June 25, 1940. W. M. UPDEGRAVE 2,205,965

APPARATUS FOR EXERCISING THE EYES

Filed May 19, 1938 3 Sheets-Sheet 1

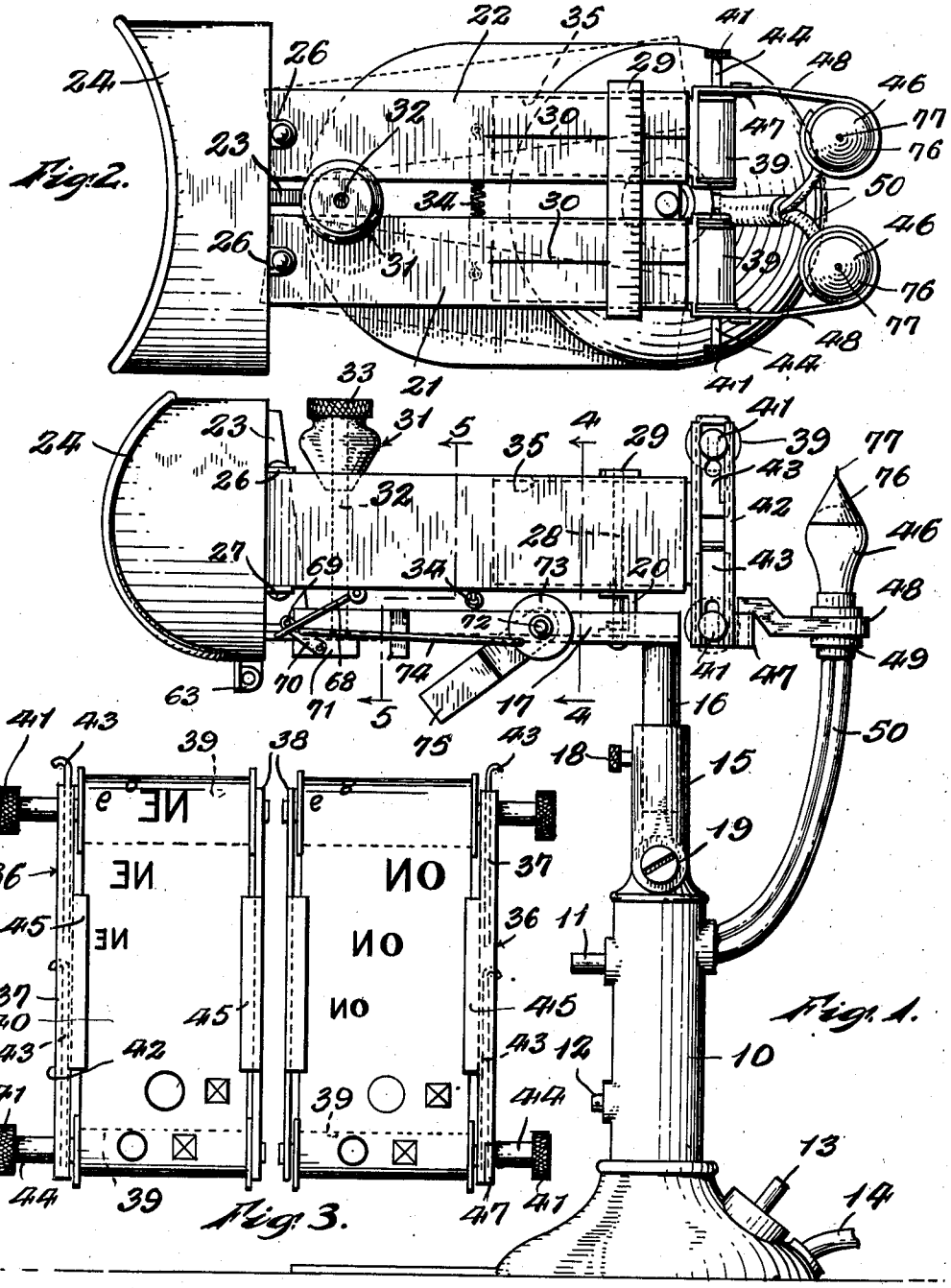


Fig. 2.

Fig. 1.

Fig. 3.

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Filed May 19, 1938 3 Sheets-Sheet 2

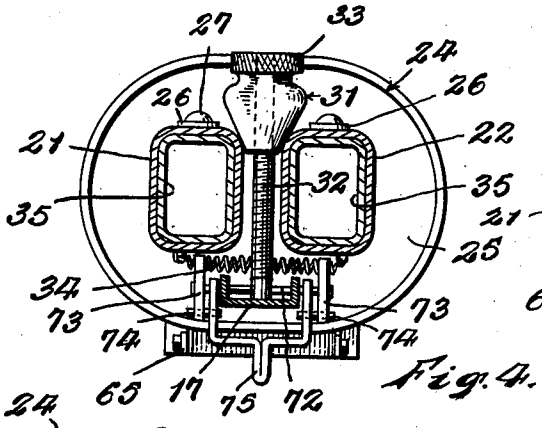


Fig. 4.

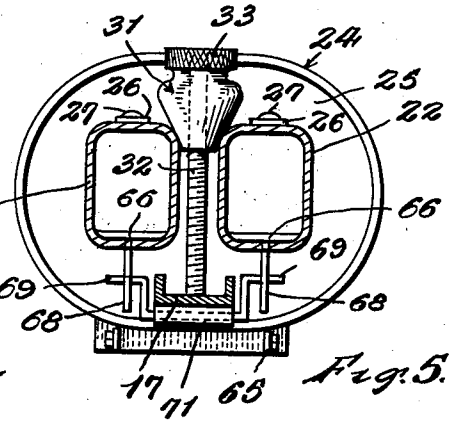


Fig. 5.

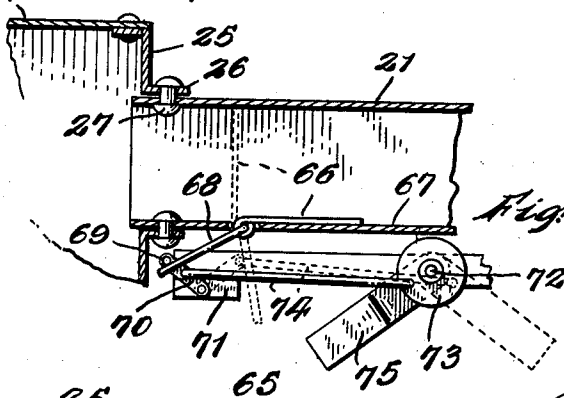


Fig. 10.

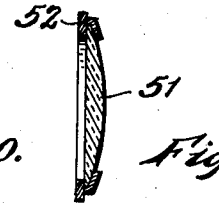


Fig. 9.

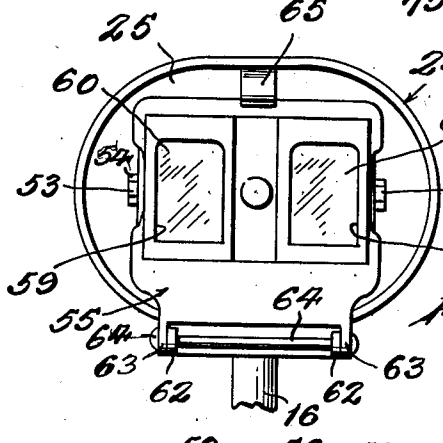


Fig. 6.

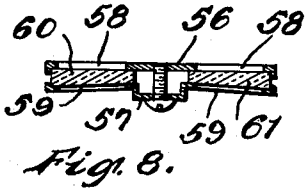


Fig. 8.

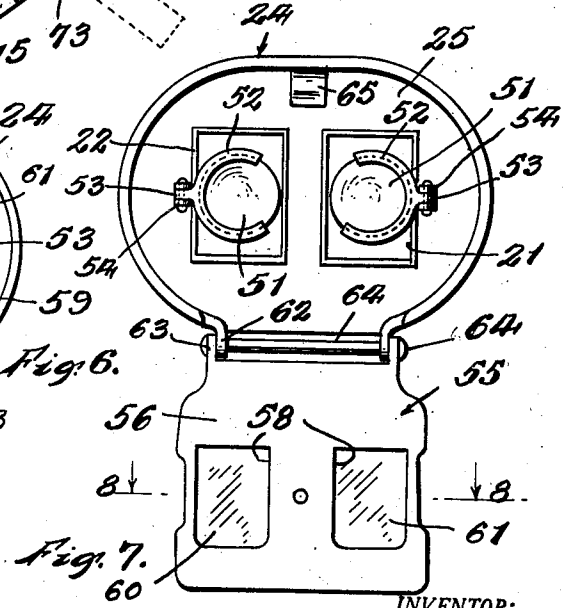


Fig. 7.

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APPARATUS FOR EXERCISING THE EYES

Filed May 19, 1938 3 Sheets-Sheet 3

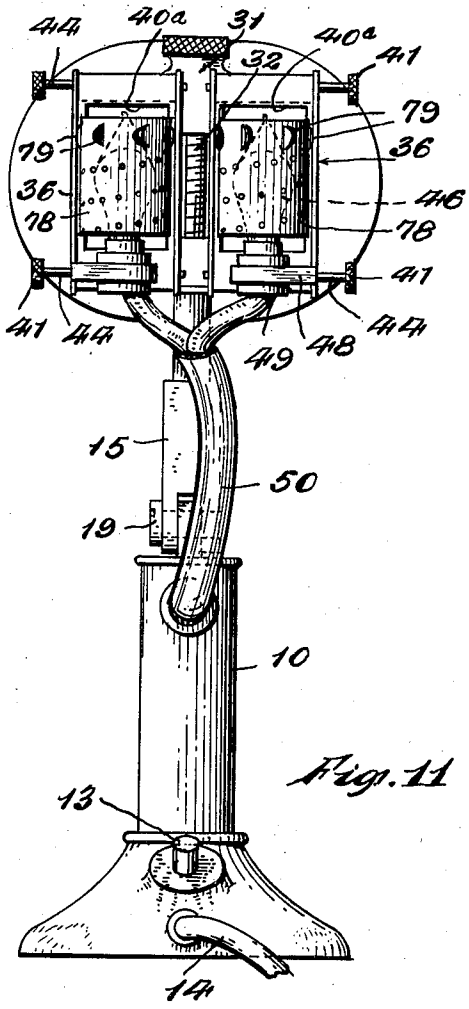


Fig. 11

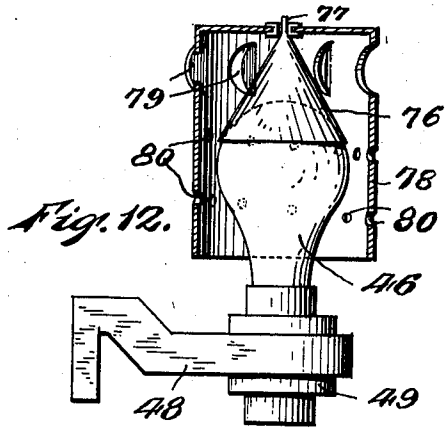


Fig. 12.

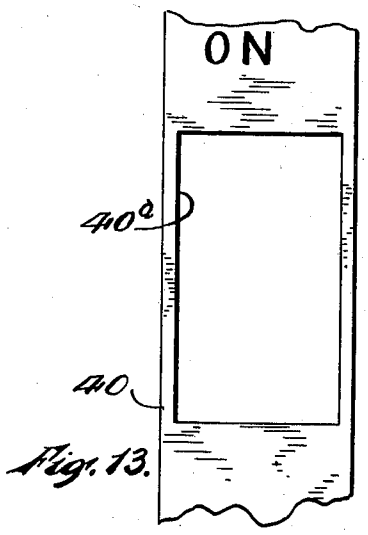


Fig. 13.

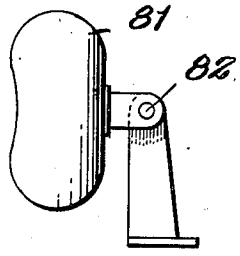


Fig. 14.

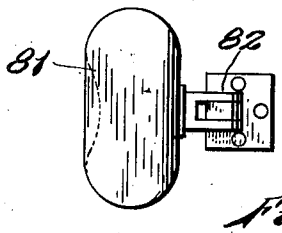


Fig. 15.

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UNITED STATES PATENT OFFICE

2,205,965

APPARATUS FOR EXERCISING THE EYES

William M. Updegrave, Johnstown, Pa.

Application May 19, 1938, Serial No. 208,893

3 Claims. (Cl. 128—76.5)

This invention relates to a means for exercising the inactive or backward muscles of the eyes, for the purpose of remedying defects of the eyes without resorting to glasses, and it consists in the constructions, arrangements and combinations herein described and claimed.

Experiments have shown that most beneficial results are obtained by the employment of transparent or translucent targets, one for each eye, the targets being movable to fuse pictures, letters or other indicia when viewed through a stereoscope, for the purpose of treating or stimulating ailing or inactive muscles.

It is an object of the invention therefore to provide a pair of transparent, movable targets having illuminating means back of each target, the illuminating means being constructed to permit periodically flashing on and off, providing active and rest periods during the time that the targets are viewed through the stereoscope, the targets being invisible at the time that the illuminating means is out.

It is also an object of the invention to provide a device of the character stated in which a stereoscope is employed, embodying a pair of laterally adjustable sight tube, each of which includes a forward telescoping section supporting respective targets and illuminating means.

It is a still further object of the invention to provide a device of the character described in which the illuminating means may be dispensed with and employ sun-light as the illuminating means, and in such event the stereoscope will embody a novel shutter means for alternately exposing and concealing the targets.

It is a still further object to employ the illuminating means other than the sun, for effecting movement of a further exercising device.

Additional objects, advantages and features of invention will be apparent from the following description considered in conjunction with the accompanying drawings, wherein

Figure 1 is a side elevation of my device.

Figure 2 is a top plan view thereof.

Figure 3 is a rear elevation of the targets and their mountings.

Figure 4 is a cross section on the line 4—4 of Figure 1.

Figure 5 is a similar view on the line 5—5 of Figure 1.

Figure 6 is a front elevation of the stereoscope portion of the device illustrating one of the lens mountings.

Figure 7 is a similar view illustrating the lens mounting in an open position and exposing further lens.

Figure 8 is a cross section on the line 8—8 of Figure 7.

Figure 9 is a cross section through one of the lenses and mounting ring.

Figure 10 is a fragmentary longitudinal sectional view through one of the stereoscope tubes illustrating a shutter mechanism.

Figure 11 is a rear elevation of the device illustrating the application of exercising devices applied to the illuminating means.

Figure 12 is an enlarged detail of the lamp, mounting, and the exercising device.

Figure 13 is a fragmentary portion of one of the films employed.

Figure 14 is a side elevation of a form of head rest which may be employed with the appliance.

Figure 15 is a top plan view thereof.

Attention is first invited to Figures 1 and 2 of the drawings wherein there is shown a supporting standard 10, which preferably is tubular, housing a double acting switch 11—12, and the base of the standard houses a main switch 13 and also has a bossed opening for reception of a current supply line 14. The upper end of the standard has a swingable socket 15, the upper end of which receives a stud 16, the latter having fixed to the upper end thereof a channel beam 17 which functions as a support for the stereoscope device, as will be described. From the structure thus far described it will be apparent that stud 16 may be vertically adjusted by loosening the set screw 18 and that the beam 17 may be adjusted to varying positions from the horizontal by loosening the screw 19 which forms the pivot for the socket 15.

A beam 20 is fixed within the channel beam 17, extending transversely thereof and positioned slightly to the rear of the stud 16, this latter beam acting as a support for the rear ends of a pair of stereoscope tubes 21 and 22. The channel beam 17 is of suitable length and extends forwardly from the stud 16 and at its extremity there is mounted an upstanding lug 23 upon which there is rigidly secured a visor 24.

The visor 24 includes a plate 25 at its forward end in which there is formed a pair of suitably spaced openings, and as may be seen in Figure 10, ears 26 are formed adjacent the openings, at the upper and lower portions thereof. The tubes 21 and 22 are positioned within respective apertures and pivot pins 27 swingably support the tubes for lateral movements, as shown by dotted lines in Figure 2.

An upstanding rod 28 is carried by the beam 20 the upper end of which supports a scale 29, positioned slightly above the tubes 21—22 to permit free movements thereof. The scale bar 29 will include any suitable markings complemental to a scale mark 30 extending longitudinally upon the upper face of each tube 21—22. Thus, the lateral movements of the tubes may be accurately determined, and this is an important factor for in treating muscles of the eyes of a patient it might be detrimental to cause lateral deflection of the muscles beyond a certain degree.

In order to obtain simultaneous movements of the tubes, I provide a camming device generally indicated at 31. The tubes 21—22 are illustrated as of rectangular formation positioned in parallel relation and occupying positions upon respective sides of the lug 23 and the rod 26. An upstanding, threaded bolt 32 is provided, the lower end being rigidly fixed to the channel bar 17, being located at a point in advance of the visor 25 and between the tubes 21—22. A conically shaped cam 33 is threadedly engaged upon the bolt, the upper end being knurled for ready manipulation. The cam 33 has a diameter greater than the normal parallel relation of the tubes 21—22, and therefore when the cam is screwed downwardly upon the bolt, the sides of the cam engage respective sides of the tubes, imparting lateral outward movement of the tubes. In order to properly tension the movements of the tubes and to also return the tubes to normal position with readjustment of the cam, a helical spring 34 is extended transversely across and connected to the undersides of the tubes.

Each of the tubes 21—22 telescopically support a tube 35, upon the outer ends of which there is secured a frame 36. The frame 36 comprises spaced vertical plates 37 and 38, having journals at their ends revolubly mounting rolls 39, about which a transparent film 40 is wound. The rolls include operating knobs 41 for rotating the rolls for changing the display of targets upon the film. The rolls 39 are preferably removably mounted, and in the present instance the plates 37 have inwardly turned flanges 42 slidably receiving keeper plates 43, the plates being slotted to engage a shoulder formed in the trunnions 44 of the rolls.

Each of the plates 37 and 38 have an inwardly directed flange 45 defining a guide-way for the film 40.

From the construction described it will be apparent that the films 40 are disposed in front of the open end of the tubes 35 and that by rotating the rolls different indicia may be brought into view, and in order that the indicia may be displayed when viewed through the visor 24 and tubes 21—22 and 35, an electric bulb 46 is positioned in front of each film. This is accomplished in the present instance, in the provision of a socket 47 secured to a lower portion of respective plates 37, the sockets receiving and supporting a bracket 48, the free end of which includes a lamp socket 49 into which the bulb 46 may be placed. The bulb 46 will be positioned in the longitudinal axis of the tubes, and if necessary, the brackets 48 may be inwardly offset, as shown in Figure 2.

An electric conductor 50 is connected with each socket 49 and also with the switches 11 and 12. By alternately actuating the switches 11 and 12, the bulbs 46 will be alternately energized and de-energized. When it is desired to have both bulbs energized at the same time, the switches 11 and 12 are not actuated, the current then passing through the main switch 13 to the bulbs.

The stereoscope will include any desired lenses, and in the present instance, I have shown a swingably mounted lens 51 for each tube. Each lens is mounted in a clip ring 52 permitting ready replacement and removal of the lenses, the rings each having a tongue 53 disposed between and pivotally connected to ears 54 on the back plate 25 of the visor. Thus, the lenses may be swing into and out of alignment with the tubes, as required. A further lens holder 55 is provided consisting of a frame member 56 and a superposed clamp 57. The frame 56 and the plate 57 have aligned openings 58—59 for sight through respective lenses 60—61 held securely between the plate and frame.

The visor 24 has a pair of spaced ears 62 adjacent its lower edge and the frame 55 includes ears 63. The ears 62—63 are aligned and receive a pivot pin 64. As shown in Figure 7, the lens holder 55 may be swung outwardly, and downwardly, to a lowered position, permitting use of the lenses 51 solely, yet when the holder 55 is swung into the position shown in Figure 6, both sets of lenses 51 and 60—61 may be employed, the holder 55 being held in its uppermost or raised position by a spring keeper 65.

In use, with the bulbs 46 energized, the film 40 may be moved in either direction, as desired, by manipulating the proper knob 41, until the desired targets are brought into view before the bulbs. Now by actuating the cam 31 to move the tubes 21—22 laterally to conform to the ocular condition of the patient looking through the stereoscope, the two letters "N" appear to be fused or overlapped to effect the spelling of a single word "One". Obviously, the patient is looking intently upon the targets during movements of the tubes and the film, and the movements of the targets therefore create exercise to muscles of the eye and in such cases where an intermittent flashing of the illumination means is desirable, this may be effected by alternately actuating the switches 11 and 12.

It is within the scope of the invention to employ sunlight as the means of illumination, in which event the bulbs 46 and associated electrical contrivances would be dispensed with, and in carrying out this phase of the stereoscope, each tube 21—22 has a shutter 66. The shutter 66 is pivotally mounted adjacent the bottom wall 67 of the tube and normally lies flat thereagainst, as shown in Figure 10. The pivot of the shutter 66 comprises an arm 68 outwardly of the tube and disposed at an angle to engage a lug 69 of a lever 70. The lever 70 is pivoted at one end to a block 71 carried by the channel beam 17. At a suitable point in the length of the beam 17, a transversely extended shaft 72 is journaled, and upon each end thereof, a disk 73 is fixed. A link 74 is connected intermediate the length of the lever 70, the other end of the link 74 being connected eccentrically to a respective disk 73. A trigger 75 is fixed to the shaft 72 and it will be seen that by alternately moving the trigger back and forth, the shutter 66 will be raised and lowered, and with the forward end of the stereoscope directed toward the sunlight, alternate light and dark periods will occur, similar to that produced by alternate energization and de-energization of the electric bulbs.

In the form of the device employing electric

bulbs, I may provide a further means for exercising the muscles of the eye, employing the heat of the lamps for creating movements of the means, and for a full understanding of this appliance, attention is now directed to Figures 11 and 12.

The bulbs 46 are each provided with a cap 76, conically shaped as heretofore shown, and in the apex there is secured an upstanding pin 77. The cap 76 may be secured to the bulb in any desired manner, as by adhesive or otherwise, and is of such size as to only engage the uppermost portion of the bulb so as to not interfere with light emitted by the bulb.

A cylinder 78 is freely supported upon the pin 77 and includes louvers 79 adjacent its upper end, and may have a series of apertures 80 arranged circumferentially thereof. These apertures may be arranged in spiral formation or otherwise, as desired.

It should be noted that the louvers 79 of one of the cylinders are struck outwardly in a direction opposite to those of the other cylinder, and in operation, the heat from the bulbs 46 will cause rotation of the cylinders in opposite directions. The cylinders 79 are constructed of light materials and will be freely revoluble about the pins 77 and will be quickly removable and interchangeable.

When the revolving cylinders 78 are employed, it will be necessary to move the film 40 to a point to bring an elongated aperture 40*a* into alignment with the tubes, and this may be done by rotating the rolls 39.

If desired, the visor 24 may be eliminated and in its stead a cushion 81 may be fixed to the plate 25 properly positioned so that when the forehead of the patient rests against the cushion his eyes will be aligned with the tubes 21—22. If desired, a hinge joint 82 may be employed for mounting the cushion, or this may be a ball and socket connection.

While I have shown and described certain preferred constructions, this is by way of illustration only, and I consider as my own all such modifications in structure as fairly fall within the scope of the appended claims.

I claim:

1. In a device of the character described, a stereoscope including a pair of tubes swingably connected at one end, the tubes normally occupying a parallel side by side relation, changeable target means at the free ends of the tubes in line of vision through the tubes, an upstanding threaded bolt positioned between the tubes, a cam threadedly engaged with the bolt, the cam having surfaces contacting respective sides of the tubes whereby to impart lateral movement of the tubes upon rotation of the cam, spring means connected between the tubes acting against such movement, a shutter member swingably mounted within each of the tubes, and manually operable means exteriorly of the tubes for actuating the shutters.

2. In a device of the character described, a stereoscope including a base having a standard and a main switch, a double acting switch in the standard, an adjustable support carried by the standard, a beam on the support, the beam having a visor at one end, said visor having a plate, the plate having a pair of apertures arranged in side by side relation, a tube disposed within each aperture and swingably connected to the plate, a transverse bar carried by the beam for support of the free ends of the tubes, telescopic tube within the free ends of the tubes, changeable target means carried by the outer ends of the telescopic sections and in line of vision through the tubes, a threaded upstanding bolt carried by the beam and positioned between the tubes adjacent their hinged connections, a conical-shaped cam member threadedly engaged upon the bolt and contacting the sides of respective tubes, spring means connected between the tubes tending to draw the tubes toward the cam member, a scale bar mounted above the tubes, each tube having a scale marking complemental to the markings of the scale bar, an electric bulb supported in advance of the targets, said bulbs being in circuit with the main and double acting switch.

3. In a device of the character described, a stereoscope including a base having a standard and a main switch, a double acting switch in the standard, an adjustable support carried by the standard, a beam on the support, the beam having a visor at one end, said visor having a plate, the plate having a pair of apertures arranged in side by side relation, a tube disposed within each aperture and swingably connected to the plate, a transverse bar carried by the beam for support of the free ends of the tubes, a telescopic tube within the free ends of the tubes, changeable target means carried by the outer ends of the telescopic sections and in line of vision through the tubes, a threaded upstanding bolt carried by the beam and positioned between the tubes adjacent their hinged connections, a conical-shaped cam member threadedly engaged upon the bolt and contacting the sides of respective tubes, spring means connected between the tubes tending to draw the tubes toward the cam member, a scale bar mounted above the tubes, each tube having a scale marking complemental to the markings of the scale bar, a shutter swingably mounted in each tube, each shutter having a crank arm, a pair of disks oscillatably supported upon the beam, levers pivoted on the beam, each lever having a lug in engagement with the crank arm, a link member eccentrically connected to respective disks, the other ends of the links being connected intermediate the length of the levers, and trigger means for oscillating the disks.

WILLIAM M. UPDEGRAVE.