

No. 720,491.

PATENTED FEB. 10, 1903.

C. F. SCHROEDER & F. E. LAUFFER.
COLORING SCREEN FOR WHITE LIGHT RAYS.

APPLICATION FILED AUG. 28, 1902.

NO MODEL.

Fig. 1.

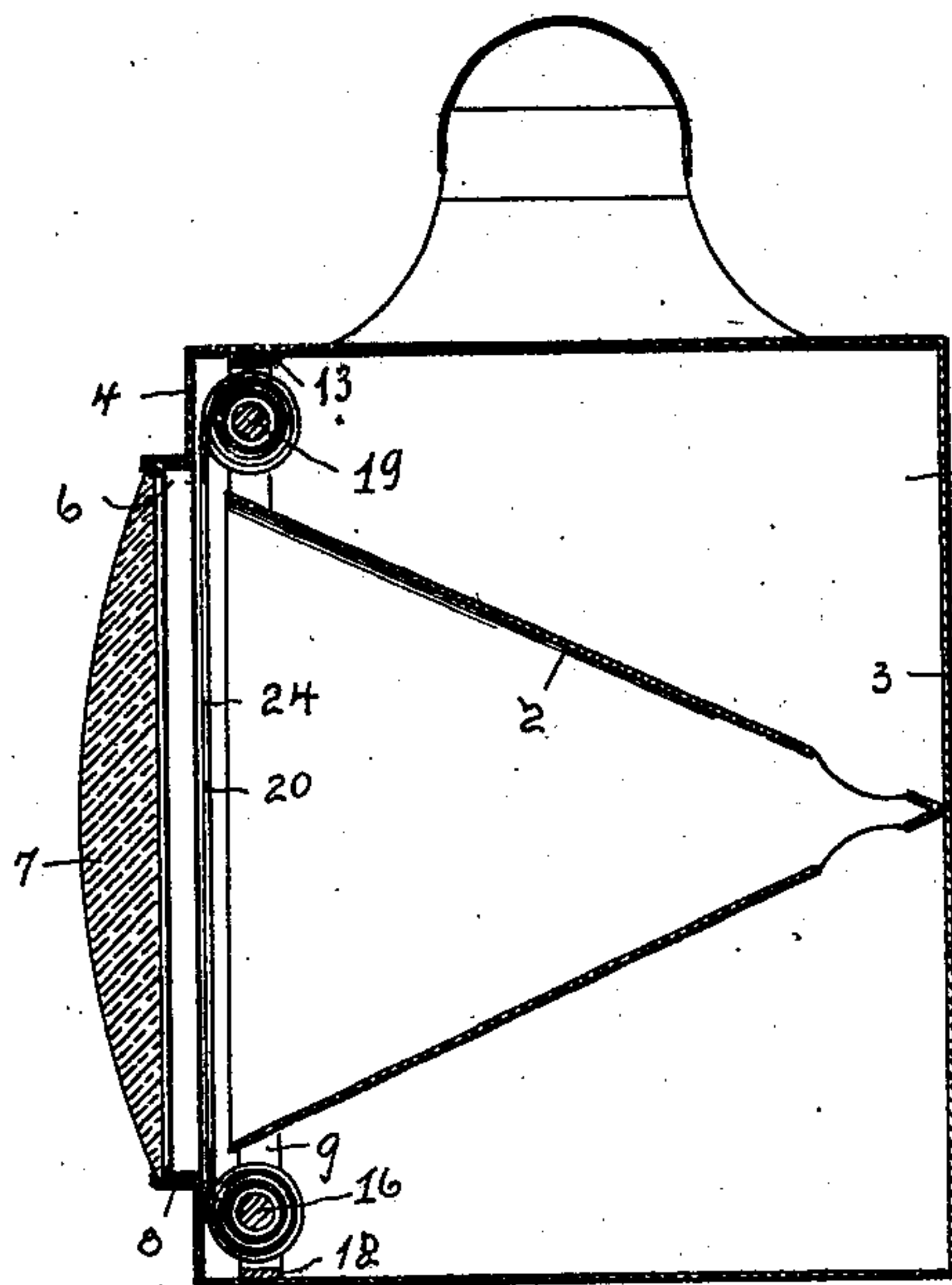


Fig. 2.

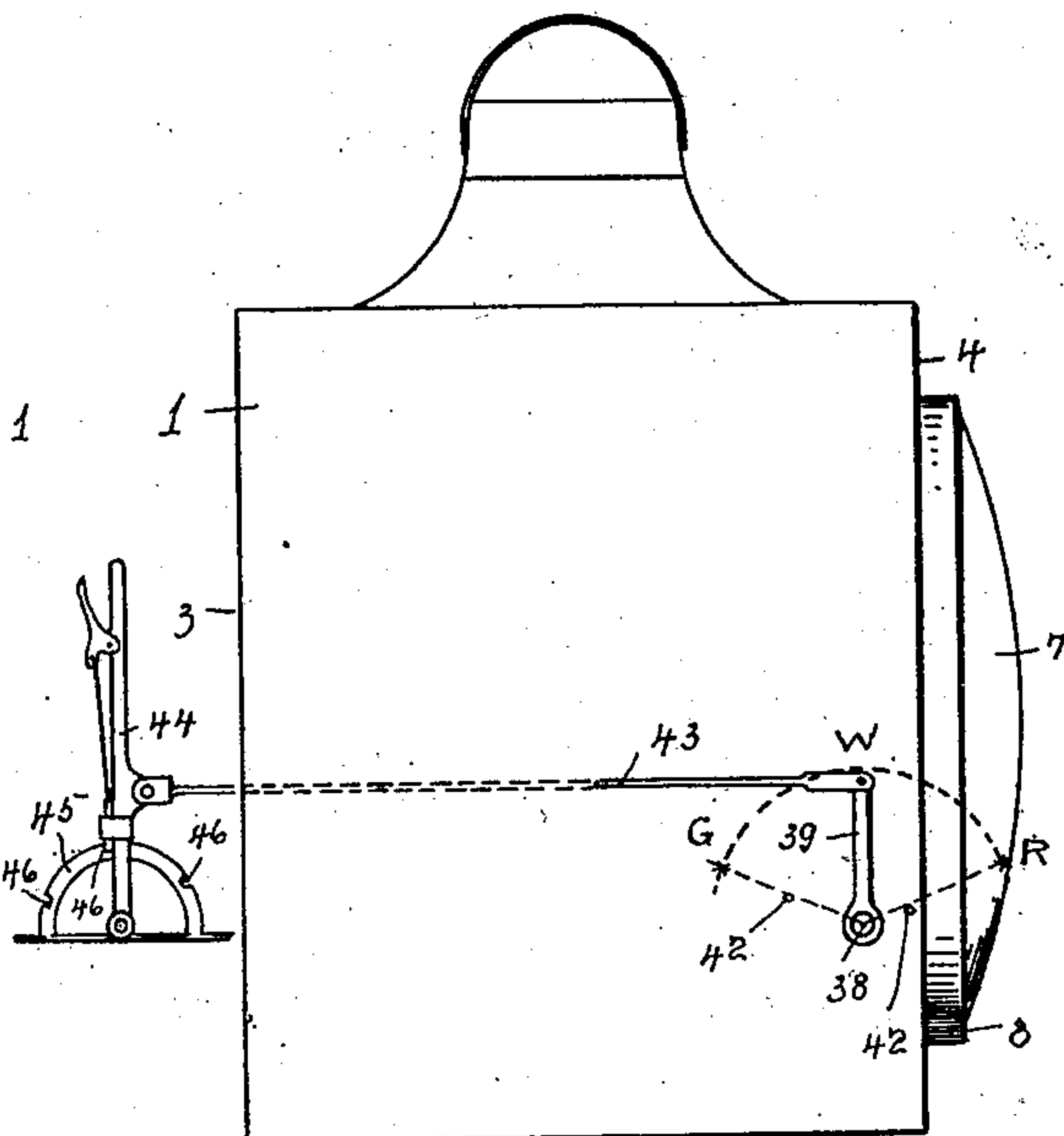


Fig. 6.

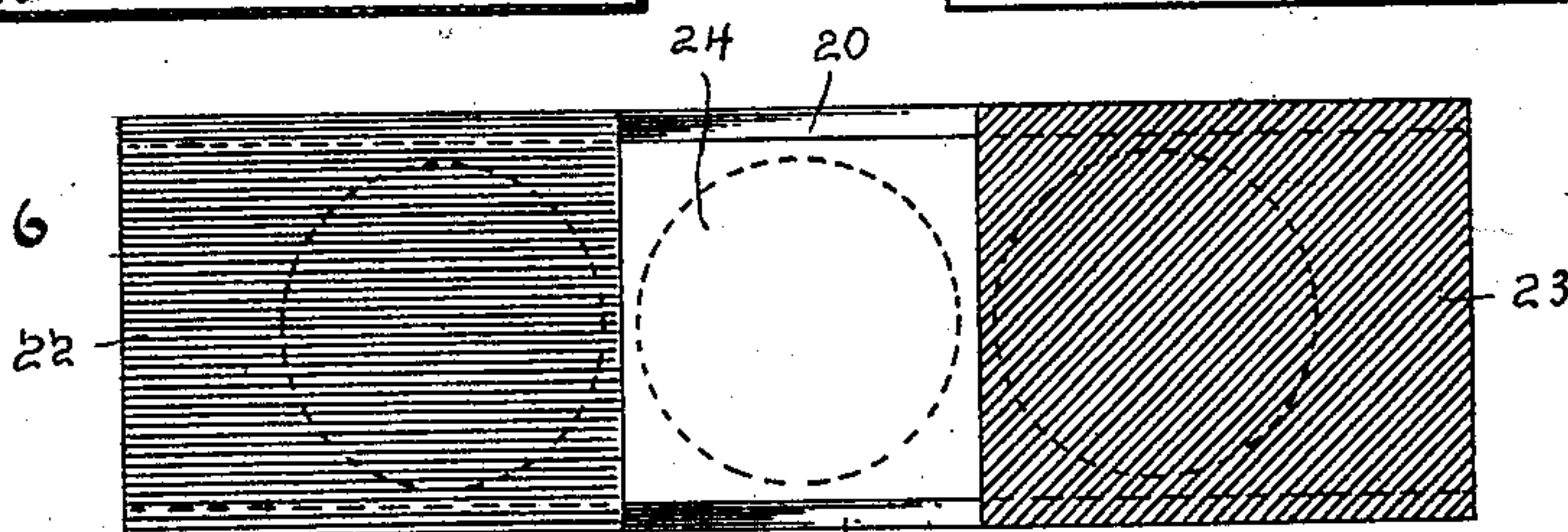


Fig. 3.

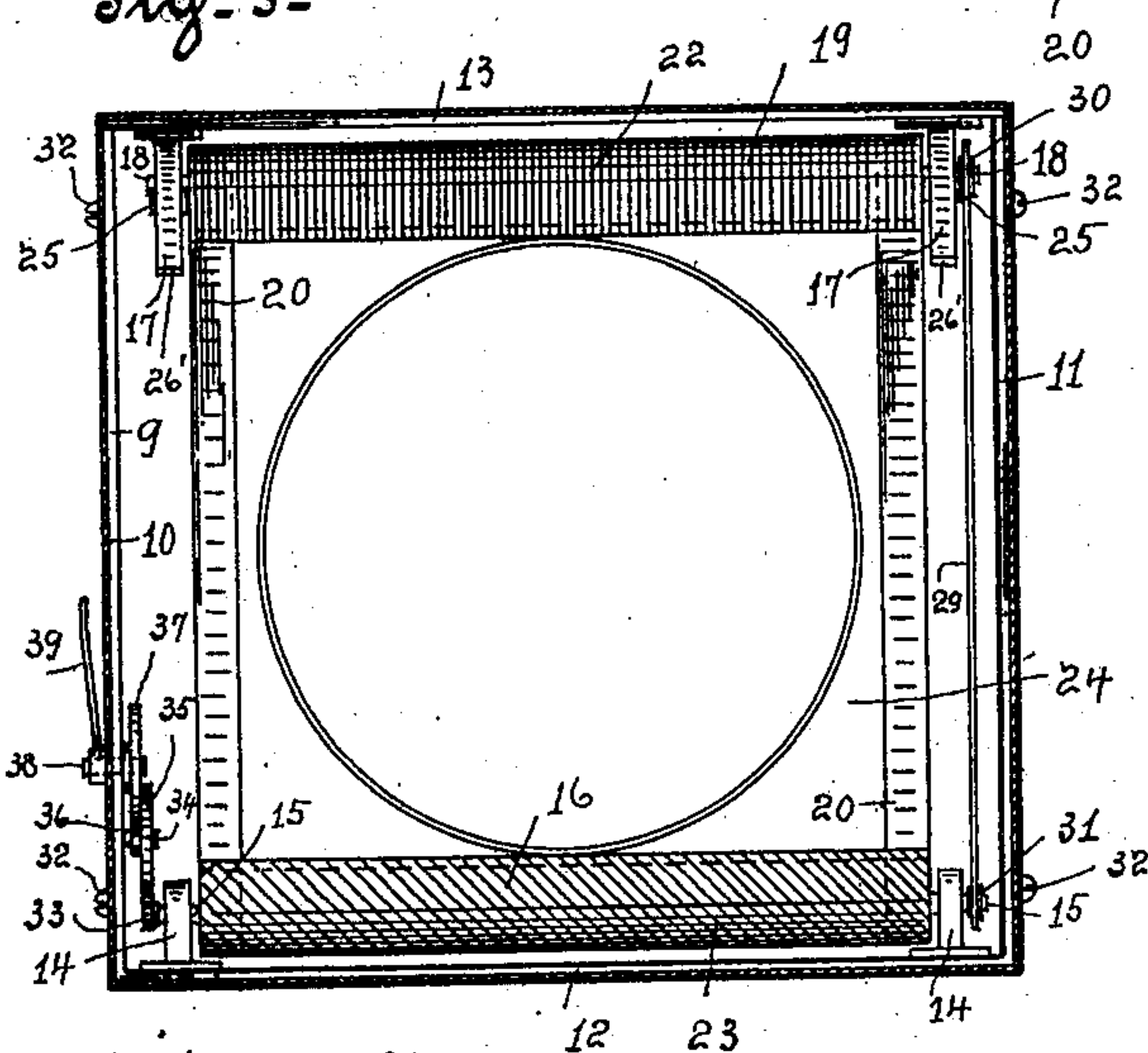


Fig. 5.

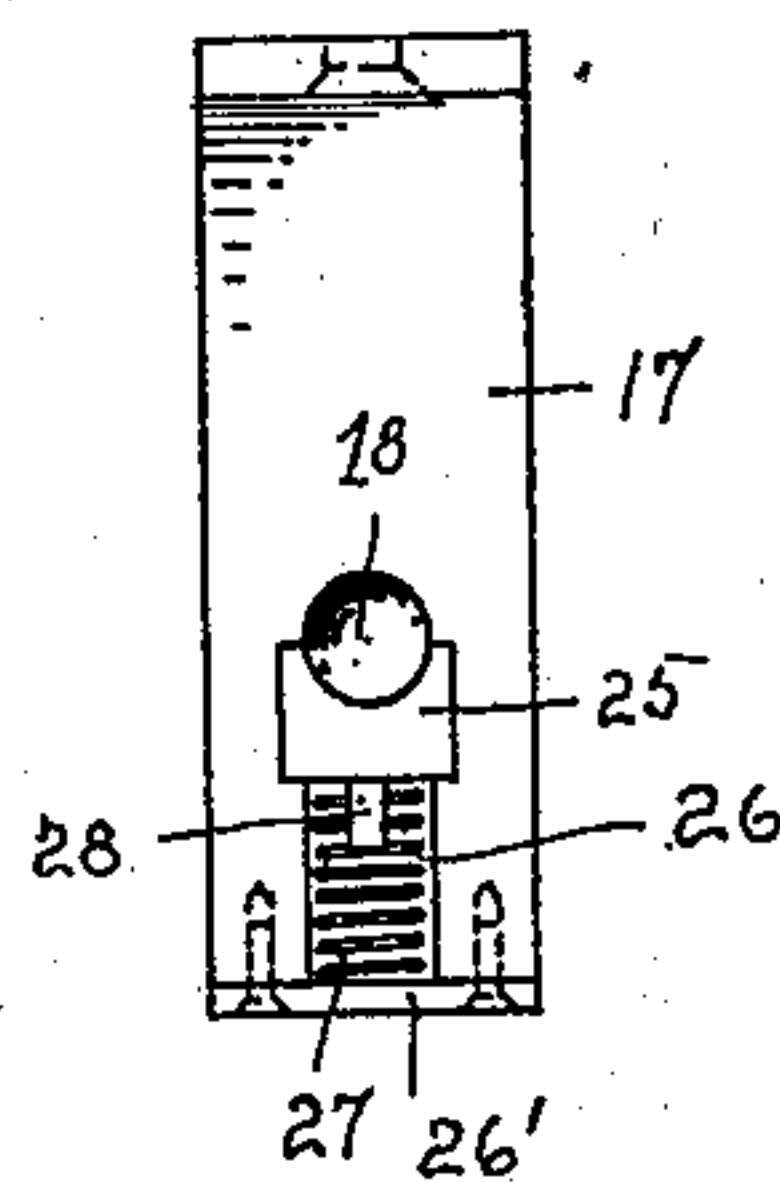
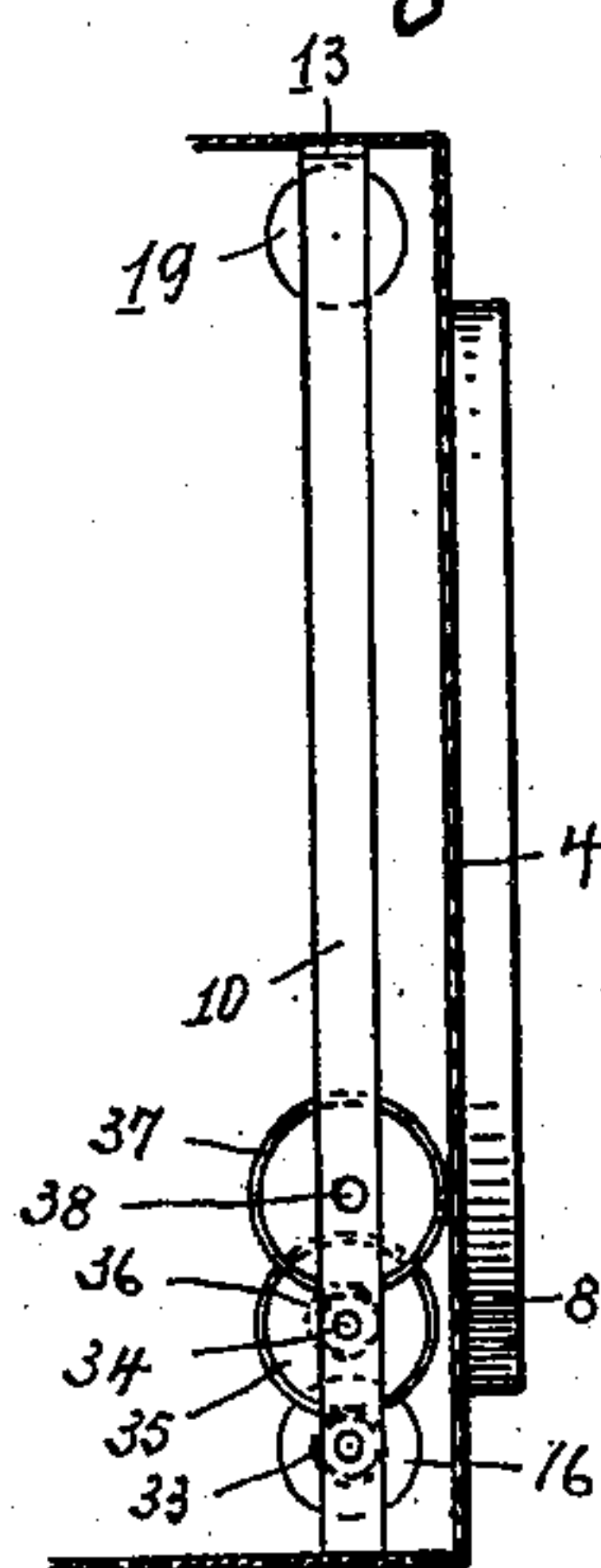


Fig. 4.



Witnesses—

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UNITED STATES PATENT OFFICE.

CHARLES F. SCHROEDER AND FREDRICK E. LAUFFER, OF TOLEDO, OHIO.

COLORING-SCREEN FOR WHITE-LIGHT RAYS.

SPECIFICATION forming part of Letters Patent No. 720,491, dated February 10, 1903.

Application filed August 28, 1902. Serial No. 121,340. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. SCHROEDER and FREDRICK E. LAUFFER, citizens of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in a Coloring-Screen for White-Light Rays, of which the following is a specification.

Our invention relates to a coloring-screen for white-light rays, and has for its object to provide a device of the kind adapted to intercept and transform white rays of light which are projected from some source of light into red, green, or other colored rays of light for the display of various signals at night from a common source of light.

The object of our invention is accomplished by providing an adjustable curtain movable in front of a light-reflector and comprising one or more screen-sections of a transparent character and of different color with or without an intervening open space between the colored sections for the displaying of a white light, and locate the curtain in front of a reflector to intercept the reflected rays of a light by one of the transparent and colored sections and change the color of the rays for displaying a safety, danger, or other kind of signal, and providing ready means to transfer one of the colored sections or the open space of the curtain in front of the reflector or remove it therefrom to change the color of the light.

In the drawings, Figure 1 is a longitudinal vertical section through a lantern equipped with our invention. Fig. 2 is a side elevation of the same, showing the operating-lever on the outside of the lantern. Fig. 3 is a front elevation of the roller-frame with the transforming-screen mounted upon rollers and showing the actuating mechanism to transfer sections of the screen from one roller to the other roller. Fig. 4 is a side elevation of the frame and the actuating mechanism. Fig. 5 is a side elevation of the top bearing and tension device for the top roller. Fig. 6 is a plan view of a red and green screen separated from each other a distance equal to the area of a reflector and showing side strip connections for the screens to form a belt with a central opening.

The lantern 1 illustrated in the drawings

is of a character usually employed by railroads for head and rear lights for trains and other purposes. Within the lantern there is mounted a conical reflector 2, which extends divergingly from the rear wall 3 toward the front wall 4, which has a flanged opening 6 for the exit of the reflected rays of light to the projecting-lens 7, which is suitably held in a short tube 8, hinged to the front wall and telescoping over the flange of the opening formed therein, and at the apex the conical reflector is provided with openings for inserting therein a suitable lighting medium.

The frame 9 for our coloring-screen comprises the side bars 10 and 11, an integral bottom plate 12, and a top plate 13, which is suitably connected to top end of the side bars. To the top of the bottom plate 13 there are secured bearings 14, adapted to journal the diametrically-reduced axle 15 of the bottom roller 16, with the ends of the axle projecting a suitable distance beyond both bearings. In parallel vertical alinement with the bearings 14 there are secured to the under side of the top plate hanger-bearings 17, in which the axle 18 of the top roller 19 is journaled, also having one end of the axle projecting beyond one of the bearings. Both of the rollers are of a length to receive upon the opposite end portions side strips 20 of a suitable fabric and width without obstructing any light-rays emitted by the reflector, and to the opposite end portions of each strip there are mounted transparent or translucent fabrics 22 and 23 to form a curtain or belt composed of sections, each section having an area to separately cover the base-opening of the reflector. The curtain thus formed is secured by its opposite ends lengthwise of the curtain to the top and bottom rollers. The transparent or translucent fabrics are of different colors adapted to denote a safety-signal or a danger-signal and for the purpose of displaying a white light. The transparent or translucent sections are separated to form an opening 24 between the side strips, and the area of the opening is such that a white light may be displayed when the opening in the belt is in front of the reflector. When thus constructed with the opposite ends of the side strips and the translucent sections attached to the top and bottom roller with

the translucent fields rolled upon the respective rollers, the opening 24 of the curtain is normally arranged in front of the reflector with a transforming-screen above and below the reflector. To maintain a constant tension upon the side belting-strips and the transparent or translucent fabrics, we have journaled the ends of the axle of the top roller in bearing-blocks 25, which are movable in a vertical slot 26, formed in each hanger. The bottom of each slot is closed by means of a plate 26', which is attached to the ends of the hanger and is adapted to support a spring 27, inserted into each slot to support the movable bearing-blocks. The springs are held in position by means of a pin 28, projecting from the under side of each bearing-block and entering within the coils of the spring. Motion is transmitted from the bottom roller to the top roller by means of a sprocket-chain 29, which is rove over sprocket-wheels 30 and 31, which are mounted upon the projecting ends of the respective axles of the bottom and the top rollers. The operating mechanism for the rollers is attached to the frame, and when so attached with the rollers and screens in position the frame, which is of suitable size, is housed within the lantern-body and located near the front wall with the rollers in position to move the transparent screen-sections over the area of the reflector to prevent the projection of rays of white light when one of the screens is so placed. The frame when inserted within the body of the lamp is secured to the side walls thereof by means of screws 32 or other suitable fastenings. The operating mechanism thus housed within the lantern-body is protected against the inclemency of the weather and comprises a pinion 33, mounted upon the end of the lower axle adjacent to bar 10, to which a stud 34 is secured, upon which a spur-wheel 35 is journaled in a position to engage the pinion on the lower axle. Upon the stud 34 there is also mounted a pinion 36, which is secured to the side of the spur-wheel 35 to revolve with the same, and the pinion 36 intermeshes with a driving spur-wheel 37, which is secured upon the arbor 38. The latter is journaled in bearings formed in the side bar 10 and is of a length to project through the adjacent side wall of the lantern. Upon the free end of the arbor there is mounted an operating-lever 39, by means of which motion is transmitted through the gearing to the rollers. The respective diameters of the wheels comprising the train of gears are arranged to transmit to the rollers by a limited movement of the lever a number of revolutions to unroll from one roller and roll upon the other roller, in the extreme movement of the lever, two-thirds of the length of the curtain, whereby one of the transparent colored end sections is brought in front of the reflector while the central section and opposite end section are rolled up. In Fig. 2 of the drawings the operating-lever is shown normally in a vertical position for

the display of white light and with the colored end screen rolled upon the top and bottom rollers, respectively. By turning the lever from W to R the transparent red-colored end section is unrolled from the top roller and brought in front of the reflector, while the side belting strips of the middle open portion are rolled upon the bottom roller. By returning the lever again to W the red screen portion is rolled up and the white light is displayed again, and by turning the lever from W to G the side strips of the middle open portion are rolled upon the red end screen and the opposite end green screen is brought in front of the reflector to change the light-rays to a green color. The arc movement of the lever is limited by means of suitable stops 42, which are secured to the side wall of the lantern.

The lever for operating the screen may be operated from any distance by means of a rod 43, having one end attached to the lever and the opposite end pivotally connected to a rack-lever 44, provided with a locking-dog. The rack 45 is provided with incuts 46 to register and lock the lever in different positions to hold screen portions in front of the reflector. The rack may be located in the locomotive-cab or any other position and when applied to locomotive-lanterns in which the headlight is white the color of the headlight can readily be changed to red or green when the train is side-tracked and waiting for a meeting train.

Experience has proven that locomotive engineers are generally unable to discern the exact track position of two trains approaching each other until separated by only a short distance. With our screen, however, the color of one of the headlights can be quickly changed to display a signal denoting the track position. The central opening may also be omitted and the coloring-curtain formed of two different color-sections without departing from the principle of our invention.

What we claim is—

In a signal-screen for a reflector, the combination of a frame surrounding the reflector-opening, a driving-roller journaled in fixed bearings at one end of the frame, an idler-roller journaled in spring-tension bearings at opposite end of the frame; a belt connecting the rollers; a curtain-screen comprising end sections of a transparent or translucent, flexible material, of respectively different colors, each of an area to cover the opening of the reflector and a central section between the end sections having an open space equal to the area of the reflector-opening, the curtain thus formed having its end sections respectively mounted and oppositely rolled, one on each roller; a gear-wheel mounted on the axle of the driving-roller; a gear-train operatively engaging the gear-wheel and adapted to rotate it in opposite directions, a full revolution for a definite part of a revolution of the master-gear of the train; and a lever

5 mounted on the axle of the master-gear having a limited movement between stops in an arc sufficient to roll two sections in one roller by a complete movement of the lever in either direction and to bring the central section over the opening of the reflector at the central point of its movement.

In witness whereof we have hereunto set our hands this 6th day of August, A. D. 1902.

CHARLES F. SCHROEDER.
FREDRICK E. LAUFFER.

Witnesses:

CHARLES C. MELLERD,
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