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(54) CINEMATOGRAPH REPRODUCING APPARATUS
(54) APPAREILS REPRODUCTEURS DE CINEMATOGRAPHES

(57) Abstract:

This invention concerns cinematograph reproducing apparatus for use with films of the kind (hereinafter referred to as the kind described), having a plurality of rows of pictures extending lengthwise thereof, the sequence between adjacent pictures in a row passing across the rows from one picture in the row to a picture in another row. It has for an object to provide apparatus whereby a story or cartoon can be presented on a relatively short length of film. Another object is to provide a simple form of apparatus which is particularly suitable for use as a toy.

According to the present invention, cinematograph reproducing apparatus comprises means for illuminating each picture in turn in the correct sequence, a separate optical projection system for each row of pictures, and operative to project the images of the pictures at a single viewing point.

Preferably, each projection system comprises a condenser and an objective lens, and at least one system is adjustable so that images produced by the respective systems may be accurately aligned.

In order that the invention may be more clearly understood, various arrangements thereof will now be described by way of example with reference to the accompanying drawings in which:-

Fig.1 is a longitudinal section on the line I-I of Fig.3;

Fig.2 is a perspective view of the objective lens assembly;

Fig.3 is a plan view of the apparatus with the cover removed, and

Fig.4 is a fragmentary view of a length of film for use with the apparatus.

Referring first to Fig.4, a relatively short length, say, 10", of cinematograph film 1 of any standard size has formed thereon two rows of pictures 2a, 3a,... and 2b, 3b,... The pictures 2a, 3a,... in one row alternate in the sequence of presentation with the pictures 2b, 3b,... in the other row, so that as the film 1 is traversed through the apparatus 4, the beam of light to be focussed on the screen is arranged to illuminate first the picture 2a in the upper row, and then the picture 2b in the lower row, as will be described more fully below.

In order to achieve this switching of the projector beam, two projector lamps 5a, 5b are mounted one above the other in the housing 4 and each has its own respective lens system 6a, 6b and 7a, 7b for illuminating the pictures 2a, 3a,... or 2b, 3b,... in an associated row on the film 1. The optical systems 6a, 7a and 6b, 7b are arranged to project their images at the same point on the screen (not shown) by providing adjusting means for the objective lenses 7a, 7b. These lenses are mounted in a common mounting 8 behind projection apertures 9 in the front wall of the housing 4. The mounting is adjustable to a desired extent towards and away from the condenser lenses 6a, 6b to vary the throw of the projector, whilst the lens 7a is mounted for independent vertical adjustment in the mounting 8 by means of a lens tube 10 which is supported on a leaf spring 11 anchored at its ends in grooves 12 in the mounting 8 and operative to urge the lens tube 10 against the ends of a pair of adjusting screws 13 which project downwards through the top of the mounting 8. The screws 13

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have conical points and are located side by side on a line at right angles to the axis of the lens tube 10 so that they form, with the spring 11, a three point mounting for the lens 7a.

The lamps 5a, 5b are connected to a battery 16 in the base 14 of the housing 4 through contacts 15a, 15b engaging a rotating contact plate 17 having alternate conducting and insulating sectors 18, 19 respectively, the arrangement being such that as one lamp 5a, say, is energised the other 5b is extinguished. The plate 17 is driven from a shaft 20 of a clockwork motor 21 which also drives a friction feed roller 22. The roller 22 cooperates with a pressure roller 23 to engage and grip the film 1 so as to feed it past the condenser lens assembly 6a, 6b, the spindle 24 of the roller 23 being urged by a spring 25 towards the feed roller 22. A pressure plate 26 keeps the film 1 pressed flat against the front surface of a mounting 27 for the condenser lenses 6a, 6b.

In operation, the feed roller 22 is driven fairly slowly so that the film 1 is inserted through a slot 28 in one side of the housing 4 and pushed behind the presser plate 26 until it is engaged by the feed roller 22 and pressure roller 23. These rollers grip the edge of the film 1 and draw it through the projector at a relatively low speed which is of the order of one inch per minute. The contact disc 17, however, rotates at a higher speed so that the lamps 5a, 5b are alternately energised many times during the passage of a vertical pair 2a, 2b &c. of pictures on the film 1. These pictures thus slowly traverse the screen in rapid alternation to give the effect of animation, to be followed without

any definite break by the next pair 3a, 3b, and so on. In this way, a film 1 of about 10" length lasts for approximately 10 minutes. It will thus be seen that the complications inherent in reeling and unreeling of the film can be dispensed with for the purposes of a toy, thus providing an apparatus which is conveniently simple for a child to operate.

Since the timing register of the picture sequences with respect to the lamps 5a, 5b is not critical, the use of a friction feed 22, 23 is permissible. This has the advantage of not requiring any skill to feed film into the apparatus 4. The projector is thus suitable for use as a toy.

A winding spindle 29 for the clockwork motor 21 passes upwards through the housing 4 and is accessible from the top thereof, thus avoiding the necessity of disturbing the projector on each occasion when the motor is wound. A combined brake and switch lever 30 serves to stop and start the clockwork motor 21 and to control the circuit to the lamps 5a, 5b.

Various alternative detail arrangements other than those described above may be adopted as desired. For example, independent controls for the motor and the lamps may be provided. Moreover, more than two rows of pictures may appear on the film, or the film may be composed of two or more webs each having one or more rows of pictures and rigidly secured in side-by-side relationship so that the pictures are projected in the correct sequence. Any convenient driving means may be adopted as desired to traverse the film through the apparatus.

The lamps 5a, 5b are of a relatively low power and may, if preferred, be operated from a transformer

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connected to the normal supply mains. The driving motor 21 may be electric if desired, or the film 1 may be traversed by hand.

WHAT I CLAIM AS MY INVENTION IS:

1. Cinematograph reproducing apparatus for use with films of the kind described comprising a separate optical projecting system for each row of pictures having a respective condenser lens, objective lens, and light source, and means for energising each light source in turn to project images of the pictures on the film in the correct sequence at a single viewing point.

2. Cinematograph reproducing apparatus according to Claim 1 wherein at least one optical projecting system is adjustable so that images projected by the respective systems may be accurately registered at the viewing point.

3. Cinematograph reproducing apparatus according to Claim 2 wherein the objective lens of an adjustable optical projecting system is mounted in an adjustable holder.

4. Cinematograph reproducing apparatus according to Claim 3 wherein the objective lens holder is supported on its underside by a resilient member and engaged on its opposite side by a pair of adjusting screws.

5. Cinematograph reproducing apparatus for use with films of the kind described comprising a separate optical projecting system for each row of pictures having a respective condenser lens, objective lens, and light source, a driving motor, friction feed rollers driven by the motor and operative to grip a margin of the film, and means for energising each light source in turn to project images of the pictures on the film in the correct sequence at a single viewing point.

6. Cinematograph reproducing apparatus for use with films of the kind described comprising a separate optical projecting

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system for each row of pictures having a respective condenser lens, objective lens, and light source, a clockwork driving motor having its winding spindle accessible from the top of the apparatus, friction feed rollers driven by the motor and operative to grip a margin of the film, and means for energising each light source in turn to project images of the pictures on the film in the correct sequence at a single viewing point.

FIG. 1

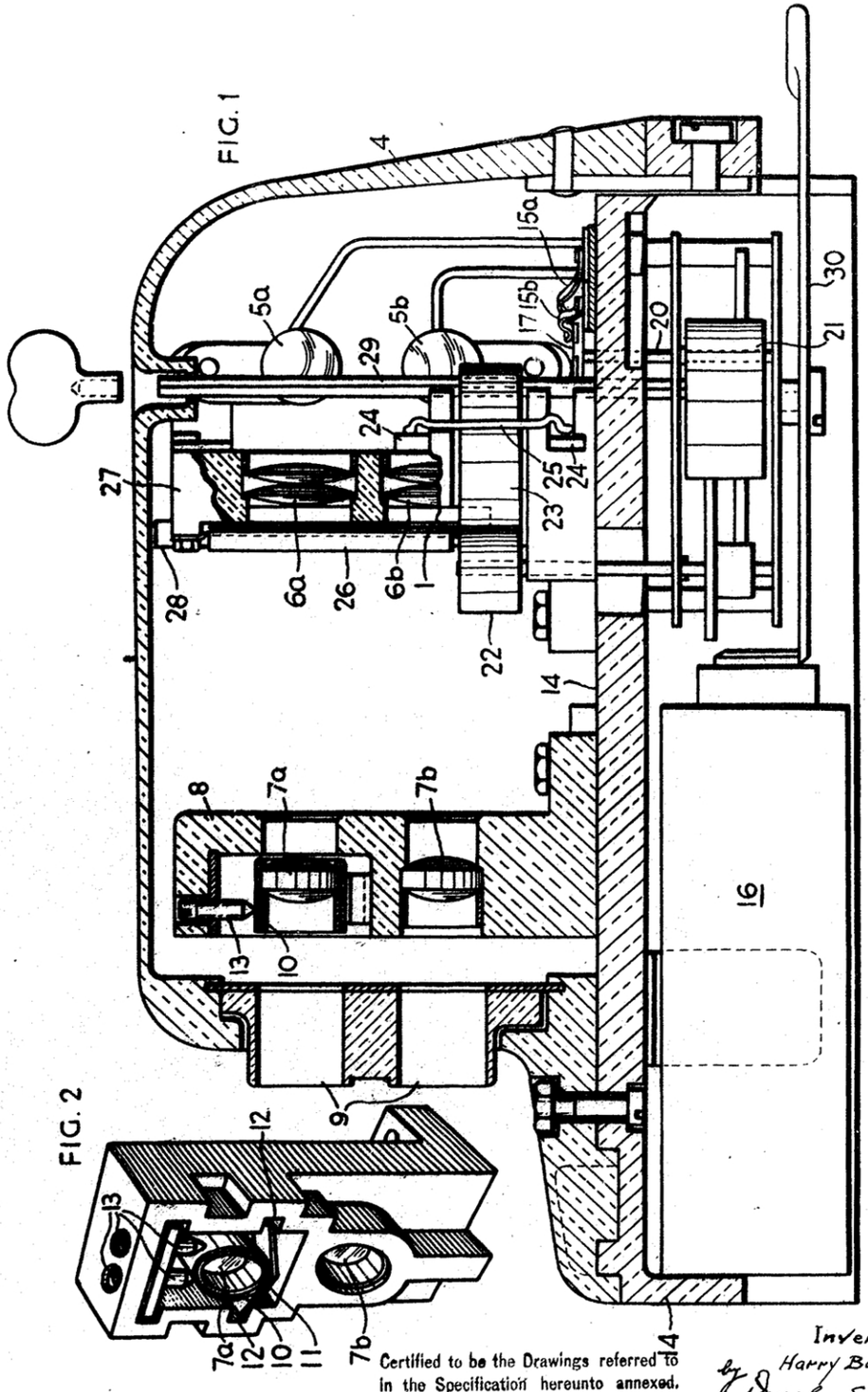

FIG. 2

Certified to be the Drawings referred to in the Specification hereunto annexed.

TORONTO, July 21st 1948

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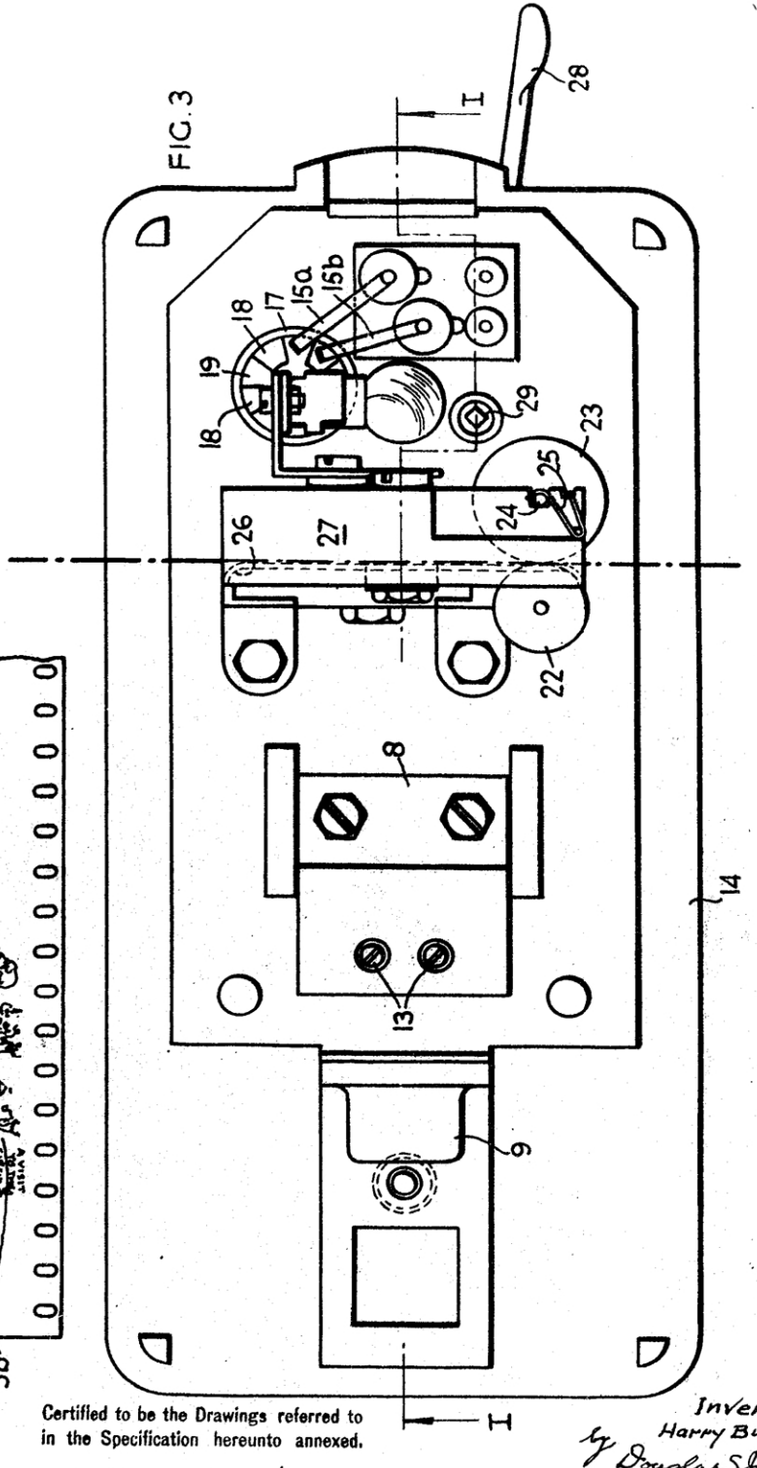
FIG. 4

FIG. 3



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