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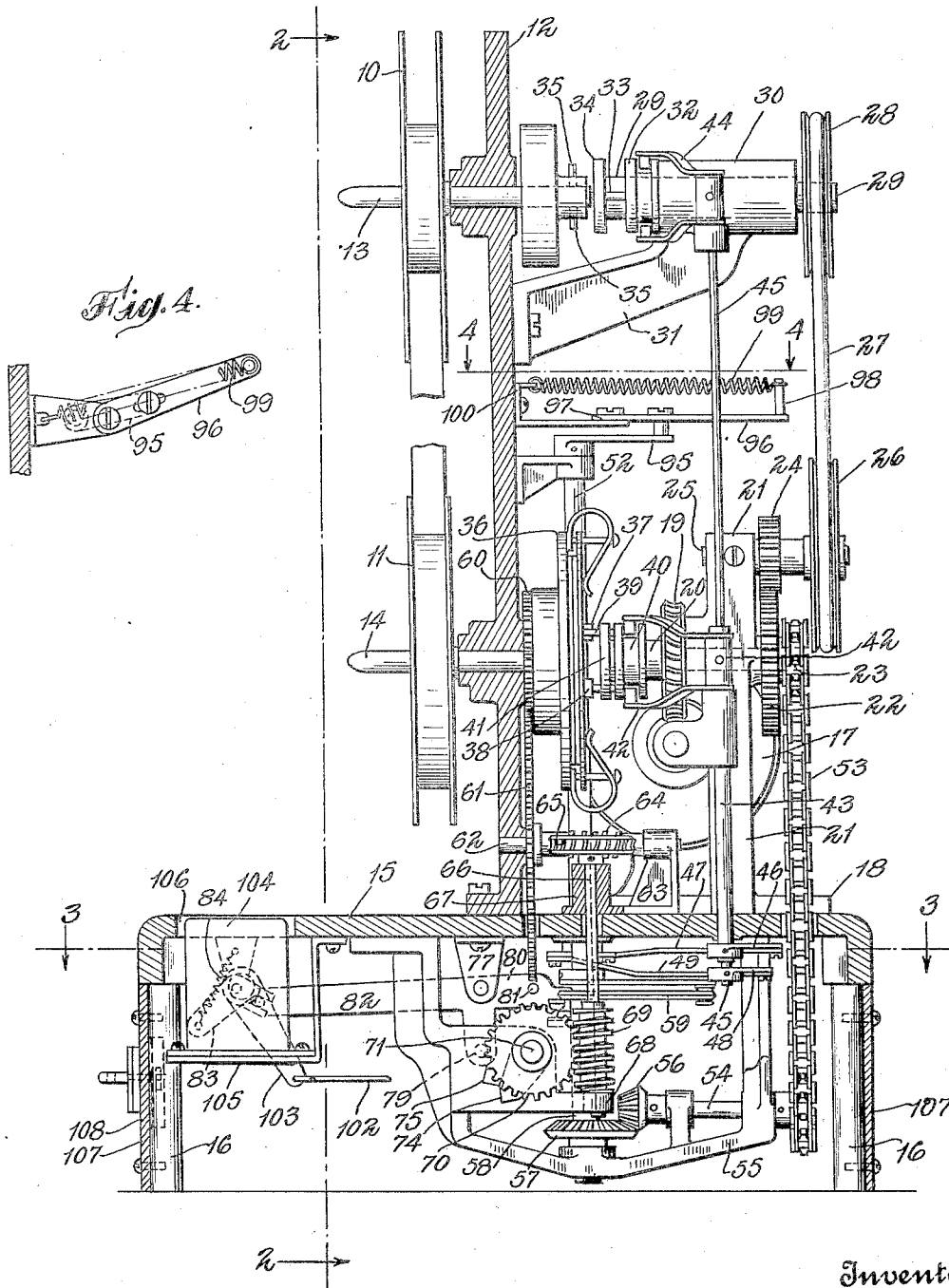
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B. A. PROCTOR
FILM PROJECTION MACHINE

Filed Oct. 3, 1925

3 Sheets-Sheet 1

Fig. 1.



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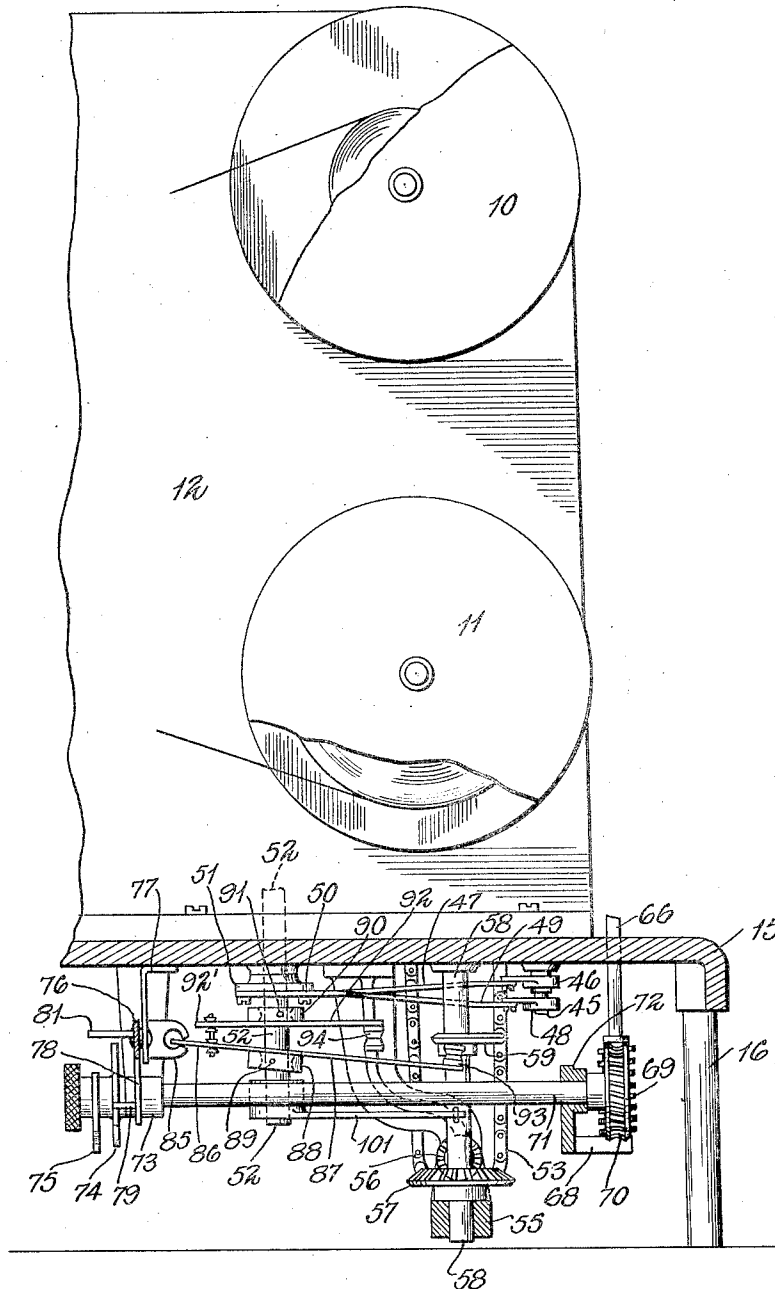
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Fig. 2.



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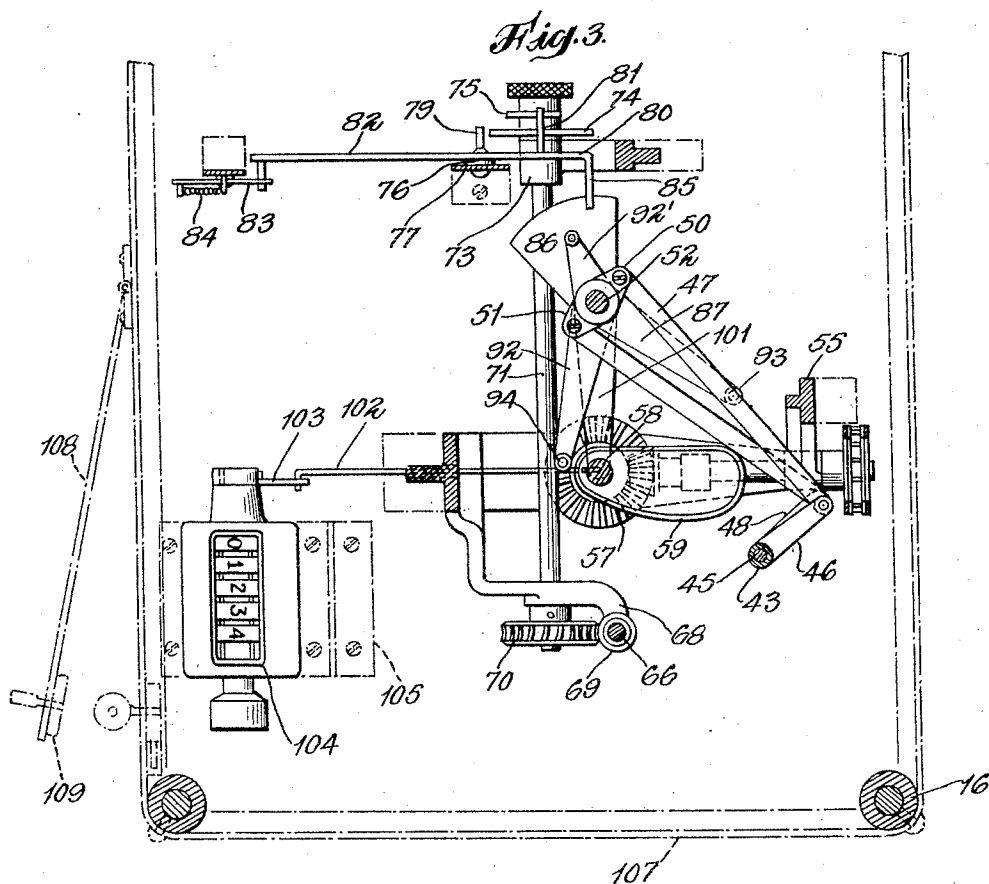
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FILM PROJECTION MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

BARTON A. PROCTOR, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
THE AUTOMATIC ADVERTISER, INCORPORATED, OF NEW YORK, N. Y., A COR-
PORATION OF DELAWARE.

FILM-PROJECTION MACHINE.

Application filed October 3, 1925. Serial No. 60,166.

The present invention relates to a film pro-
jection machine, and is more particularly di-
rected to a film reversing mechanism ar-
ranged so that the machine may automatically
reroll a strip of film and then again pass
it through the projector so as to repeat the
exhibition of the picture.

The invention contemplates the provision
of an electrically driven projecting machine
with suitable mechanism so that it is unneces-
sary to stop or reverse the electric motor
when stopping or reversing the film. The
motor is arranged to operate a gear train
which may be connected to one or the other
of the reels so as to alternately transfer the
film from one reel to the other. A suitable
mechanism is provided so that a pair of
clutches may be engaged with or disengaged
from the reels, and these clutches are arranged
to be automatically operated when it is de-
sired to change the direction of motion of
the film.

Machines of the character referred to, are
frequently used for advertising purposes and
are rented to the advertiser. Under certain
conditions, it is more equitable to base the
rental of the machine on the amount of use
to which it is put, and the present invention
contemplates the association with a machine
of the character referred to, of a counter
mechanism or register which will be actuated
each time the film is exhibited, thereby total-
ing the number of complete operations
through which the machine passes. In this
manner the payment for the use of the ma-
chine may be regulated according to the
amount of exhibiting done by the machine.
This counter mechanism is preferably located
in part of the machine which is inaccessible
to the user.

Other and further objects of the invention
will appear as the description proceeds.

The accompanying drawings show, for pur-
poses of illustrating the invention, one of the
many possible embodiments in which it may
take form, it being understood that the draw-
ings are merely illustrative of the invention
which may be embodied in various forms.

In these drawings:

Figure 1 is an elevational view of the ma-
chine, with parts in section;

Fig. 2 is an elevational view, with parts in
section taken along the line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view taken
along the line 3—3 of Fig. 1; and

Fig. 4 is a section along line 4—4 of Fig. 1.

The supply reel 10 and receiving reel 11
are disposed in front of a vertical support-
ing plate 12, and are carried on shafts 13
and 14 which are mounted on and project
from the front side of this plate. This front
plate is supported on a table or platform
15, carried on suitable legs or other supports
16, so that the mechanism may be mounted in
a desired location.

On top of the table 15 and behind the plate
12, a driving motor 17 is mounted on a bracket
18. This motor drives a worm wheel 19
through a worm (not shown), and this worm
wheel 19 is mounted on a shaft 20 suitably
supported in a bracket 21 carried on the plat-
form 15. This shaft is drivingly connected
with a gear 22 and is provided with a sprocket
wheel 23 on the end thereof. The gear 22
meshes with a pinion 24 carried on a stub
shaft 25, mounted in the bracket 21, and this
shaft carries a pulley 26. A belt 27 connect-
ing the pulley 26 with the pulley 28 drives
the pulley 28 carried on a shaft 29 which is
mounted in bearings 30 of the bracket 31
suitably supported on the back side of plate
12. The gear ratios are arranged so that the
pulley 28 rotates faster than the shaft 20.

A sliding collar 32, carried on the inner
end of shaft 29, is provided with pins 33
which pass through holes in a flange 34 on
the shaft 29. These pins are engageable with
pins 35 carried on the adjacent end of shaft
13, when the sliding collar 32 is moved to the
left, or are disengaged therefrom when the
collar is moved to the right, as shown in Fig.
1. The lower reel shaft 14 is associated with
the usual step by step movement for advanc-
ing the film. As the same forms no part of
the present invention, it is omitted from the
drawings. The position of the mechanism
used for compensating for the varying diam-
eter of the wound film is indicated generally

by the reference character 36. The lower reel shaft 14 is drivingly connected with lugs 37 and 38, which are adapted to engage pins 39 carried by sliding collar 40, mounted on shaft 20. The pins 39 pass through holes in a flange 41 carried by shaft 20 so that the shafts 20 and 14 may be drivingly connected when the sliding collar is in a left position, as indicated.

According to the present construction the electric motor is arranged to drive and actuate certain mechanisms which may move the sliding collars back and forth at the proper time so as to clutch one reel to the motor, and simultaneously de-clutch the other reel whereby the reels will be actuated either to feed the film from the supply reel 10 to the receiving reel 11 in the act of exhibition or to return the film from the reel 11 back to the reel 10, the exhibition feed being referred to as the winding feed and the reversed action as the rewinding feed. Since it is necessary to have a quick movement of the clutches, it is desirable to provide a mechanism which is brought suddenly into operation, and to which sufficient power is supplied to accomplish the shifting of the clutches.

The lower sliding collar 40 is connected by a yoke 42, with a vertical hollow shaft 43, rotatably supported in any suitable manner and extending down below the table 15. The upper collar 32 is connected by means of a similar yoke 44 with a rod 45 which passes down through the inside of the shaft 43. The lower end of the shaft 43 is connected with a short crank 46 whose free end is pivotally connected with a link 47, while the lower end of shaft 45 is similarly connected by a crank 48 with a link 49. The links 47 and 49 are connected to two arms 50 and 51 fixedly carried on a vertical shaft 52 so that oscillation of the shaft 52 will rock the shafts 43 and 45 in opposite directions, and actuate the clutches to disconnect one reel and connect the other to the motor driven train.

The primary power for the moving of the shaft 52 on its axis is obtained from the motor. The sprocket wheel 23 on the motor driven shaft 20 drives the chain 53 which in turn drives a shaft 54 carried in a bracket 55 supported on the under side of the plate 15. The shaft 54 is provided with a bevel pinion 56 meshing with a bevel gear 57 mounted on a vertical shaft 58, which is supported in bearings in the frame 55, and on the lower side of the plate 15. This shaft carries a cam 59 which is utilized to apply the power at the proper time to the vertical shaft 52. The gears in the drive train for the cam shaft are such that the shaft rotates at a comparatively slow speed say one hundred revolutions per minute.

It will thus be seen that the cam 59 revolves a number of times during the exhibition of

the reel of film, and that it may be utilized at any desired time to apply power through a follower brought into the range of action of the cam. In order that such followers may be introduced or brought into a proper position to operate with cam 59, an auxiliary mechanism is provided which may be operated only when it is desired to reverse the direction of the movement of the film. A suitable mechanism is shown in the drawings.

A gear 60 is drivingly connected with the lower reel shaft 14. This gear drives a larger gear 61 mounted on a shaft 62 which is supported in the plate 12 by a bracket 63 carried on the plate 15. The shaft 62 is provided with a worm 64 which drives a worm wheel 65 mounted on a vertical shaft 66. This shaft 66 is carried in a bearing 67 mounted on the plate 15 and in a bracket 68 which may form a part of the frame 55. The lower end of the shaft 66 is provided with a worm 69 which drives a worm wheel 70 mounted on a horizontal shaft 71. This shaft is mounted in bearings 72 and 73, carried by the bracket 55 or otherwise supported from the plate 15. The gear train for driving this shaft 71 is such that the shaft is never turned through a complete revolution during the exhibiting of the longest film. The shaft 71 is provided with a fixed cam 74 and with an adjustable cam 75. These cams may be adjustable angularly in accordance with the length of the film to be reversed.

These cams are arranged to actuate an oscillatory lever which operates other elements to interpose them in the path of the cam 59, so that they are actuated thereby. As here shown a three armed lever 76 is pivotally mounted on a bracket 77. One arm 78 of this lever is provided with a pin 79, which is in a position to be engaged by the cam 75 so as to swing the lever in a clock-wise direction. The arm 80 of this lever is provided with a pin 81 which is engageable with the cam 76 to swing the arm in a counterclockwise direction. In order that the lever 75 may have a quick positive movement, the end 82 of the lever is arranged to operate a bell crank member 83, which is under the control of a biased spring 84. When either of the cams 74 or 75 engage the corresponding pin, the lever will be rocked far enough to cause the spring 84 to pass over the center or pivot of the bell crank. The spring will then throw the lever to the extreme limit of its movement.

The arm 80 of the lever 76, is provided with a lateral projection 85 which embraces a sector 86. This sector is here shown as being part of an arm 87. As here shown, this arm is carried by a collar 88, which is swingingly mounted on a horizontal pin 89, carried by the vertical shaft 52. The collar is cut away as indicated in dotted lines so that the collar and arm may pivot about the pin 89, and so that the shaft 52 and arm 87 must swing together

about a vertical axis. The arm 87 may be swung about the pin 89 as a center, and its position is under the control of the three armed lever 76, which is in turn controlled by the cams 74 and 75.

Above the collar 88, a second collar 90 is similarly mounted on a pin 91 so that it can be swung about on a horizontal axis and turn with the shaft 52. This collar carries an arm 92, one end 92' of which is loosely connected with the sector 86 so that both arms 92 and 87 may be moved up and down by the lever 76. The free ends 93 and 94 of the levers 87 and 92 may thus be raised and lowered according to the position of the swinging lever 76. When these levers are in the position shown in Fig. 2, the cam 59 will engage with the end 94 of lever 92 and will swing this lever to the left as indicated in Fig. 3 thereby turning the shaft 52 on its axis.

In order that this shaft 52 may complete its movement suddenly, and actuate the clutches connected to it in the same manner, a suitable snap mechanism is provided. It is shown in the drawings as consisting in an arm 95 carried on the upper end of shaft 52, see Figs. 1 and 4, and having pin and slot connections with a swinging link 96 pivotally supported at 97 on a fixed support and connected at the free end 98 with a coil spring 99 anchored at 100. The arrangement is such that the cam 59 will engage the end of the interposed arm 87 or 92 and will move the shaft 52 angularly thereby tensioning the spring 99. When this angular movement is sufficient to cause the spring 99 to pass over the center 97, the spring will contract, and cause the shaft 52 to move suddenly. This movement is transmitted through the links 47 and 49 to the shafts 43 and 45 respectively and the corresponding yokes 42 and 44 so that one clutch is disconnected and the other clutch connected.

When the lever 76 is in the other position it will throw the follower 94 out of the range of action of the cam 59 and will bring the follower 93 in position to be actuated by the cam. This will swing the shaft 52 in the other direction and the snap mechanism will shift the clutches in the opposite manner.

In order that a counter or register may be operated to indicate the number of times which the film mechanism has been actuated, the machine is preferably provided with such mechanism which is preferably carried underneath the table 15 so as to be inaccessible to the user. An arm 101 is attached to the lower end of shaft 52 and this arm is connected with a link 102 which engages with an actuating arm 103 of a register counter 104. This counter may be conveniently mounted on a platform 105 supported on the under side of the plate 15. The top of the counter may be carried in a hole 106 in this plate so that the reading may be readily observed.

In order to prevent tampering with the counter mechanism and with the more intricate parts of the reversing mechanism, the machine is preferably inclosed as indicated at 107. A door 108 is provided with a lock 109 so that the door can be locked if desired. This door may be placed convenient to the counter to facilitate resetting it.

By providing the machine with a counter, it is, of course, possible for the owner to ascertain the use to which the machine is put. The charge for its use may then be based on the time the machine is rented and the number of times the film is exhibited. It also enables one to keep an account of the number of times a film is used.

I claim:

1. In combination, a pair of film winding and rewinding reels, a support therefor, a motor, a pair of shafts drivingly connected with the motor, a pair of clutches each adapted to connect one shaft with the corresponding reel, an oscillating member for actuating the clutches so that they are alternately connected to the corresponding shaft, a table on which the support is mounted, the oscillating member projecting below the table, a counter having a control arm carried underneath the table, and a link connecting said control arm with said oscillating member whereby the oscillation of said oscillating member in one direction when the reels will be rotated to rewind the film will actuate the control arm to operate said counter and the oscillation of the oscillating member in the opposite direction when the reels will be rotated to wind up the film will return the control arm to initial position.

2. In combination, a table, a support extending upwardly from said table, a pair of reel shafts mounted in said support, a film supply reel mounted on one of said shafts and a film receiving reel mounted on the other of said shafts, a motor mounted on said table, a pair of driving shafts mounted on said support and drivingly connected with the motor, a pair of clutches each adapted to connect with the corresponding reel shaft, means for connecting said clutches with one another, an oscillating member for actuating the clutches alternately to connect one of said driving shafts with the corresponding reel shaft whereby the reel shafts will be driven either to cause the film to be wound up on said receiving reel or on said supply reel, a housing formed with said table into which the oscillating member projects, a counter having an oscillating control arm supported in said housing, a window in said housing registering with the reading face of said counter, and a link connecting the control arm of said counter with said oscillating member whereby the oscillation of said oscillating member in one direction when the reels will be rotated to wind up the film on the supply reel will actu-

ate the control arm to operate said counter and the oscillation of the oscillating member in the opposite direction when the reels will be rotated to wind up the film on the receiving reel will return the control arm to initial position.

3. In combination, a table, a support extending upwardly from said table, a pair of reel shafts mounted in said support, a supply reel mounted on one of said shafts and a receiving reel mounted on the other of said shafts, a motor mounted on said table, a pair of driving shafts mounted on said support and drivingly connected with the motor, a pair of clutches each adapted to connect with the corresponding reel shaft, means for connecting said clutches with one another, an oscillating member for actuating the clutches alternately to connect one of said driving shafts with the corresponding reel shaft whereby the reel shafts will be driven either to feed the film from the supply reel to the receiving reel or from the receiving reel to the supply reel, a counter having an oscillating control arm supported below said table, and a link connecting the control arm of said counter with said oscillating member whereby the oscillation of said oscillating member in one direction when the film will be fed from the receiving reel to the supply reel will actuate the control arm to operate said counter and the oscillation of the oscillating member in the opposite direction when the film will be fed from the supply reel to the receiving reel will return the control arm to initial position.

4. In combination, a housing, a support outside of said housing, a pair of reel shafts mounted on said support, a film supply reel mounted on one of said shafts, a film receiving reel mounted on the other of said shafts,

driving means for drivingly connecting said reels either to transfer the film from said supply reel to said receiving reel or from said receiving reel to said supply reel, reversing means operatively connected to said driving means for reversing the direction of travel of said film, said reversing means being located in said housing, a counter in said housing having a control arm, a link in said housing connecting the control arm of said counter with said reversing means whereby the actuation of said reversing means will actuate said counter, and means for locking said housing to prevent tampering with said counter.

5. In combination, a housing, a support outside of said housing, a pair of reel shafts mounted on said support, a film supply reel mounted on one of said shafts, a film receiving reel mounted on the other of said shafts, driving means, clutches for drivingly connecting said reels either to transfer the film from said supply reel to said receiving reel or from said receiving reel to said supply reel, reversing means operatively connected to said driving means for reversing the direction of travel of said film, said reversing means being located in said housing, an oscillating member extending into said housing to connect said reversing means with said reel shafts, a counter in said housing having a control arm, a window in said housing registrable with the readable face of said counter, a link in said housing to connect the control arm of said counter with said oscillating member, a door to afford access to the interior of said housing, and a lock for locking said door to prevent tampering with said counter.

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