United States Patent [19]

Frewer

[11] **3,825,011**

[45] **July 23, 1974**

[54] **ARTERY CLAMP**

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[52] **U.S. Cl.** **128/346,** 128/326

[51] **Int. Cl.** **A61b 17/12**

[58] **Field of Search** 128/346, 326, 321, 322, 128/325; 81/13, 3, 10; 145/52

[56] **References Cited**

UNITED STATES PATENTS

3,631,859 1/1972 Crutchfield 128/346

Primary Examiner—Dalton L. Truluck

Attorney, Agent, or Firm—Edwin E. Greigg

[57] **ABSTRACT**

An artery clamp useful in the treatment of intracranial aneurysms and other vascular disorders of the type described in U.S. Pat. No. 3,631,859 and which includes a yoke member having limbs thereof in releasable engagement with a plate, a pressure plate mounted for reciprocation between and orthogonal to the limbs of the yoke member, with the improvement herein involving the flaring of the terminal portions of the limbs of the yoke to facilitate assembly thereof with the plate as well as the inclusion of flanges on the pressure plate to prevent rotation thereof relative to the yoke member.

2 Claims, 5 Drawing Figures

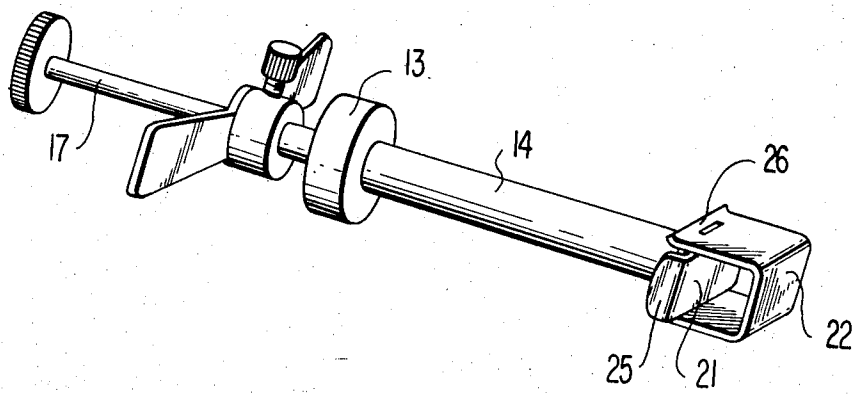
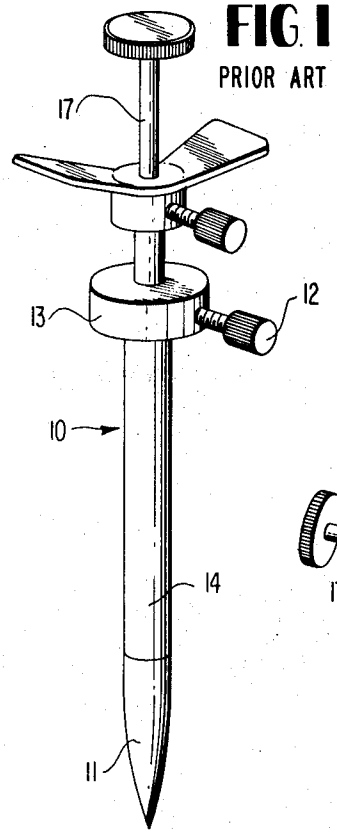


FIG. 1
PRIOR ART



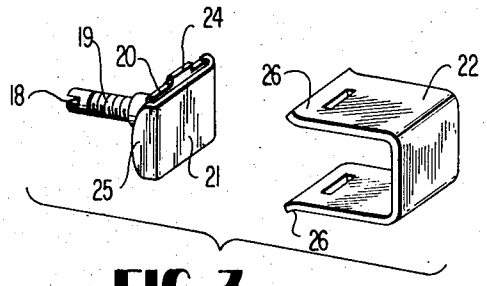


FIG. 3

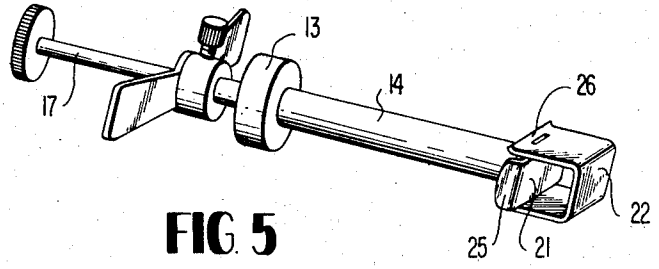
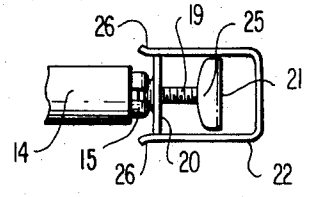


FIG. 5

FIG. 4



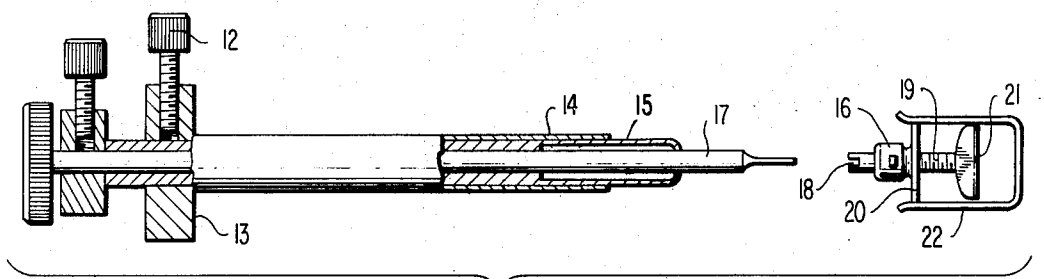


FIG. 2

ARTERY CLAMP

BACKGROUND OF THE INVENTION

This invention relates to further improvements in artery clamps useful in the treatment of intra-cranial aneurysms and more particularly to a concept that will facilitate the use by surgeons of the instrument patented by William Gayle Crutchfield on Jan. 4, 1972, U.S. Pat. No. 3,631,859.

It is recognized that this Crutchfield patented invention is definitely a step forward in the art relating to instruments necessary to a proper treatment of intracranial vascular disorders. However, use of any instrument frequently reveals that it needs improving upon and it is for this reason that this concept was born.

Heretofore surgeons have found it to be awkward to try to assemble the support plate with the perforations in the yoke member by reason of the pressure plate rotating freely in juxtaposed retracted position relative to the support plate and thereby interfering with the projections on the support plate from gaining quick access to the perforations in the yoke limbs.

OBJECTS AND SUMMARY OF THE INVENTION

Accordingly the principal object of this invention is to facilitate assembly of a yoke member, that has been placed around an exposed artery, with a support plate that is associated with a control assembly.

Another object of the invention is to provide for easy alignment of the legs carried by the clamping plate with the perforations provided adjacent to the ends of the legs of the yoke member.

These and other objects are accomplished according to the present invention by the provision of flange-like members on the pressure plate which prevent rotation of the pressure plate during assembly with the yoke member. A further provision of the present invention resides in the fact that the free ends of the yoke member are flared outwardly in order to facilitate assembly with the support plate.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the control assembly according to the prior art with a stabbing cap mounted thereon in place of the clamp assembly;

FIG. **2** is a view of the control assembly in partial section with the stabbing cap removed and the clamp assembly according to the present invention shown spaced therefrom;

FIG. **3** is a perspective view of the parts of the clamp assembly prior to assembly and preparatory for attachment to the control assembly;

FIG. **4** shows the clamp assembly with the end of the control assembly latched thereto; and

FIG. **5** is a perspective view of the artery clamp with clamp assembly and the control assembly in operative association.

DETAILED DESCRIPTION

Turning now to FIG. **1** there is shown in this view the control assembly **10** to the end of which is secured the stabbing point **11** this being necessary as explained earlier in the Crutchfield patent to gain access through the flesh of the patient adjacent to the incision and so that the surgeon can align the control assembly with and attach the yoke member thereto. As soon as the device has been inserted through the flesh the stabbing point is removed by releasing the tension on the screw **12** which is positioned in collar **13,** the latter being fastened to the constricting sleeve **14** with the outer end thereof being bifurcated at **15.**

The boss **16** of the clamp assembly includes an offstanding protuberance which is registered between one of the bifurcated legs as shown in FIG. **4** and held tightly therein by sliding the sleeve **14** forwardly and securing it in this position by the nut **12.**

As also explained in the Crutchfield patent the screwdriver **17** is now in registry with the bifurcated portion **18** that is carried at the end of the threaded stem **19** the opposite end of which passes through the supporting plate **20** and is affixed to the pressure plate **21.** It will be readily understood at this point, particularly from a study of the drawings in the Crutchfield disclosure that since the screwdriver is in contact with the threaded stem the pressure plate **21** is free to revolve thus making it difficult to assemble the perforated limbs of the yoke **22** with the support plate.

The difficulties experienced in the use of the Crutchfield assembly have been overcome by the improvements that will now be described.

Reference is made at this time to the construction of the clamping assembly as believed best shown in FIGS. **3, 3***a*, **4** and **5** of the issued patent to Crutchfield with the reference numerals identified in these figures being utilized. It will be apparent to one skilled in the art that assuming the yoke has been positioned about the artery to be treated and that the control assembly has been inserted through the flesh and the stabbing point removed the surgeon must now assemble the two elements in order to have an operative device capable of applying pressure to the artery.

It is also understood, of course, that since the yoke is held by some instrument such as forceps around the artery by one hand of the surgeon the control assembly must be maneuvered into position by the other hand so that the protuberances on the support plate **10** can be inserted in the perforations in the limbs of the yoke **12.**

It is also believed well understood from the drawing and description in Crutchfield's patent that the screwdriver **16** is in engagement with the bifurcated threaded stem with the opposite end thereof extending through the support plate **10** and secured to the pressure plate **14** and thus is free to rotate in front of the support plate. As a result the surgeon has considerable difficulty in manipulating the control assembly and securing the protuberances on the support plate with the limbs of the yoke **22** by reason of the interference of the pressure plate which blocks access of the perforated limbs to the projections on the supporting plate.

To overcome this the present invention teaches an arrangement whereby the pressure plate **21** includes parallel rearwardly extending flanges **25** — **25** which engage the outwardly extending flat walls of the support plate **20** thus preventing the pressure plate **21** from rotating. Accordingly, with the pressure plate **21** locked against rotation a surgeon will have a practically effortless job of assembly of the control assembly with the clamp assembly when the yoke **22** is positioned around the artery in the incision.

A further improvement on the Crutchfield device that is disclosed herein that is of value in facilitating as-

sembly of the control assembly with the above portions of the clamp assembly is the inclusion of flared terminal portions **26 — 26** adjacent to the extremity of the limbs of the yoke **22.** It will be readily understood that in Crutchfield's construction at least one perforation of the limb of the yoke has to be placed on a protuberance which offstands above the surface of the support plate and then the unattached other limb of the yoke has to be bent outwardly by the surgeon's forceps until that perforated limb can perceive the other protuberance on the support plate.

In this improvement by providing the slot or small perforation in the flat wall of the limbs of the yoke and of the flared portions in the parallel extent of each of the limbs thereof the control assembly can be easily guided between the flared limbs so that the limbs are gradually bent away from one another simultaneously and the protuberance can engage in the perforations in the limbs of the yoke.

What is claimed is:

1. In an instrument for use in the treatment of intracranial aneurysms and other vascular disorders including (a) a substantially U-shaped yoke member having a pair of parallel laterally spaced apart limbs connected at one of their adjoining ends and having opposing free ends, (b) a clamp support plate fitted between the free ends of the limbs of the yoke member, (c) releasable interengaging connecting means between said clamping support plate and the free ends of the limbs of the yoke member, (d) a pressure plate mounted for reciprocation between and orthogonal to the limbs of the yoke member and disposed inwardly of the clamp support plate, (e) a pressure plate reciprocating stem mounted in threaded engagement in the clamp support plate and in rotatable engagement at one end thereof with the pressure plate and having an outwardly projecting end portion provided with engaging means, (f) a tubular support member having a resilient end portion in latching engagement with the clamp support plate (g) a rotatable pressure plate actuating member slidably and rotatably mounted in the tubular support member and having an end portion provided with engaging means complementary to and engageable with the engaging means on the outwardly projecting end portion of the pressure plate reciprocating stem for rotation thereof, (h) a sleeve member slidably mounted on the tubular support member for urging the resilient end portion of the support member into latching engagement with the clamp support plate, (i) disengageable lock means for selectively preventing movement of the pressure plate actuating member in the tubular member, (j) disengageable lock means for selectively preventing movement of the sleeve member on the tubular support member, the improvement comprising parallel rearwardly extending flanges extending from opposite sides of the pressure plate to prevent rotation thereof during assembly of the yoke member therewith, said flanges overlying the support plate when the pressure plate is in a retracted, pre-operative position whereby the free ends of the limbs of the yoke member have interference-free engagement with the support plate.

2. In an instrument as claimed in claim **1,** wherein the free ends of the limbs of the yoke member include flared end portions to facilitate assembly thereof with the support plate.

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