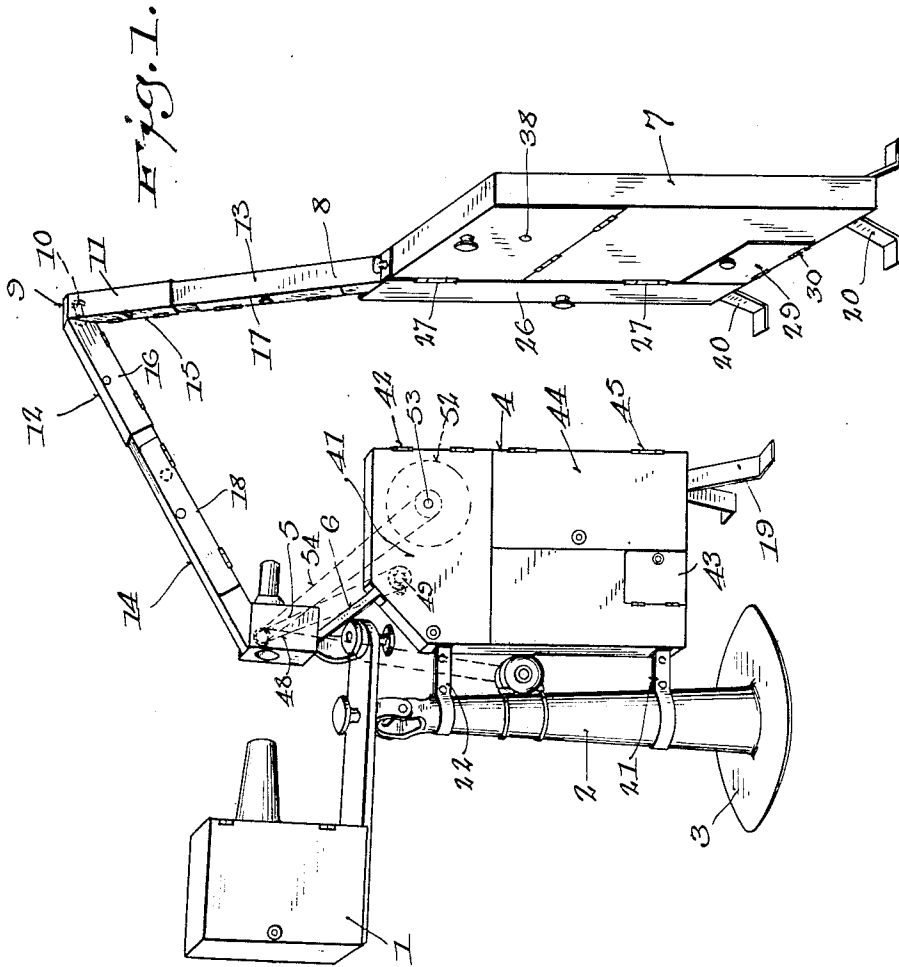


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MOVING PICTURE APPARATUS.
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1,399,208.

Patented Dec. 6, 1921.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

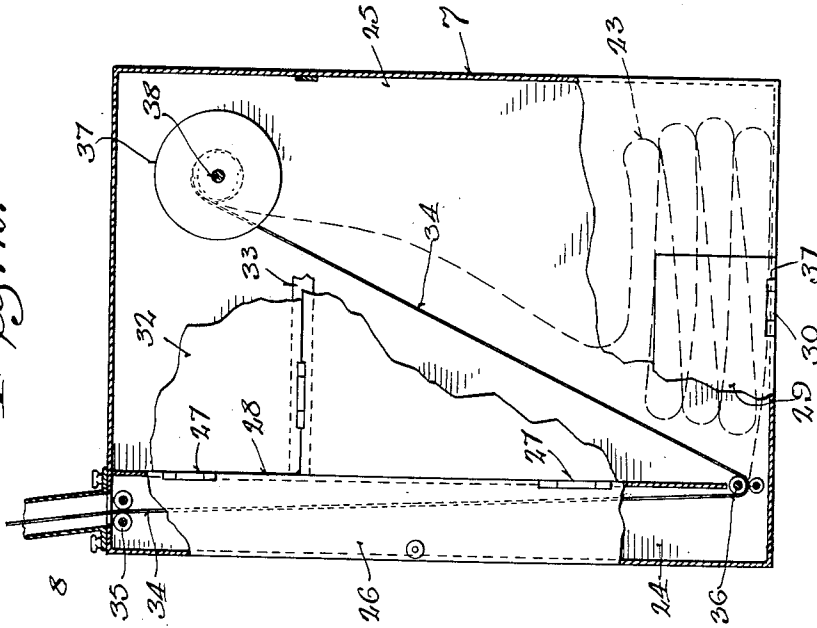
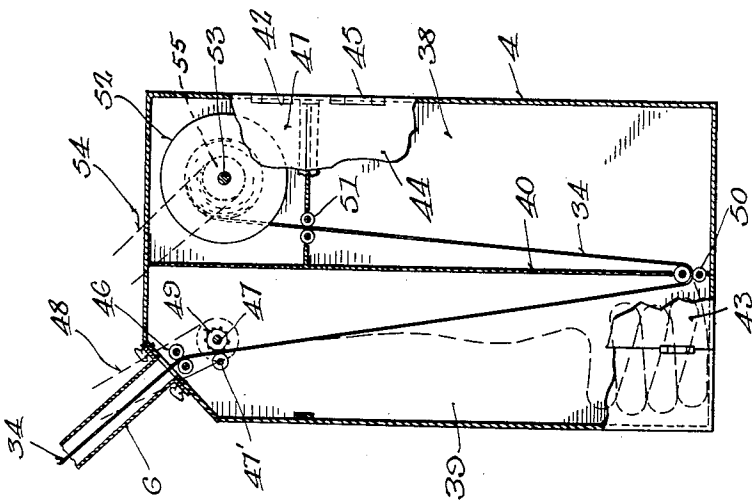


Fig. 3.



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UNITED STATES PATENT OFFICE.

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MOVING-PICTURE APPARATUS.

1,399,208.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK H. GRABHORN, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Moving-Picture Apparatus, of which the following is a specification.

This invention relates to moving picture apparatus.

10 One of the objects of this invention is to make a moving picture apparatus, either a camera or projecting apparatus, which may be operated continuously, without interruptions due to the changing of either the delivery or receiving film reels.

15 Other objects of this invention are to provide a device which may be used to continuously project pictures, without interruptions due to changing of the film reels either at the receiving or delivery end of the apparatus; to provide a device in which the film is protected from fire at all times; in which means are provided for forming slack in the film, whereby sufficient film is allowed for the changing of the film rolls without stopping the machine; and to provide an apparatus which may be attached to an ordinary projecting machine.

20 Further objects are to provide film reel housings, and film housings for both the supply and delivery end of the apparatus; to provide a connecting telescopic passage-way for the film; to provide compartments, which compartments will be fire proof, and will protect the film; and to provide an apparatus through which the film may be readily and conveniently threaded when the machine is initially started.

In the drawings:—

40 Figure 1 is a perspective view showing a projecting apparatus embodying this invention.

Fig. 2 is a sectional view of the delivery apparatus, and

45 Fig. 3 is a sectional view of the receiving apparatus.

Fig. 1 shows the general arrangement of the entire apparatus. A projector 1 is mounted upon a standard 2, and supported from a base 3. To this standard is clamped the receiving apparatus 4, which is positioned beneath the head 5 of the projector, and is connected therewith by means of a chute 6.

55 The delivery apparatus 7 is positioned at right angles to a plane through the project-

ing apparatus, and the receiving apparatus 4, and to one side thereof,

A telescopic chute 8 connects the delivery apparatus 7, and the projecting head 5. 60 This chute has an angular bend 9 formed therein, and a roller 10 positioned at such angular bend. The upper portions 11 and 12 slide over or telescope the lower portions 13 and 14 so that this chute may be arranged 65 in a room of any desired height. The portions 11, 12, 13 and 14 are provided with doors 15, 16, 17 and 18, respectively, which are hingedly mounted upon the chutes, and may be opened, suitable latches being provided to lock the doors in closed position. 70 When these doors are opened the film may be readily threaded through the chute.

The receiving and delivery apparatus 4 and 7 are conveniently mounted upon legs 75 or stands 19 and 20, which may be secured upon the floor. The receiving apparatus 4 may be further secured to the standard 2 by means of clamping members 21 and 22.

Fig. 2 shows a sectional view of the delivery apparatus. This apparatus comprises a fire proof box of slightly greater width than the film, so that the film will not tend to twist in the box, but may be caused to fold, under certain conditions, back and forth as indicated in dotted lines at 23. This fire proof casing is divided into two main compartments: a vertical compartment 24, which is in communication with the chute 8, and extends from the upper portion of the casing to the lower portion, and a main-compartment 25 which also extends the full height of the casing. The compartment 24 is provided with a suitable door 26 extending the full length thereof, and hinged at 27 to the partition 28. This door is shown in Figs. 1 and 2; in the latter figure, however, such door is shown partly broken away. The compartment 25 is provided with a small door 29 hingedly mounted at 30 to the lower portion 31 of the compartment, and is further provided with an upper door 32 hingedly mounted upon a transverse brace 33, extending across the compartment 25, but not passing into such compartment. These 105 doors are secured by means of appropriate latches, so that they may be locked in closed position.

At the point where the film 34 passes from the chute 8 into the compartment 24, rollers 110 35 are provided which prevent the passage of fire, either to or from the compartments,

At the point where the film 34 passes from the compartment 25 to the compartment 24, corresponding rolls 36 are provided.

The delivery reel 37 is mounted upon a
5 suitable support 38 in the upper portion of
the compartment 25, and may be readily
placed therein by opening the door 32. The
film is slightly unrolled and hangs down in
the compartment 25. The door 32 is now
10 closed, and the door 29 opened. The opera-
tor then reaches his hand upwardly into the
compartment 25, and catches the end of the
film, thereafter threading such end between
the rollers 36 into the compartment 24. The
15 door 29 is now closed, and the door 26
opened. The operator now catches the film,
and draws it upwardly through the com-
partment, finally passing between the roll-
ers 25 and into the chute 8. Thereafter the
20 film is threaded through the chute, access be-
ing provided by means of the doors previ-
ously described. This completes the thread-
ing of the film through the compartment or
delivery apparatus 7 and the chute 8.

From the chute 8 the film passes through
the projector head 5, through the chute 6
and into the receiving apparatus 4. This
receiving apparatus 4 comprises a fire proof
sheet iron casing which is divided into two
30 vertical compartments 38 and 39, by means
of the partition 40. Access to the compart-
ments 38 and 39 may be had at their upper
ends by means of a door 41 hingedly mount-
ed at 42 to the casing. Access to the lower
35 portion of the compartment 39 is had by
means of the door 43. Access to the lower
portion of the compartment 38 is had by
means of the door 44, which door is suitably
hinged at 45 to the casing.

The film 34 is passed from the chute 6
40 between rollers 46, and into the compart-
ment 39. From the rollers 46 the film passes
between the rollers 47 and 47', the roller 47
being a sprocket driving roller, and receiv-
45 ing its motion through the medium of a belt
48 driven from the projecting apparatus,
and the pulley 49 mounted upon the shaft of
the roller 47. Thereafter the film passes
downwardly to the bottom of the compart-
50 ment 39 between rollers 50, and into the
compartment 38. From this point the film
passes upwardly between guide rollers 51
and to the receiving reel 52. This reel 52 is
mounted upon a shaft 53 which is driven
55 from the projecting apparatus by means of
the belt 54, and a pulley 55, such pulley
being mounted upon the shaft 53.

By providing the compartments 25 and
39 in the manner, and associated as shown,
60 suitable space or room for the slack in the
film, formed at certain times in the opera-
tion of the device, is provided. The opera-
tion of the delivery and receiving apparatus
will now be described in detail.

65 The receiving apparatus guides the film

in the manner shown in full lines under
normal conditions. However, when the end
of the film is approached, the operator opens
the door 32, gives the reel 37 a spin, thereby
unwinding a substantial length of film, and 70
causing it to fold back and forth in the
compartment 25, as indicated at dotted lines
at 23. Thereafter the old reel is removed,
a new reel inserted and the end of the old
film jointed to the beginning of the new 71
film, such operation requiring a very short
time, and sufficient slack being provided in
the compartment 25 so that the film may be
continuously withdrawn from the compart-
ment 25 without interruption while this 80
change is being made.

The receiving apparatus is designed to
provide a reservoir or compartment 39 for
the slack film which is formed when the
operation of the receiving reel 52 is stopped. 85
When the reel 52 is filled and the end of the
old film arrives at such reel, its operation is
stopped temporarily. The feed roll 47 con-
tinues to operate, and the incoming film is
projected into compartment 39 folding back 90
and forth in such compartment, as shown in
dotted lines. While the slack in the film is
being stored in compartment 39 a new reel is
positioned upon the shaft 53, and the end
of the film started upon such new reel. The 95
reel is now caused to operate, and the slack
is withdrawn from the compartment 39, the
film finally arriving at the full line posi-
tion in Fig. 3.

It will thus be seen that a moving picture 100
apparatus has been provided in which there
will be no interruptions of the picture or
operation of the machine while either a new
reel is being installed, or an old reel re-
moved. 105

It will also be seen that a very simple and
efficient device has been provided for ac-
complishing these objects, and that such
device may be readily operated, and does
not require unusual skill in its operation. 110

It will further be seen that the film is al-
ways protected from creasing or knotting,
and that it is further always protected from
fire by the arrangements shown.

I claim:

115 1. A moving picture machine comprising
a projecting apparatus, a film delivery ap-
paratus, and a film receiving apparatus, said
delivery and receiving apparatus having
separated compartments through which the 120
film passes and arranged to allow the tem-
porary accumulation of a supply of film
upon either side of the projecting appa-
ratus.

2. A film delivery apparatus, for a mo- 125
tion picture machine, comprising a casing
having a plurality of compartments; one of
said compartments having a reel receiving
device adjacent its upper end, and being
of substantial dimensions below said film 130

receiving device; means for allowing withdrawal of film from the bottom of said compartment; and means for providing access to said reel; whereby when the end of said film is approached the reel may be caused to deliver film into the lower portion of the compartment, in which the reel is located, and form slack therein thereby permitting the continuous removal of film by the motion picture machine while a new reel is being installed.

3. A moving picture machine comprising a projecting apparatus, and film delivery and film receiving means associated therewith, one of said means including a fire-proof receptacle, a film reel support therein, said receptacle having an aperture through which the film passes and having a space below said reel support to allow the temporary accumulation of film while a new reel is substituted for the old reel.

4. A moving picture machine comprising an optical apparatus and film delivery and film receiving means associated therewith, one of said means including a compartment,

a film reel support mounted therein, and a film guiding roller located below said reel support, said compartment having a space below said film reel support to allow the temporary accumulation of film and having an opening through which said film may pass.

5. A moving picture machine comprising an optical apparatus and film delivery and film receiving means associated therewith, each of said means including a compartment, a film reel support mounted therein and a film guiding roller located below said reel support, said compartment having a space below said film reel support to allow temporary accumulation of film, and a chute connecting said film delivery and said film receiving means.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANK H. GRABHORN.

Witnesses:

A. J. MCKERIHAN,
O. C. WEBER.