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STEREOSCOPE.

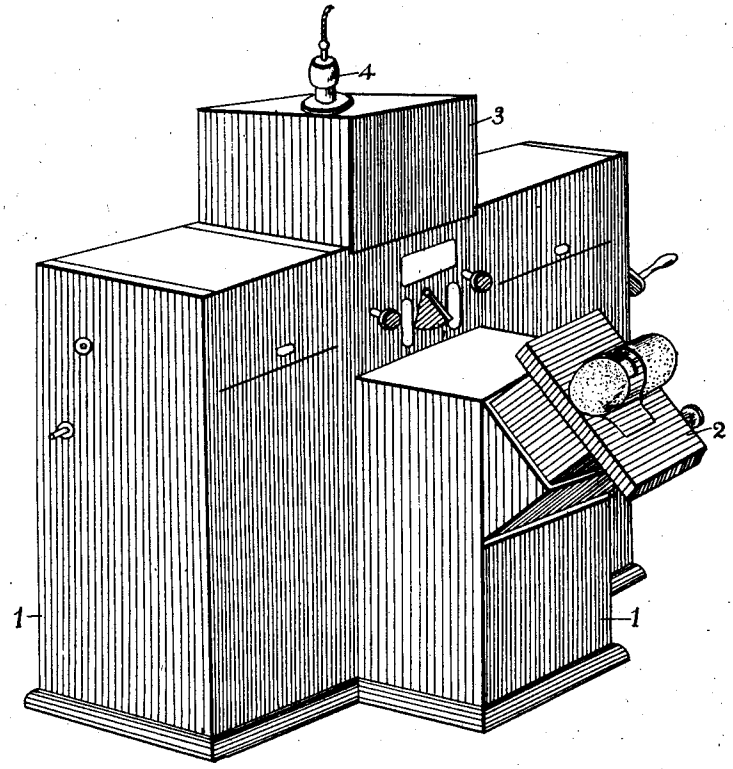
APPLICATION FILED JULY 25, 1916.

1,349,018.

Patented Aug. 10, 1920.

5 SHEETS—SHEET 1.

Fig 1



WITNESSES

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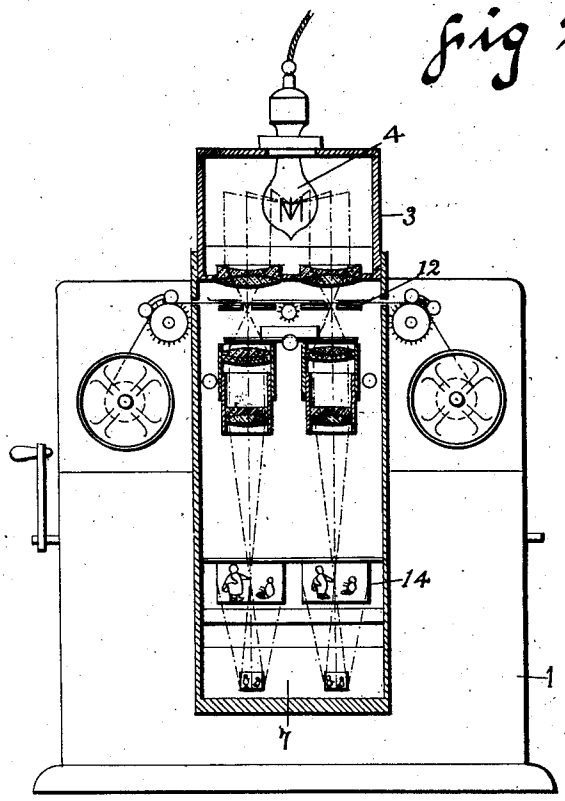
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5 SHEETS—SHEET 2.

fig 2



WITNESSES

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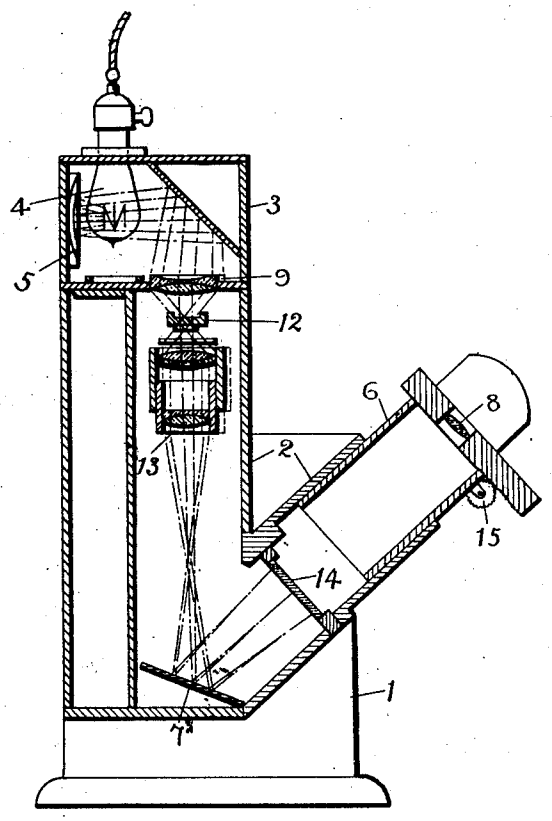
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5 SHEETS—SHEET 3.

fig 3



WITNESSES

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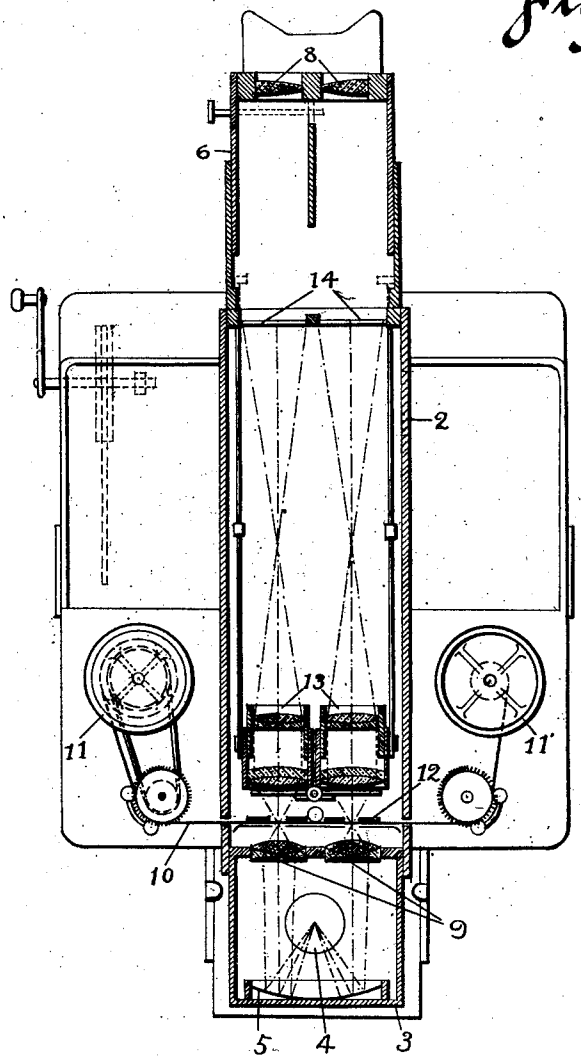
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5 SHEETS—SHEET 4.

Fig 4.



WITNESSES

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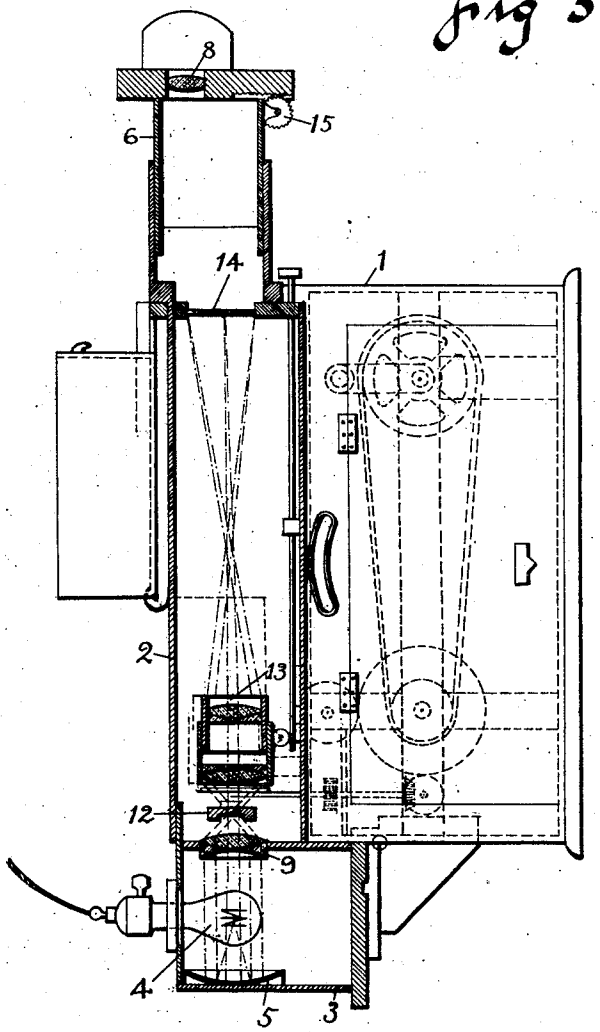
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APPLICATION FILED JULY 25, 1916.

1,349,018. Patented Aug. 10, 1920.

5 SHEETS—SHEET 5.

fig 5



WITNESSES

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UNITED STATES PATENT OFFICE.

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STEREOSCOPE.

1,349,018. Specification of Letters Patent. Patented Aug. 10, 1920.

Application filed July 25, 1916. Serial No. 111,111.

To all whom it may concern:

Be it known that I, TOYOJIRO TERASHIMA, a subject of Japan, residing at Tokyo Club, Tokyo, Japan, have invented certain new and useful Improvements in Stereoscopes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a special stereoscope which enables enlarged images to be projected from the pictures of a film by two lens systems of the character of those used in a magic lantern. The said lenses are spaced and offset so as to coöperate with the upper and lower halves respectively of the film. The said film has the same pictures at the upper and lower halves, but spaced or out of line. The apparatus is so designed that the two images will be thrown side by side on a suitable surface or screen, where they can be viewed stereoscopically, being exhibited very distinctly even when the pictures on the film are very small.

In the drawings:

Figure 1 is a perspective view of the improved stereoscope;

Fig. 2 is a front elevation with parts in section;

Fig. 3 is a vertical section through the center of one of the lens systems of Fig. 2;

Fig. 4 is a horizontal section of another form of this invention; and

Fig. 5 is a longitudinal sectional elevation of the same.

Similar numbers of reference indicate corresponding parts throughout the several figures of the drawings.

As shown in Figs. 1, 2 and 3, on one side of a properly constructed box 1, a light-directing casing 2 is attached, and on another side of said box 1, a lamp casing 3 in which a suitable light source 4 is located. On the inner side of the back-wall of the lamp casing 3 a reflector 5 is arranged to throw the rays from the light source 4, against another reflector 5^a and through the casing 2 into a box having a double eye-piece 6 at the other end of the light-directing casing 2. This casing and the lamp casing 3 are connected and constructed in such a way that the eye-piece 6 has its longitudinal axis at an angle to the direction in which the reflector 5 throws the light, and in this case I employ a plane mirror 7 at the bend of the angular casing 2. At the outer end of the double eye-piece 6, two lenses 8 are provided, spaced according to pupillary distance, as in an ordinary stereoscope. The rays emitted by the light source 4 and reflected by reflectors 5 and 5^a are collected by the two compound lenses 9 placed between the light-directing casing 2 and the lamp casing 3 the same distance apart as a man's eyes, but one of the lenses 9 is slightly in advance of the other as indicated in Fig. 3 so as to throw the light of one lens on the picture at the upper portion of a film 10, and the light collected by the other lens, on the picture at the lower portion of such film. This film is printed so as to have the same picture at the upper and lower halves of the film, two like pictures being the same distance apart as a man's eyes. The film is wound from a spool 11 at one side upon a spool 11′ at the other side of the box, and passes between two guides 12 placed a slight distance beyond the foci of the lenses 9. The condensers 13 which have lenses of the same type as an ordinary magic lantern, are attached within the light-directing casing 2, the same distance apart as a man's eyes, but one slightly in advance of the other (see Fig. 3), corresponding to the arrangement of the compound lenses 9. The condensers 13 enlarge the images and with the aid of the mirror 7 throw the images upon a screen which may be formed by two ground glasses 14, where such images may be viewed by looking through the lenses 8. Any suitable mechanism may be employed for rotating the spools to cause the film to travel past the lenses 9. For the purpose of adjusting the lenses 8 lengthwise according to the eye-sight of the observer, I provide a pinion 15 meshing with a rack.

In the form of my invention illustrated by Figs. 4 and 5, the path of the light is substantially straight from the reflector 5 to the lenses 8 of the double eye-piece 6, and the reflectors 5^a and 7 are thus dispensed with. In other respects, this second form of my invention corresponds to the description made with reference to Figs. 1, 2 and 3.

This invention is designed to enlarge the image and to present the same image simultaneously to both eyes of the observer looking at the images projected from a positive film which is printed so as to have the same pictures at the upper and lower halves of it, the lateral distance between like pictures being the same as the distance between a man's eyes. This invention is very useful not only

for the purpose of exhibiting views perfectly, but also in that comparatively small prints may be used, with a corresponding saving in amount of film required.

I claim:

A stereoscope comprising a lamp casing containing a lamp and reflector, a light directing casing, compound lenses disposed between said casings, spaced apart a pupillary distance and one being slightly in advance of the other, condensing lenses disposed within the light directing casing and spaced apart a pupillary distance, one being slightly in advance of the other, a picture support disposed between said compound and said condensing lenses, an observation chamber disposed at an angle to said light directing casing, a reflector at the junction of said last named casing and said chamber, a screen in said observation chamber, and observation openings in said observation chamber.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

TOYOJIRO TERASHIMA.

Witnesses:
DAIJIRO ISHI,
KOICHI URIU.