



## PATENT SPECIFICATION

608,278

Application Date: Feb. 19, 1946. No. 5216/46.  
" " Aug. 29, 1946. No. 26016/46.

One Complete Specification left (under Section 16 of the Patents and Designs Acts, 1907 to 1946): Dec. 23, 1946.

Specification Accepted: Sept. 13, 1948.

Index at acceptance:—Class 97(i), E1a29b2.

PROVISIONAL SPECIFICATION

## ERRATA

SPECIFICATION No. 608,278.

Page 4, line 35, *after* " the " *insert*  
" same "  
Page 4, line 85, *after* " the " *insert*  
" fixed plate 15. Vertical adjustment  
of the "

THE PATENT OFFICE,  
18th February, 1949.

motion picture can be obtained with the utilisation of a much less length of film.

The invention has for its object to devise a cinematographic projector by which film as above described can be projected in a satisfactory and practical manner.

The invention consists in a cinematograph projector comprising means for moving a film lengthwise past the actual projector system and means operable to produce relative movement between the

slowly in the longitudinal direction either continuously or intermittently and if desired in a jerky manner so as to bring the next scene opposite the projector.

While normally the two movements will take place simultaneously it may be so arranged that there is no longitudinal movement of the film while the vertical reciprocatory movement thereof is taking place.

Dated this 19th day of February, 1946.

MARKS & CLERK.

PROVISIONAL SPECIFICATION  
No. 26016 A.D. 1946.

## Improvements in and relating to Cinematograph Projectors

I, FRITZ PÄCHT, of 78, Drury Lane, Hollinwood, Manchester, Lancashire, of Austrian nationality, do hereby declare the nature of this invention (a communication to me from abroad by Miguel Enrique Nebel, of Hotel Ritz, Barcelona, Spain, of Uruguayan nationality) to be as follows:—

This invention relates to cinematograph  
[Price 2/-]

projectors and is concerned with the provision of satisfactory means for producing the relative translational and longitudinal motions described in my co-pending Application No. 5216, of 1946.

According to the present invention the film is supported or carried on a frame or like structure which is subjected to the influence of means for producing the

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PROVISIONAL SPECIFICATION  
No. 5216 A.D. 1946.

## Improvements in and relating to Cinematograph Projectors

I, FRITZ PÄCHT, of 78, Drury Lane, Hollinwood, Manchester, Lancashire, of Austrian nationality, do hereby declare the nature of this invention (a communication to me from abroad by Miguel Enrique Nebel, of Hotel Ritz, Barcelona, Spain, of Uruguayan nationality) to be as follows:—

This invention relates to cinematograph projectors particularly to such as are intended to be used as a toy and which can be employed to project film which is subdivided into two or more longitudinal bands in which picture matter is so arranged that to project it, it is necessary that the films should not only be "scanned" longitudinally, as is usual, with cinematographic projecting apparatus, but that it should also be scanned transversely. In this way the semblance of a motion picture can be obtained with the utilisation of a much less length of film.

The invention has for its object to devise a cinematographic projector by which film as above described can be projected in a satisfactory and practical manner.

The invention consists in a cinematograph projector comprising means for moving a film lengthwise past the actual projector system and means operable to produce relative movement between the

film and projector system.

The invention also consists in a cinematograph projector according to the preceding paragraph wherein the second said means is operable to reciprocate the film transversely with respect to the gate of the projector system.

Consider, for instance, a 35 mm. standard film sub-divided into four longitudinal rows of pictures with the single phases of each scene so arranged that they appear in a row extending transversely of the film. By a transverse reciprocatory or oscillatory movement of the film one phase after the other can be projected onto the screen to produce a motion picture of the scene represented by the different phases, which scene can be repeated as many times as desired. At the same time the film may be made to move slowly in the longitudinal direction either continuously or intermittently and if desired in a jerky manner so as to bring the next scene opposite the projector.

While normally the two movements will take place simultaneously it may be so arranged that there is no longitudinal movement of the film while the vertical reciprocatory movement thereof is taking place.

Dated this 19th day of February, 1946.

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PROVISIONAL SPECIFICATION  
No. 26016 A.D. 1946.

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I, FRITZ PÄCHT, of 78, Drury Lane, Hollinwood, Manchester, Lancashire, of Austrian nationality, do hereby declare the nature of this invention (a communication to me from abroad by Miguel Enrique Nebel, of Hotel Ritz, Barcelona, Spain, of Uruguayan nationality) to be as follows:—

This invention relates to cinematograph  
[Price 2/-]

projectors and is concerned with the provision of satisfactory means for producing the relative translational and longitudinal motions described in my co-pending Application No. 5216, of 1946.

According to the present invention the film is supported or carried on a frame or like structure which is subjected to the influence of means for producing the

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desired translational motion of the film and which frame or like structure also carries a driving sprocket or like device for the film which is reciprocable with the frame whilst the sprocket is being rotated to effect the desired longitudinal film motion.

The invention also consists in a cinematograph projector according to the preceding paragraph wherein the means for producing the desired transverse motion consists of a polygonal element which is rotated intermittently in order that different portions thereof may be presented to the frame or structure carrying the film and thereby determine the transverse motion of the latter.

In a particular construction in accordance with the invention a cinematograph projector is provided wherein a film having an arrangement of pictures or representations thereon as described in my co-pending Application No. 5216 of 1946 is supported on a frame so that, for example, the film extends horizontally past the gate, in front of which there is the usual convergent lens for focussing the images on the screen and behind which gate there is the condensing lens and lamp, and in order that the film may be reciprocated vertically with respect to the projector system the frame is mounted for reciprocatory motion in such direction under the control of an element which is of polygonal form and is eccentrically mounted upon a rotary shaft which carries also a Maltese cross which is actuated by a pin member and thereby causes the polygonal element to rotate intermittently with the result that the film is reciprocated up and down but in such manner that as the successive pictures are brought opposite the gate they remain there momentarily until the next picture, by a further actuation of the frame by the action of the polygonal element, jumps into position.

The member carrying the pin may be arranged to be rotated by the actuation of a handle, clock-work device or an electric

motor, for example, and the arrangement is such that the rotary motion is transformed, by the action of the Maltese cross and pin, into an intermittent or a jerky motion. For instance, the Maltese cross, having a radial slot in each of its six arms makes a quick turn of  $60^\circ$ , then stands still for  $1/5$  second and so on while the polygonal element performing the same jerky rotation as the Maltese cross causes the frame, supporting the film, to move up and down with a similar jerky action, the shape of the polygonal element being such that for each said turn of  $60^\circ$ , the frame is pushed up or down by exactly the height of one picture on the film.

In this way, through the combined action of the Maltese cross and the polygonal element the pictures of each transverse sequence thereof on the film are made to appear in front of the gate and stop there for a period of e.g.,  $1/5$  second, the change-over from one picture to the other however being so quick as not to be noticeable to the eye.

Simultaneously with the aforesaid vertical reciprocation of the film the latter is also required to be moved slowly longitudinally so that one transverse sequence of pictures after the other appears opposite the gate. This longitudinal film motion can be effected by a film sprocket, having teeth engaging in the film perforations, being slidably mounted upon a rotary driving spindle which operates to rotate the sprocket but at the same time allows the latter to reciprocate axially together with the film carrier or frame, the spindle being also conveniently driven from the same main gearing as that employed for rotating the shaft carrying the polygonal element and the Maltese cross.

If desired a clutch may be fitted to enable the longitudinal film motion to take place independently of the up and down or transverse film motion, this being an advantage when it is desired to insert a new film.

Dated this 29th day of August, 1946.

MARKS & CLERK.

## COMPLETE SPECIFICATION

### Improvements in and relating to Cinematograph Projectors

I, FRITZ PÄCHT, of 78, Drury Lane, 100 Hollinwood, Manchester, Lancashire, of Austrian nationality, do hereby declare the nature of this invention (a communication to me from abroad by Miguel Enrique Nebel, of Hotel Ritz, Barcelona, 105 Spain, of Uruguayan nationality) and in what manner the same is to be performed, to be particularly described and ascer-

tained in and by the following statement:—

This invention relates to cinematograph projectors, particularly to such as are intended to be used as a toy, of the kind which employ a film having pictures arranged in a plurality of adjacent longitudinal rows, and in which a transverse scanning of the film takes place simul-

taneously with the longitudinal feed of the film.

The object of the invention is to provide an improved cinematograph projector of the kind referred to, in which each of a number of cyclic movements can be projected on to the screen a number of times, thus producing the illusion of continuous cyclic movement, and effecting a great saving of film in the projection of such cyclic movement.

The invention consists in a cinematograph projector of the above kind in which means are provided for producing a slow interrupted longitudinal movement of the film, together with means for producing a reciprocating interrupted transverse movement of the film, the said two means being so interconnected that the longitudinal and interrupted transverse movements always take place simultaneously, in such a manner that each section of the film is transversely scanned a number of times during its longitudinal passage past the gate.

The invention also consists in a cinematograph projector according to the preceding paragraph in which means are provided for interrupting the interconnection between the means effecting the longitudinal movement of the film and the means effecting the transverse movement thereof, thereby allowing either independent longitudinal movement of the film, e.g., for the insertion of a film; or its independent transverse movement, i.e., the repeated scanning of the same section of film.

In the accompanying drawings:—  
Figure 1 is a vertical section on the line A—A of Figure 2, with the outer casing of the projector removed;

Figure 2 is a side elevational view of one construction of projector in accordance with the invention, with the outer casing carrying the projector lens shown in chain dotted lines;

Figure 3 is a front elevational view of Figure 2, with the outer casing removed and looking in the direction of the arrow B; and

Figure 4 is a vertical section on the line C—C of Figure 2, also with the outer casing removed.

In carrying the invention into effect in one convenient manner as illustrated in the drawings, a cinematograph projector is provided wherein a film 1 having an arrangement of pictures or representations 2 thereon as above described is supported on a frame 3 so that the film extends horizontally past the gate 6, in front of which there is the usual projector lens 5 for focussing the images on to a

screen and which gate is illuminated

through an elongated slot 4 in the frame 3. A small electric lamp 7 is fitted behind the gate 6 and in order that the film may be reciprocated vertically, step-by-step, with respect to the projector system the frame 3 is mounted for vertical reciprocatory motion under the control of a cam element 8 which is of polygonal form and is eccentrically mounted upon a rotary shaft 9 which carries also a Maltese cross 10 which is actuated by a pin member 11 (the Maltese cross and its co-operating pin forming a Geneva gear, such as is well known) so as to cause the polygonal cam element to rotate intermittently, with the result that the film is reciprocated stepwise up and down, in such manner that as the successive picture areas, disposed transversely to the film, are brought opposite the gate they remain there momentarily until the next picture area, by a further actuation of the frame by the action of the polygonal cam element, jumps into position. Each picture area may contain one or more images. Each transverse sequence of images represents a cyclic movement, the component images of the sequence, which lie in one line at right-angles to the longitudinal direction of the film, corresponding to the successive phases of the cyclic movement.

The pin 11 is carried on a disc 12 mounted upon a shaft 13 rotatably mounted upon a rear vertical end plate 14 of a frame which includes a front vertical end plate 15, the two end plates being connected together by transverse stays 16 and the whole being mounted upon a base 17 which normally supports an outer removable casing 18 carrying the lens 5 at its front end.

The disc 12 carries the usual segment 19 found on a Geneva gear to permit the Maltese cross to be rotated intermittently only when the pin 11 is in engagement with one of the radial slots 20 of the cross, and when the projector is in use the disc 12 is arranged to be rotated continuously, as by the rotation of a handle 21, which drives the disc through a gear train 22.

Thus the member 12 carrying the pin 11 may be arranged to be rotated by the actuation of a handle 21, a clock-work device or an electric motor, for example, and the arrangement is such that the rotary motion is transformed, by the action of the Maltese cross and pin, into an intermittent or jerky rotary motion. For instance, the Maltese cross, having a radial slot 20 in each of its six arms, makes a quick turn of  $60^\circ$ , then stands still for  $1/5$  second and so on. The polygonal cam element 8, performing the same jerky rotation as the Maltese cross, causes the frame 3, supporting the film, 130

to move up and down with a similar jerky action, the shape of the polygonal cam element being such that for each said turn of 60°, the frame 3 is pushed up or down by exactly the height of one picture area on the film.

In this way, through the combined action of the Maltese cross and the polygonal cam element the picture areas are made to appear in front of the gate and stop there for a period of, e.g., 1/5 second, the change-over from one picture area to the next, however, being so quick as not to be noticeable to the eye.

Simultaneously with each of the aforesaid transverse movements of the film the latter is also displaced slightly longitudinally so that the transverse sequences of images reach the gate and slowly pass it one after the other, the images of a transverse sequence appearing opposite the gate in turn in the order resulting from the reciprocating transverse movement of the film, until the said sequence has moved longitudinally past the gate. This longitudinal film motion can be effected by a film sprocket 24, having teeth 25 engaging in the film perforations 26, being slidably mounted upon a vertical rotary driving spindle 27 which operates to rotate the sprocket, but at the same time allows the latter to reciprocate axially together with the film carrier or frame 3, the spindle 27 being conveniently driven from the main gearing 22 as that employed for rotating the shaft 9 carrying the polygonal cam element and the Maltese cross and such driving connection for the spindle being conveniently afforded by a worm 28 on the shaft 9 engaging with a worm wheel 29 at the lower end of the spindle. The film sprocket 24 is in the form of a sleeve which has an elongated slot 24a in which a pin 27a on the spindle 27 engages to provide a rotary driving connection between the spindle and the film sprocket, which connection, however, is such as permits the spindle 27, by actuation of the knob 27b, to be lifted, against the action of a restoring spring 27c, to cause the worm wheel 29 on the spindle to be disengaged from the worm 28. By this means, and while the spindle 27 is held in a raised position with its worm wheel disengaged from the worm 23, it is possible, by rotation of the spindle, to rotate the film sprocket independently of the gearing referred to. Such independent rotation of the film sprocket may be resorted to when it is desired to insert a new film and provides also for the moving of the film longitudinally, backwards or forwards, independently of the transverse motion above-mentioned.

The film carrier 3 has a transverse slot 30 through which the film can be inserted from one side of the carrier and guided through the latter for delivery at its opposite side as the film sprocket 24 operates to effect the longitudinal feeding movement of the film in the operation of the projector.

The gate 6 incorporates the condenser lens 6j, which latter is mounted immediately behind the gate and is carried at the inner end of a cylindrical shroud 6a which projects rearwardly from one face of a plate 6b, the front face of which plate is formed with a rectangular frame 6c the opening in which defines the gate 6. This frame part 6c is mounted for vertical adjustable sliding movement within a corresponding recess 15a on the front face of the thus combined gate and condenser lens is effected by the actuation of a knob 6d on a spindle 6e having an inner screw-threaded end 6f which engages in a correspondingly screw-threaded bore in a block 6g integral with the plate 6b. The spindle 6e is guided through an opening in a bracket 15b projecting rearwardly from the plate 15 and the desired relative movement between the spindle and the block is obtained by the provision upon the spindle of a pair of axially spaced collars 6h either of which is moved into abutting relationship with the bracket 15b depending upon the direction of rotation of the spindle 6e. This provision for vertical adjustment of the combined gate and condenser lens enables the gate and lens to be accurately set so that they will register with the rows of pictorial matter on the film, the actual dispositioning of which rows may vary for different films. On the other hand the combination of the gate and condenser lens upon a common part (i.e., the plate 6b, shroud 6a and frame 6c all of which are integral with each other) ensures that the condenser lens remains always in correct register with the gate.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A cinematograph projector of the kind referred to having means for producing a slow interrupted longitudinal movement of the film and means for producing a reciprocating interrupted transverse movement thereof, the said two means being so interconnected that the longitudinal and interrupted transverse movements always take place simultaneously, in such a manner that each section of the film is transversely scanned a number of times during its longitudinal

passage past the gate.

2. A cinematograph projector as claimed in Claim 1 in which the drive for the longitudinal movement and the drive for the transverse movement are both taken from a common intermittently rotated shaft.

3. A cinematograph projector as claimed in Claim 1 or 2 in which means are provided for interrupting the inter-

connection between the said two means, thereby allowing of the film being moved only longitudinally or only transversely for the purposes set forth.

4. The improved cinematograph projector of the kind referred to substantially as described herein with reference to the accompanying drawings.

Dated this 23rd day of December, 1946.

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Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1948.  
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies, price 2s. 0d. each (inland) 2s. 1d. (abroad) may be obtained.

[This Drawing is a reproduction of the Original on a reduced scale.]

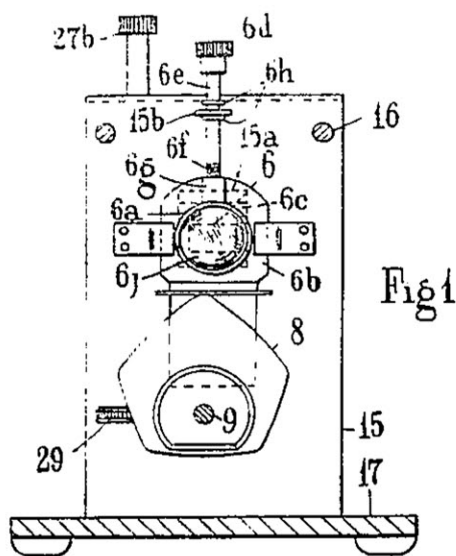


Fig 1

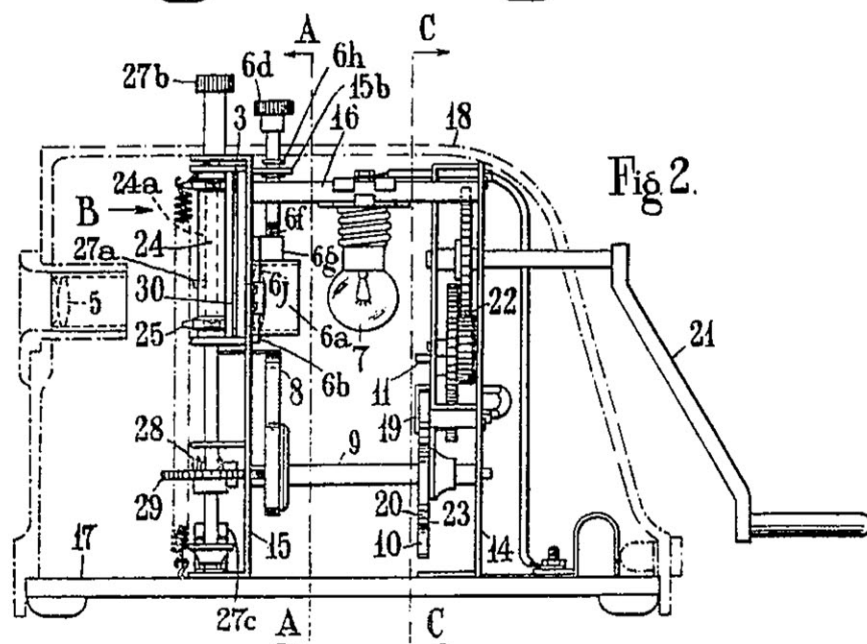


Fig 2

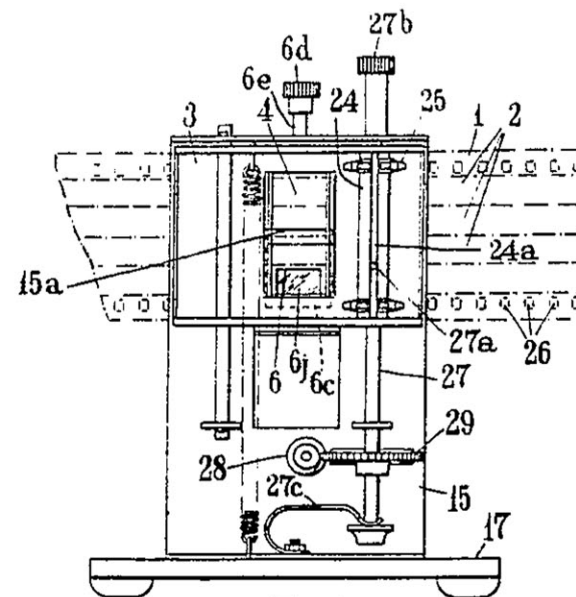


Fig 3

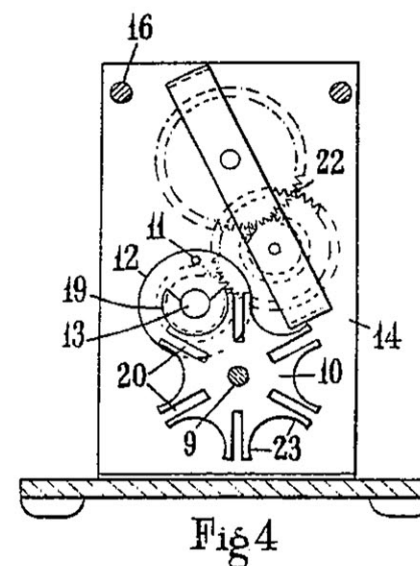


Fig 4