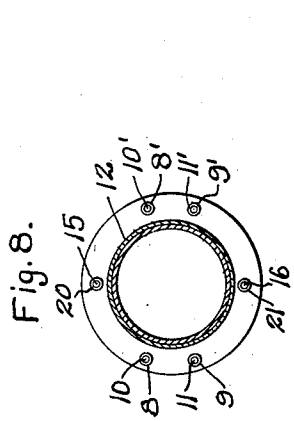
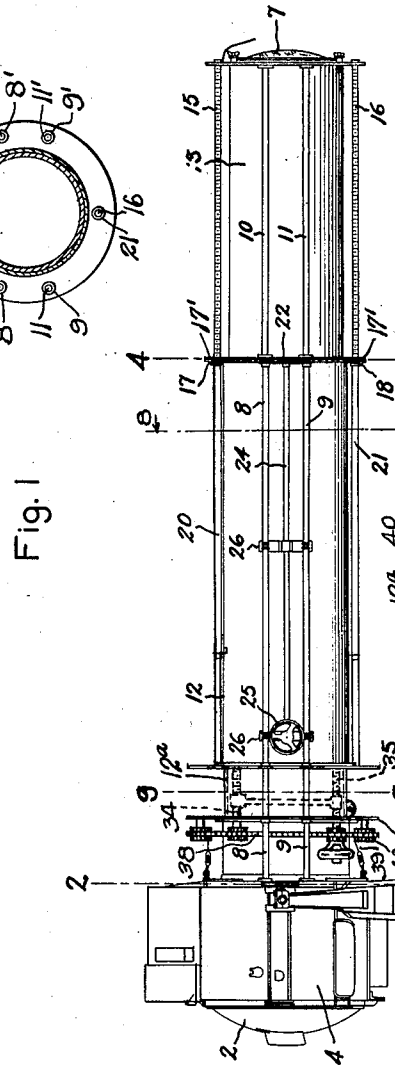
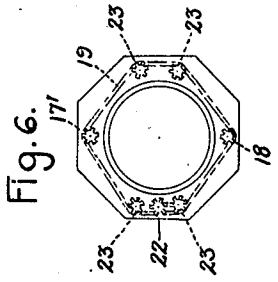
July 21, 1931. W. D'A. RYAN 1,815,801

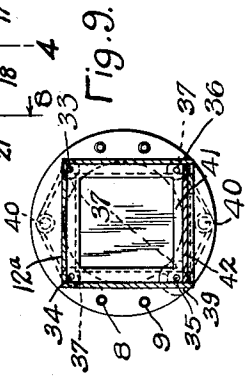
LIGHT PROJECTOR

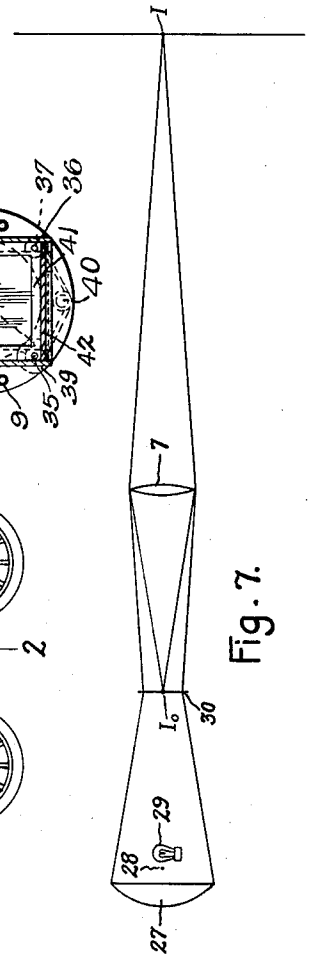
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Inventor:
Walter D'A. Ryan,
by Charles E. Mullen
His Attorney.

July 21, 1931. W. D'A. RYAN 1,815,801

LIGHT PROJECTOR

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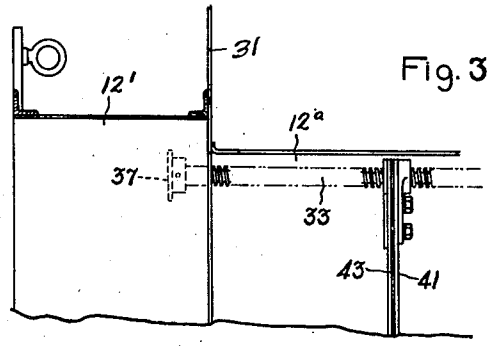


Fig. 3.

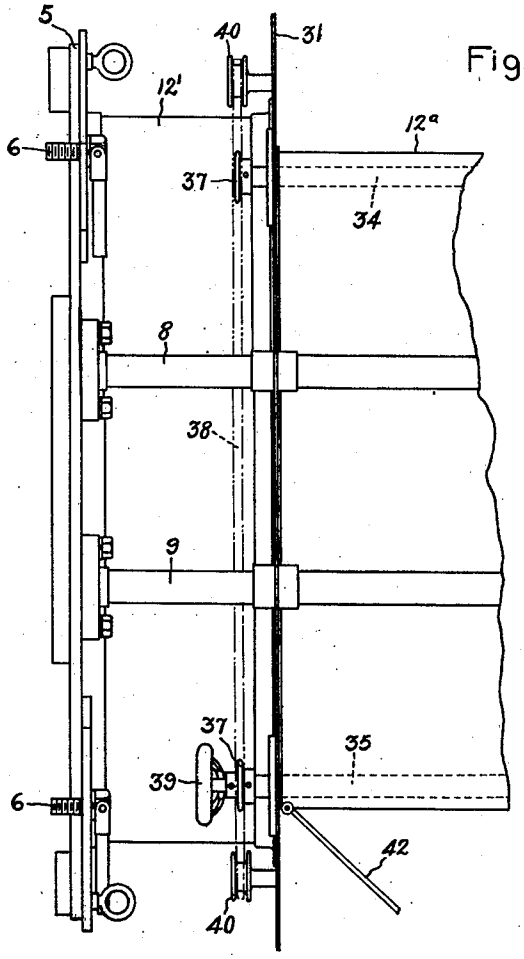


Fig. 2.

Inventor:
Walter D'A. Ryan,
by Charles O'Malley
His Attorney.

July 21, 1931. W. D'A. RYAN 1,815,801

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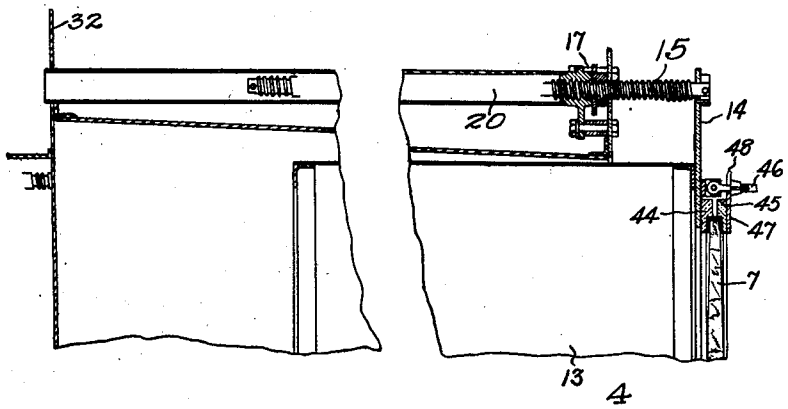
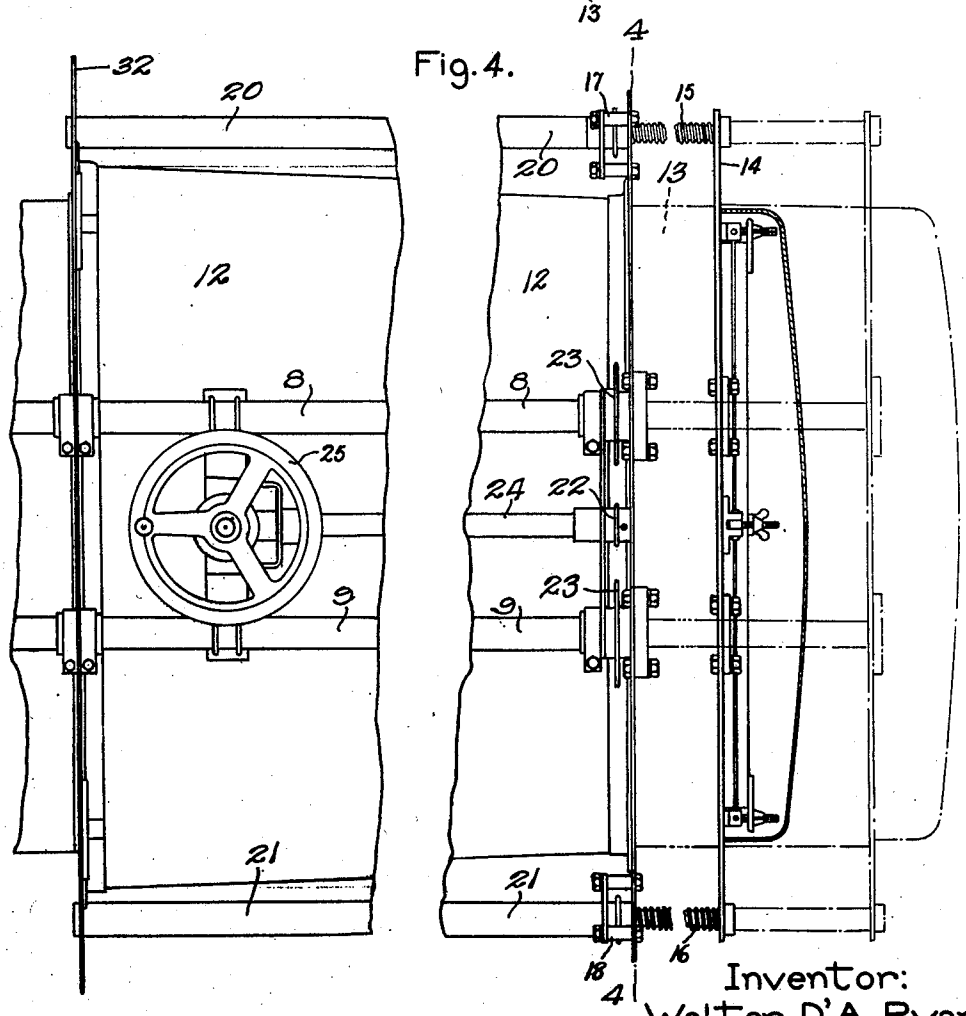


Fig. 5.

Fig. 4.



Inventor:
Walter D'A. Ryan,
by Charles D. Miller
His Attorney.

Patented July 21, 1931

1,815,801

UNITED STATES PATENT OFFICE

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

LIGHT PROJECTOR

Application filed January 17, 1928. Serial No. 247,431.

My invention relates to light projectors. More particularly it relates to projectors of the type that are especially adapted for advertising, and more particularly still, to the type of advertising device that makes use of a screen in the open, such as a cloud, a bank of fog, steam, or other such medium.

The invention will be more readily understood by reference to the accompanying specification and claims, reference being had to the accompanying drawings in which Fig. 1 shows a projector, in side elevation, comprising the features of the invention. In this figure a common type of searchlight drum is shown with an attachment to the front of the drum in place of the usual door. Fig. 2 shows an enlarged side elevation of a portion of the device located between the lines 2—2, 3—3. Fig. 3 is a detailed section of the portion of the device of Fig. 2. Fig. 4 is an enlarged portion of the device to the right of line 3—3, Fig. 1. This portion of the device is broken for convenience. Fig. 5 is a detailed section of the portion of the device of Fig. 4. Fig. 6 is a front view of the adjusting mechanism indicated in Fig. 3, by means of which mechanism the lens located at the extreme right of the device is moved back and forth. Fig. 7 is a diagrammatic representation of the optical system used in the device. Fig. 8 is a section on line 8—8, Fig. 1, and Fig. 9 is a section on line 9—9, Fig. 1.

Referring to the drawings, it will be seen that in Fig. 1 the left hand portion of the device is in the form of an ordinary searchlight element 2 mounted upon a suitable support 3, which is in turn mounted upon wheels in order that it may be readily moved about. The searchlight comprises the usual reflector element located within the drum 4. In place of the usual door I provide the mechanism which is shown in Fig. 1 to the right of line 2—2. This mechanism has a frame 5 (see Fig. 2) which is adapted to be secured to the front of the drum by means of suitable screws 6. Projecting from this frame, there are four pipes 8, 9, 8′, 9′, (see Figs. 8 and 9). The forward part of the device is provided with four rods 10, 11, 10′, 11′, (see Fig. 8), which are adapted to slide in the pipes 8, 9, 8′, 9′, respectively. Located within the region embraced by rods 8, 9, 8′, 9′, there is a tube 12, the left hand end of which is secured to the frame 5, (see Fig. 2) and the right hand end of which terminates in a ring 17′, (see Fig. 6). The tube 13 terminates at the right in a frame 14, see Figs. 4 and 5, which frame has secured to it a set of rods 10, 11, 10′ and 11′. These rods are adapted to slide in the tubes 8, 9, 8′ and 9′ respectively in order that the tube 13 may be adjusted with respect to the tube 12. The tube 13 is secured at the right hand end just to the left of the lens 7, to a frame 14 (see Figs. 4 and 5). This frame is also secured to the rods 10, 11, 10′ and 11′, so that by sliding the frame 13 to the right and left, Fig. 1, the rods 10, 11, 10′ and 11′, and the tube 13 are adjusted with respect to the tube 12. The lens 7 is also carried by the frame 14 and consequently may be adjusted with respect to the light source when the tube 13 is moved back and forth. For the purpose of moving the tube as indicated, a pair of screw elements 15 and 16 are provided. These elements 15 and 16 are, as shown in Fig. 5, in threaded engagement with the respective nut elements 17 and 18, see Figs. 1, 4, 5 and 6. These nut elements are mounted in bearings at the end of the tube 12 so that they may rotate, but are imprisoned so that they cannot move laterally. These nut elements are provided with sprockets for engaging a chain 19 (see Fig. 6). By driving the chain the nuts 17 and 18 are rotated and therefore the screws 15 and 16 may be moved in and out with respect to the tubes 20 and 21 mounted on the outside of the tube 12. For the purpose of driving this chain a driving sprocket element 22 (see Fig. 6) is provided which is in engagement with the chain 19. For the purpose of supporting the chain about the tube 12 there are provided in addition to the elements 17, 18 and 22, four rotating idlers 23, Fig. 6. The driving sprocket 22 is secured to the right hand end of shaft 24, Fig. 1, which shaft may be rotated by means of the handwheel 25, the wheel being suitably geared in engagement with the shaft 24. As shown in Fig. 1, the shaft 24 is held in position by

suitable clamps 26 supported along the pipes 8 and 9.

Referring to Fig. 7, it will be seen that the reflector contained within the drum 2 is represented by the element 27 at the left. The focal point 28 of this reflector is shown just to the right of the reflector. In proximity to this focal point the lamp 29 is located. If the lamp 29 is assumed to be just to the right of the focal point, as indicated in this figure, the beam produced by the reflector, assuming the reflector to be paraboloidal, will taper toward the right, as indicated, and then broaden again. Along the narrow region of the beam the slide 30, which may be either in the form of a transparent lantern slide or in the form of a metal plate perforated with the characters that are to be projected, is inserted. Obviously, therefore, by properly adjusting the position of the lens 7, the image on the slide can be projected to the point I at the right. Assuming that there is a cloud at that point, the image will appear in the cloud. If the cloud is further from or nearer than the point I, the lens, of course, must be adjusted back and forth to suit the position of the screen. Referring to Figs. 1, 2 and 3, the section of the tube 12 between the lines 31 and 32 is shown square. This section I have indicated as 12*a*. At each corner of this square there is a screw. I will designate these screws as 33, 34, 35, 36. Each of these screws is provided with a sprocket nut 37, (see Fig. 9) there being four such sprockets. The chain 38 is provided around the tube which engages with all of these sprockets. The screw 35, see Fig. 2, terminates in a handwheel 39. By turning this handwheel the four screws may be rotated simultaneously. For convenience, a number of idlers 40 are provided along the path of the chain. By rotating the handwheel 39, therefore, the lantern slide frame 41 may be adjusted back and forth within the box section 12*a*. On the lower side of the section 12*a* there is an opening or door 42. When this door is opened a lantern slide may be inserted into the frame 41, this frame being provided on two sides with grooves 43. (See Fig. 3.) When the lantern slide is inserted in position the door 42 is closed and latched whereupon the weight of the lantern slide is supported upon the inside of the door 42. Any other suitable arrangement may be employed for holding the lantern slide in position.

Referring to Fig. 5, it will be seen that the lens 7 is adapted to be placed in position at the end of the tube 13 and clamped between the elements 44 and 45 by means of the latches 46. The elements 44 and 45 are each in the form of a ring, each with a recess. It will be seen that the lens 7 is provided with a gasket 47 which is seated in the said recesses. The ring 47 is provided with slotted prongs 48 that receive the latch element 46 for clamping the ring 48, (see Fig. 4) and therefore the lens, in place. In Fig. 4 the lens 7, (see Fig. 5) is shown removed and the cap is shown covering the lens holder. The dotted lines in this figure represent an adjusted position of the tube 13.

It will be understood that while I have illustrated in the drawings a specific form of device, I do not intend in the appended claims to be limited to such specific form of construction inasmuch as in view of the disclosure variations may readily be made without departing from the spirit of my invention.

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

1. In a projector, a tube, a light source, a reflector for projecting light from said source in the form of a beam through said tube, an adjustable lantern slide frame in said tube, means in said slide frame for receiving a slide, means for adjusting said frame back and forth along the axis of said tube, said tube being provided with an adjustable extension whereby the length of the tube may be increased or decreased along the axis of the beam, a lens holder supported by said tube extension, and means for securing a lens to said lens holder in the path of said beam, said lantern slide frame and said extension being mounted each on adjusting screws disposed about the periphery of said tube and parallel therewith, each set of adjusting screws being independent of the other whereby the lantern slide and the lens may be adjusted each independently of the other, sprocket means associated with said screws and located about the periphery of said tube, a chain in operative engagement with each set of sprockets, and means individual to each chain for driving the corresponding chain whereby the corresponding adjustable element may be adjusted with respect to each other and with respect to the light source.

2. In a projector, a tube, a light source, a reflector for projecting light from said source in the form of a beam through said tube, an adjustable lantern slide frame in said tube, means in said slide frame for receiving a slide, means for adjusting said frame back and forth along the axis of said tube, said tube being provided with an adjustable extension whereby the length of the tube may be increased or decreased along the axis of the beam, a lens holder supported by said tube extension, and means for securing a lens to said lens holder in the path of said beam, said lantern slide frame and said extension being mounted each on adjusting screws disposed about the periphery of said tube and parallel therewith, each set of adjusting screws being independent of the other whereby the lantern slide and the lens may be adjusted each independently of the other, sprocket means associated with said screws and located about the periphery of said tube, a chain in operative

engagement with each set of sprockets, and means individual to each chain for driving the corresponding chain whereby the corresponding adjustable element may be adjusted with respect to each other and with respect to the light source, a drum for said reflector and said light source, said tube being secured to said drum and projecting forward from said drum along the axis of the drum.

3. In a projector, a tube, a light source, a reflector for projecting light from said source in the form of a beam through said tube, an adjustable lantern slide frame in said tube, means in said slide frame for receiving a slide, means for adjusting said frame back and forth along the axis of said tube, said tube being provided with an adjustable extension whereby the length of the tube may be increased or decreased along the axis of the beam, a lens holder supported by said tube extension, and means for securing a lens to said lens holder in the path of said beam, said lantern slide frame and said extension being mounted each on adjusting screws disposed about the periphery of said tube and parallel therewith, each set of adjusting screws being independent of the other whereby the lantern slide and the lens may be adjusted each independently of the other, sprocket means associated with said screws and located about the periphery of said tube, a chain in operative engagement with each set of sprockets, and means individual to each chain for driving the corresponding chain whereby the corresponding adjustable element may be adjusted with respect to each other and with respect to the light source, a drum for said reflector and said light source, said tube being secured to said drum and projecting forward from said drum along the axis of the drum, said adjusting means being all secured to said tube.

4. In a projector, the combination of a light source and a reflector, said source being located in proximity to and in advance of the focal point of said reflector whereby a beam of light may be projected by the reflector converging to a neck and diverging again, a lantern slide, a support for said slide located in proximity of the neck region of said beam, means for adjusting said support along the axis of the beam whereby the slide may be adjusted into position in the neck of said beam, a lens beyond said slide, a frame for supporting said lens, and means for adjusting the frame of said lens along the axis of the projector whereby the lens may be adjusted in turn along said axis with respect to a screen located at varying distances from the said slide.

5. In a projector, a tube, a light source, a reflector for projecting light from said source in the form of a beam extending through said tube, a lantern slide frame in said tube, means in said frame for receiving a lantern slide, means for adjusting said frame back and forth along the axis of the tube, said tube being provided with an extension, and means for adjusting said extension whereby the length of the tube may be varied, a lens holder supported by said extension, and means for securing a lens to said holder in the path of said beam, said means for adjusting the slide frame and said means for adjusting said extension, each comprising a set of screws disposed about said tube and extending along the length of the tube, each set of screws being provided with a corresponding set of sprockets in operative engagement therewith, a chain in engagement with each set of sprockets and a driving means for each chain whereby said sprockets may be operated for adjusting the said adjustable elements, each set of screws being operable independently of the other whereby the lens may be adjusted independently of the slide.

6. In a projector, a tube, a light source, a reflector for projecting light from said source in the form of a beam through said tube, a lantern slide frame in said tube, means in said frame for receiving a lantern slide, means whereby the frame may be adjusted back and forth whereby the slide may be correspondingly adjusted along the axis of said tube, said tube being provided with an extension, a lens, a holder for said lens on the end of said extension for holding said lens in the path of said beam, means for adjusting said extension, said last adjusting means being independent of the adjusting means for said slide whereby the lens may be adjusted independently of the slide, said light source being located in advance of the focal point in said reflector whereby said reflector may project a beam from said source in which the rays thereof cross and form a restricted portion in the beam at a point where the beam crosses the said slide.

In witness whereof, I have hereunto set my hand this 16th day of January 1928.

WALTER D'A. RYAN.