March 22, 1949. E. J. PEDRICK 2,465,263

DENTAL FLUOROSCOPIC DEVICE

Filed Nov. 2, 1945

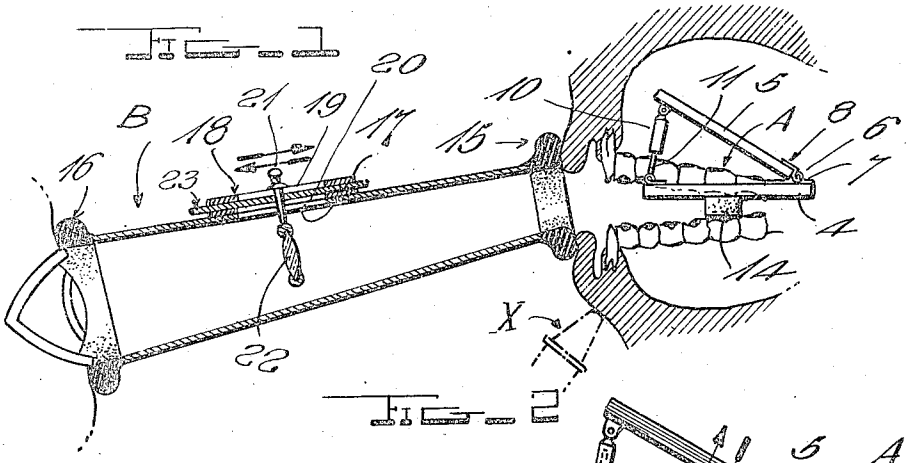


FIG. 2

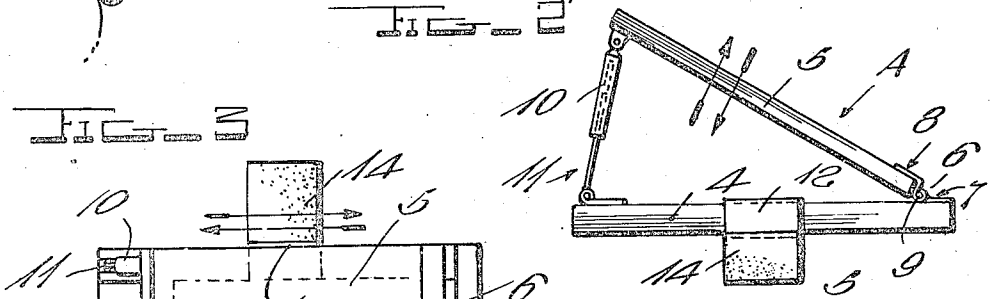


FIG. 3

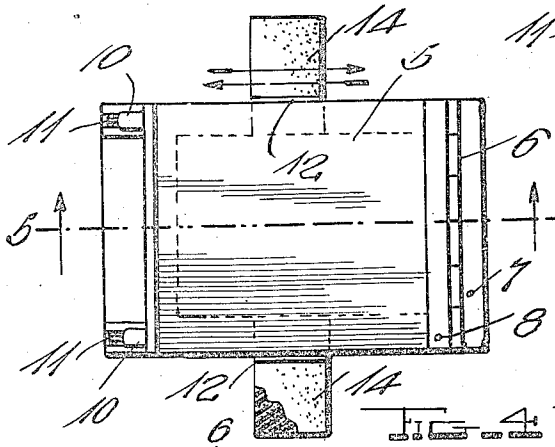


FIG. 4

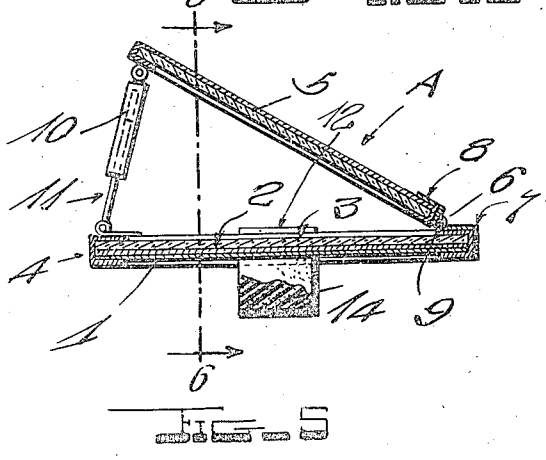


FIG. 5

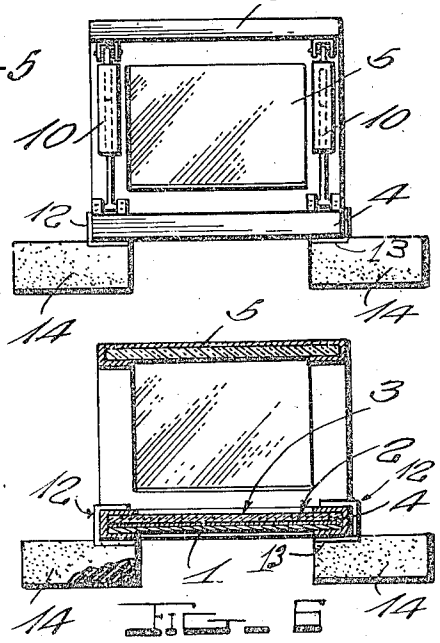


FIG. 6

INVENTOR

Edward J. Pedrick

Shrewe, Crowe & Gordon

ATTORNEYS

Patented Mar. 22, 1949 2,465,263

UNITED STATES PATENT OFFICE

2,465,263

DENTAL FLUOROSCOPIC DEVICE

Edward J. Pedrick, Quitman, Ga.

Application November 2, 1945, Serial No. 626,350

3 Claims. (Cl. 250—78)

1

Generically this invention relates to fluoroscopy, but more particularly to an oral fluoroscope adapted in conjunction with an X-ray device to expose radiographic films to enable diagnosis both gross and detail of the oral cavity.

One of the principal objects of this invention is the provision of a mechanism of this character which will be safe, economic, diagnostic, and at the same time comfortable without strain or undue pressure upon the tissues of the oral cavity, designed to effect a saving in time and expense to both the patient and practitioner, and eliminate the necessity and inconvenience of requiring the patient to retire to a dark room during the course of the examination.

An important object of this invention is the provision of a fluoroscopic device of this character operable in a manner such that the practitioner is enabled, without the use of a dark room, to give the patient a quick and accurate examination of the oral organs.

Another important object of this invention is the provision of a fluoroscopic device adapted to be completely housed within the oral cavity, and flexible means in connection with said device adapted to be held by the teeth to maintain the device in position.

A further object of this invention is the provision of a fluoroscopic device of this character, and a light excluding dark field producing element comprising a substantially cone-shaped member adapted to light excludingly fit over the mouth, the free end of said member being formed to light excludingly fit over the eyes of the operator to enable viewing of said fluoroscopic device, whereby the necessity of a dark room is eliminated.

A further important object of this invention is the provision of a fluoroscopic device of this character comprising cooperating parts positioned within and without the oral cavity operable in a manner to eliminate the necessity of a dark room, and to enable the practitioner to immediately observe and see the destruction or presence of objects common to the organs of the oral cavity, such as: dentition of the deciduous teeth, dentition of the permanent teeth, structure of the osseus tissues, hard tissues where teeth are missing, infiltration of peridontal tissue, periodontoclasure, alveoclasure, hypercementosis, tumors, cyst, fractures, peridontia pockets, calcious, peridental membranes, periapical areas, pulp stones, caries in teeth, caries underneath fillings, overhanging margins of fillings, crude fitting crowns, exposures to horn or pulp of teeth,

2

foreign objects (needles, broaches, burrs, fillings, bullets, shot and other objects that have radiopacity, size, position and characteristics), tooth roots that remain in the osseus tissues, root canal fillings and lateral canals, impacted teeth and destruction of tissue surrounding same, salivary calcious and same in ducts of glands associated with the oral cavity and objects within the sinusus.

With these and other objects in view, which will become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which like characters of reference indicate like parts throughout the several figures, of which:

Fig. 1 is a sectional view showing the fluoroscope device disposed within the oral cavity and clamped between the teeth, and the dark field producing member disposed in operative relation with respect to said device.

Fig. 2 is an enlarged side elevation of the fluoroscope device.

Fig. 3 is a plan view.

Fig. 4 is an end elevation.

Fig. 5 is a central vertical longitudinal sectional view taken on the line 5—5 of Fig. 3.

Fig. 6 is a transverse vertical section taken on the line 6—6 of Fig. 5.

Briefly stated this invention embodies the provision of a device comprising in combination an adjustable fluoroscope unit including a radiolucent plate, an intermediate fluoroscopic screen and a glass or transparent plate assembly in superimposed relation constructed to provide a moisture proof compartment between said lucent and transparent plates, and a mirror or reflecting element connected to one end of said assembly. Means for securing said mirror in adjusted angular position with respect to said assembly, and teeth engaging means for holding said unit in operative position within the oral cavity without any exteriorly projecting portions, and a cone-like light excluding member, elliptical in cross section, with its small extremity adapted to light excludingly fit over the patient's mouth and having mounted therein an adjustable magnifying lens, the free end of said cone member being formed to light excludingly fit over the eyes of the practitioner or operator. Said device is not intended to take the place of, or to eliminate or substitute for the use of radiographic films, intra-oral and extra-oral, for record and diagnostic purposes, but to eliminate the neces-

sity of a dark room, and to enable a quick and accurate examination of the oral cavity by an immediate observance of the condition, destruction, or presence of objects common to the organs of the oral cavity.

In the illustrated embodiment characterizing this invention there is shown (Fig. 1) the fluoroscopic section A and a dark field producing section B.

The fluoroscopic section or unit A, rectangular in configuration, is adapted to be positioned within the oral cavity comprising a radiolucent plate 1, a fluoroscopic screen 2 mounted thereon in superimposed relation, a glass or transparent plate 3 overlying said screen, and a band 4, substantially C-shaped in cross section is adapted to extend over the free edges of said superimposed plates and into binding engagement with the exposed surface of the plates 3 and 1, uniting or binding said plates into a unitary assembly, and sealing said edges to provide a moisture and gas proof chamber intermediate plates 1 and 3. Mounted in overlying relation with respect to transparent plate 3 and of slightly greater length and narrower width is a glass or other material reflecting surface mirror or prism 5 having its rear end hingedly connected to band 4 at the rear edge of plate 3 by a suitable hinge element 6, including a portion 8 suitably secured to the exposed non-reflecting surface 5 and a hinged portion 7 connected to said band, said portions 7 and 8 being interlockingly connected by a pin 9 in such a manner that it will maintain mirror 5 in any desired adjusted position within its rotative range, substantially one to ninety degree angle. While not necessary to the operative positioning of said mirror, if desired, at each front corner may be suitably secured a small cylinder 10 adapted to receive one end of a plunger pin 11, the free end of said pin being suitably and movably anchored to the upper surface of band 4, said pin fitting into said cylinder in a manner to support the mirror at any adjusted angular position desired.

Mounted at one or both side edges of the unit A on band 4, slidably adjustable thereon, is a substantially C-shaped sleeve 12, suitably attached as at 13 to a bite block 14 constructed from rubber or other suitable material; said block or blocks may be of variable sizes and adapted to extend between the patient's teeth to open and so maintain the arches of the oral cavity and to hold said unit A immovable and in operative position. The flexible blocks 14 may be adjusted and placed to position said device A so that when the X-ray machine X is in operation a view may be had within an oral cavity having either a so called flat, medium or high palatal arch.

The dark field producing section B is substantially cone-like in configuration and elliptical in cross section. The said member is constructed of any suitable light excluding material and has mounted on and suitably secured to its small end a mouth covering member 15 constructed of rubber or other soft resilient material adapted to fit over the mouth and conform to the conformation of the face in light excluding engagement therewith when the mouth is open. The free or large end of said member B has mounted on and suitably secured thereto a face engaging member 16 constructed from soft rubber or other cushion like material, such as velvet, plush, and the like and shaped and adapted conform to the shape of the forehead and face of the operator when placed firmly in light excluding engagement over the operator's eyes with the nares free.

Said cone member B is formed with a slot 17 and suitably mounted exteriorly on the member is a sleeve 18 having openings at its ends and formed with slots 19 and 20 adapted to register with slot 17 and through which slots extends handle 21 of a magnifying lens or focusing unit 22, said handle 21 adapted to extend through and be suitably secured to a plate 23 of a length greater than said sleeve and slidably extending through the end openings therein, so as to permit reciprocal adjustment of the plate and lens to effect proper focus according to the vision of the particular operator. Said structural arrangement adapted to exclude all light from the interior of the cone member, while at the same time permitting adjustment of said lens.

From the above it will be apparent that I have designed a combination adjustable fluoroscopic screen device adapted to be completely housed within the oral cavity, operable in connection with an X-ray machine, and means in connection with the screen adapted to be gripped by the teeth for holding the screen in the desired operative position, and a tubular-like dark field producing member adapted for light excluding engagement over the mouth of the holder of the screen device and the eyes of the operator coacting with said screen device to enable the quick and accurate examination of the oral cavity by an immediate observance of the conditions common to the organs therein, as shown in the image formed on said screen and reflected by said mirror, and under existing light conditions and without the necessity of moving the patient to a dark room. The said light excluding member being provided with a lens adjustable in accordance with the vision of the particular operator, said device being simple in construction, comprising few parts, readily operable, manufacturable at a reasonable cost, and efficient for the purposes intended.

Although in practice I have found that the form of my invention illustrated in the accompanying drawings and referred to in the above description as the preferred embodiment is the most efficient and practical, yet realizing that conditions concurrent with the adoption of my invention will necessarily vary, I desire to emphasize that various minor changes in details of construction, proportion and arrangement of parts may be resorted to within the scope of the appended claims without departing from or sacrificing any of the principles of this invention.

Having thus described my invention, what I desire protected by Letters Patent is as set forth in the following claims:

1. A fluoroscopic device adapted to be completely housed within the oral cavity and adjustable therein and including a lucent plate, a fluoroscopic screen arranged thereon in superimposed relation, a transparency overlying said screen, a band element extending over the free edges of said superimposed elements and into binding engagement with the exposed surfaces of said lucent plate and said transparency to bind said enclosed parts into a unitary structure and to provide a moisture and gas proof chamber intermediate said lucent plate and transparency to exclude moisture from said screen, a reflecting surface element hingedly mounted on said band at the rear edge of the transparency in overlying adjustable relation with respect to said transparency, and means for maintaining

said reflecting element at any desired adjusted position with respect to said fluoroscopic screen.

2. A fluoroscopic device adapted to be completely housed within the oral cavity and adjustable therein and including a lucent plate, a fluoroscopic screen arranged thereon in superimposed relation, a transparency overlying said screen, means binding said superimposed parts into a unitary structure and forming intermediate said lucent plate and transparency a moisture and gas proof chamber adapted to prevent moisture from reaching said screen, a reflecting surface element hingedly mounted on said surface structure in a manner such as to permit angular adjustment of said element with respect to said transparency to reflect the image formed on said fluoroscopic screen and to automatically maintain said reflecting element in any desired adjusted position, and means mounted on said binding means and adjustable with respect to said chamber structure adapted for insertion between the teeth for holding said device in operable position.

3. A fluoroscopic device adapted to be completely housed within the oral cavity and adjustable therein and including a lucent plate, a fluoroscopic screen arranged thereon in superimposed relation, a transparency overlying said screen, a band element extending over the free

edges of said superimposed elements and into binding engagement with the exposed surfaces of said lucent plate and said transparency to bind said enclosed parts into a unitary structure and to provide a moisture and gas proof chamber intermediate said lucent plate and transparency adapted to exclude moisture from said screen, a reflecting surface element hingedly mounted on said band at the rear edge of the transparency in overlying adjustable relation with respect to said transparency, means for maintaining said reflecting element at any desired angular adjustment with respect to said fluoroscopic screen, and a resilient bite block insertible between the teeth including a substantially C-shaped sleeve slidably engageable on said band for holding said device in adjusted operative position.

EDWARD J. PEDRICK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,012,561	Ketcham	Dec. 19, 1911
1,596,328	Wilt	Aug. 17, 1926