

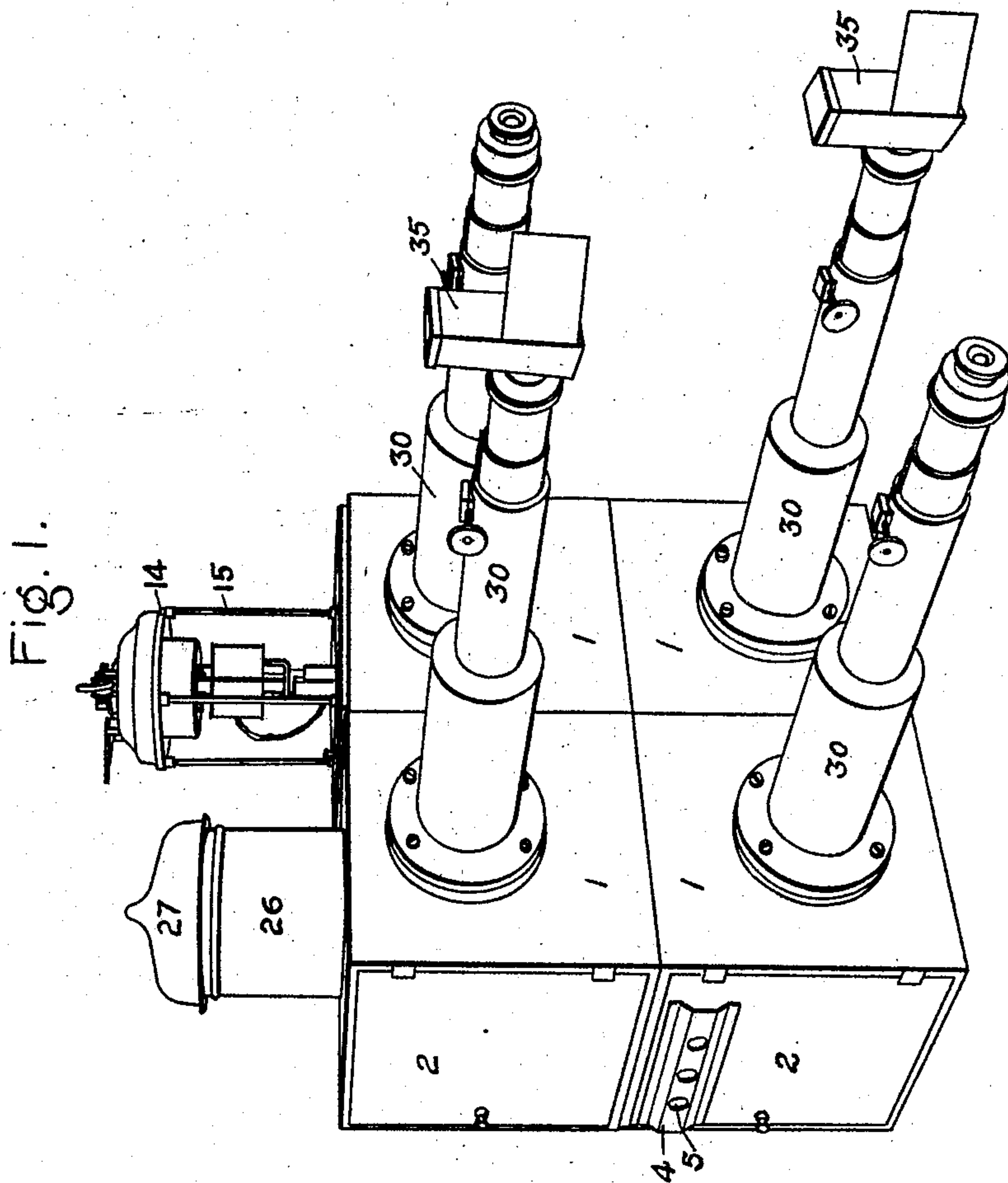
No. 815,865.

PATENTED MAR. 20, 1906.

W. D'A. RYAN.
DEVICE FOR COMPARING LUMINOUS AREAS.

APPLICATION FILED JULY 28, 1904.

2 SHEETS—SHEET 1.



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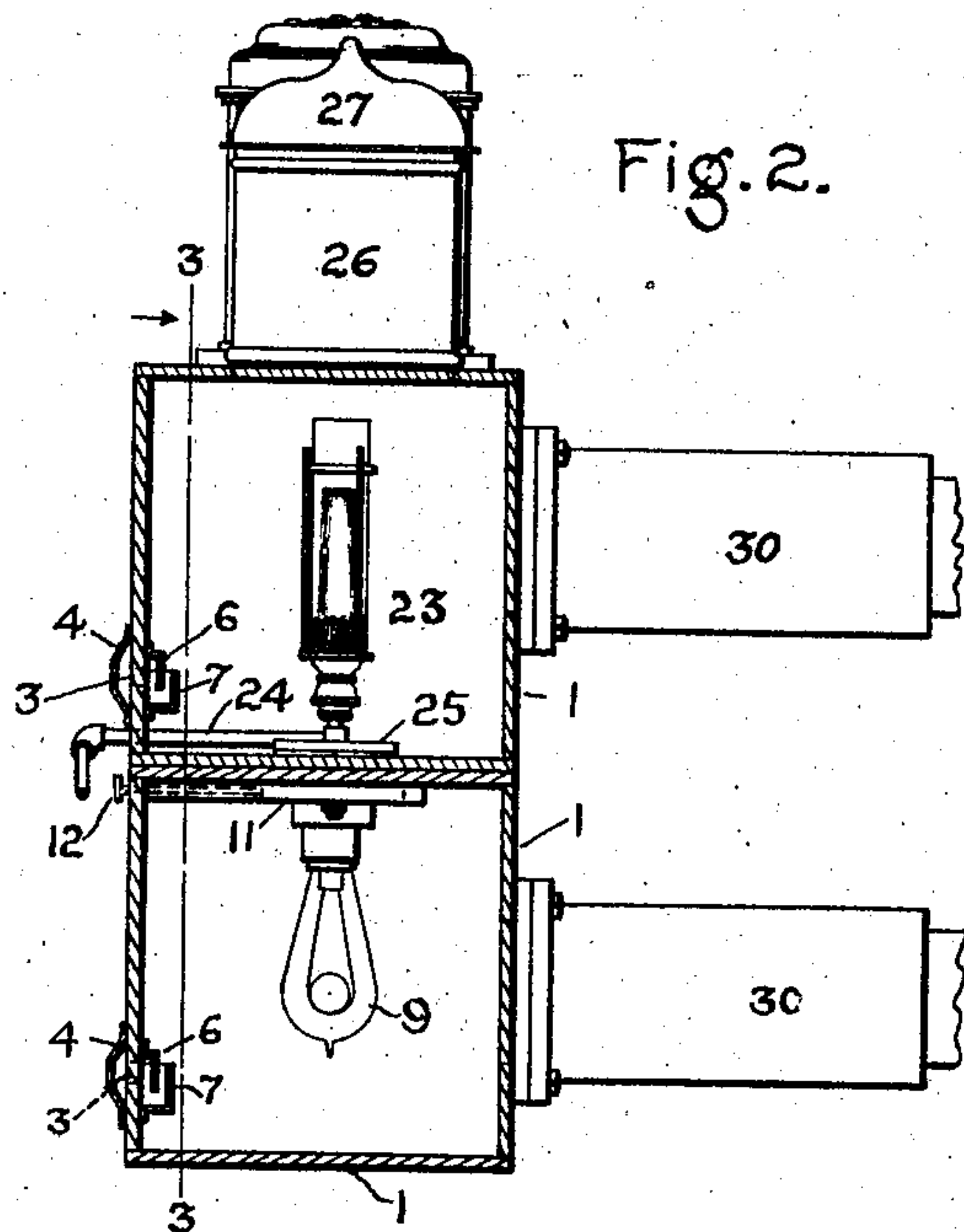


Fig. 2.

Fig. 4.

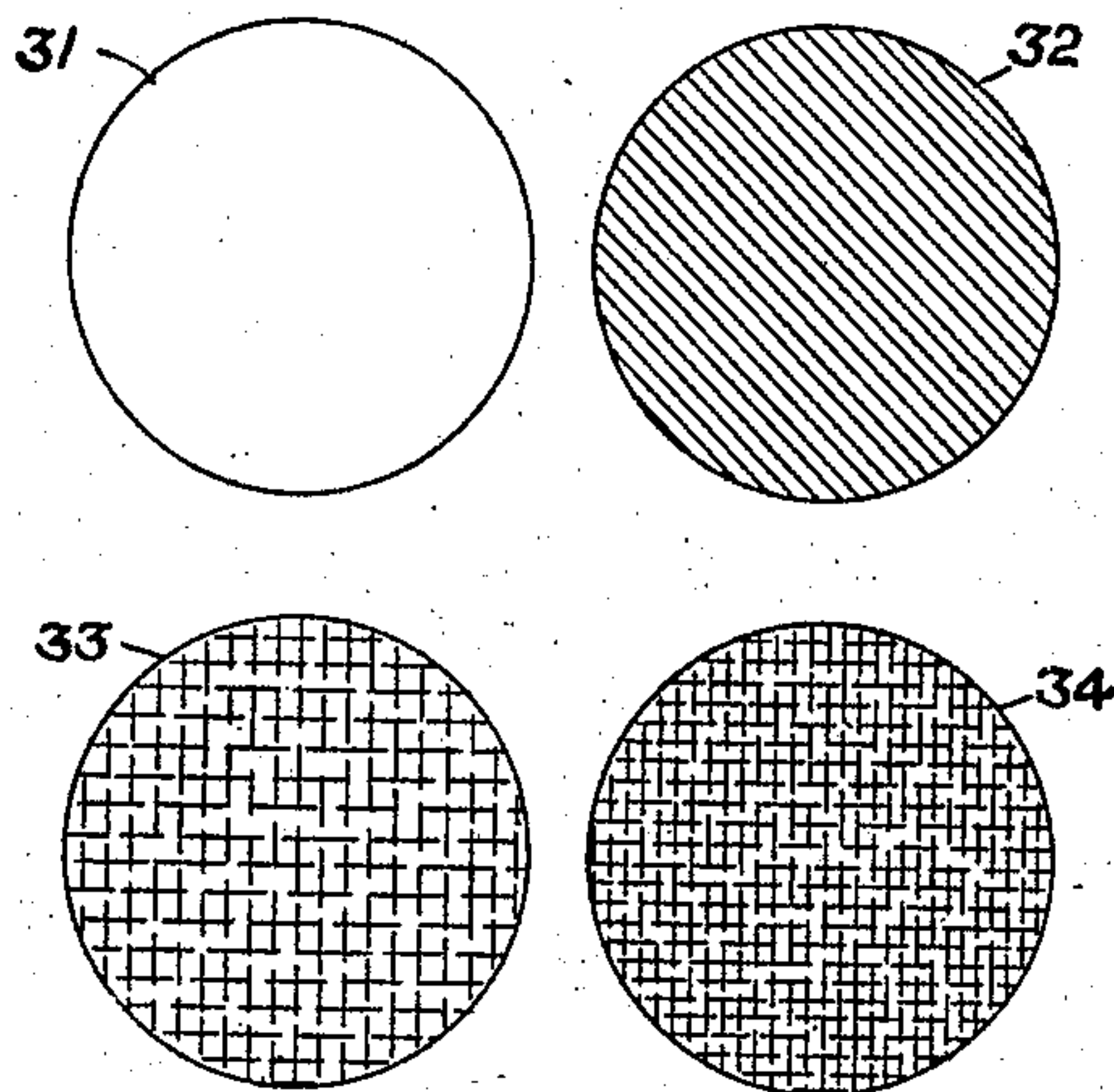


Fig. 3.

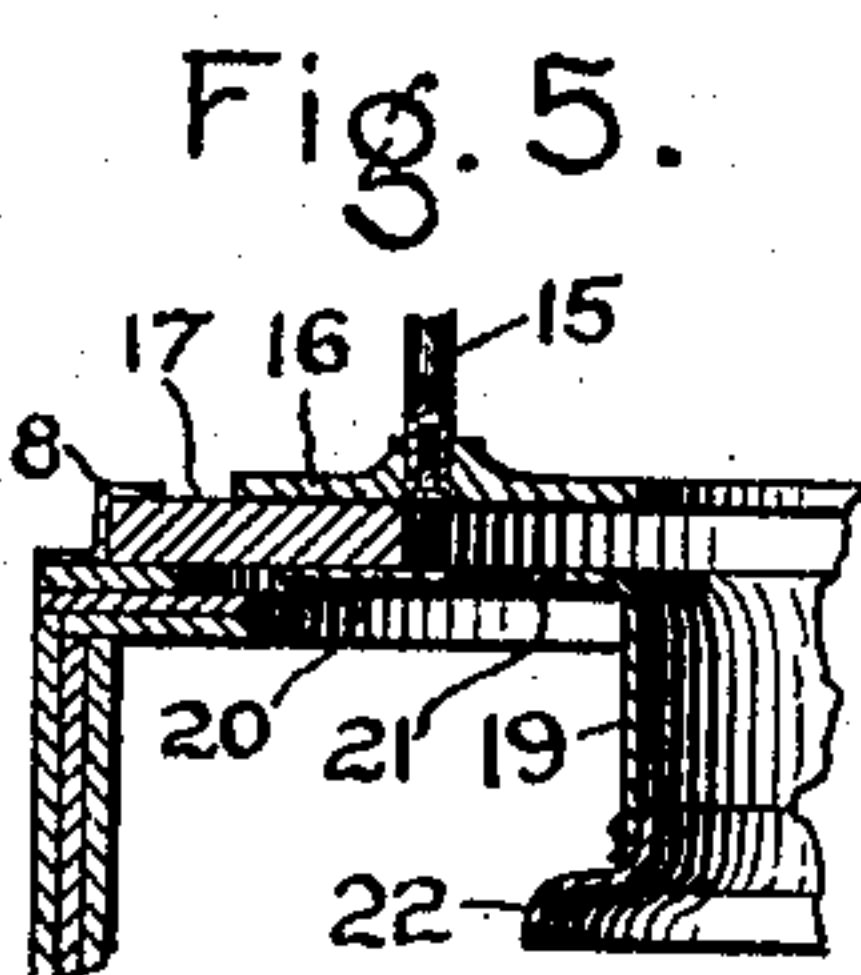


Fig. 5.

Fig. 6.

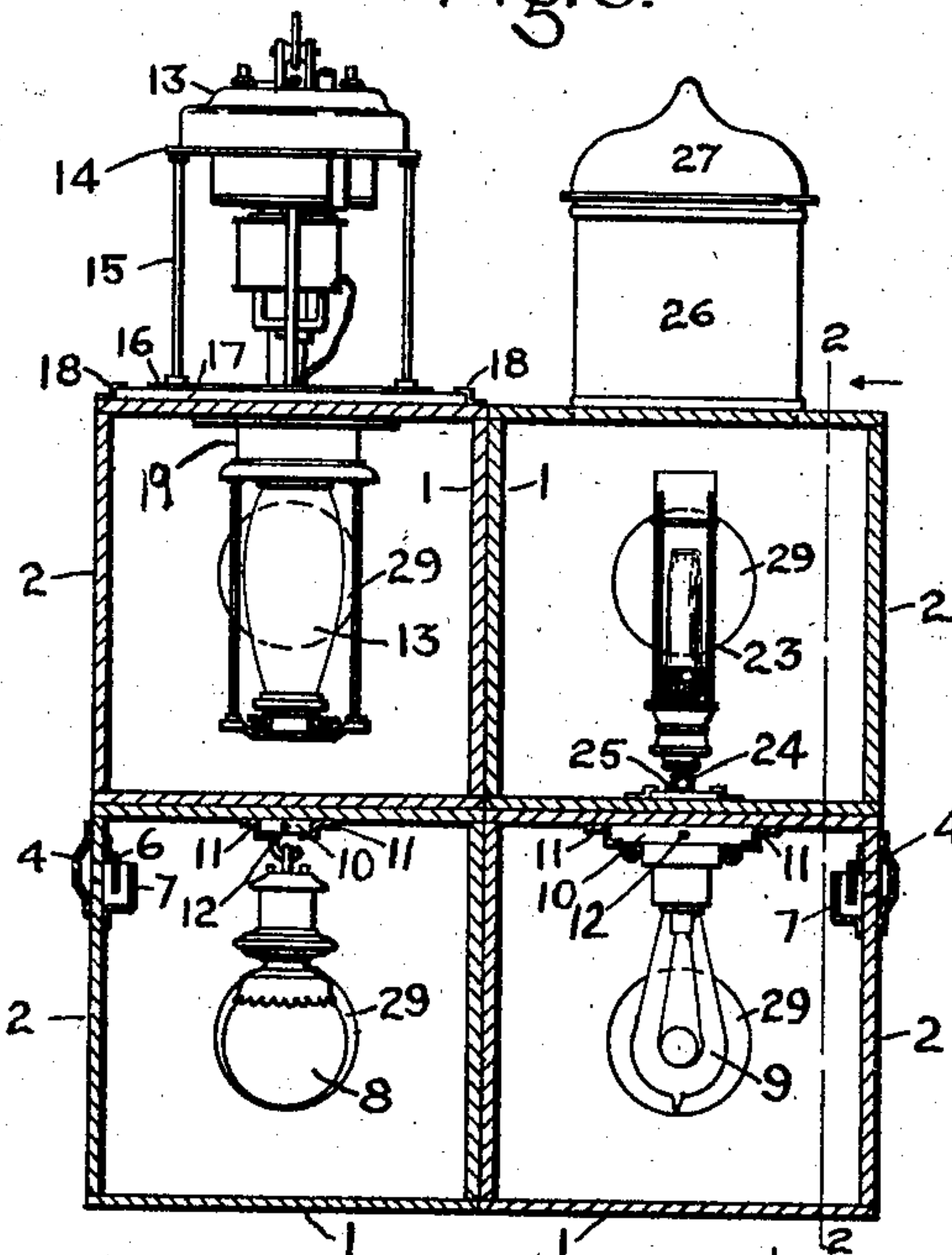
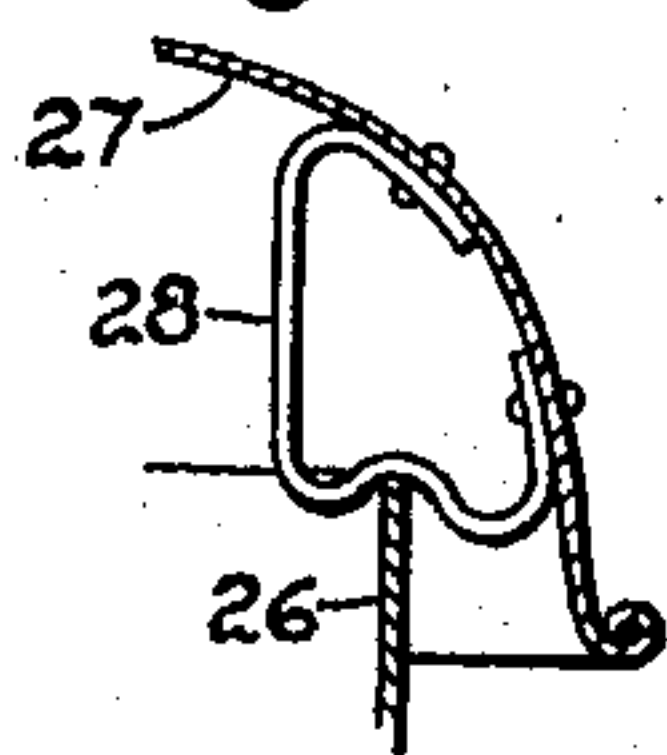


Fig. 7.

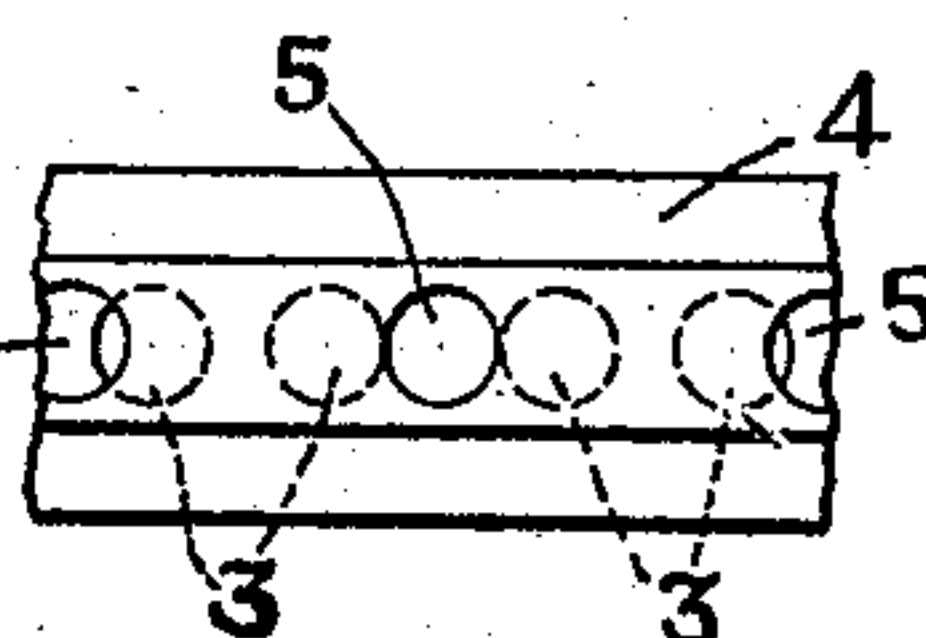
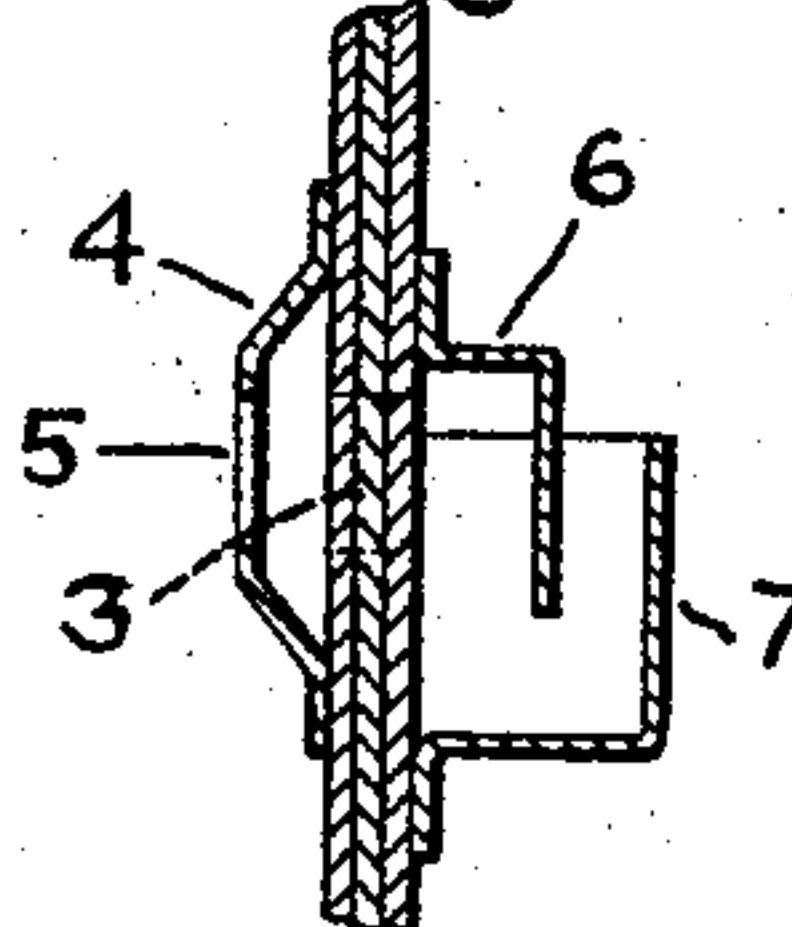


Fig. 8.



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UNITED STATES PATENT OFFICE.

WALTER D'A. RYAN, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

DEVICE FOR COMPARING LUMINOUS AREAS.

No. 815,865.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed July 28, 1904. Serial No. 218,519.

To all whom it may concern:

Be it known that I, WALTER D'A. RYAN, a subject of the King of Great Britain, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Devices for Comparing Luminous Areas, of which the following is a specification.

This invention relates to photometry; and its object is to enable an observer to compare the light emitted from two or more sources with special reference to the color effects.

It consists, as its name implies, in an apparatus arranged to throw upon a screen areas of illumination from different luminous objects, so that their difference in color may be readily seen and compared.

The preferred form of apparatus is herein after shown and described, and the novel features are pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of an apparatus embodying my invention. Fig. 2 is a side elevation, partly broken away and partly in section, on the line 2 2, Fig. 3. Fig. 3 is a rear sectional elevation on the line 3 3, Fig. 2. Fig. 4 shows the field of view as thrown on a screen by the apparatus illustrated. Figs. 5 and 6 are detail cross-sections. Fig. 7 is a front elevation of a portion of a ventilator, and Fig. 8 is a cross-section of the same.

The parachromoscope or multiple projector herein shown and described is arranged to compare four different lights—as, for instance, an arc-lamp, a Welsbach gas-burner, a Nernst lamp, and an incandescent lamp; but it is evident that other lamps or burners may be substituted for any of these, if desired.

The body of the apparatus shown has four compartments arranged in two tiers of two each. Each compartment is preferably a separate box 1, of which one side 2 is hinged. Near the bottom of the back of each box is an inlet-ventilator, preferably a row of holes 3, protected by a screen 4, containing holes 5 out of line with the holes 3. Inside the box two overlapping baffle-plates 6 7 stand opposite the holes to break up the entering air-currents and prevent the escape of light-rays. The boxes which contain the Nernst lamp 8 and the incandescent lamp 9 also have a similar ventilator at the top of one side—as, for instance, the door 2—to permit the escape of

heated air. These lamps are each supported by a slide 10, movable in cleats 11 at the top of the box and running from front to rear. A rod 12 extends from each slide out through the back of the box.

The arc-lamp 13 is hung from a ring 14, supported on posts 15, set in sockets on a base 16, fastened on top of a slide 17, which can be moved back and forth on top of the box in guides 18. The base is annular, and the slide has a large opening registering therewith. A short sheet-metal tube 19 depends below said opening, having an outwardly-projecting flange 20 at its upper end, by which it is secured to the bottom of the slide concentric with said opening. In the flange are several holes 21, lying inside the edge of the opening. The inner edge of the base 16 projects over these holes, being spaced above them by the thickness of the slide. These holes thus afford means for the heated air to escape from the box up through the center of the base 16. An annular flange 22 is secured to the lower end of the tube 19 and has a downwardly-curved edge fitting over the cap of the lamp-globe, so that no light can escape through the top of the box. The top of the box has an opening, through which the tube depends, large enough to permit the slide and tube to be moved back and forth a considerable distance.

The Welsbach burner 23 is mounted on a gas-pipe 24, which can be slid back and forth through the back of the box and is supported on a slide 25 inside the box. Above this burner is a ventilator comprising an upright sheet-metal cylinder 26, surmounted by a dome 27, supported on brackets 28. The edge of the dome comes down below the top of the cylinder, having an annular space all around for the escape of the heated air and products of combustion without letting out any light-rays.

In the front of each box is an opening 29, leading into a projector 30, which is provided with specially-ground lenses without balsam in order to avoid the danger of selective absorption. The projector has an iris-shutter contained in the enlarged casing shown on the end of the projector. The axes of the several projectors are non-convergent, so that the field of light thrown by each one does not overlap the others.

The operation of the instrument is as fol-

lows: The various sources of light are adjusted back and forth, and the iris-shutters are manipulated until the luminous intensity of all the lights is brought to the same value, preferably at about the D line of the spectrum. The four disks of light, preferably about fifteen inches in diameter, are thrown on a screen—say ten feet from the instrument. The disk 31 from the arc-lamp appears white, the disk 32 from the Welsbach burner green or greenish yellow, the disk 33 from the Nernst lamp pale yellow, and the disk 34 from the incandescent lamp a deeper yellow. By placing a sheet of colored fabric so as to include all the disks the relative effects of the various lights are clearly shown. A plaid material of certain colors shows that different colors under different lights undergo radical changes. The instrument is therefore of especial value—for instance, in demonstrating to merchants dealing in dress goods how their wares appear under the various kinds of lights. If it is desired to study the lights spectroscopically, a prism attachment 35 can be placed on each projector, so that the four spectra are thrown on the screen side by side, and the composition of the lights can very readily be compared.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. An instrument for comparing the relative effects of different sources of light, comprising a separate compartment for each light and a projector extending therefrom, said projectors permanently fixed with their axes non-convergent, and the light source in each compartment being of a different kind from those in the other compartments.

2. An instrument for comparing the relative effects of different sources of light, comprising a separate compartment for each light, permanently-fixed non-convergent projectors extending therefrom, a shutter on said projector, and means for adjusting the position of the light in each compartment the light source in each compartment being of a different kind from those in the other compartments.

3. An instrument for comparing the relative effects of different sources of light, comprising a separate compartment for each light, permanently-fixed non-convergent projectors extending from the front of the same, a slide movable back and forth in each compartment, and a light source mounted on said slide, said light sources being of different kinds.

4. An instrument for comparing the relative effects of different sources of light, com-

prising a separate compartment for each light, permanently-fixed non-convergent projectors extending from the front of the same, a slide in each compartment for supporting the light, and ventilators at the lower and upper parts of each compartment the light source in each compartment being of a different kind from those in the other compartments.

5. In a device for comparing luminous areas, the combination with a box having a projector on its front, and means for adjustably supporting a light, of a ventilator comprising a row of holes in the wall of the box, an external screen having holes not registering with those in the box, and internal overlapping baffle-plates.

6. In a device for comparing luminous areas, the combination with a box having a projector on its front, and an opening in its top, of a slide on the top of the box containing an opening, an arc-lamp supported on said slide and depending into the box, and a ventilator concentric with the opening in the slide.

7. In a device for comparing luminous areas, the combination with a box having a projector on its front and an opening in its top, of a slide covering said opening and containing an opening itself, an annular base-plate concentric with said slide-opening, posts on said plate and an annular lamp-support on said posts.

8. In a device for comparing luminous areas, the combination with a box having a projector on its front and an opening in its top, of a slide covering said opening, an annular plate concentric with said slide-opening and extending partly over the same, a short tube having a flange secured to the under side of the slide and containing a number of holes, a flange secured to the lower end of said tube, and an arc-lamp supported on said plate and depending through said tube.

9. In a device for comparing luminous areas, the combination with a plurality of compartments each having a projector rigidly mounted on its front, the axes of said projectors being non-convergent, of means in one compartment for supporting an arc-lamp, means in another compartment for supporting an incandescent lamp, and means in another compartment for supporting a gas-burner device.

In witness whereof I hereunto set my hand this 25th day of July, 1904.

WALTER D'A. RYAN.

Witnesses:

DUGALD McK. McKILLOP,
JOHN A. McMANUS.