No. 886,862. PATENTED MAY 5, 1908.

P. REPSOLD.

DRILLING APPARATUS.

APPLICATION FILED JULY 25, 1906.

Fig. 2

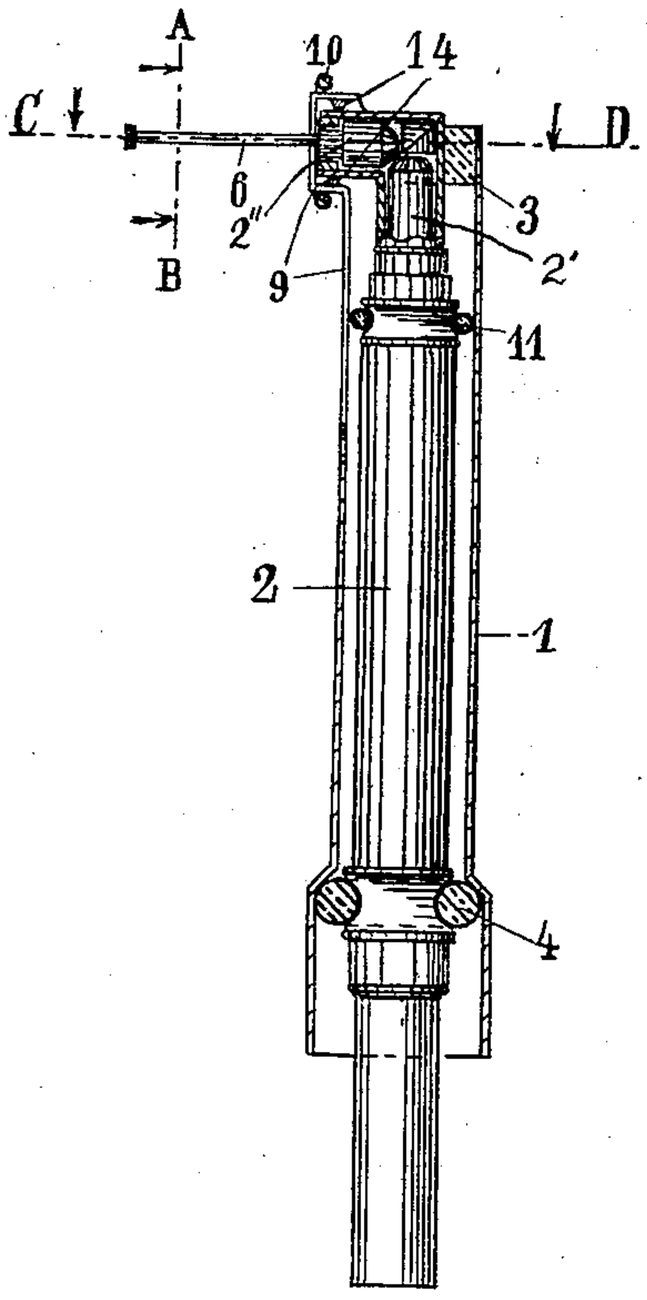


Fig. 3

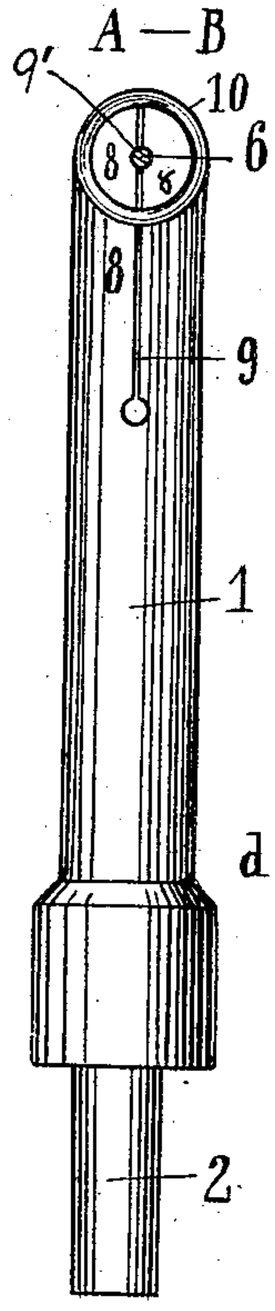


Fig. 4.

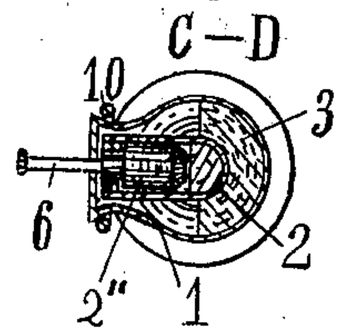
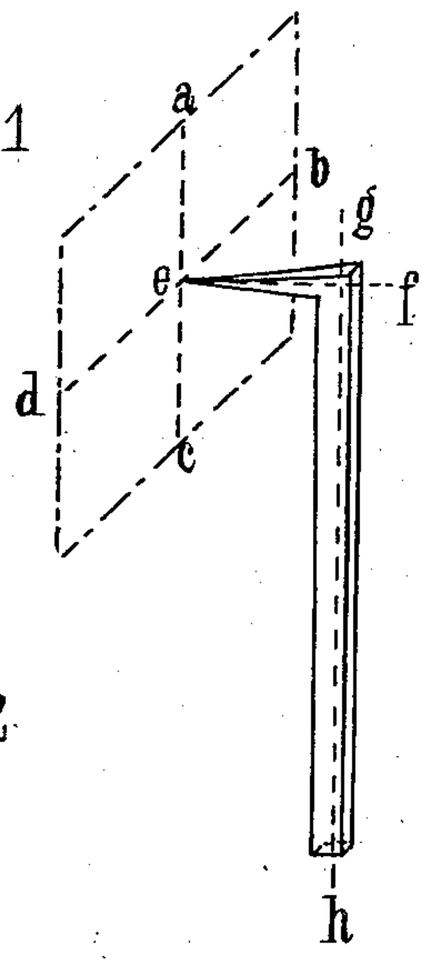


Fig. 1.



Witnesses.
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UNITED STATES PATENT OFFICE.

PAUL REPSOLD, OF RIGA, RUSSIA.

DRILLING APPARATUS.

No. 886,862. Specification of Letters Patent. Patented May 5, 1908.

Application filed July 25, 1906. Serial No. 327,746.

To all whom it may concern:

Be it known that I, PAUL REPSOLD, surgeon dentist, citizen of the Kingdom of Prussia, residing at Riga, Kaufstrasse 3II, Empire of Russia, have invented certain new and useful Improvements in Drilling Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in drilling apparatus and more especially to drilling apparatus suitable for the use of dentists.

The object of my invention is to provide a special holder or casing designed to inclose the handle of the drilling apparatus and such form of a casing has been devised for use with a drill adapted for drilling at an angle to the handle. A similar device has been devised by me and is found in my Letters Patent No. 866,518.

In the construction of my device I have taken into account the effect of reaction upon such a drill and the present casing is devised to greatly reduce the force of vibration due to the operation of the drill.

In the accompanying drawings forming a part of this application and in which similar designating numerals denote the same parts throughout the several views:—Figure 1 is a diagrammatical view illustrating the action on the drill of the forces due to reaction. Fig. 2 is a longitudinal section through the casing with the drill inclosed therein partly in elevation and partly in section. Fig. 3 is an elevation of the casing taken on a plane A, B at right angles to that of Fig. 2. Fig. 4 is a plan view partly in a horizontal section taken on the line C, D of Fig. 2.

Referring more specifically to the drawings, the numeral 1 designates the outer casing inclosing the drill handle 2. The said casing is arranged free from contact at all points with said handle, but rubber rings 4 and 11 are disposed between said casing and handle, adapted to impart an elastic connection between the two.

It is to be understood that the handle 2 is of the ordinary hollow form and is provided with a rotary shaft 2′ journaled therein and adapted through suitable beveled gears or equivalents thereof to impart rotary motion to the shaft 2″ journaled in the angular portion of the drill handle which is provided at the free end thereof. In the rotary shaft 2″ is removably mounted the drill 6.

The upper end of the casing 1 is formed on one of its sides with a longitudinal slot 9, providing opposite tongues 8, herein shown as being restrained from separation by means of a ring or clip 10, said tongues being each provided with a semi-circular recess coincident with each other and forming a bearing 9′ for rotatably journaling the drill 6.

The ring or stop 14 may also be advantageously provided and lies between the drill handle and the casing adjacent the free end of said handle.

The reaction on the point of the drill is illustrated in Fig. 1 and may be resolved into four forces *ea, eb, ec, ed,* whereof *ea* and *ec* act parallel to the axis *gh,* of the handle, while the forces *eb* and *ed* act at right angles thereto. The varying action of these four forces renders the solution of the problem some difficult as the forces act partially parallel to the arm *ef* and partially perpendicular to this arm so as to produce around the axis *gh* a torque, of which the distance *ef* constitutes the arm. The solution of the problem is effected by spring mounting the rear end of the handle, while arranging the drill in a bearing or aperture and supporting the apex of the angle of the handle within the casing by means of a suitable elastic member.

The apex of the angle, which has to withstand the torque due to the forces *eb, ed* acting with the leverage *ef* is here disclosed as mounted in a bearing of elastic material 3, such as india rubber, the bearing surface consisting of a semi circular recess. However, it may be desirable that the rear end of the short rotary shaft section 2″ should be accessible and under such circumstances the spring bearing 3 may be adapted to slide longitudinally of the handle, or may be replaced by a bifurcated metallic spring. It is also noted that the stop 14 above referred to is adapted to relieve the tongues 8, 8 from undue strain due to the action of the forces *ea, ec.*

I do not wish to be understood as confining the invention to any special materials or for use with the single form of drill handle herein illustrated, but desire to cover all forms and embodiments of the same that will fall within the spirit and scope of the appended claims, and especially with a form of casing consist-

ing of two parts and retained together by suitable means.

I claim:

1. A drilling apparatus comprising a handle having a main portion and a portion disposed at an angle to said main portion, rotatable shafts mounted within both of said portions and operatively connected, a drill mounted in said angular portion, a casing surrounding said handle and furnished with a longitudinal slot, an aperture positioned at one end of said slot and adapted to position the drill, one or more resilient annular rings interposed between said handle and said casing, and a spring bearing disposed in said casing adapted to bear upon the rear end of the angular portion of said handle.

2. A drilling apparatus suitable for the use of dentists comprising a handle having a portion inclined at an angle thereto, drill operating means journaled in said handle and provided at one end with a drill holder, a drill mounted in said drill holder, a casing surrounding said handle and provided with a longitudinal slot terminating in angularly-disposed tongues provided with coincident semi-circular recesses to form a bearing for said drill, a retaining clip encircling said casing adjacent to said slot, resilient means interposed between said handle and casing, and a spring bearing provided in said casing at the rear end of the angular portion of the handle, and said spring bearing being movable longitudinally of the handle.

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

PAUL REPSOLD.

Witnesses:

P. V. LÜHR,

OTTO REPSOLD.