Dec. 10, 1968 I. A. SMALL 3,414,975

DRILL GUIDE FOR MANDIBULAR STAPLES AND STAPLE CONSTRUCTION

Filed Nov. 22, 1966

FIG. 1

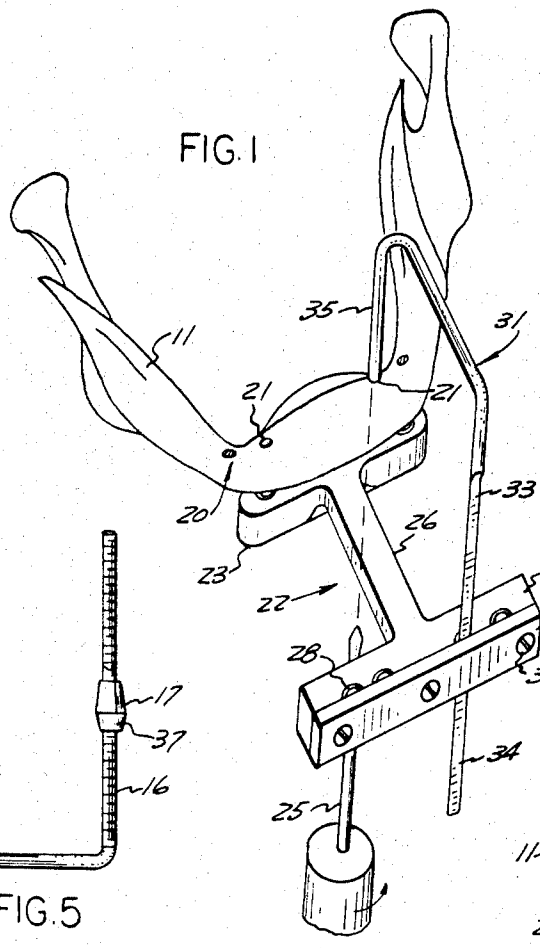


FIG. 3

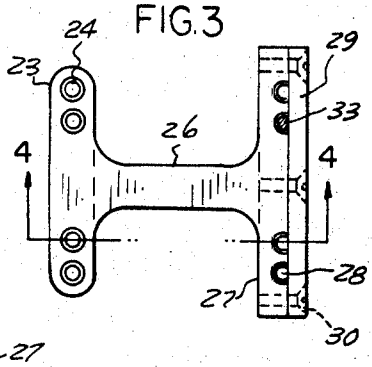





FIG. 5

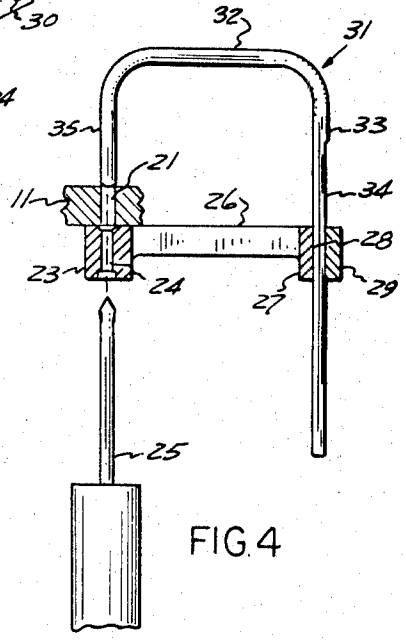


FIG. 4

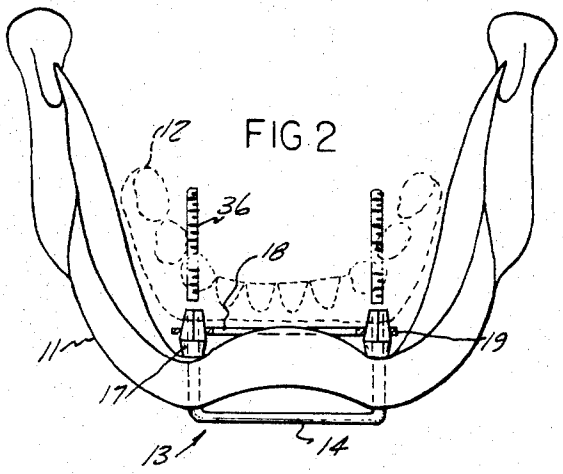


FIG. 2

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# DRILL GUIDE FOR MANDIBULAR STAPLES AND STAPLE CONSTRUCTION

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6 Claims. (Cl. 32—2)

## ABSTRACT OF THE DISCLOSURE

The present invention is particularly directed to a drill jig to be used for guiding a drill for making apertures through a mandibular jaw at symmetrically arranged points, said bores through the jaw adapted to receive the U-shaped mandibular staple over the free ends of which are threaded nuts which project above the said jaw adapted to be interlockingly nested and received within under-cut apertures within a removable denture for anchoring the denture against lodgement.

The present invention relates to a drill guide for mandibular staples and for the mandibular staple used therewith.

*Disclosure*

The present invention is directed to a drill guide or jig bore for mandibular staples to provide an accurate means for guiding the drilling of apertures through a mandible jaw be it human or animal, which apertures once drilled, are adapted to receive a mandibular staple with fastening means thereon which retainingly engage the jaw and which provide a means for interlock with a denture removably mounted upon said jaw.

Heretofore in the use of dentures of the removable nature and particularly with reference to the lower mandible jaw natural suction or cohesion is often reduced due to the age and wasting away of the jaw bone tissue. Various efforts have been employed to provide a means for anchoring the lower removable denture against accidental dislodgement.

The use of adhesives or mechanical devices heretofore attempted have been ineffective and inefficient for the intended purpose and accordingly it is the objective of the present invention to provide for the use of a mandibular staple which is actually secured to the mandible jaw beneath the subcutaneous tissue, and which once secured in place by a pair of nuts is so arranged that the nuts themselves are adapted to be interlockingly nested within undercut apertures within a removable denture for anchoring the denture against accidental displacement with respect to the jaw.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawing in which:

FIG. 1 is a perspective view of the present drill guide shown in exploded relation with respect to a mandibular jaw and a drill used with the said drill guide, fragmentarily shown.

FIG. 2 is a front elevational view illustrating the present mandibular staple as assembled upon and to the mandibular jaw and with the removable denture shown in dotted lines, portions of the mandibular staple as cutaway being shown for illustration of the process.

FIG. 3 is a partly sectional plan view of the present drill guide.

FIG. 4 is a fragmentary section taken in the direction of arrows 4—4 of FIG. 3.

FIG. 5 is a side elevational view of the present mandibular staple before assembly and cutting off.

It will be understood that the above drawing illustrates merely a preferred embodiment of the invention and that other embodiments are contemplated within the scope of the claims hereafter set forth.



Referring to the drawing FIGS. 1 and 2 show a human mandible jaw which could also be for an animal which is dentureless and is adapted to receive a removable lower plate such as designated at **12**, FIG. 2.

Mounted upon the mandible jaw **11** is the present mandibular staple generally indicated at **13**, FIG. 2. Said staple is of U-shape including the bite **14** adapted to underly the mandible jaw when assembled, FIG. 2, and which includes free end portions **15**, FIGS. 2 and 5, which are threaded at **16** to receive the removable irregularly shaped nuts **17**, FIGS. 2 and 5. Said free ends after assembly of said nuts, FIG. 2 are cut off leaving the throw-away portions **36** FIG. 2. End portions of the staple are stone ground or otherwise smoothened, or maybe distorted if desired to anchor the nuts against loosening once assembled so as to operatively engage the upper surface of the mandibular jaw **11**, FIG. 2. Shown in FIG. 2 is a spanner **18** whose ends are socketed as at **19**, of a polygonal shape, for example, in order to cooperatively register over and to interlockingly engage the respective nuts **17**, to anchor the same against unloosening, the said spanner **18** being interposed below the removable denture **12**, shown in dotted lines, FIG. 2.

Referring to FIG. 1 it is the drilling of the apertures **21** within the mandibular jaw **11** which presents the most significant problem, primarily because it is essential that the bores **21** through the jaw be accurately located symmetrically with respect to the jaw centerline inwardly of the conventional nerve centers **20** schematically shown in FIG. 1.

For this purpose there is provided the present drill guide or drill jig generally indicated at **22**, FIG. 1 which provides a means of accurately locating the drill **25** before the apertures **21** are formed within the mandibular jaw.

The present drill guide **22** includes an elongated body **23** preferably of stainless steel or other inert material, which may be a plastic substance or some alloy, as for example a chromium or molybdenum alloy for illustration. The body **23** has formed therethrough a series of pairs of symetrically arranged and spaced jig bores **24**, there being an inner pair as shown in FIG. 3 which are symetrically arranged with respect to the connecting arm **26** and an outer parallel spaced pair of bores **24** which are spaced from each other a distance different from the spacing between the inner pair of bores **24** as best shown in FIG. 3.

Arm **26** which projects centrally from the body **23** terminates in the transverse elongated rod support **27** secured thereto and parallel with body **23** and including formed therethrough corresponding pairs of spaced symmetrically arranged parallel slots **28**, each of the said slots **28** being opposed from and parallel to a corresponding bore **24** in a symmetrical relationship.

The respective parallel elongated slots **28** are of U-shape in cross-section and open outwardly of the end face of the support **27** and the retaining plate **29** is mounted over said rod support **27** and secured thereto by fasteners **30** for the purpose of anchoring the U-shape director rod **31** within one of the said slots **28** as hereafter described.

Said director rod is of general U-shape, FIGS. 1 and 4, includes bite **32**, long arm **33** and short arm **35**. The long arm, FIG. 4 is cutaway to provide a flattened portion **34** adapted for cooperative registry with the retaining plate **29** in the assembly shown in FIGS. 1 and 4 and to facilitate longitudinal adjustment of the said locator rod with respect to the rod support **27**.

In use the lower end of the short arm **35** of said director rod is adapted for vertical registry, FIG. 1 with a pre-selected point marked in some manner upon the

mandibular jaw **11** upon the interior thereof, which is to be the axis or correspond to the axis for the drilling of a proper bore through said jaw as shown at **21** for receiving the mandibular staple **13**.

For this purpose the locator rod is manually adjusted and locked with respect to the drill guide assembly so that the short arm **35** of the director rod is in registry with the exact location which has been marked upon the interior of the mandibular jaw for the drilling of a suitable bore therethrough such as shown in FIG. 1. So located and due to the symmetry of construction the corresponding jig bore **24** is adapted to serve as the guide for drill **25** located in direct axial registry with short arm **35** and the said marking on the jaw. This guarantees that when drilling occurs using the body **23** and the corresponding aperture **24** as a jig, the drilling up through the undersurface of the mandible jaw will be accurate.

The present construction provides for symmetrical arrangement of the respective bores **24** and the respective slots **28** so that once the particular symmetrical markings have been made upon the mandibular jaw **11**, FIG. 1, inwardly of the nerve endings **20** to avoid problems, it becomes a simple matter to use the drill **25** through the corresponding bore **24** in said body for securing the first aperture therethrough as indicated at **21**, FIG. 1.

Once the first aperture has been completed through the mandible jaw, by retaining the short arm **35** in the position shown in FIG. 1 the same or a different drill may be applied to the corresponding other spaced symmetrical bore **24** for drilling of the second aperture **21** through the mandible jaw. Said apertures are adapted to coperatively receive the free ends **16** of staple **13** of FIG. 2.

As a final step once the apertures **21** have been properly drilled through the mandible jaw, it being understood that the subcutaneous tissue prior to drilling has been cut away and turned back, the staple **13** is properly assembled, as shown in FIG. 2 through the said apertures **21**. The nuts **17**, are threaded thereover into cooperative retaining registry with a top portion of jaw **11**, FIG. 2. After this the free ends **36** are cut away as shown in FIG. 2 so as to be flush with the upper ends of nuts **17**.

It is contemplated in the present construction that the said denture **12** will have a pair of similarly and symmetrically arranged under-cut apertures adapted to cooperatively receive the projecting nuts **17** to thus anchor the denture against accidental displacement with respect to jaw **11**.

The nuts **17** are tapered and quadrangular with an undercut lower border **37** to protect the soft tissue of the gum around the pin. The quadrangular and tapered contour will allow for positive seating in removable denture **12**.

Having described my invention reference should now be had to the following claims. I claim:

**1.** A drill guide for mandibular staples comprising;
an elongated body having a pair of spaced symmetrically arranged parallel jig bores;
an arm on and projecting from said body;
an elongated rod support secured on said arm parallel to said body and including a pair of spaced symmetrically arranged parallel slots, each slot opposed from and parallel to a corresponding bore;
and a U-shaped director rod having a long arm adjustable nested and secured within a slot and a short arm spaced from and in axial registry with a corresponding bore; said director rod being so adjusted on said support that the end of its short arm is in registry with a pre-determined point on one side of a mandible jaw through which a bore is to be drilled; a corresponding jig bore being in axial registry therewith upon the opposite side of said jaw, adapted to guidably receive a drill.

**2.** In the drill guide for mandibular staples of claim **1**, a pair of symetrically arranged points for drilling through said jaw being pre-selected corresponding to and adapted for registry with said jig bores respectively;
whereby the other jig bore is automatically located relative to said jaw to guidably receive a drill for a second bore therethrough.

**3.** In the drill guide of claim **1**, there being a second pair of spaced symmetrically arranged parallel jig bores in said body at a different spacing than said first pair of jig bores;
there being a second corresponding pair of spaced symmetrically arranged parallel slots in said rod support, each opposed from and parallel to a corresponding second bore;
said director rod being selectively nested and secured in one of said slots.

**4.** In the drill guide of claim **1**, said rod support slots opening laterally outward;
the securing of said director rod including a retainer plate removably secured to said rod support over said slots.

**5.** In the drill guide of claim **4**, portions of said long arm being flat.

**6.** The method of locating and retaining a removable denture upon a mandible jaw which comprises:
(1) accurately drilling a pair of spaced bores through a mandible jaw;
(2) projecting the free ends of a U-shaped mandibular staple through said bores into snug engagement with said jaw;
(3) threading fasteners over the free ends of said staple into cooperative retaining registry with said jaw; and
(4) mounting a preformed apertured denture upon said jaw and snugly nesting said fasteners into the denture apertures.

**References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 744,292 | 11/1903 | Carr | 32—2 |
| 1,312,141 | 8/1919 | Slack | 32—10 |
| 3,120,136 | 2/1964 | Bieker | 77—32.2 |


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U.S. Cl. X.R.

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