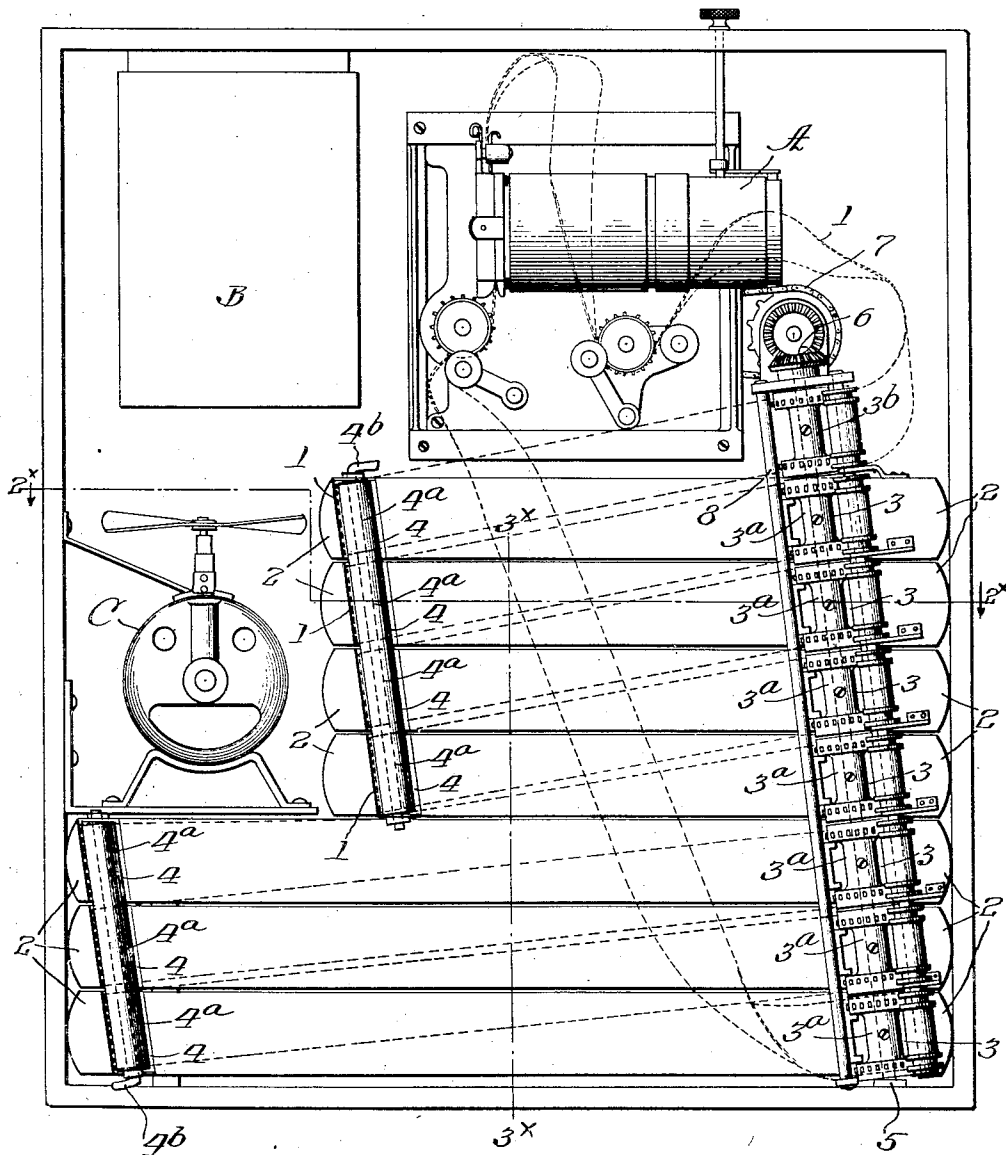


P. J. McCULLOUGH.
MOTION PICTURE MACHINE.
APPLICATION FILED AUG. 19, 1920.

1,399,504.

Patented Dec. 6, 1921.
2 SHEETS—SHEET 1.

Fig 1.



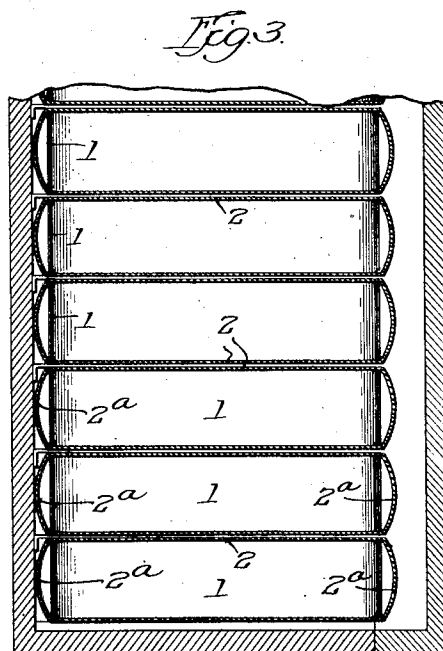
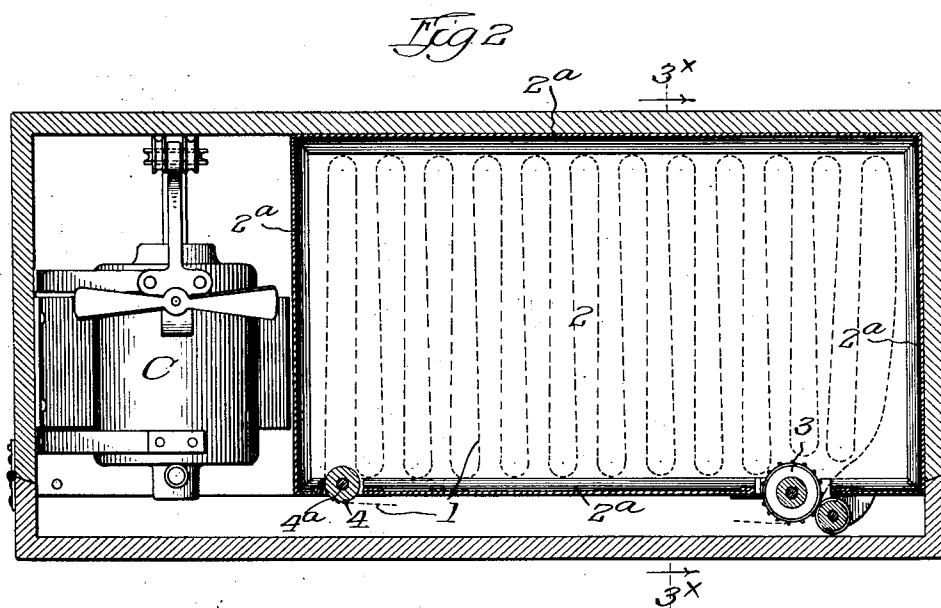
Witness:
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Inventor
Paul J. McCullough,
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P. J. McCULLOUGH.
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

PAUL J. McCULLOUGH, OF ST. LOUIS, MISSOURI, ASSIGNOR TO DE VILBISS ENDLESS FILM MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

MOTION-PICTURE MACHINE.

1,399,504.

Specification of Letters Patent.

Patented Dec. 6, 1921.

Application filed August 19, 1920. Serial No. 404,640.

To all whom it may concern:

Be it known that I, PAUL J. McCULLOUGH, a citizen of the United States, residing at St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Motion-Picture Machines, of which the following is a specification.

This invention relates to means for storing and feeding continuous photographic films, being particularly adapted in its preferred form for use in connection with endless film which is to be fed rapidly through a projector.

The object of the invention is to provide means which will store the film by folding it in a storage compartment and to arrange a plurality of such compartments in such relation that each will store a portion of the film and permit it to be fed successively through the several compartments while maintaining in each the quota of film which it is intended to store.

In the accompanying drawings—

Figure 1 shows in elevation a motion picture projecting machine with which a film storing device embodying the features of the present invention is combined.

Fig. 2 is a section on the line 2^x, 2^x of Fig. 1.

Fig. 3 is a section on the line 3^x, 3^x of Figs. 1 and 2.

A represents the projector, B the lamp box and C the motor of the motion picture projector of known construction.

1 represents a film which is to be supplied to the projector A and received from said projector and stored rapidly so long as the projector is in operation.

For storing the film 1, the present invention provides a series of compartments 2 into each of which a considerable length of the film may be accumulated by gathering the film in folds therein, these compartments being associated side by side in series (preferably vertical), and each compartment having a depth substantially equal to the width of the film to be stored, a width corresponding substantially to the length of loops or folds into which the film is to be gathered and a length determined by the number of folds to be accommodated or such as may be conveniently admitted in the cabinet or other space in which the compartments are to be arranged.

Each compartment has a receiving gate 3 and a delivery gate 4, preferably located near the respective ends of the compartment and in suitable position between these gates, preferably closely related to the receiving gate, is a feeding device 3^a which receives the film from the delivery gate of one compartment and delivers it to the receiving gate of the next compartment while positively advancing the film. At each delivery gate 4 is preferably arranged a roller 4^a over which the film travels. The gates are arranged in lines extending transversely across the compartments and are given an angular set which will present each gate in position normal to the line of feed from the delivery gate of one compartment to the receiving gate of the next. Beyond the series of film feeding devices 3^a at the receiving gates is a film feeding device 3^b which receives and draws the film from the delivery gate of the last compartment in the series and passes it on toward the projector. Preferably the rollers 4^a at the delivery gates will be mounted upon common spindles 4^b which are readily removable to release the rollers and enlarge the opening at the delivery gates for facilitating the introduction of the end of the film and turning it through the compartments in originally storing it. The film feeding devices 3^a and 3^b are mounted upon driven by a common shaft 5 which is rotated through bevel gearing 6 connected by a chain 7 with some suitable driven member of the machine. A drag bar 8 parallel to the axis of the line of feeding devices 3^a receives the film and assists in holding its perforations in mesh with teeth upon the feeding devices.

As shown more clearly in Fig. 3, those walls of the compartments 2 which are presented toward the face of the film are convexed or trough-shaped so that the film can only contact therewith at its edges and scratching of the face of the film is therefore avoided.

In using the device, an end of the film is passed in at the receiving gate of the first compartment and out at the delivery gate thereof, where the end is held while the machine is permitted to run, until it feeds into said first compartment the proportion of quota of the film which it is desired to store in one compartment and which gathers therein automatically in the form of folds

substantially as suggested in Fig. 2. From the delivery gate of the first compartment the film passes in a diagonal path, as suggested by dotted lines in Fig. 1, to the receiving gate of the second compartment and is threaded through the second compartment and held at the delivery gate thereof while the machine is operated, until an additional quota of film is fed through the first compartment and into the second compartment, to accumulate in the latter its quota of film. Similarly, the end of the film is threaded through each compartment and held at the delivery gate thereof until the accumulation of film occurs in the compartment and then passed on to the next. All the film fed by the feeding device at the receiving gate of the first compartment will pass through all of the compartments in series, being taken out of each only so fast as it enters, and each compartment will therefore contain at all times the proportion of film which it is intended to store. By this means many hundreds of feet of film may be stored in a comparatively compact space. The film is subdivided into groups of folds with the groups separated. Only those portions of the film which lie between the delivery gates, together with the leads or portions lying between the projector and the feeding means, are exposed, and these may be separately housed if desired.

I claim:

1. In a film feeding machine, a plurality of independent compartments, each adapted to receive and store a portion of a continuous film and each having gates through which it receives and discharges film; a discharging gate on one compartment being adapted to deliver to the receiving gate of the next compartment; means being provided for positively advancing the film from each compartment to the next.

2. In a film feeding machine, a plurality of independent compartments, each adapted to receive and store a portion of a continuous film and each having gates through which it receives and discharges film; a discharging gate on one compartment being adapted to deliver to the receiving gate of the next compartment, and means being provided for positively feeding film through said gates.

3. In a film feeding machine, a plurality of independent film compartments, each adapted to store a portion of a continuous film, and means for positively feeding the film, located in position to receive the film from one compartment and deliver it to another.

4. In a film feeding machine, a plurality of independent parallel compartments, each adapted to receive and store a portion of a continuous film and each having gates through which it receives and discharges

film; a discharging gate on one compartment being adapted to deliver to the receiving gate of the next compartment, and each compartment having at its receiving gate means for positively advancing the film.

5. In a film feeding machine, a plurality of independent compartments, each adapted to receive and store a portion of a continuous film and each having gates through which it receives and discharges film; a discharging gate on one compartment being adapted to deliver to the receiving gate of the next compartment, and each compartment having at its receiving gate means for positively advancing the film; the film advancing means at the receiving gate of one compartment being presented to receive the film in a normally disposed path leading from the delivery gate of an antecedent compartment.

6. In a film feeding machine, a plurality of independent compartments, each compartment being adapted to receive and store a portion of a continuous film, said compartments having gates through which they receive and discharge the film, the delivery gate of one compartment being at the end remote from the receiving gate of the next compartment and said film passing diagonally from a delivery gate of one compartment to the receiving gate of the next.

7. In a film feeding machine, a plurality of independent compartments related in series, each adapted to receive and store a portion of the continuous film and each having gates through which it receives and discharges the film, with the receiving gate of one compartment positioned to receive film from the delivery gate of the antecedent compartment; the receiving gate of the first compartment having means for receiving and directing film from an extraneous source.

8. In a film feeding machine, a plurality of independent compartments, each adapted to receive and store a portion of the continuous film and each having gates through which it receives and discharges film; the corresponding gates of the respective compartments being provided with means for positively advancing the film; means being provided for receiving and advancing film from the delivery gate of the last compartment.

9. In a film feeding machine, a compartment adapted to receive and store a film in folds; said compartment having its walls which are presented toward the face of the film concaved to prevent contact with such face.

10. In a film feeding device, a compartment adapted to receive and store a film in folds; said compartment having a depth substantially equal to that of the film, and having its walls which are presented toward the face of the film concaved to prevent contact with said face.

11. In a film feeding device, a compartment adapted to receive and store a film in folds, having a depth substantially equal to that of the film, with the walls presented toward the face of the film concaved to prevent contact of said face therewith, and means for feeding film into said compartment in position to present the face of the film toward said concave walls.

12. In a motion picture machine, the combination of a projector and means for receiving and storing film from said projector and returning it thereto, consisting of a series of independent compartments, and having means for positively feeding film from the projector into the first compartment and from each compartment into the succeeding compartment, and from the last compartment back to the projector.

13. In a motion picture machine, the combination of a projector and means for receiving and storing film from said projector and returning it thereto, consisting of a series of independent compartments and having means for positively feeding film from the projector into the first compartment and into each of the succeeding compartments, and from the last compartment back to the projector; said compartments having gates at the respective ends thereof through which the film enters and leaves.

14. In a motion picture machine, the combination of a projector and means for receiving and storing film from said projector

and returning it thereto, consisting of a series of independent compartments and having means for feeding film from the projector into the first compartment and from said first compartment through each of the succeeding compartments, and from the last compartment back to the projector; said compartments having gates at the respective ends thereof through which the film enters and leaves, and means being provided at the receiving gate of each compartment positively to advance the film toward the same.

15. In a motion picture machine, the combination of a projector and means for receiving and storing film from said projector and returning it thereto, consisting of a series of independent compartments, and having means for feeding film from the projector into the first compartment and from said first compartment through each of the succeeding compartments, and from the last compartment back to the projector; said compartments having gates at the respective ends thereof through which the film enters and leaves, and means being provided at the receiving gate of each compartment positively to advance the film toward the same, and the film feeding means being provided in position to receive the film from the delivery gate of the last compartment and advance it toward the projector.

Signed at St. Louis, Missouri, this 7th day of August, 1920.

PAUL J. McCULLOUGH.