

June 10, 1930.

E. C. FRITTS

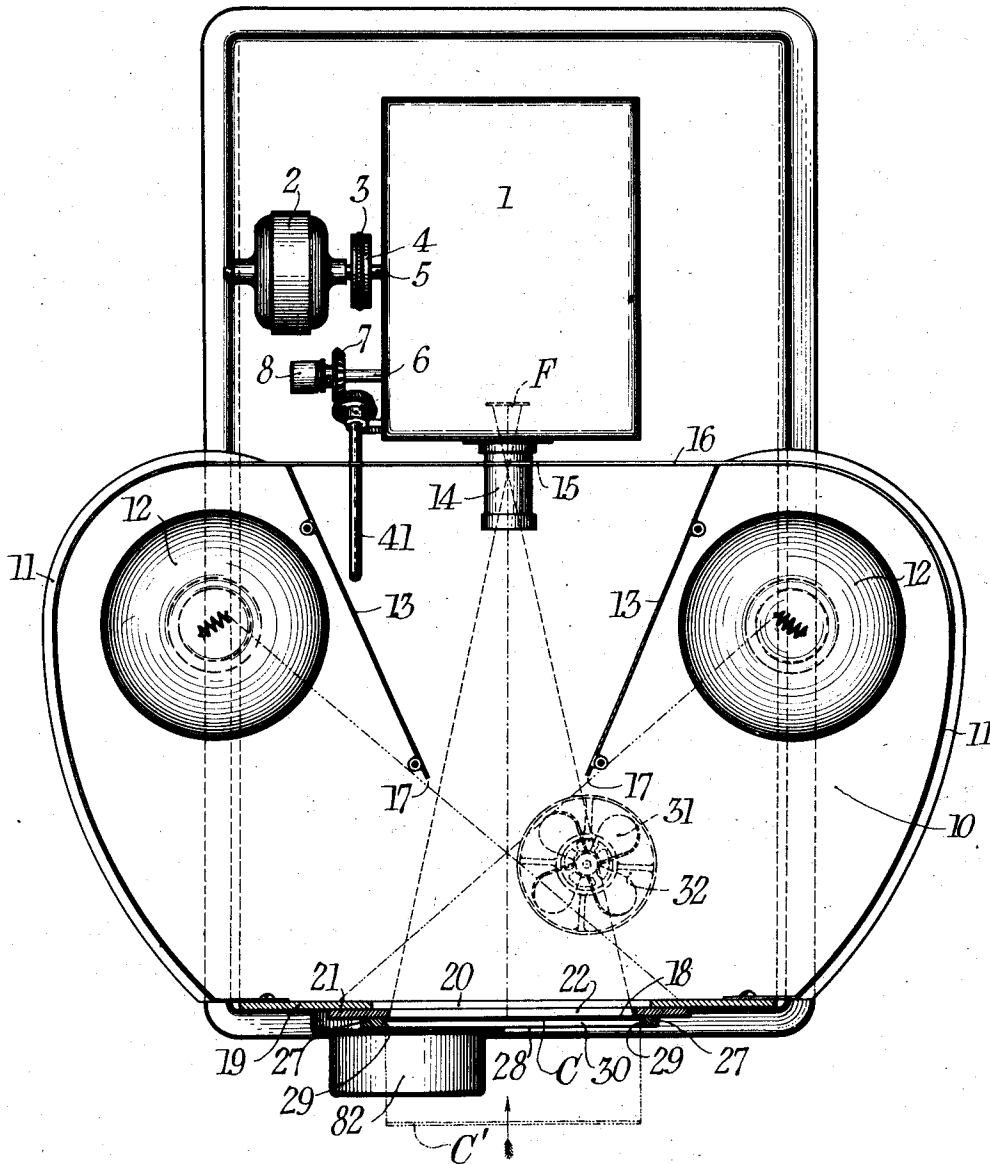
1,763,231

MOTION PICTURE TITLE MAKING MACHINE

Filed Aug. 26, 1927

3 Sheets-Sheet 1

FIG - 1 -



INVENTOR,
Edwin C. Fritts,
BY *R. L. Stinchfield*
Charles H. Stuart
ATTORNEYS.

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E. C. FRITTS

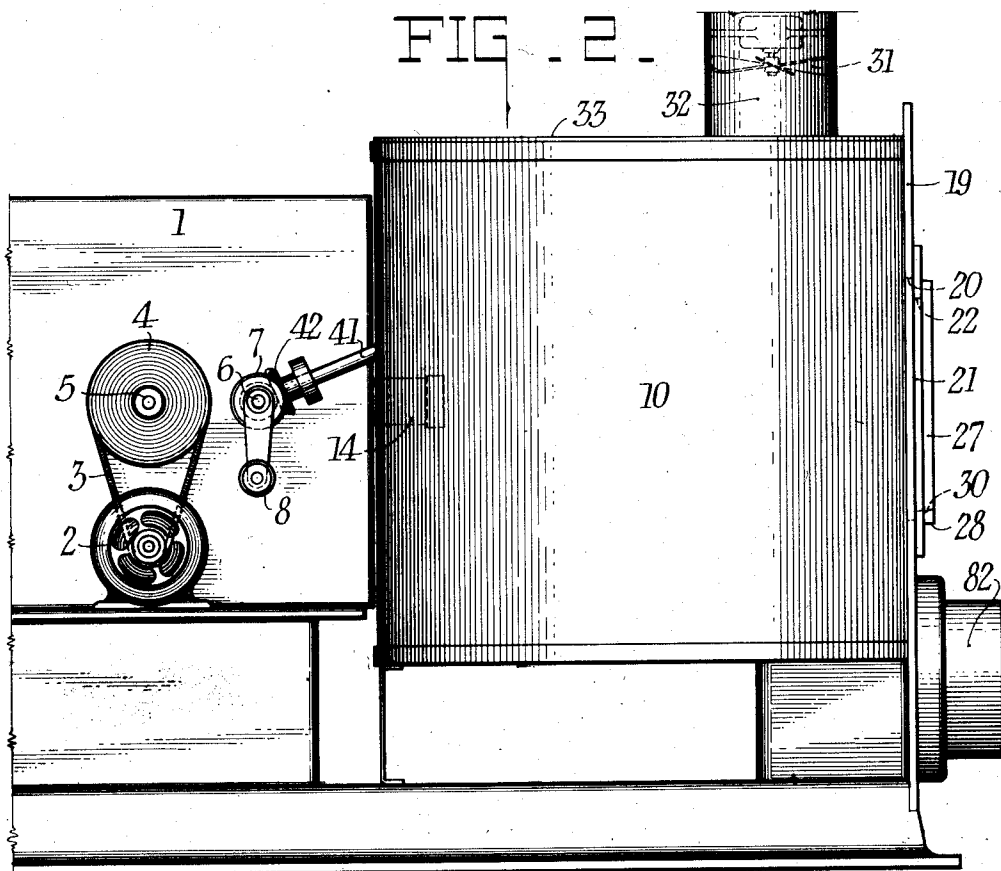
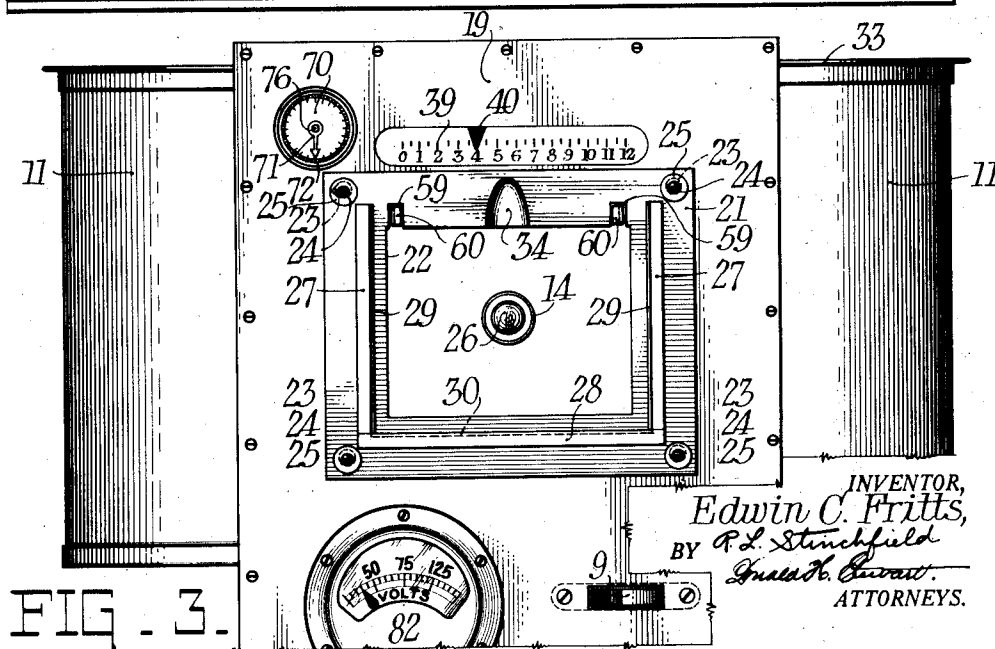
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FIG. 2.



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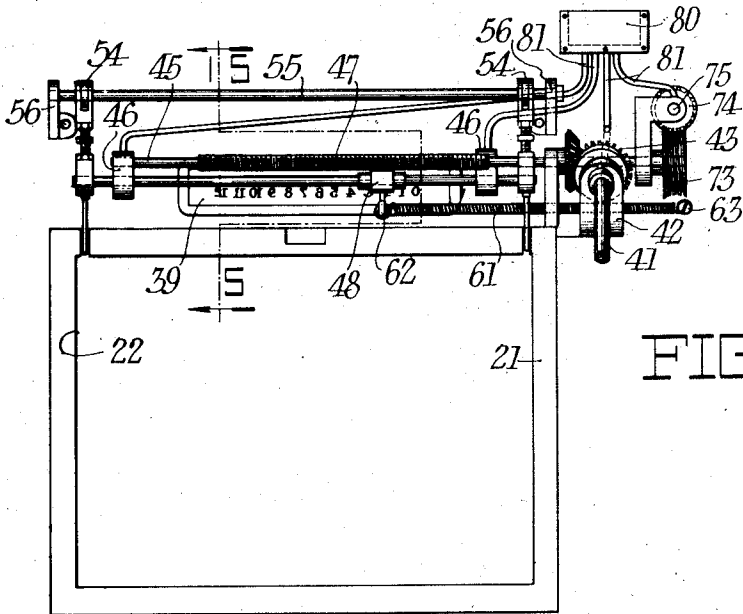


FIG. 4.

FIG. 5.

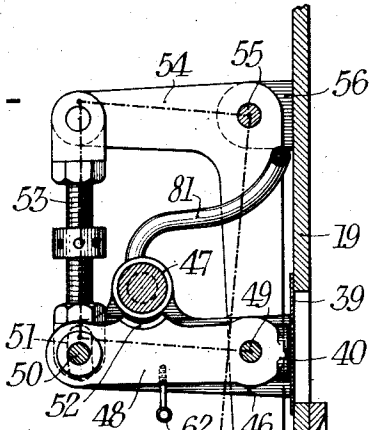
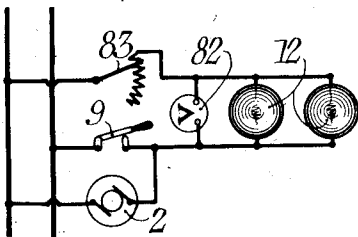


FIG. 6.



INVENTOR,
Edwin C. Fritts,
BY P. L. Stinchfield
Gerald H. Stewart,
ATTORNEYS.

UNITED STATES PATENT OFFICE

EDWIN C. FRITTS, OF ROCHESTER, NEW YORK, ASSIGNOR TO EASTMAN KODAK COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK

MOTION-PICTURE TITLE-MAKING MACHINE

Application filed August 26, 1927. Serial No. 215,609.

This invention relates to photography and more particularly to photographic machines for making a series of pictures rapidly, being particularly adapted for use in making titles for motion pictures. One object of my invention is to provide a machine which is simple to operate and which requires but few movements on the part of the operator. Another object is to provide a machine which is practically automatic in its operation. Another object is to provide a machine which will hold a suitably printed card substantially flat during the time the card is being photographed. Another object is to provide a suitable illuminating system and a means for preventing the heat of the illuminating system from damaging the object being photographed. Another object is to utilize the ventilating system for moving and for holding the card in position for photographing. Another object is to provide an automatic metering device upon which the number of exposures or footage of film used for one title may be readily ascertained. Still another object is to provide a measuring device which will at all times render visible to the operator the amount of film as it is used photographing a card or title, and other objects will appear from the following specification, the novel features being particularly pointed out in the claims at the end thereof.

Coming now to the drawings wherein like reference characters denote like parts throughout:

Fig. 1 is a top plan view partially in section showing a preferred embodiment of a motion picture title making machine constructed in accordance with and embodying one form of my invention;

Fig. 2 is a fragmentary side elevation of the machine shown in Fig. 1;

Fig. 3 is a fragmentary front elevation of the same machine;

Fig. 4 is a fragmentary detail of the meter mechanism removed from the camera to-

gether with a frame which surrounds the exposure opening;

Fig. 5 is a section on line 5—5 of Fig. 4 taken through the meter mechanism and a part of the plate which supports it; and

Fig. 6 is a wiring diagram for the photographing machine.

This machine may consist of a motion picture camera 1 which is driven at a suitable speed by a motor 2 through a belt 3 and pulley 4. The mechanism of the camera forms no part of the present invention, and is not, therefore, shown. It may, however, be of the type shown in Patent No. 1,572,252, Tessier, Feb. 9, 1926, or of the type shown in Patent No. 1,588,082, Wittel, June 8, 1926.

The pulley 4 actuates a shaft 5 which is connected to suitable parts of the camera mechanism to which there is also connected a shaft 6 which carries a bevelled gear 7 and a handle 8 by which the parts may be manually operated if desired. Thus the machine may be operated either manually by the handle 8 when the belt is disconnected or it may be operated by the motor 2 from a convenient source of power for which a switch 9 is provided, as shown in Fig. 3.

I prefer to provide artificial illumination since this may be more readily kept constant. To this end there is a substantially air tight chamber 10 which has curved side walls 11 which serve as reflectors for the lamps 12 which are preferably of the concentrated filament type. Baffle plates 13 mask off the light from lamps 12 so that no light rays may pass directly into the objective carried by the lens barrel 14 which projects through an aperture 15 in the rear wall 16 of the casing. The forward end 17 of the baffle plates are preferably spaced apart just a sufficient distance to permit the objective to form an image of an object to be photographed at 18 upon the film F in the camera 1.

In the forward part of the casing there is a panel 19 which is provided with an ex-

posure opening 20. This panel carries an exposure frame 21 which is provided with an opening 22 which is proportionate in size to one exposure frame of a motion picture film.

Frame 21 is provided with apertures 23 through which screws 24 pass, these screws also passing through washer 25. This permits an initial adjustment of frame 21 so that the center of the exposure aperture 22 may be properly aligned up with the axis of the objective 26 carried by lens barrel 14.

Motion picture titles are ordinarily printed upon cards. For use with this machine the cards are of a standard size, and are accurately positioned for exposure by means of the bevelled strips 27 and 28. As best shown in Fig. 3, strip 27 is bevelled toward the exposure opening 22 and strip 28 is bevelled at 30 away from this opening. Thus the strip 28 carries a downwardly extending ledge against which the bottom of the card may be placed. By turning the card upon its bottom edge the card may be rotated into position. The edges of the card, which may be designated broadly as C2, contact with and are positioned by the bevelled edges 29 of the strip 27.

In order to hold the cards in position for exposure I provide an air moving mechanism shown diagrammatically in Fig. 2 as a power fan 31 suitably mounted in a pipe 32 leading from the top 33 of the chamber 10. This fan is constantly running and creates a suction tending to hold a card in position for exposure. The casing is not completely air tight except for the exposure opening, as there is some air leakage about the objective and past the finger opening 34 which facilitates removing the card C from exposure position.

As will be readily seen the air passes from pipe 32 more rapidly when there is no card in position for exposure so that the heat from the lamps 12 is drawn from the casing 10.

The double function resulting from the arrangement above described is particularly useful because it not only ventilates the lamp house 10 but, by holding the cards in position, makes very rapid operation of the machine possible. The operator may position a card behind a card being photographed by locating the bottom on the bevel 30 of strip 28 with the top edge of the card in the position shown in the fine broken lines C' in Fig. 1. By drawing the first card upwardly from the exposure position C and by releasing the second card, the latter is rapidly drawn in the direction indicated by the arrow to the exposure position indicated at C. The bevelled edges 29 automatically position the card as it turns about its contact with strip 28, and the suction causes the card to move rapidly.

In changing cards the operator grasps the top through the finger opening 34 and pulls

the card from the exposure frame merely dropping a second card in place very much as small size printing presses are operated.

The number of exposure frames in a motion picture film title are determined by the amount of wording or reading on the title, and it is, therefore, necessary for the operator to know how many frames are being exposed by the camera. In order to determine this mechanism as indicated in Fig. 3 gives visible record upon scale 39 by means of a pointer 40. This scale may be graduated into suitable units and is here shown as being graduated into units of feet. The title cards may conveniently bear on the back the number of feet required.

There is a shaft 41 having a bevelled gear 42 meshing with a smaller gear 7. As best shown in Figs. 1 and 2 shaft 41 passes through the wall 16 of the chamber 10 across the chamber towards the panel 19. Referring to Fig. 4 the forward end of shaft 41 is supported in a bracket 42 which may be carried by panel 19. A beveled gear 43 drives a similar gear 44 so that shaft 45 which is supported in bearings 46 is continuously rotated as long as the camera mechanism is rotated either by motor 2 or handle 8. Shaft 45 carries a thread 47 and this thread may drive the pointer 40 across the scale 39 in the following manner:

The pointer 40 is carried on the end of a lever 48 supported on a fixed shaft 49 at one end and a movable shaft 50 at the other. Shaft 49 is fixedly supported in brackets 46 which also support shaft 45. Shaft 50, however, may move relative to bracket 46 being guided in the arcuate slots 51 in the ends of the brackets, as best shown in Fig. 5. On the upper edge of lever 48 there is a threaded segment 52 adapted to mesh with a screw 47 when member 48 is moved through arms 53 by means of bell crank levers 54 pivoted upon a shaft 55 supported by brackets 56. The long ends 57 of these bell crank levers are bent downwardly at 58 and extend through slots 59 in the exposure frame 22, the ends being bent over at 60 to form card contacts.

The parts above described are balanced so that very little pressure is required to thrust member 58 inwardly from the full line position to that diagrammatically indicated in dot and dash lines, Fig. 5. Consequently when a card C is drawn inwardly by air pressure the bell crank lever is swung, thus operating member 48 throwing the gear segment 52 into mesh with the rotating screw 47. This in effect forms a clutch which drives the pointer carrying member by means of the screw as long as a card is in position to be photographed. As soon as the desired number of pictures have been made, as indicated by the pointer moving across the scale 39, the card C is withdrawn permitting the bell crank lever to move a sufficient distance for

the teeth of the screw 47 and the segment 52 to become unclutched or disengaged; at which time a spring 61 which is attached at one end 62 to member 48, and at the other end 63 to the panel 19 to draw member 48 upon its supporting rods 49 and 50 back to the zero position on scale 39. Thus it will be seen that the film footage for each title may be watched during the printing operation.

I preferably make the motion picture camera 1 large in size so that a large roll of motion picture film can be carried. However, in order to indicate the total film footage I provide a dial 70 on the outside panel 19, this dial having a hand 71 which may indicate on a scale 72 the total amount of film which has been exposed in the camera.

In order to drive the hand 71 I provide on the end of shaft 45 a worm 73 meshing with another gear 74 which drives a shaft 75. Shaft 75 may be connected through suitable reduction gearing with a shaft 76 which drives the dial hand 71.

The meter mechanism may be oiled from an oil tank 80 by means of suitable pipes 81 leading to the parts which need lubrication.

I also prefer to provide a volt meter 82 and a rheostat 83 so that the brilliance of lamps 12 may be properly maintained. This is shown diagrammatically in Fig. 6.

The operation of the photographing machine above described is as follows: Switch 9 is operated to start the motor and light the lamps 12. The operator has a pile of cards bearing the titles to be made, each card preferably also bears a mark indicating the footage required. These cards are successively fed into printing position, and are there held by air pressure until the pointer 40 indicates the desired footage. As the camera is continuously driven the developed film will bear a series of titles with a few film areas separating each series which bear no titles. This is convenient for editing purposes as the separate sections are cut apart through these areas. When the dial 70 indicates that the camera film has become exhausted the machine may be stopped and the camera reloaded in the usual manner.

It is obvious from the foregoing description that certain features of my invention are useful for other purposes besides making motion picture titles, and I do not wish to be limited except as indicated by the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a photographing machine, the combination with an enclosed chamber having an exposure opening therein, of means for evacuating air from the chamber, whereby a card to be photographed may be held against the exterior edges of the exposure opening, and a camera on that side of the opening

toward which the card is held and focused on the plane of the opening for photographing that side of the card so held that faces the chamber.

2. In apparatus of the character described, an enclosed casing having an exposure opening in a wall thereof, means for removing air from the chamber whereby a card to be photographed may be held against the exterior edges of the opening, a lamp within the casing to illuminate the window and the card thereat from within, and a camera positioned on the same side of the opening as the light and focused on the opening therein, to photograph the inner side of a card at the opening.

3. In apparatus of the character described, an enclosed casing having an exposure opening in a wall thereof, means for removing air from the chamber whereby a card to be photographed may be held against the outer edges of the opening, a lamp within the casing to illuminate the window and a card thereat from within, and a camera positioned within and focused on the plane of the opening therein to photograph the inner side of a card at the opening.

4. In combination, a casing having an exposure opening, a light within the casing for illuminating the opening, and means for moving air through the casing by way of the opening as an entrance therefor, a device near the edges of the opening for positioning a card at said opening whereby the casing is cooled and a card may be held against edges of the exposure opening.

5. In combination, a casing having an exposure opening, a light within the casing for illuminating the opening, a constantly driven camera adapted to photograph a card at the opening, a movable trigger positioned at the edge of the opening and normally impelled outside of the casing and easily movable toward the casing, mechanism controlled by said trigger for determining film footage, connections between said trigger and mechanism driven in timed relation with the camera, and means for impelling air through the casing by way of the opening as an entrance therefor, whereby the casing is cooled and a card may be drawn against the opening and move the trigger adjacent thereto.

6. In combination, a support for an object to be photographed, a motion picture camera positioned to photograph a card at the support, a film footage indicator, a measuring device mounted on the support and controllable by a card positioned thereon for controlling the operation of the film footage indicator.

7. In combination, a casing having an exposure window in a wall thereof, means for evacuating air from the casing whereby a card may be pressed against the edges of the opening, a motion picture camera positioned

to photograph a card so held, an indicator for showing the amount of film passing through the camera, operable connections between the motion picture camera and the indicator, and means at the edge of the opening and operable by the pressure of the card and connected to said indicator to control the operation thereof.

8. In combination, a casing having an exposure window in a wall thereof, means for evacuating air from the casing whereby a card may be pressed against the edges of the opening, a motion picture camera positioned to photograph a card so held, an indicator for showing the amount of film passing through the camera, means tending to set the indicator at a set reading, a mechanism for connecting the indicator to the camera to be driven synchronously therewith, and means at the edge of the opening and operable by the pressure of the card and connected to said mechanism to control the said connection of the indicator to the camera, whereby the indicator will operate when a card is positioned at the window and will return to said set reading when a card is removed from the window.

9. In combination, a support for an object to be photographed, a motion picture camera positioned to photograph an object at the support, a film footage indicator, a common drive for the indicator and camera, a disconnectible connection between the indicator and the drive, means tending to set the indicator automatically at a set position, and means on the support and operable by an object in position thereat, controlling the connection and thereby causing the indicator to operate.

10. In a photographing machine, the combination with an exposure frame, of a motion picture camera for photographing objects positioned by the exposure frame, a power drive for the camera, a meter visible near the exposure frame for measuring film, connections between said meter and said camera power drive whereby the former may be actuated by the latter, a clutch between the camera and meter, and a clutch controlling device at the exposure frame, and operable by contact with an object to be photographed positioned against the exposure frame.

11. In a photographing machine, the combination with an exposure frame, of a motion picture camera for photographing objects positioned by the exposure frame, a power drive for the camera, a meter for measuring film used in the camera, connections between the camera and meter whereby the latter may be moved synchronously with the former, said connections including a clutch member adapted to be actuated each time a card is placed in the exposure frame.

12. In a photographing machine, the combination with an exposure frame, of a motion picture camera for photographing ob-

jects positioned by the exposure frame, a power drive for the camera, a meter for measuring film used in the camera, connections between the camera and meter for intermittently moving the latter synchronously with the former, and means associated with the exposure frame for controlling the intermittent movements.

13. In a photographing machine, the combination with an exposure frame, of a motion picture camera for photographing objects positioned by the exposure frame, a power drive for the camera, a meter for measuring film used in the camera, connections between the camera and meter for intermittently moving the latter synchronously with the former, and means associated with the exposure frame comprising a trip member projecting from the exposure frame and completing the connection between the meter and the camera during the interval that a card lies in position for exposure against the exposure frame.

14. In a photographing machine, the combination with an exposure frame, of a motion picture camera for photographing objects positioned by the exposure frame, a power drive for the camera, a meter, and connections between the meter and power drive whereby the former may be driven synchronously with the latter, said meter including a nut, a screw for moving the nut, and means for engaging the nut and thread under control of a card positioned in the exposure frame.

15. In a photographing machine, the combination with an enclosed chamber, of an exposure frame carried by the side of the chamber, means tending to exhaust air from said chamber, guide strips on the frame, said guide strips having beveled edges adapted to accurately position a card with relation to the exposure frame as said card is moved towards said chamber by air pressure.

16. In a photographing machine, the combination with an enclosed chamber, of an exposure frame carried by the side of the chamber, means tending to exhaust air from said chamber, guide strips on the frame, including side and bottom members having beveled edges, the edges of the side members being beveled toward the exposure opening and the edge of the bottom member being beveled away from the exposure opening whereby a card may be positioned by placing an edge thereof on the bottom guide and turning the card upon this edge into contact with the exposure frame said card being at least partially positioned by air pressure.

17. In a photographing machine, the combination with an enclosed chamber, of an exposure frame carried by the side of the chamber, means tending to draw air into the chamber through the exposure frame, guide strips on the frame, one guide for horizontal

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location of a card including a ledge for receiving an edge of the card and two guides spaced apart having edges closer together near the chamber than those spaced from the chamber, whereby a card placed on the ledge may be readily rotated upon that edge being guided by the side members into an exposure position, said card tending to move into said exposure position under the influence of air being drawn into the chamber through the exposure frame.

Signed at Rochester, New York, this 22nd day of August 1927.

EDWIN C. FRITTS.