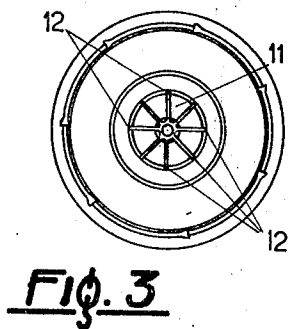
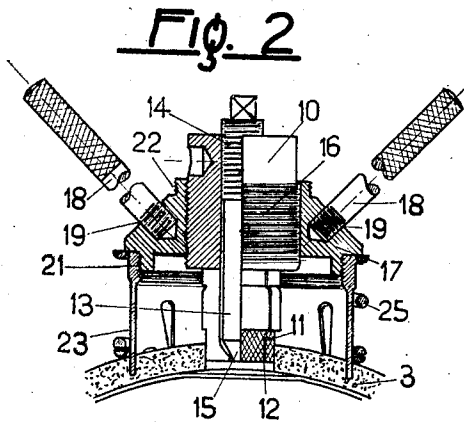
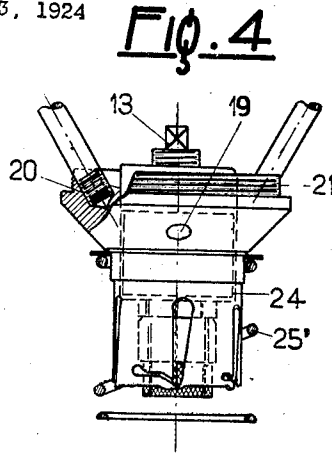
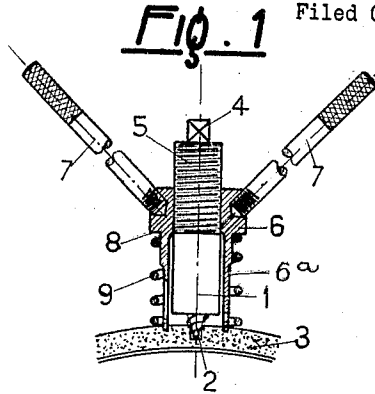


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A. JENTZER ET AL
TREPPANNING INSTRUMENT

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Inventors:
Albert Jentzer and
Henri Courvoisier.
By *Hunter & Mason*,
Attorneys.

UNITED STATES PATENT OFFICE.

ALBERT JENTZER AND HENRI COURVOISIER, OF GENEVA, SWITZERLAND.

TREPPANNING INSTRUMENT.

Application filed October 3, 1924, Serial No. 741,409, and in Switzerland October 12, 1923.

This invention relates to trepanning instruments.

One object of the invention is to provide a device which will allow the cutting out of a plug from the osseous covering of the skull and will automatically be prevented from penetrating the layer beneath the same.

A further object of the invention is to provide a cutter having teeth the cutting action of which is arrested by a covering spring member which is automatically forced out of position when the cover encounters a sufficiently high resistance.

The accompanying drawings illustrate several forms of construction of the invention.

In these drawings, Fig. 1 is a longitudinal section of one form.

Fig. 2 is a longitudinal section of a second form.

Fig. 3 is a plan view of Fig. 2 seen from underneath.

Fig. 4 is a view corresponding to Fig. 2 with the securing ring for the cutter reversed.

Fig. 5 is a detail.

Referring in detail to the drawings, the device comprises a shaft 1 having means at one end to hold the shaft in position in an aperture formed in the skull.

In Fig. 1 the shaft is threaded as at 2 and this end is adapted to be screwed into a hole formed in the osseous covering of the skull the hole being formed previously, for example by an ordinary surgical drill, the length of which is regulated so that it cannot pass into the brain box.

The shaft 1 is provided with key means adapted to be fitted on the squared end 4 in order to screw the threaded end 2 into the skull 3.

The shaft 1 is provided externally with a thread of close pitch on which is mounted a ring member 6 to which is secured a tubular cutting blade 6^a. The cutter is operated by means of two handles 7 mounted detachably within the ring member 6. The ring 6 is formed at its upper end with a flange or shoulder adapted to receive one end of a compression spring 9 the other end of which is adapted, when the tool is in position, to bear on the osseous skull wall 3.

In the form of construction shown in Figs. 2, 3 and 4 a shaft 10 threaded at its upper

end is provided the shaft being hollow and at its lower end being knurled as shown at 11 and divided radially as at 12. Within the hollow shaft 10 is a rod 13 in threaded engagement by means of a thread 14 with the shaft 10, which rod, on its rotation relative to the shaft 10 is adapted to force a conical end 15 axially of the shaft 10 and thereby expand the split end 11 to engage a hole previously formed in any desired manner in the skull wall.

The shaft 10 is threaded externally as at 16 to receive a ring 17 the ring being provided with operating handles 18. At opposite ends of the ring 17 are threaded portions 21 and 22 formed on flanges of different diameter. These threaded flanges are adapted to receive tubular cutters of different diameter, one or other of which may be used according to the size of the plug it is desired to cut out. The ring 17 may be arranged as in Fig. 2 with the flange of larger diameter downwards or in the position of Fig. 4 with the flange of smaller diameter extending downwardly.

In order to allow the insertion of the handles 18 the ring is provided with two sets of apertures for the same as shown at 19 and 20. A spring 25 (Fig. 2) or 25' (Fig. 4) is arranged externally of the ring 17 and is adapted to bear against a flange provided for that purpose.

The cutters 6, 23 and 24 above described, are each formed of a tubular member having teeth 26 (Fig. 5) at their edge adapted to contact with the skull wall and to cut the same. The peripheral wall is further slotted to form spring members 27 the ends 28 of which, in their normal position, lie level with the teeth 26 and prevent the cutting action thereof. As soon as the cutting edge of the cutter bears against the wall of the skull pressure is exerted on the spring strips 27 which yield slightly and uncover the teeth 26 which carry on the cutting operation.

When it is desired to effect a trepanning operation it is preferable firstly to use the cutter shown in Fig. 1 and subsequently the cutter shown in either Figs. 2 or 4. A small hole is made in the skull wall 3 by means of a surgical drill the length of which is insufficient to pass through the osseous wall. In the hole thus formed the threaded end 1 of the shaft 2 is placed, operation being effected by a key fitted on the squared end

of the shaft 1. The cutter is thus fixed to the skull and a plug cut out therefrom by rotating the tubular cutter 6, 6^a, by means of the handles 7, the spring 9 being interposed between the flange on the ring 6 and the skull wall.

When the cutter presses against the skull wall the spring strips 27 yield and the teeth 26 proceed to cut a plug out of the wall 3. When the cutter has penetrated the thick part of the skull the strips 27 no longer encounter resistance and resume their original position so as to cover the teeth 26 thus preventing further cutting action thereby. Immediately the plug is cut out of the wall 3, the spring 9 acting in an axial direction forces the tool and the plug which is attached to the threaded end of the shaft 1 upwardly and thus prevents any injury to the dura mater by the cutter.

If it was desired to remove a still larger plug from the skull wall, the cutter shown in Figs. 2 or 4 is used, the knurled end 11 of the shaft 10 being inserted in position within the aperture formed in the skull and the shaft 13 rotated to expand the lower knurled end of the shaft 10 to cause the same to grip the peripheral walls of the aperture. In the manner above indicated the cutter is then rotated by means of the handles 18 and when the plug has been cut out the cutter is forced upwardly away from the dura mater by means of the spring 25.

We declare that what we claim is:—

1. A trepanning instrument comprising a shaft, a tubular cutter mounted for rotation and axial movement on said shaft, means to secure said shaft within an aperture formed in a skull, and spring means arranged externally of and bearing against said cutter and adapted to project beyond the cutting edge of said cutter and to act in an axial direction.

2. A trepanning instrument comprising a shaft having a threaded outer surface, a tubular cutter in threaded connection with said shaft, means to secure said shaft within an aperture formed in a skull and spring

means arranged externally of and bearing against said cutter and acting in an axial direction.

3. A trepanning instrument comprising a shaft having a threaded outer surface, a ring in threaded connection with said shaft, a tubular cutter secured to said ring, means to secure said shaft within an aperture formed in a skull and spring means arranged externally of said cutter to control the axial movement of said shaft.

4. A trepanning instrument comprising a shaft having a threaded outer surface, a ring in threaded connection with said shaft, a tubular cutter mounted on said ring, means on said ring to allow the mounting of a plurality of cutters of different diameter and spring means arranged externally of said cutter and adapted to bear on the wall of a skull to withdraw a plug automatically as soon as the said plug is cut out.

5. A trepanning instrument comprising a hollow shaft internally threaded at one end and having its outer opposite end knurled and the walls of said knurled end radially divided, expanding means lying within and in threaded engagement with said hollow shaft and adapted to be moved axially thereof, a ring adapted to carry tubular cutters of different sizes mounted on said shaft and spring means arranged externally of said cutter to control the axial movement of said shaft.

6. In a trepanning instrument a threaded shaft, a tubular cutter mounted on and movable axially of said shaft, cutting teeth having faces extending parallel with the axis of said tubular cutter and protecting means for said cutting teeth adapted to move axially of said cutter to expose said teeth for cutting when said cutter encounters a sufficiently high resistance.

In witness whereof, we have hereunto signed our names this 20th day of September, 1924.

DR. ALBERT JENTZER.
HENRI COURVOISIER.