Sept. 23, 1924. 1,509,092

C. ANSELMI ET AL

INTERMITTENT DRIVING MEANS IN CINEMATOGRAPHIC APPARATUS

Filed May 7, 1921 3 Sheets-Sheet 1

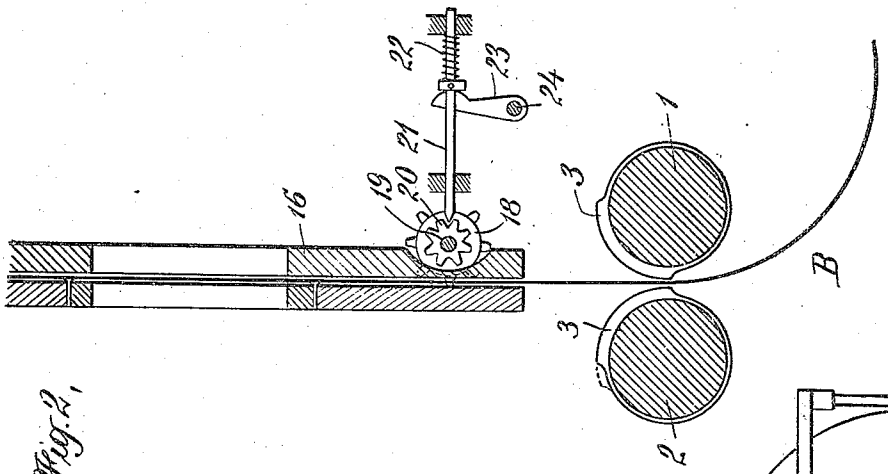


Fig. 2.

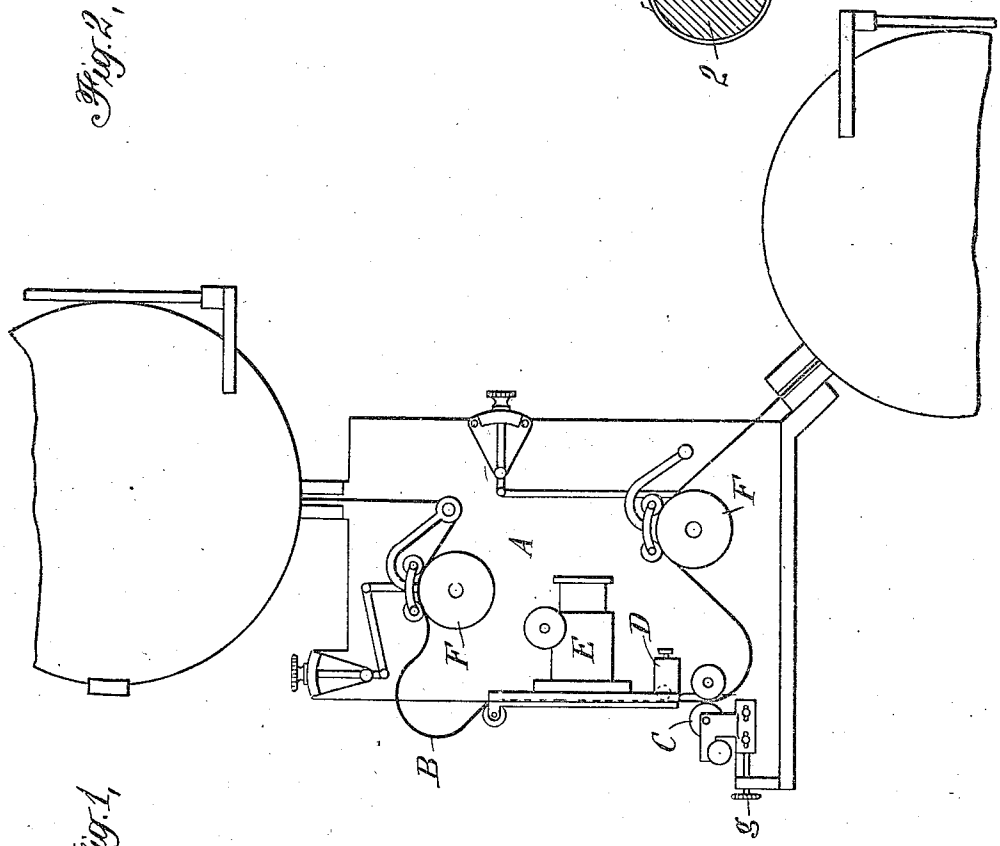


Fig. 1.

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Filed May 7, 1921 3 Sheets-Sheet 2

Fig. 5.

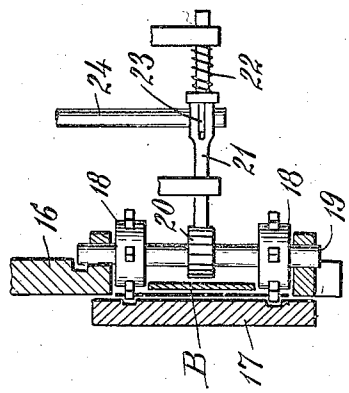


Fig. 4.

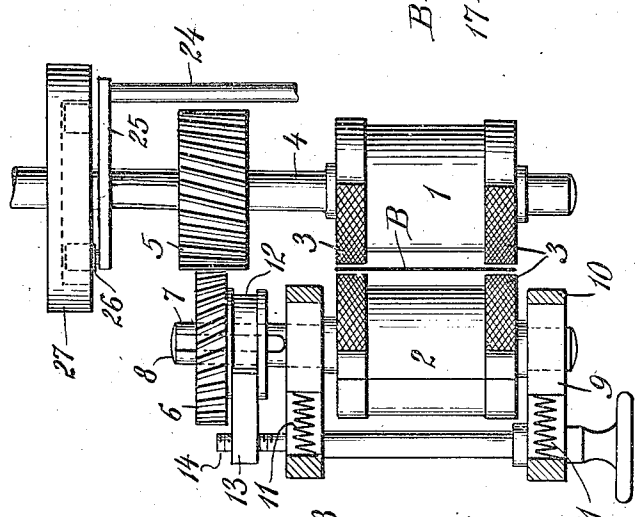
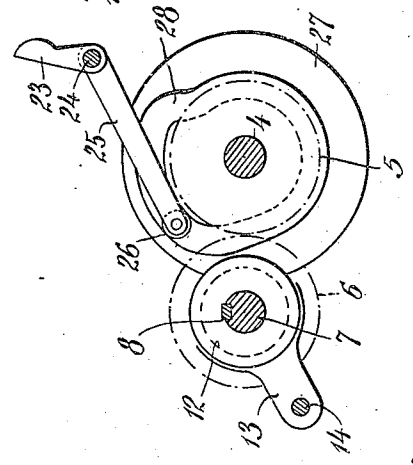


Fig. 3.



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Filed May 7, 1923 3 Sheets-Sheet 3

Fig. 7.

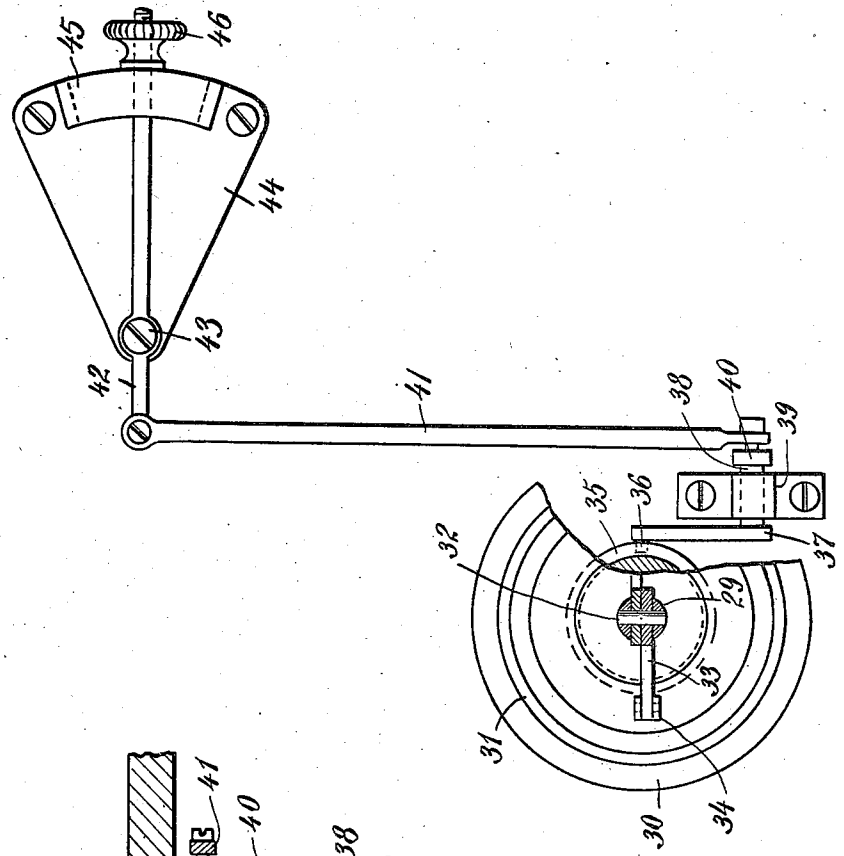
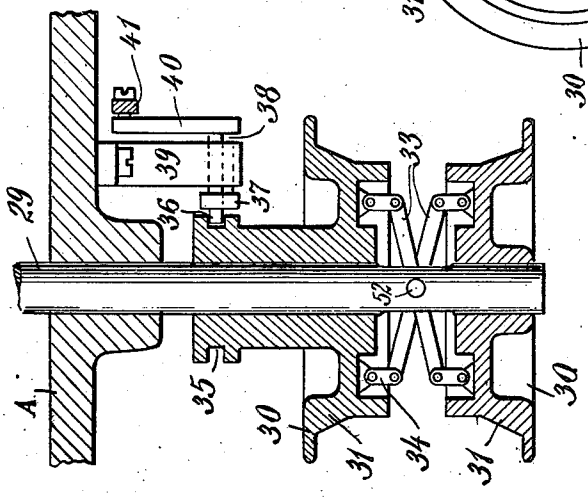


Fig. 6.



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UNITED STATES PATENT OFFICE.

CARLOS ANSELMI AND MARCELINO VITURRO, OF BUENOS AIRES, ARGENTINA.

INTERMITTENT-DRIVING MEANS IN CINEMATOGRAPHIC APPARATUS.

Application filed May 7, 1921. Serial No. 467,538.

To all whom it may concern:

Be it known that we, CARLOS ANSELMI and MARCELINO VITURRO, subjects of the King of Italy and of the King of Spain, respectively, residing at 3175 Federico Lacroze Street, Buenos Aires, Republic of Argentina, have invented certain new and useful Improvements in Intermittent-Driving Means in Cinematographic Apparatus, of which the following is a specification.

Our invention relates to certain improvements in apparatus for the projection of cinematographic films its main object being the provision of a new device for the intermittent driving of the film, said device eliminating the use of the usual perforations on the film for the driving of same.

Another object of our present invention consists in the provision of a controlling device working in synchronism with the driving mechanism, by means of which, and using a number of conveniently disposed perforations on the film the position of the picture to be projected through the window is accurately regulated, and by which means the small inaccuracies which might be caused by slipping of the film are exactly compensated.

Our invention contemplates also the provision in cinematographic apparatus of extensible driving and grinding rollers, which width may be regulated at will to suit varying widths of the films.

Our invention has further objects in view, which will be clearly seen from the following specification and which are specifically set forth in the appended claiming clauses.

In order that our invention may be clearly understood and easily carried into practice a preferred embodiment of the same has been illustrated in the accompanying drawings, wherein,

Figure 1, is a side view showing diagrammatically an apparatus for the projection of cinematographic films constructed according to our present invention.

Figure 2, is an enlarged sectional view of the intermittent-driving device for the film and the controlling means for the same, the means for the transmission of movement having been omitted.

Figure 3, is a side view of the driving means for the said devices.

Figure 4, is a plan view of the device for intermittently driving the film and of the transmission connections to the controlling device.

Figure 5, is a plan view of the said controlling device.

Figure 6, is a detailed sectional view of one of the regulable driving rollers and finally,

Figure 7, is a side elevation of one of the said driving rollers clearly showing the means for regulating the width of the same.

Similar characters of reference denote same or like parts throughout the said drawings.

With reference to the diagrammatic illustration of Figure 1, A is the usual frame of cinematographic apparatus, B being the film projected through the same. C is the improved device for the intermittent driving of the film B. D is a controlling or regulating device working in synchronism with the said driving device C. E is the lens and window in front of which the film is driven and finally F are the driving rollers of adjustable width. *g* is a device for the original setting of the device for intermittently driving the film.

According to our present invention the intermittent driving of the film is effected by means of two parallel disposed rollers 1 and 2 each having a protruding portion 3 which is so disposed that the protruding parts of both rollers are in contact with each other during a determined period of the rotation of the said rollers. Both rollers turn in opposite directions so that they only contact when their protruding portions 3 meet, at which moment said protruding portions firmly hold the film between them and pull it downwards, said pull lasting only whilst said protruding portions contact, which may be easily regulated by adjusting the surface of the contacting portions to the length of a picture of the film.

Roller 1 is rigidly fixed to an axle 4 to which movement is transmitted from any suitable source of power. A toothed wheel 5 is rigidly mounted on the said axle 4 said wheel being of a considerable width and having its teeth angularly disposed. A wheel 6 similarly provided with angular teeth meshes with toothed wheel 5 and receives movement from the same. Said wheel 6 is mounted on an axle 7 corresponding to the driving roller 2 and is capable of longitudinal sliding on the said axle by means of a pin 8, as illustrated in Fig. 4. 10 is a supporting frame for roller 2 having bearings 9 for its axle 7. Said bearings 9 are resiliently mounted so as to afford a resilient contact between the protruding portions 3 of both rollers 1 and 2 in order to compensate the irregularities in the thickness of film B.

Integral with gear wheel 6 there is an extension provided with a circular groove 12 wherein a fork 13 may engage. Said fork 13 has a screw-threaded part in which screws a screw threaded portion 14 of a stem rotatably supported in the frame 10 said stem carrying a finger stud so as to turn at will said stem in one or the other direction. Said stem is not capable of longitudinal sliding movement in its supports so that on turning, the fork 13 will be moved forwards or backwards, motion of wheel 6—wheel 5 being fixed, will determine a certain angular displacement of cylinder 2 with respect to cylinder 1 and hence, the contacting surface of the protruding parts 3 of the said cylinders will be augmented or diminished at will. In this way the pull of the intermittent driving means may be always accurately regulated according the length of the pictures of the particular films used.

Figure 5, shows clearly the special device for controlling the intermittent drive of the film. The frame 16 carries beneath the projecting window or on the top of the same if desired, a plate 17 provided with a groove at each side of the same so as to allow a tooth to engage in the same. On the said frame 16 and in front of the above mentioned plate 17 a transverse and horizontal axle 19 carrying two fixed wheels 18 are each provided with conveniently spaced teeth so that each consecutive tooth may penetrate into a perforation of the film at each side of the same whilst the movement of the device, as it may be clearly seen from the said Figure 5.

A toothed wheel 20 is fixed at a central part of the axle and on the said wheel a pointed rod 21 may actuate, said rod penetrating by its pointed end into the space between two teeth of the wheel 20. Said rod is suitably supported in brackets and carries a coiled spring 22 which tends to push it normally against the wheel 20, as may be clearly seen from Figure 2. 23 is a retention stop fixed to axle 24 which in its turn is also fixed to a lever arm 25 having at the opposite end a guide roller 26 which may run in a cam groove 28 formed in a wheel 27 rigidly fixed to the main axle 4, as may be seen from Figures 3 and 4. The said cam groove 28 is so formed that at the moment in which the protruding parts of rollers 1 and 2 contact, the push piece 23 pushes back the rod 21, whereby the wheel 18 is set free to rotate under the action of the advancing film, but as soon as the forward motion of the said film is suspended, the push piece recedes and rod 21 is free to again advance under the action of spring 22 until its pointed end penetrates between two teeth of the wheel 20. In this manner any small inaccuracy which might occur in the driving of the film is easily compensated, as said film cannot advance beyond a certain regulable limit.

The driving rollers of the film having no driving teeth a great economy is effected in the manufacture and wearing of the film, as according to our present invention films with no driving perforations may be used.

Said driving rollers are mounted on an axle 29 suitably supported in the frame A of the apparatus. Each one of the said rollers is formed of two symmetrical halves 30 having near their edges a conical portion 31 with the bases adjacent to the said edges and also a cylindrical intermediate portion. Both halves of the roller are connected with a set of articulate levers 33—34 pivoted at 32 on the axle 29, as may be clearly seen from Figure 6. One of the halves of the said rollers is formed with an extension having a groove 35 in which a finger 36 may penetrate. Said finger 36 is formed at one end of a lever 37 angularly fixed on an axle 38 rotatably mounted in bearings 39 in the frame of the apparatus. Said axle is formed with a collar 40 and has conveniently articulated at its end a rod 41 pivoted to the end of a two arm lever 42 pivoted at 43 on a segment 44 having at the round part a groove 45 into which the end of the other lever arm passes. Said lever is capable of an angular displacement within the said segment. On moving lever 42 in one direction or the other the extension 35 of one of the halves of the roller will be advanced or recede with a corresponding opposite movement of the other half of the roller. In this way the width of the roller may be easily regulated to suit variable widths of the film. In order to fix the roller to a predetermined width, the end of lever 42 may be screw threaded and a nut 46 pressed against the edge of the segment.

The operation of the apparatus accord-

ing to our present invention for the projection of cinematographic films may be easily understood from the preceding description and need not be fully specified. The advantages to be obtained will be clearly understood by all experts in the art.

It is obvious that many constructive and other changes may be introduced in the above described construction, without departing from the scope of the invention which will be clearly set forth in the appended claiming clauses.

What we claim as new desire to protect by Letters Patent is—

1. A moving picture projection apparatus comprising a film feed mechanism and a projector aperture, means for moving the picture bearing film intermittently past the projector aperture, said intermittent driving means comprising a pair of rollers arranged with their axes in substantial parallelism, means for driving the rollers in opposite directions and synchronously with the film feed mechanism, a protruding portion provided on each cylinder of periphery substantially equal to the length of a picture on the film, said protruding portions engaging the film between them during each revolution of the rollers and thereby advancing the film a distance equal to the length of a single picture, means for effecting a relative angular displacement of said feed rollers thereby varying the time of contact between said protruding portions and correspondingly varying the amount or distance the film moves at each revolution of the rollers and a resilient mounting for the axle of one of said rollers whereby a yielding pressure is secured between the rollers during the period of advancing of the film.

2. A motion picture projection apparatus comprising a film feed mechanism and a projector aperture, means for moving the picture bearing film intermittently past the projection aperture, said intermittent driving means comprising a pair of rollers arranged with their axes in substantial parallelism, means for driving the rollers in opposite directions and in synchronism with the film feed mechanism, a protruding portion provided on each roller of periphery substantially equal to the length of the picture or film, said protruding portions engaging the films between them during each revolution of the rollers and thereby advancing the film a distance equal to the length of a single picture, separate means for rectifying the inaccuracies in the travel of the film and automatic means for throwing the rectifying means out of operation during the advance of the film and bringing them into operation as soon as said advance has ceased.

3. In a motion picture projection apparatus in accordance with claim 1, rectifying means comprising a pair of sprocket wheels mounted on a common axle adjacent to the path of the film, the teeth of said sprockets engaging perforations with said film and running freely during the operation or advance of the film; a third toothed wheel rigidly mounted on the sprocket axle, an actuating lever operating in synchronism with the intermittent driving rollers, a spring associated with said lever and a rod having a pointed end adapted to be reciprocated by the action of said lever through the medium of the spring, the pointed end of said rod engaging between the teeth of the toothed wheel on the sprocket axle when fully extended, thereby regulating the amount of the advance of the film.

4. A motion picture projecting apparatus comprising a film feed mechanism and a projector aperture, means for moving the picture bearing film intermittently past the projector aperture, said intermittent driving means comprising a pair of rollers arranged with their axes in substantial parallelism, means whereby said rollers may be driven in opposite directions and synchronously with the film feed mechanism, a protruding portion provided on each cylinder of periphery substantially equal to the length of a picture on the film, said protruding portions engaging the film between them during each revolution of the rollers and thereby advancing the film a distance equal to the length of a single picture, and regulating means for adjusting the advance of the film to a proper extent, said regulating means comprising an actuating lever operating in synchronism with said intermittent driving means, a spring associated with said lever, a rod adapted to be reciprocated by the action of said lever through the medium of the spring, a pair of toothed wheels mounted on a common axle adjacent the path of the film, the teeth of said wheels engaging perforations in said film and running freely during the period of advance of the film, and a third toothed wheel carried by said axle, said wheel being mounted in such relation to said reciprocating rod that the end of said rod engages between the teeth of the wheel synchronously with the operation of said intermittent driving means and thereby regulates the amount of advance of the film.

5. A film feed mechanism comprising feed rollers, each of said rollers being formed in two parts, articulated rods connecting said parts, a set of lever arms associated with one of said parts for effecting relative movement between the parts of the rollers and thereby regulating the width of the roller, and intermittent feed mechanism associated with said feed rollers comprising a pair of rollers arranged with their axes in substantial par-

allelism, means whereby said rollers may be driven in opposite directions and synchronously with the film feed mechanism, and a protruding portion provided on each cylinder of periphery substantially equal to the length of a picture on the film, said protruding portions engaging the film between them during each revolution of the rollers and thereby advancing the film a distance equal to the length of a single picture.

In testimony whereof we have hereunto set our hands.

CARLOS ANSELMI.
MARCELINO VITURRO.

Witness:
RODOLFO RAMÍREZ.