Jan. 9, 1951 T. R. ROSENBERG 2,537,373

COLLAPSIBLE DAY VIEWING AND PROTECTIVE DEVICE FOR FLUOROSCOPE SCREENS

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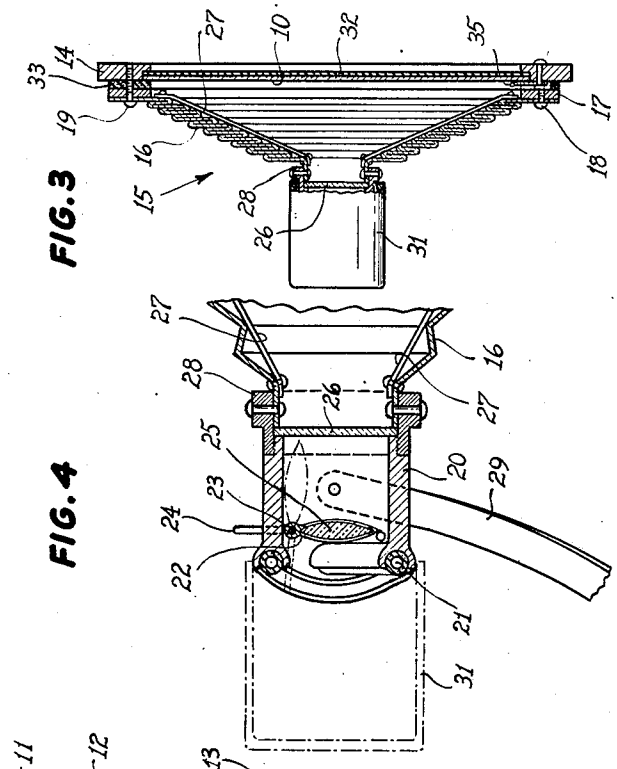


FIG. 3

FIG. 4

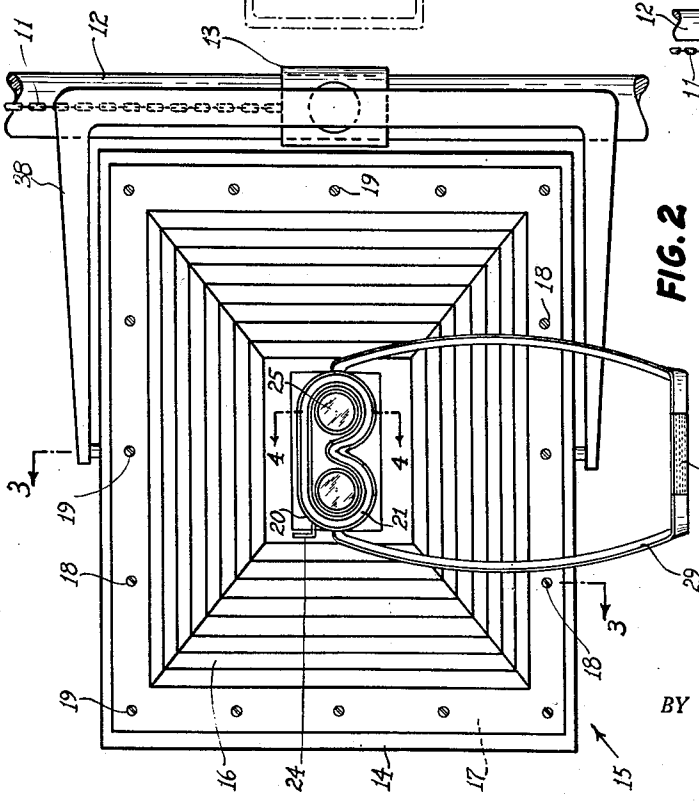


FIG. 2

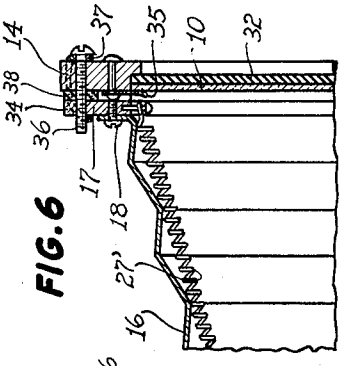


FIG. 6

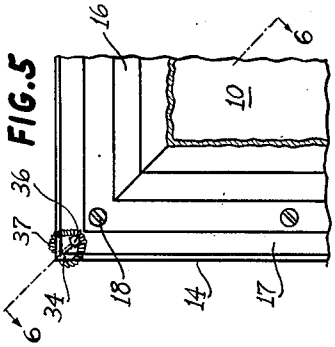


FIG. 5

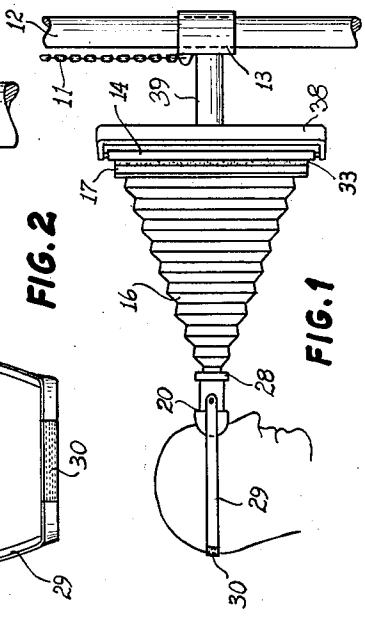


FIG. 1

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COLLAPSIBLE DAY VIEWING AND PROTECTIVE DEVICE FOR FLUOROSCOPE SCREENS

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4 Claims. (Cl. 250—78)

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My invention relates to fluoroscopic screens, more particularly the type of screens used by the medical profession for examining the chest or other parts of the body of a patient.

Heretofore it has been customary to make these examinations in a darkened room, calling for elaborate preparations especially when carried out during the hours of daylight and inconveniencing both the physician and the patient.

It is, therefore, an object of the present invention to provide means for enabling a physician to examine a patient fluoroscopically in the presence of ordinary illumination.

Another object of my invention is to provide means selectively operable for the detailed observation of any portion of the screen or for an overall viewing of the entire image.

A further object of this invention is to provide convenient means for protecting a fluorescent screen from the harmful effects of daylight when not in use.

A further object is to provide means for making it possible to view a fluorescent screen in the manner referred to while leaving the hands of the observer free, thereby enabling him to take notes or make necessary adjustments at the controls of the machine.

Yet a further object of the invention is to provide a single device capable of performing all of the various functions set forth above.

The invention will be particularly described with reference to the accompanying drawing in which:

Fig. 1 is a side elevation of the device in use, attached to a fluorescent screen of conventional type;

Fig. 2 is a front elevation, on a larger scale, of the device shown in Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 2, with the device in idle position;

Fig. 4 is a section on the line 4—4 of Fig. 2, drawn to a still larger scale and showing the device in position of use;

Fig. 5 is a fragmentary view similar to Fig. 2, showing a modification; and

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

Referring first to Figs. 1 through 4, there is shown a conventional screen 10, of fluorescent material, held by suitable means such as clips 35 in a frame 14 which in turn is supported in a bracket 38; this bracket is mounted for vertical movement on a standard 12 which it engages through a guide sleeve 13, the latter being secured by an arm 39 to the bracket 38. The sleeve 13 is

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suspended from a chain 11 which may be led in conventional manner over rollers (not shown) and provided at its other extremity with a counterweight for keeping the screen 10 and its associated parts in balance.

In accordance with the present invention, I provide the screen 10 with a viewing device 15 comprising a bellows 16 which may be extendable to a length of, say, 18 inches. The rear of the bellows 16 is secured to a frame member 17, as by screws 18; similar but longer screws 19 serve to secure the frame 17 to the frame 14. A rubber gasket 33 is interposed between the two frames, this gasket having suitable recesses, as shown, to accommodate the clips 35.

Attached to the front or smaller end of the frusto-pyramidal bellows 16 is an eye piece 20 provided at its free end, which is open toward the observer, with an annular gasket 21 consisting, for example, of a rubber tube. Disposed internally of the eye piece 20 is a lens carrier 22, pivotally mounted therein by a pin 23 which extends through the wall of the eye piece and carries at its projecting end a handle 24 for displacing the lens carrier from its vertical or operative position, shown in full lines in Fig. 4, into its horizontal or inoperative position, shown in dot-dash lines in the same figure. The lens carrier 22 holds a pair of lenses 25, which may be biconvex magnifying lenses of, say, 12 to 18 inches depth of focus. Back of the lens carrier 22 a protective lead glass plate 26 may be inserted into the eye piece 20.

In order to prevent the bellows 16 from sagging under the weight of the eye piece, I provide four diagonally arranged resilient elements, such as elastic threads 27, which extend from the four corners of the frame 17 toward corresponding corners of the frame 28 through which the eye piece is secured to the bellows. These elastic threads should be strong enough to maintain the eye piece, when released by the operator, in substantially centered position with respect to the screen 10, at the same time collapsing the bellows as shown in Fig. 3, without however unduly impeding the extension of the bellows by the observer and the movement of the eye piece relative to the screen. A head band 29, provided with an elastic insert 30 for adjustment to different head sizes, is attached to the eye piece 20 and enables the operator, as illustrated in Fig. 1, to extend the bellows and adjust the eye piece relative to the screen without using his hands or risking the intrusion of light between his eyes and the eye piece.

When not in use, the eye piece is preferably encased in a cover 31 which bears against the frame 28, thereby effectively protecting the sensitive fluorescent screen 10 from the effects of daylight or other harmful radiation, the rear of the screen being conventionally protected by a resinous plate 32, permeable to X-rays but otherwise opaque, which is permanently secured to the screen 10. The strap 29 may be detached before encasement if it cannot be conveniently accommodated inside the cover 31.

In the modification shown in Figs. 5 and 6, the frame 17 is provided at its four corners with holes 34 adapted to receive bolts 36 screwed into frame 14, these bolts projecting beyond the frame 17 when the two frames are mounted adjacent each other with the rubber gasket 33 between them; gasket 33 has holes aligned with the holes 34 of frame 17, in order to allow for the passage of the bolts 36 therethrough.

Anchored to each bolt 36 is a resilient clip 37 allowing for the rapid attachment of the device 15 to the screen frame 14, this clip being represented by a coil spring forming a loop which may be snapped around the projecting end of bolt 36, as shown, thereby holding the frame 17 in place and urging it toward the frame 14. It will be understood that the stiffness of the clips 37 should be greater than that of the diagonally extending resilient elements (which in this modification have been shown as helical springs 27'), in order to insure good contact between the frames 14, 17 and the gasket 33.

From Fig. 1 it should be clear that the operator, upon strapping the eye piece 20 to his head by means of the band 29, may extend the bellows 16 by simply stepping or bending back to the desired distance from the screen 10 and may align the eye piece 20 with any portion of the screen by movements of his head, thus leaving his hands free for other tasks. For the observation of details the handle 24 may be turned up, thereby bringing the lenses 25 into operative position, and the bellows may be somewhat released to bring the eyes of the observer closer to the screen, whereas for a viewing of the entire screen surface the length of the bellows should be increased and the lenses 25 left in place or moved out of the way, as desired. It will be apparent that the elasticity of the insert 30 should also be considerably less than that of the elements 27 or 27', thereby insuring full contact between the face of the observer and the eye piece.

The weight of the device 15 should be small in relation to that of the sliding assembly 10, 13, 14, 38, 39 so that the screen will remain in balance whether or not the device is attached thereto.

It is to be noted that the invention is not limited to the precise embodiments shown and described but is, on the contrary, capable of numerous adaptations and modifications within the scope of the appended claims.

I claim:

1. In an apparatus having a fluorescent screen and viewing means for observing said screen, the combination, with an extendible bellows having a larger end secured to said screen and a smaller end secured to said viewing means, of resiliently contractile, flexible means exerting a contracting force in a generally axial direction upon said smaller end, thereby tending to collapse said bellows with said viewing means centered with respect to said screen, said contractile means by the flexibility thereof permitting sideways movement of said viewing means substantially parallel to said screen.

2. In an apparatus having a fluorescent screen and viewing means for observing said screen, the combination, with an extendible bellows having a larger end secured to said screen and a smaller end secured to said viewing means, of a plurality of resiliently contractile, flexible, elongated elements extending in different directions between said screen and said viewing means and exerting a contracting force in a generally axial direction upon said smaller end, thereby tending to collapse said bellows with said viewing means centered with respect to said screen, said contractile elements by their flexibility permitting sideways movement of said viewing means substantially parallel to said screen.

3. In an apparatus having a fluorescent screen and viewing means for observing said screen, the combination, with an extendible bellows having a larger end secured to said screen and a smaller end secured to said viewing means, of a plurality of resiliently contractile, flexible, elongated elements extending within said bellows from end to end between said screen and said viewing means and exerting a contracting force in a generally axial direction upon said smaller end, thereby tending to collapse said bellows with said viewing means centered with respect to said screen, said contractile elements by their flexibility permitting sideways movement of said viewing means substantially parallel to said screen.

4. In an apparatus having a fluorescent screen and viewing means for observing said screen, the combination, with an extendible bellows of frusto-pyramidal configuration, having its larger end secured to said screen and its smaller end secured to said viewing means, of a plurality of resiliently contractile, flexible, elongated elements extending between corresponding corners of said smaller and larger ends and exerting a contracting force in a generally axial direction upon said smaller end, thereby tending to collapse said bellows with said viewing means centered with respect to said screen, said contractile elements by their flexibility permitting sideways movement of said viewing means substantially parallel to said screen.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
387,092	Mann	July 31, 1888
699,767	Saxby	May 12, 1902
703,655	Happold	July 1, 1902
984,520	Campbell	Feb. 14, 1911
1,143,045	Freud	June 15, 1915
2,290,767	Reuter	July 21, 1942

FOREIGN PATENTS

Number	Country	Date
33,231	Holland	June 16, 1934
735,512	France	Nov. 10, 1932