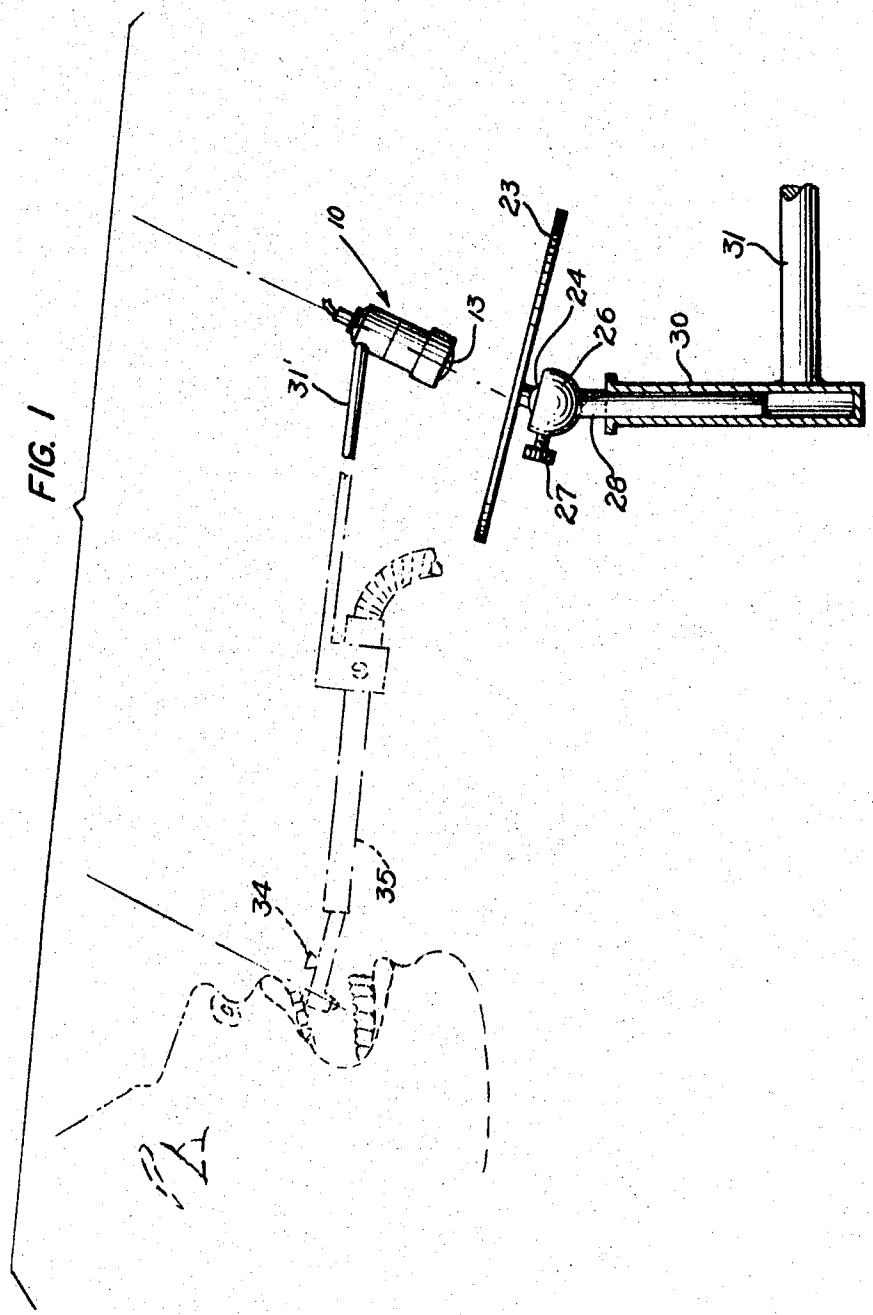
Aug. 26, 1969 M. GREENBERG ETAL 3,462,842

DENTAL SENSING DEVICE

Filed July 10, 1967 2 Sheets-Sheet 1

FIG. 1



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DENTAL SENSING DEVICE

Filed July 10, 1967 2 Sheets-Sheet 2

FIG. 2

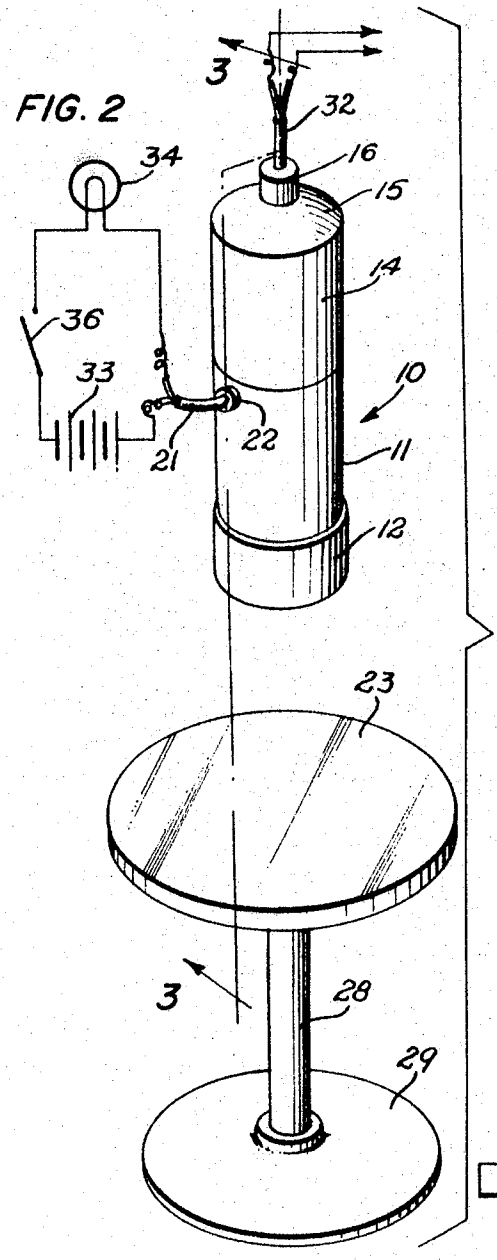


FIG. 3

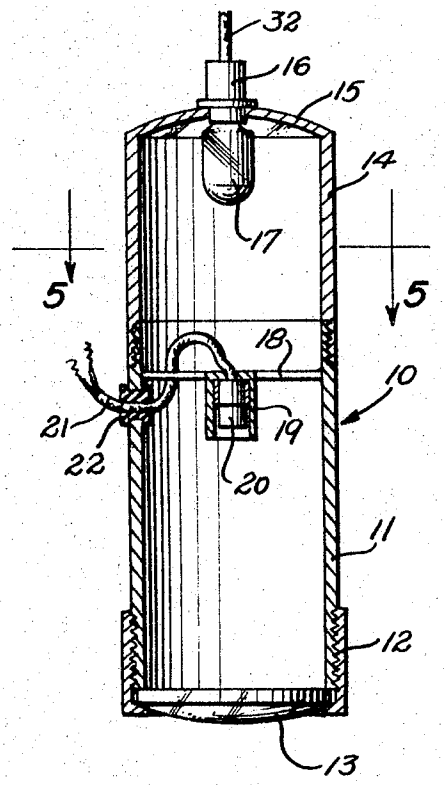


FIG. 4

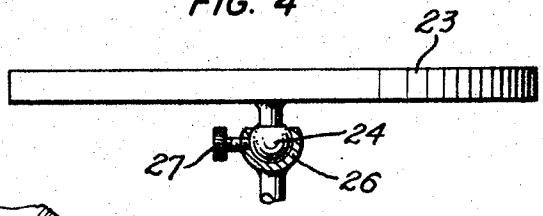
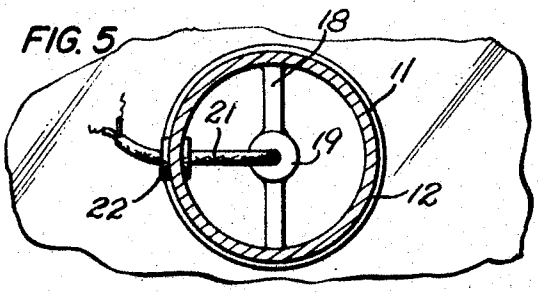


FIG. 5



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DENTAL SENSING DEVICE

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Int. Cl. A61c 3/00
U.S. Cl. 32—67 9 Claims

ABSTRACT OF THE DISCLOSURE

This sensing device is for use with the usual dental drill having a hand piece and a bur extending at an angle to the hand piece. A clamp bar is secured at one end to the hand piece. The other end of the clamp bar is secured to a source of a beam of light, which beam is directed at the same angle as the bur. A reflecting mirror is located in the path of the light beam and is adjustably mounted so that the mirror can be secured in a position with the light beam normal to the mirror, when the bur is at the desired angle. A photocell is secured to the clamp bar in a position to receive light when the light is reflected back along the beam. An indicator lamp located on the hand piece is connected to the photocell. Deviation of the bur from the proper angle is indicated by the indicator lamp.

This invention relates to dentistry which is defined as that department of medicine concerned with the prevention, diagnosis, and treatment of diseases of the teeth and adjacent tissues, and the restoration of missing dental and oral structures. The invention relates still more particularly to a device that is used for the purpose of sensing and indicating perpendicularity to an established plane in dentistry.

This dental sensing device consists of two major parts. These are, first, a tube that contains a light source, a photoelectric cell or conductor, and a lens. The tube and its contents are suitably attached to any dental drill or the like. The second part of the invention consists of a flat mirror mounted on a swivel that is adjustable in any direction. Actually, a small indicator bulb could be considered to be a third part of this novel invention which works on the principal that a beam of light will be reflected back to its source when and only when the beam of light is perpendicular to the reflecting surface.

The principal object of this invention is to provide a dental sensing device that can be successfully used with the equipment already found in any dental office for the purpose herein stated.

Another object of this invention is to provide a dental sensing device that takes up a minimum amount of space and will therefore not in any way interfere with the dentist as he performs his work in the patient's mouth.

Still another object of this invention is to provide a dental sensing device that can be manufactured integrally with new dental drills and the like.

Other and further objects and advantages of this invention will come to light as the reading of the description of the invention proceeds and the appended drawings are examined.

In the drawings:

FIG. 1 is a pictorial view of this invention in use.

FIG. 2 is a pictorial view of the two major parts of this invention and its electrical wiring diagram.

FIG. 3 is a sectional view of the tubular part of this invention, showing the photo electric cell, the light bulb, and the lens.

FIG. 4 is a side view of the reflecting mirror.

FIG. 5 is a sectional view of this invention, taken along

line 5—5 of FIGURE 3, and viewed in the direction indicated by the arrows.

In the appended drawings, like parts are indicated by like reference numbers throughout the several views.

The reference number **10** indicates the tubular member of this invention and its contents. The aforesaid tubular member **10**, comprises a tubular body **11** having external threads on the lower end thereof on which is screwed the lens holding ring **12** after the lens **13** has been placed thereon. Like external threads on the upper end of the same tubular body **11** are engaged in the internal threads that are in the lower end of the tubular body **14** which has an integrally formed curved upper end **15** through the center of which projects the holder **16** of the electric bulb **17**, as is clearly shown in FIGURE 3 of the appended drawings. An arm **18** is located inside the aforesaid tubular body **11**, with each end of the arm made integral with the inside wall of the body **11**, while the center of the arm is provided with an integrally formed tubular body **19** for the reception of the photocell **20** that is pointed downward toward the aforesaid lens **13**. Electric wires **21** pass outward from the aforesaid photocell **20** through a grommet **22** that is located in the wall of the aforesaid tubular body **11**.

Looking now at FIGURES 1 and 4 of the drawings it will be seen that the reflecting mirror **23** is provided with a downwardly projecting centrally located ball **24** that rests in the socket **26** to which the ball **24** is locked in place by means of the knurled headed screw **27**. The aforesaid socket **26** is integrally formed on the upper end of the shaft **28** that has its lower end terminating in either a round base **29**, as is shown in FIGURE 2 of the drawings, or in a tubular member **30** that is integral with a right-angle member **31** which can terminate in any desired form of holder. The aforesaid tubular member **30** is shown only in FIGURE 1 of the appended drawings.

The way in which this dental sensing device works will be clearly understood by those experienced in dentistry upon the examination of FIGURE 1 of the appended drawings. Here it is seen that the aforesaid tubular member **10** is secured to any dental drill or the like by means of a clamp bar **31**. The electric wires **32** connect the electric bulb **17** (FIGURE 3) with any available source of electricity, while the aforesaid electric wires **21** connect the photocell **20** with both the electric source **33** and the indicator electric bulb **34**. The aforesaid bulb **34** is located on the upper and outer end of the hand piece of an electric drill which is indicated by the reference number **35** in FIGURE **1** of the appended drawings. The electric switch **36**, for the indicator bulb **34**, is shown in FIGURE 2 of the appended drawings. Should the drilling be done on the upper teeth, the aforesaid tubular member **10** must still be pointed in the direction shown in FIGURE 1 of the drawings. This can be accomplished by rotating the clamp bar **31** that is secured to the rear portion of the electric drill hand piece **35**. The electric drill, of course, is not an actual part of this invention. In actual use, the dentist will hold the drill at the desired angle in the patient's mouth while an assistant will bring the reflecting mirror in a position such tht the light beam is perpendicular to the mirror. This just described action will fix the plane that the mirror is to be positioned by means of the knurled headed screw **27**. After this has been done, the mirror **23** will be lowered about one or two inches and the dental work will proceed. As long as the drill is directed at the right angle, tubular member **10** will be perpendicular to reflecting mirror **23** and the indicator bulb **34** will be light.

As a final thought on this invention before making claims for the same, it should be realized that, while this invention has been made for the dental art, it is by no

means to be limited to this art. This invention has great possibilities in other medical arts as well as in any other art where an operation of this same basic type is desired.

What we now claim as new and desire to protect by Letters Patent according to the United States Code Title 35 is:

1. A dental sensing device for the purpose of indicating perpendicularity to an established plane of a dental drill having a hand piece, a bur extending at an angle to one end of the hand piece, tube means to be secured to the hand piece for directing a beam of light at the same angle as the bur, a flat mirror adjustably secured in the path of the light beam in a plane normal to the light beam, a photocell positioned within said tube means to receive light from said light beam which is reflected back along the light beam, and an indicator bulb connected to the photocell to indicate that the photocell is receiving light from the light beam.

2. The invention of claim 1, wherein the said means of directing the ray of light is a tubular body, an electric bulb that is located in the upper end of the said tubular body, the said electric bulb being suitably connected to a source of electricity.

3. The invention of claim 2, wherein the photocell is located within the said tubular body, the said photocell being connected to both a source of electricity and to the said indicator electric bulb.

4. The invention of claim 3, wherein the said tubular body is also provided with a lens in the lower end thereof.

5. The invention of claim 4, wherein the said tubular body consists of two tubes screwed together, the lower tube being provided with a screwed on lens holding ring.

6. The invention of claim 5, wherein the said photocell is located in a tubular body that is centrally located and integrally formed on an arm whose ends are integrally formed with the inside of the lower one of the tubes that go to make up the said tubular body, the said photocell facing downward toward the said lens.

7. The invention of claim 6, wherein the said reflecting mirror is provided with a centrally located and integrally formed ball that extends downward from the underside thereof to rest in a socket that is integrally formed on the upper end of a suitable support, the said socket being provided with a knurled headed screw for adjustably securing the said ball and reflecting mirror in the desired position.

8. The invention of claim 7, wherein the said tabular body is adjustably secured to the said hand held electric drill by means of an arm.

9. The combination of claim 8 in which the indicator bulb is mounted on the hand piece.

References Cited

UNITED STATES PATENTS

1,962,353	6/1934	Kovalsky	250—230
2,703,505	3/1955	Senn.	
3,244,846	4/1966	Kopp	32—27 XR
3,341,710	9/1967	Cade	250—239

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