Feb. 12, 1929. 1,701,698

A. F. SHORE

VIEW ANALYZER

Filed July 10, 1926

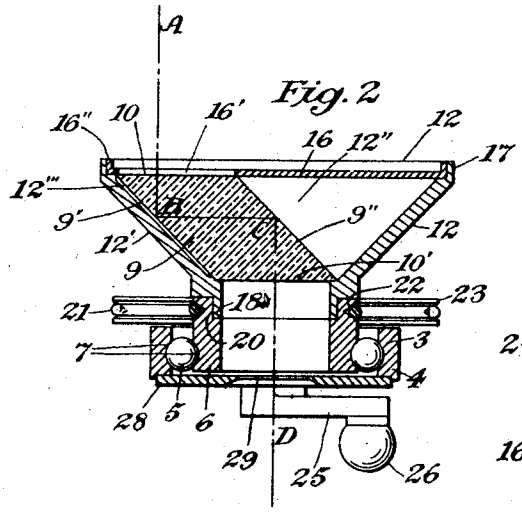


Fig. 2

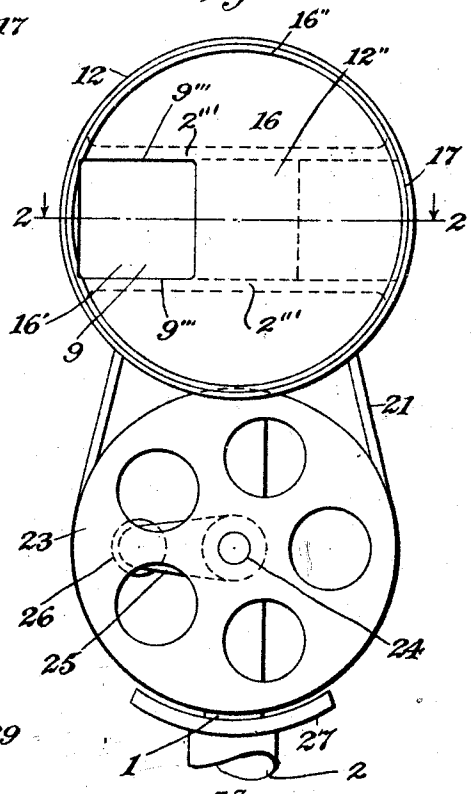


Fig. 1

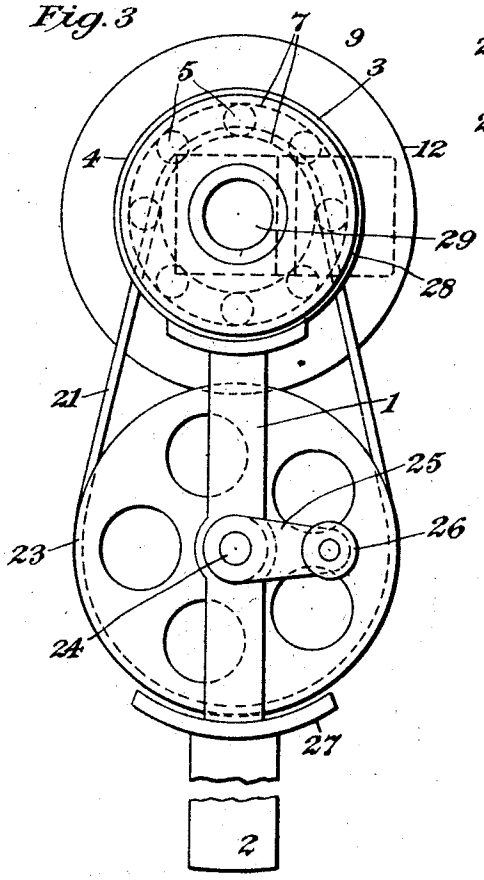


Fig. 3

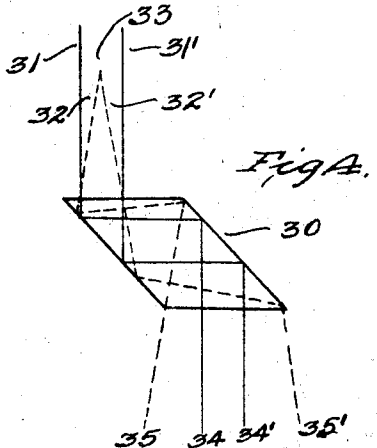


Fig 4.

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VIEW ANALYZER.

Application filed July 10, 1926. Serial No. 121,506.

This invention relates to view analyzing devices and more particularly to devices of this class as disclosed in my co-pending application Ser. No. 111,150, filed May 24, 1926.

The main object of this invention is to provide a device of this class which is adapted to give a comparatively greater lateral displacement of visual rays per unit weight of the optical shifting members, than that of the specific form illustrated in said application, and another object is to provide a device embodying a double reflecting element which can be conveniently arranged in fixed relation to the holding elements and shiftable with the same for a selected purpose. My invention preferably embodies a rhombical or double prismatic element, or its equivalent, including two inclined surfaces, one for receiving and the other for transmitting visual rays to the human eye. The said prismatic element or double reflecting member is shown arranged for a rapid continuous shifting of the receiving surface, preferably by rotation of the same about an axis in the field and direction of vision of the eye.

Other features of the invention not hereinbefore mentioned will presently be described with reference to the drawing accompanying and forming part of this specification, and in which:

Figure 1 is a front elevation of one form of my improved view analyzing device.

Fig. 2 is a horizontal section of the same, taken on the line 2—2 of Fig. 1.

Fig. 3 is a rear elevation of a portion of the same, and

Fig. 4 illustrates diagrammatically the paths followed by rays of light emanating from both near and distant objects crossing the rotating prism.

Like characters of reference refer to like parts in all the figures of the drawing.

Referring to the drawing, the numeral 1 denotes the frame of my improved view analyzing device, and said frame may be of any suitable form and preferably embodying a handle, such as 2, by means of which the device can be held or supported by the hand. The frame 1 preferably supports a bearing, such as 3, which ordinarily is a ball bearing as illustrated. Journaled in said bearing by means of the balls 5 is a ring 6 containing one of the two ball races 7, and which ring is secured to and in operation forms part of the casing 12. The latter is preferably annular and conical at one part indicated by 12′ and serves to house the double reflecting member 9 which is the double prismatic element or rhombical form hereinbefore mentioned. The said member 9 has an inclined ray-transmitting surface 9″, an outer surface 10′ and an inner surface 10′ parallel to each other and to the front of the casing 12 and substantially at 45 degrees to the surfaces 9′ and 9″. The casing 12 is provided with space 12″ of suitable width and configuration to house the member 9 which is held in said space by suitable means, as by cementing it at the sides 9‴, leaving a space 2‴ between the surface 9′ and the casing 12.

There is a front plate 16 having an eccentric opening 16′ preferably rectangular and a flange 16″ by which said plate is secured in the opening 17 in the front of the casing 12. The casing 12 has an annular portion 18 which extends into an annular recess 20 of the ring 6 and is secured in said recess by suitable means, as by soldering. The ring 6 is preferably provided with an annular groove or belt-carrying portion, such as 22.

It will be noted that the casing 12 is adapted to be rotated about its axis by the turning of the ring 6 in the bearing 3. Such turning may be effected in any suitable way, as by means of the pulley 23, here shown as grooved. Said pulley 23 is secured to a short shaft 24, suitably journaled in the frame 1, and turned by means of the crank 25, operated by its handle 26. There is a belt, such as 21, shown in the drawing as round, carried around said pulley 23 and the annular belt-carrying portion or groove 22 of the member 6, so that the said member 6 and casing 12 are caused to rotate on turning the crank 25. The handle 2 of the device has a portion 27 to guard the hand from the pulley 23 when the latter is turned. On the ring 4 of the bearing 3 is secured an annular plate 28 having an eye aperture 29 which is held next to the eye of the operator when using the device.

Referring to Fig. 4, the numeral 30 designates a diagram of the parallel-sided refractor shown at 9 in Fig. 2, with a set of incident light-rays, of which the full lines 31 and 31′, respectively, indicate the parallel light-rays coming in from the infinite distance, whereas the dotted lines 32 and 32′, respectively, indicate two angular light-rays issuing from a near-by point 33. The lower ends of the full lines at 34 and 34′ indicate the position of the bent light-rays indicated by

the full lines at 31 and 31′, whereas the lower ends of the dotted lines at 35 and 35′ indicate the comparative oblique approach of the angular rays of light, indicated by the dotted lines at 32 and 32′, toward the eye-piece.

The operation of this invention is as follows:

The device is held in one hand by means of its handle 2 with the eye aperture 29 close to the eye of the observer. The opening 16′ having been directed toward a landscape or prospect to be viewed, the crank 25 is rapidly turned by means of its handle 26, which causes the rotation of the shaft 24 and pulley 23, which by means of the belt 21 brings about the rotation of the portion 22, the ring 6 and casing 12 with the double prism therein, at an increase in rate. This rotation must be continuous and rapid enough to allow the visual rays to pass to the eye without sensible interruption. The path of a light ray is indicated at A, coming from an object viewed and meeting the surface 9′ at B, thence to the surface 9″ at C, and thence along the line D to the eye. Other light rays will take similar paths at different distances from the one described, as the view may require, as shown in diagram, Fig. 4.

In a view containing a number of foreground objects that partly mask those in the background, the final result of my device is to effect a blurring out or apparent disappearance of the foreground objects. The background objects are clarified and stand out more distinctly, as, for instance, in a landscape containing numerous bushes and trees in the foreground which mask buildings, works, men, animals, or other objects in the background, on viewing the same through the rapidly and continuously revolving view-analyzer, the brushes and trees in the forepart of the view are reduced to a mere haze through which the buildings, works, men or animals at the rear are clearly seen. This general operation is even more fully explained in my before-mentioned application, to which reference may be had.

It is understood that while I have shown a double right-angle refracting-prism as the vital principle of my view-analyzer, which is in harmony with the higher standard of optical practice, ordinary mirror-reflectors may be substituted for these, particularly those of the speculum variety, which have the same degree of optical accuracy as the refractor-total reflecting prisms.

What I claim is:

1. A view-analyzer, embodying a double reflecting element adapted to receive and transmit visual rays, and mechanism for causing a rapid continuous shifting of the receiving portion of said element.

2. A view-analyzer, embodying a double reflecting member adapted to receive and transmit visual rays on given axes respectively, and mechanism for causing a rapid continuous shifting of said receiving portion relative to the transmission axis.

3. A view-analyzer, embodying a movable casing having an eye aperture located in its axis of movement and a front opening eccentric to said axis, double reflecting means in said casing including two inclined surfaces respectively opposite to the front opening and eye aperture, and means for rapidly and continuously rotating the casing and its contents on said axis.

4. A view-analyzer, embodying a casing having an eye aperture on one side and a receiving opening offset from it on the opposite side, a double reflecting prism of transparent material housed in the casing and arranged with an inclined light-receiving surface opposite said receiving opening and an inclined light-transmitting surface opposite the eye aperture, and mechanism for rapidly and continuously rotating said casing and double prism about the axis of the eye aperture.

5. A view-analyzer, embodying a casing having a journal portion, an annular belt-carrying portion and an eye aperture on the same axis, and an opening on the side opposite to the eye aperture and eccentric to the axis thereof, a double total reflecting prism in said casing having two inclined surfaces one opposite said front opening and one opposite the eye aperture, a frame having a bearing in which the journal portion of the casing can rotate, a pulley rotatably mounted on said frame in alinement to the belt-carrying portion of the casing, a belt from said pulley to said carrying portion, and means for rotating said pulley.

In testimony whereof, I affix my signature.

ALBERT F. SHORE.