No. 713,876. Patented Nov. 18, 1902.

G. F. HATTON.

KINEMATOGRAPHIC APPARATUS.

(Application filed Aug. 11, 1902.)

(No Model.) 2 Sheets—Sheet 1.

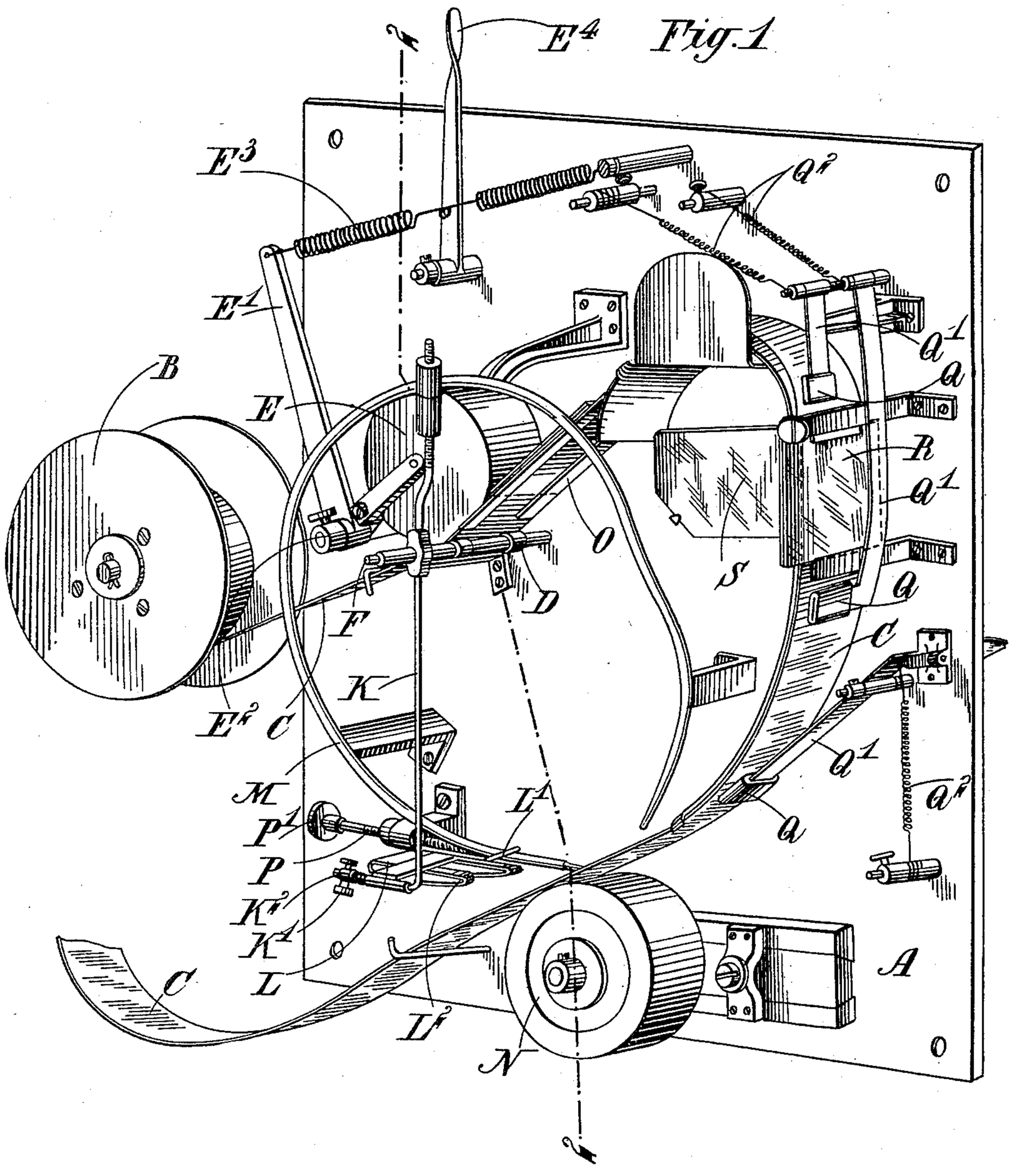

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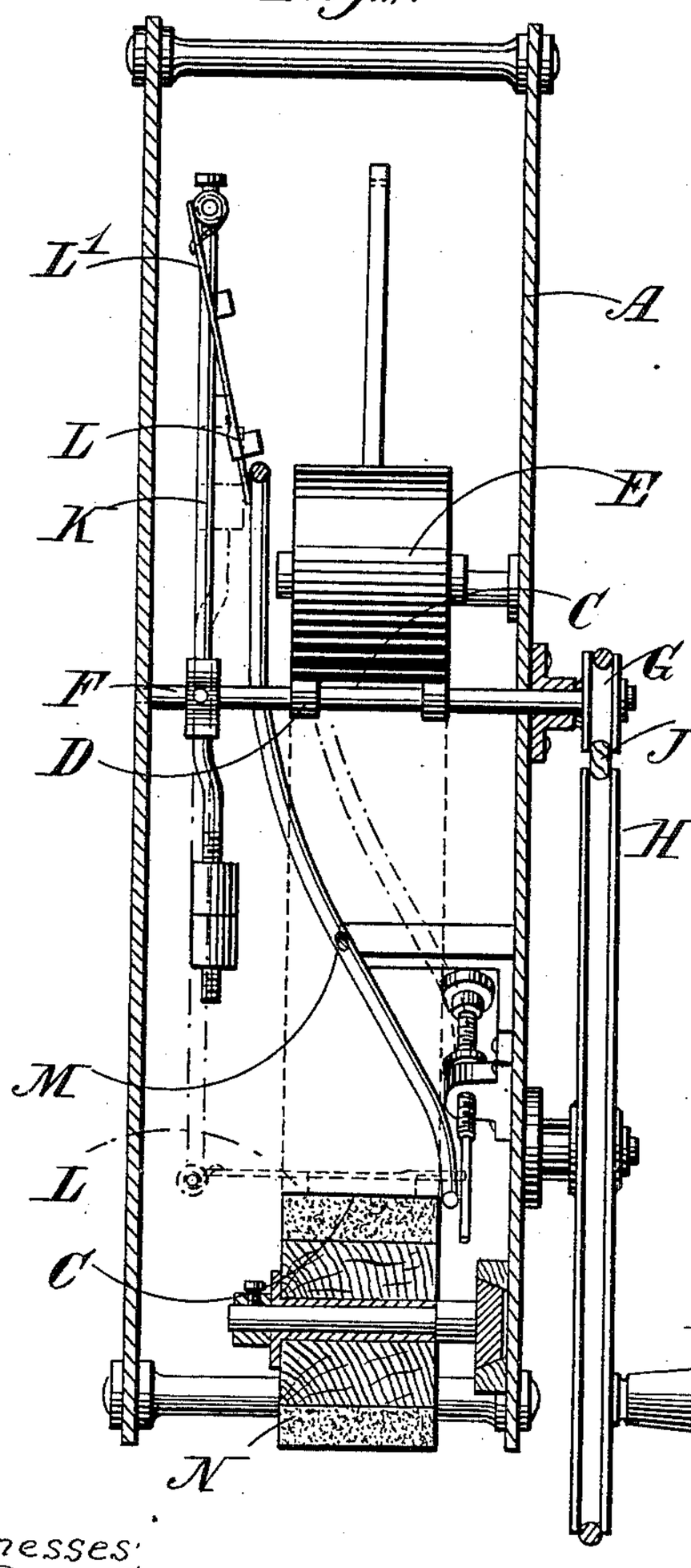
Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE FREDERIC HATTON, OF ST. LEONARDS-ON-SEA, ENGLAND.

KINEMATOGRAPHIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 713,876, dated November 18, 1902.

Application filed August 11, 1902. Serial No. 119,331. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FREDERIC HATTON, a subject of the King of England, residing at St. Leonards-on-Sea, Sussex, England, have invented certain new and useful Improvements in or Relating to Kinematographic Apparatus, of which the following is a specification.

The present invention relates to kinematographic apparatus, the object being to provide a machine which will successively change the sections of a kinematographic film in a rapid and simple manner, the mechanism being entirely driven from one shaft without employing spur or other gear. The apparatus can be adapted either for taking or exhibiting kinematographic pictures.

In the accompanying drawings, Figure 1 is a perspective view of the film-operating mechanism according to this invention, part of the casing being removed; and Fig. 2 is a transverse section of the apparatus on the line 2 2 of Fig. 1.

Like letters indicate like parts throughout the drawings.

Referring to the drawings, the casing A carries a film-spool B, from which passes a series of pictures, transparencies, or the like or a photographic film C, adapted to receive a series of pictures. The film C is fed into the apparatus at uniform speed by a constantly-rotating roller D, against which the film is pressed by a roller E. The roller D is formed on the axle F, and its circumference is arranged to be equal to the width of one picture-section, and thus one picture is passed through at each revolution of the axle F, which is driven by a pulley G through a belt J, passing around a driving-pulley H, having a handle H′, or the shaft F may be driven in any other convenient manner.

The pressure-roller E is carried by a bell-crank lever E′, pivoted at E^2, and is normally held against the film C by means of a spring E^3, and in order to regulate the pressure of the roller E, and consequently the rate of feed of the film C, the tension of the spring E^3 may be slightly altered by means of a pivoted lever E^4, attached thereto.

The necessary intermittent movement of the film at the exhibiting or exposing point is effected by intermittently drawing or jerking the strip or film a distance corresponding to the width of a picture-section. The intermittent movement or jerk is accomplished by a constantly-rotating arm K, carrying a gripper L, which is so guided that during a portion of its path it is in contact or engagement with the film C and imparts to the latter the necessary movement. The gripper L engages the film at both edges and is provided with frictional gripping material L^2, which engages the film.

The guide comprises a rail M, suspended from the casing and arranged to lead the gripper L into and out of contact with the film at the necessary positions. The gripper L is pivoted to the arm K and carries a finger L′, which is kept pressing against the guide-rail M by a spring K′, having an adjusting-screw K^2. The film having been guided past the exhibiting-point by suitable means passes over a friction-roller N, and the guide-rail M terminates a short distance on either side of the roller N, and the gripper L therefore leaves the rail and presses the film C against the roller N and pulls the film through the guides to an amount approximately equal to the width of one picture-section. The guides for the film consist of metal plates O, between which the film passes from the roller and by which it is brought into proximity with the roller N. The side of the guide-plates which is in contact with the emulsion on the film is cut away in the center in order that the metal may not damage the pictures. At one end of the guide-rail a screwed rod P is provided having an adjusting-handle P′, by means of which the distance during which the gripper is in contact with the film can be adjusted. Normally the film is just out of contact with the roller N, so that the roller may continuously rotate, owing to the impulses imparted to it by the gripper L, and that the film may only be in contact with the roller while a jerk is taking place.

The film is more firmly held between the feed-rollers D E than it is by the gripper L, so that if the gripper be set to feed rather more than one picture the film will always be drawn tight, and the gripper will then slip over the film slightly. This slip can be made as small as desired.

In order to keep the film in proper relation

to its guides, pads Q, carried on levers Q', may be kept pressing against the film by springs Q^2 or the like.

A lens is disposed in front of the exhibiting-point R, and in the case of a kinematographic camera a suitable shutter is also provided. When the machine is employed as a lantern, the light may conveniently be reflected through the exhibiting-film by a mirror S, arranged at a convenient angle to the film.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a kinematographic apparatus the combination of a film having a series of pictures, a constantly-rotating feed-roller, a radial arm on the same axle as the roller and carrying a gripper which intermittently engages the film.

2. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, a radial arm on the same axle as the roller and carrying a gripper which intermittently engages the film.

3. In a kinematographic apparatus the combination of a film having a series of pictures, a feed-roller, a radial arm on the same axle as the feed-roller, a movable gripper on the end of the arm and means for intermittently guiding the gripper into contact with the film.

4. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, a radial arm on the same axle as the feed-roller, a movable gripper on the end of the arm and means for intermittently guiding the gripper into contact with the film.

5. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, a radial arm on the same axle as the feed-roller, a movable gripper on the end of the arm and means for guiding the gripper into contact with the film for a distance rather more than the width of one picture-section.

6. In a kinematographic apparatus the combination of a film having a series of pictures, a feed-roller, means for keeping the film in contact with the roller, a radial arm on the same axle as the feed-roller, a movable gripper on the end of the arm and means for guiding the gripper into contact with the film for a certain distance.

7. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, means for keeping the film in contact with the roller, a radial arm on the same axle as the feed-roller, a gripper pivoted to the end of the arm, means for guiding the gripper into contact with the film for a certain distance and a surface against which the gripper presses the film.

8. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, means for keeping the film in contact with the roller, means for varying the pressure on the film, a radial arm on the same axle as the feeding-roller, a gripper pivoted on the end of the arm, means for guiding the gripper into contact with the film for a certain distance and a surface against which the gripper presses the film.

9. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, means for keeping the film in contact with the roller, means for varying the pressure on the film, a radial arm on the same axle as the feed-roller, a gripper pivoted on the end of the arm, adjustable means for pressing the gripper out of alinement with the arm, means for guiding the gripper into contact with the film for a certain distance and a surface against which the gripper presses the film.

10. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, means for keeping the film in contact with the roller, means for varying the pressure on the film, a radial arm on the same axle as the feed-roller, a gripper pivoted on the end of the arm, adjustable means for pressing the gripper out of alinement with the arm, means for guiding the gripper into contact with the film for a certain distance, means for adjusting that distance and a surface against which the gripper presses the film.

11. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, means for keeping the film in contact with the roller, means for varying the pressure on the film, a radial arm on the same axle as the feed-roller, a gripper pivoted on the end of the arm, adjustable means for pressing the gripper out of alinement with the arm, means for guiding the gripper into contact with the film for a certain distance, means for adjusting that distance, a surface against which the gripper presses the film and means for guiding the film through the apparatus from the feed-roller to that surface.

12. In a kinematographic apparatus the combination of a film having a series of pictures, a roller which feeds one picture at each revolution, means for keeping the film in contact with the roller, means for varying the pressure on the film, a radial arm on the same axle as the feed-roller, a gripper pivoted on the end of the arm, adjustable means for pressing the gripper out of alinement with the arm, means for guiding the gripper into contact with the film for a certain distance, means for adjusting that distance, a surface against which the gripper presses the film, means for guiding the film through the apparatus from the feed-roller to that surface and means for driving the axle of the feed-roller.

13. In a kinematographic apparatus the

combination of a film having a series of pictures, a roller which feeds one picture at each revolution, means for keeping the film in contact with the roller, means for varying the pressure on the film, a radial arm on the same axle as the feed-roller, a gripper pivoted on the end of the arm, adjustable means for pressing the gripper out of alinement with the arm, means for guiding the gripper into contact with the film for a certain distance, means for adjusting that distance, a surface against which the gripper presses the film, means for guiding the film through the apparatus from the feed-roller to that surface, means for driving the axle of the feed-roller, and means for supporting the unwound film in proper relation to the feed-roller.

14. In a kinematographic apparatus the combination of a casing, an axle bearing therein, a feeding-roller on the axle whose circumference is equal to one picture-section, a kinematographic film passing over the roller a radial arm mounted on the same axle as the feed-roller and a gripper on the arm which intermittently engages the film.

15. In a kinematographic apparatus the combination of a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a kinematographic film passing over the roller, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm and a rail supported in the casing to guide the gripper into contact with the film at certain positions.

16. In a kinematographic apparatus the combination of a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller, a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm and a rail supported in the casing to guide the gripper into contact with the film at certain positions.

17. In a kinematographic apparatus the combination of a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller, a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm, a rail supported in the casing to guide the gripper into contact with the film at certain positions and a roller against which the film is pressed by the gripper.

18. In a kinematographic apparatus the combination of a casing, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring attached to the bell-crank lever to maintain the pressure of the roller, a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm, a rail supported in the casing to guide the gripper into contact with the film at certain positions and a roller against which the film is pressed by the gripper.

19. In a kinematographic apparatus the combination of a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring attached to the bell-crank lever to maintain the pressure of the roller, a pivoted hand-lever attached to the spring by which its tension may be altered, a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm, a rail supported in the casing to guide the gripper into contact with the film at certain positions and a roller against which the film is pressed by the gripper.

20. In a kinematographic apparatus the combination of a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring attached to the bell-crank lever to maintain the pressure of the roller, a pivoted hand-lever attached to the spring by which its tension may be altered, a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm, a spring on the arm engaging the gripper, an adjusting-screw for the spring on the arm, a rail supported in the casing to guide the gripper into contact with the film at certain positions and a roller against which the film is pressed by the gripper.

21. In a kinematographic apparatus the combination with a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring attached to the bell-crank lever to maintain the pressure of the roller, a pivoted hand-lever attached to the spring by which its tension may be altered, a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm, a spring on the arm engaging the gripper, an adjusting-screw for the spring on the arm, friction-surfaces on the gripper, a rail supported in the casing to guide the gripper into contact with the film at certain positions and a roller against which the film is pressed by the gripper.

22. In a kinematographic apparatus the combination with a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring

attached to the bell-crank lever to maintain the pressure of the roller, a pivoted hand-lever attached to the spring by which its tension may be altered a kinematographic film passing between the rollers, a radial arm mounted on the axle of feed-roller a gripper pivoted on the end of the arm, a spring on the arm engaging the gripper, an adjusting-screw for the spring on the arm, friction-surfaces on the gripper, a rail supported in the casing to guide the gripper into contact with the film at certain positions, a roller against which the film is pressed by the gripper and an adjustable rod forming a continuation of the rail.

23. In a kinematographic apparatus the combination with a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring attached to the bell-crank lever to maintain the pressure of the roller, a pivoted hand-lever attached to the spring by which its tension may be altered a kinematographic film passing between the rollers, a radial arm mounted on the axle of feed-roller, a gripper pivoted on the end of the arm, a spring on the arm engaging the gripper, an adjusting-screw for the spring on the arm, friction-surfaces on the gripper, a rail supported in the casing to guide the gripper into contact with the film at certain positions, a rail against which the film is pressed by the gripper, an adjustable rod forming a continuation of the rail and metal guides over which the film passes cut away at the point where the emulsion carries a picture.

24. In a kinematographic apparatus the combination with a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring attached to the bell-crank lever to maintain the pressure of the roller, a pivoted hand-lever attached to the spring by which its tension may be altered a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm, a spring on the arm engaging the gripper, an adjusting-screw for the spring on the arm, friction-surfaces on the gripper, a rail supported in the casing to guide the gripper into contact with the film at certain positions, a rail against which the film is pressed by the gripper, an adjustable rod forming a continuation of the rail, metal guides over which the film passes cut away at the point where the emulsion carries a picture and spring-controlled pads which keep the film in proper relation to the guides.

25. In a kinematographic apparatus the combination with a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring attached to the bell-crank lever to maintain the pressure of the roller, a pivoted hand-lever attached to the spring by which its tension may be altered a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm, a spring on the arm engaging the gripper, an adjusting-screw for the spring on the arm, friction-surfaces on the gripper, a rail supported in the casing to guide the gripper into contact with the film at certain positions, a rail against which the film is pressed by the gripper, an adjustable rod forming a continuation of the rail, metal guides over which the film passes cut away at the point where the emulsion carries a picture, spring-controlled pads which keep the film in proper relation to the guides, and a pulley-and-belt gear to drive the axle of the feed-roller.

26. In a kinematographic apparatus the combination with a casing, an axle bearing therein, a feeding-roller whose circumference is equal to one picture-section, a pressure-roller supported in proximity to the feed-roller on a pivoted bell-crank lever, a spring attached to the bell-crank lever to maintain the pressure of the roller, a pivoted hand-lever attached to the spring by which its tension may be altered a kinematographic film passing between the rollers, a radial arm mounted on the axle of the feed-roller, a gripper pivoted on the end of the arm, a spring on the arm engaging the gripper, an adjusting-screw for the spring on the arm, friction-surfaces on the gripper, a rail supported in the casing to guide the gripper into contact with the film at certain positions, a rail against which the film is pressed by the gripper, an adjustable rod forming a continuation of the rail, metal guides over which the film passes cut away at the point where the emulsion carries a picture, spring-controlled pads which keep the film in proper relation to the guides, a pulley-and-belt gearing to drive the axle of the feed-roller and a spool from which the film is fed.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE FREDERIC HATTON.

Witnesses:
ERNEST F. FOTHERGILL,
CLAUDE S. R. MCKENZIE.