes and diameters and have tapered axial bores designed to pass over the tapered stem of the arbor until the tapered surfaces engage each other and the wedging action is sufficient to retain the shell against longitudinal movement. But inasmuch as the common method of preventing the rotation of the shell has been to provide the arbor shank with longitudinally projecting fixed ribs and to form the cutter with notches adapted to engage such fixed ribs, there has been great difficulty experienced in securing the cutter properly upon the arbors. For example, when, by reason of the distortion of the stem or the accumulation of dirt thereon, it is not possible to advance the cutter so that the notches at the upper end come into full engagement with the fixed ribs, the cutter will, under strain, slip and rotate upon the stem of the arbor. Again, when the bore of the cutter is so large that the bottom of the notches or any part of the shell abuts against any fixed part of the shank, then, as will be plain, no wedging action takes place between the interior surface of the cutter and the exterior surface of the stem to hold the cutter fixedly in position. I am aware that it has been sought to avoid this trouble by doing away with a tapered stem and using a cylindrical stem instead and employing a non-rotatable collar having bayonet clutches adapted to engage coöperating notches on the upper part of the cutter shell. In this prior structure the cutter is secured by the bayonet clutches to the collar and is not longitudinally movable independent thereof after it has once been placed in position. Such a structure is not satisfactory for several reasons. Among others, the bore of the cutter must fit very accurately to the stem, otherwise the looseness of the parts will be sufficient to destroy the cutter's efficiency. Furthermore, the cutter frequently becomes wedged upon the bayonet locks and it becomes necessary to place the two in a clamp before the parts can be disengaged. I have, however, devised a structure in which engagement between the notches of the shell and the ribs holding the cutter against rotation may be perfect notwithstanding the variations in fit between the axial bore and the tapered stem, and further the loosening of the engaging elements may be effected without the use of additional tools.

Referring to the drawings, Figure 1 is an elevation of my improved arbor without the removable parts. Fig. 2 is an elevation of the arbor with the longitudinally adjustable collar and the adjusting nut thereon. Fig. 3 is an elevation of the arbor with the adjusting nut and collar thereon and a cutter fixed on the tapered stem. Fig. 4 is a perspective view of the adjustable collar. Fig. 5 is a perspective view of a modified form of adjustable collar showing a different construction for preventing rotation of the collar upon the arbor. Fig. 6 is a cross section taken upon the line 6—6 of Fig. 3. Fig. 7 is an elevation, and Fig. 8 is a section on line 8—8 of Fig. 7 illustrating the modification shown in Fig. 5.

In the structure which I have devised the arbor is screw threaded between the shank A and the tapered stem A′ and adapted to receive an adjusting nut B thereon. In front of the adjusting nut I place a longitudinally adjustable collar B′ which is secured against rotation by any preferred means, such as a longitudinal feather B^2 fitted to a groove A^2 in the shank, or by flat broad surfaces adapted to engage similar surfaces upon the shank as shown in the modification in Fig. 5, or by any other convenient means. At the forward end of the adjustable collar are projecting lugs or ribs B^3, B^3, designed to fit into notches C in the upper end of the ordinary cutter C′.

By this structure it will be seen that the cutter C′ may be moved over the tapered stem A′ until it is firmly wedged thereon.

When it is firmly in position it is immaterial whether this position is a little in advance or behind the ordinary location for which it was designed, as the adjusting collar may be either advanced or retracted correspondingly so as to cause a full engagement of the ribs with the notches of the shell and yet avoid any abutment between the same which would prevent the proper wedging action taking place between the shell and the stem. Further, as will be evident, it is immaterial how tightly the cutter may become wedged upon the stem during use, as it can be readily detached by hand through the simple rotation of the adjusting nut, which, acting as a slow wedge, moves the adjusting collar forward, driving the shell off of the stem. Thus, it will be seen that I have provided an arbor having all of the advantages of those hitherto known in the art, and in addition thereto having an amount of adjustability coupled with closeness of fit and capacity for disengagement not hitherto possible.

Having described my invention, I claim:

1. In combination, in an arbor, a tapered stem adapted to receive a shell tool, a non rotatable longitudinally movable member adapted to engage with said tool after the latter has been wedged on the stem and to hold said tool against rotation, and means for forcing said non-rotatable member in the direction to loosen the tool from the arbor stem.

2. In combination, a shell tool and an arbor, the arbor adapted to receive the tool and having a longitudinally movable member designed to hold said tool against rotation, said tool and said member being so constructed that positive engagement between them may be effected by the longitudinal movement of said member.

3. In combination, in an arbor, a tapered stem adapted to receive a shell tool and a non-rotatable longitudinally movable member having a smooth surface adapted to be brought into engagement with a corresponding surface lying in a longitudinal plane on the tool by the longitudinal movement of said member.

4. In combination, in an arbor, a tapered stem, a screw threaded portion, a nut upon said threaded portion and a non-rotatable longitudinally movable member having means thereon adapted by a longitudinal movement thereof to engage a shell tool and hold the same against rotation.

5. An arbor having a tapered end adapted to receive a tool and a screw threaded portion, a nut on the threaded portion, a sleeve slidably but non-rotatably mounted on said arbor and arranged to abut against one end of the nut, and means on the sleeve adapted to interlock with the tool.

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

EUGENE C. PECK.

Witnesses:
J. M. WOODWARD,
E. B. GILCHRIST.