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G2E A17A A6A2
(72) Inventor JOHN JOSEPH BUNDSCHUH

(54) MOTION PICTURE PROJECTOR AND CARTRIDGE

(71) We, EASTMAN KODAK COMPANY, a Company organized under the Laws of the State of New Jersey, United States of America of 343 State Street, Rochester, New York 14650, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to motion picture projectors and to cartridges adapted to contain a reel of film and to be mounted on such projectors.

In accordance with the present invention there is provided a motion picture projector arranged to draw film from a film supply reel contained within a cartridge, the projector being of the kind having film stripping means arranged to enter the cartridge mounted on a wall of the projector and there to engage the leading end of the film, in combination with such cartridge which has a pair of parallel walls between which the reel is contained with the reel axis perpendicular to these walls and between which the said stripping means may enter the cartridge, one of the said walls of the cartridge having a non-planar surface formation, including a projection or recess, which is adapted to co-operate with a complementary non-planar surface formation, including a recess or projection, on the said wall of the projector to establish the lateral and angular orientation of the cartridge on the said projector wall, and the projector having releasable clamping means adapted to engage the said one wall of the cartridge to prevent any movement of the cartridge that would disengage the said surface formations.

A motion picture projector in accordance with the invention has a wall on which the cartridge may be mounted, this wall having a non-planar surface formation, comprising a recess or projection, which is adapted to co-operate with a complementary surface

formation on one wall of the cartridge to establish the lateral and angular orientation of the cartridge on the said projector wall, the projector having releasable clamping means movable from the said projector wall to engage the said one wall of the mounted cartridge to prevent any movement of the cartridge that would disengage the said surface formations, and film stripping means arranged to enter the mounted cartridge to engage the leading end of the film therein.

A cartridge in accordance with the invention has a pair of parallel walls between which a reel is contained with the reel axis extending perpendicular to these walls and between which film stripping means of the projector may extend to engage the leading end of the film, one of the said walls of the cartridge having a non-planar surface formation, including a projection or recess, which is adapted to co-operate with a complementary non-planar surface formation on a projector wall to establish the lateral and angular orientation of the cartridge on this wall of the projector, and the said one wall of the cartridge having an opening for receiving clamping mean projecting from the said projector wall.

Constructions of cartridge and motion picture projector in accordance with the present invention will now be described by way of example with reference to the accompanying drawings in which:—

Fig. 1 is an exploded elevation, partly broken away, of a preferred embodiment of a cartridge of the invention and showing a reel containing motion picture film between the cartridge parts;

Fig. 2 is a plan of the lower cartridge part shown in Fig. 1;

Fig. 3 is a perspective view of the cartridge and a portion of a projector which co-operates with the cartridge to locate and support the latter on the projector;

Fig. 4 is an elevation of the opposite side of the portion of the projector shown in Fig.

9 and depicting a mechanism for releasably latching the cartridge on the projector;

Fig. 5 is an enlarged fragmentary section taken along line 11—11 of Fig. 10;

5 Fig. 6 is a view similar to Fig. 9 showing another embodiment of the locating structure;

10 Fig. 7 is an enlarged fragmentary perspective of part of the cartridge locating structure;

Fig. 8 is a view showing part of the Fig. 6 projector structure;

15 Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, a cartridge 1 of the invention comprises two separate cartridge halves or parts 3 and 5. The upper cartridge part 3 has a generally semicylindrical recess 7 therein defined by a pair of thin, substantially semicircular walls 9 and 11 which are held in spaced and generally parallel planes by an arcuate wall 13, the latter closing the top of part 3. The lower edge of wall 9 has substantially straight end portions 15a and 15b separated by a centrally located semicircular notch portion 17. Similarly, the lower edge of wall 11 has substantially straight end portions 19a and 19b separated by a centrally located semicircular notch portion 21, the latter being coaxial with and somewhat smaller in diameter than the notch 17 in wall 9. The difference in diameters of the notches enables a reel 23 to be oriented correctly in the cartridge as explained later.

20 Reel 23 comprises a hub 25 and a pair of spaced, generally parallel annular flanges 27. A length of strip material 29, such as motion picture film, is wound on hub 25 between the flanges. Preferably, the diameter of the flanges 27 exceeds the diameter of the strip material on the hub so that there is a narrow annular space between the flanges at their outer extremity that is free of film. A pair of spaced, generally semicircular rails 31, 33 project radially inwardly from end wall 13 of part 3. These rails are spaced apart by a distance less than the spacing between the inner surfaces of reel flanges 27 so that the rails can project into the space between the reel flanges to prevent clock springing of the strip material beyond the outer periphery of the reel flanges as disclosed in Patent Specification No. 1,235,382. The outer portions of the reel flanges are received in spaces 34 between the rails and the walls 9 and 11.

30 Cartridge part 5 has a recess 35 defined by a pair of thin, generally parallel, substantially semicircular walls 37 and 39 which are held in spaced relation by an arcuate end wall 41 at the outer perimeter of part 5. The lower portion of end wall 41 is slotted as shown at 43 to provide access for means for stripping film from reel 23. The film stripping means may comprise part of a motion

picture projector such as described in Patent Application No. 55365/68 (Serial No. 1,254,705). A more detailed description of the shape of slot 43 and its function is set forth in the beforementioned Patent Specification No. 1,235,382.

70 The upper edge of wall 37 comprises straight end portions 53a and 53b separated by a semicircular centrally located notch portion 55. Similarly, the upper edge of wall 39 comprises straight end portions 57a and 57b separated by a semicircular notch portion 59, the latter being coaxially aligned with the corresponding portion 55 on wall 37. As best shown in Fig. 1, the radius of notch 59 is somewhat smaller than the radius of notch 55, and notches 55 and 59 have the same radius of curvature as notches 17 and 21, respectively, of part 3. When the parts are assembled together, the notches are aligned and jointly form two coaxial circular holes at opposite sides of the cartridge. When the cartridge is positioned on a projector, the projector spindle (not shown) passes through the larger of the holes into the hub 25 of the reel for rotating the reel within the cartridge. Edges 15, 19 and 53, 57 form the interface between the cartridge parts when they are assembled together.

95 A reel pin 60 retains an end of the film on the reel and projects laterally beyond one of the flanges 27. The pin is spaced from the axis of the reel hub by a distance which is greater than the radius of notches 21, 59, but less than the radius of the notches 17 and 55. This positioning of the pin requires that the reel be inserted into the cartridge in the manner shown in Fig. 1 since any attempted insertion while the reel is reversed (i.e., with its axis rotated 180° from the position shown in Fig. 1) will be blocked by engagement of the pin with the edges of notches 21 and 59. A more detailed construction of the pin and its mounting on the reel are described in Patent Application No. 55786/68 (Serial No. 1,255,793).

100 Cartridge part 5 has a pair of spaced, generally semicircular rails 61 and 63 which project radially inwardly from wall 41 into the recess 35, and the ends of rails 61, 63 are spaced from the upper edges of part 5. Rails 61, 63, as well as rails 31, 33 in part 3, are each spaced from the adjacent semicircular cartridge walls, thereby providing in each cartridge part a pair of axially spaced annular spaces or openings. The openings in part 5 are both designated 65. The axially outer surfaces of the rails 31, 33 and 61, 63 are spaced apart by a distance less than the spacing between the inner surfaces of the reel flanges 27 so that when the reel is positioned within the cartridge the reel flanges are received in openings 34 and 65. Thus, rails 31, 33, 61 and 63 project into the area between the reel flanges to prevent clock 130

springing of the strip material 29 beyond reel flanges. The rails also control the axial position of the reel within the cartridge. As shown in Fig. 2, reel 27 fits loosely within the substantially cylindrical chamber jointly formed by recesses 7 and 35 in the cartridge parts so that the reel is free to rotate with respect to the cartridge during unwinding and rewinding of the film on the reel.

Means are preferably provided for making improper insertion of the reel into the cartridge substantially impossible, i.e., to prevent insertion of the radially outer portion of the reel flanges 27 into any portion of the cartridge other than the openings 34 and 65. This is accomplished by means of two cross-ribs 67 and 69 which extend from the end wall 41 upwardly and inwardly between the end portions of rails 61 and 63. The innermost ends of the ribs project into the recess 35 substantially the same distance as the rails 61 and 63. As is apparent from Figs. 1 and 2, the spacing between the ribs is less than is required for insertion of the reel flanges into cartridge part 5. Thus the ribs block improper insertion of reel flanges 27 into the cartridge by requiring insertion of the outer portion of the reel flanges into the openings 65 at the sides of the rails.

The cartridge parts are fastened together to form a substantially integral unit by means of latch structure comprising a tongue 71 on each end of part 3 which is adapted to be interlocked with a latch member shown in the form of a bar 73 at each end of the cartridge part 5. This arrangement forms the subject of Patent Application 55782/68 (Serial No. 1,261,525) from which the present application is divided.

In accordance with the invention, surface formation means are provided on the cartridge for accurately locating the cartridge on the face of a projector. By way of example the projector may be of the type described in Patent Application No. 55365/68 (Serial No. 1,254,705). This locating means is best illustrated in Figs. 1 and 3 to 5 and comprises a pair of spaced and generally parallel ribs 101 and 103 on wall 37. The ribs extend from the lower edge 105 upwardly to the upper edges 53a and 53b respectively of cartridge part 5. These ribs are joined by a transverse rib 107 which projects from wall 37 and extends along the periphery of the notch 55. There are four openings 109, 111, 113 and 115 through the wall 37 near the upper ends and lower ends of the ribs 101 and 103 and at the outer side of the ribs. The ribs are preferably generally channel shaped except at the upper and lower edges where inclined chamfered surfaces 117, 119, 121 and 123 slope inwardly toward the adjacent one of the openings 109, 111, 113 and 115.

The cartridge is adapted to be mounted

on the surface of a plate 125 comprising part of a motion picture projector. The plate has a pair of spaced and generally parallel channel-shaped grooves or recesses 127 and 129 joined at their upper ends by a generally arcuate recess 131. The spacing, shape and dimensions of the recesses 127, 129 and 131 are such that ribs 101, 103 and 107, respectively fit snugly within the recesses. The close fitting engagement between the sides of ribs 101, 103 and the walls of the recesses or grooves established and maintains the lateral position and angular or rotational orientation of the cartridge with respect to plate 125. Preferably, contact pads 133 are provided in the bottom of the grooves. The relation between the pads and ribs 101, 103 is such that the loaded cartridge is properly located in parallel relation to the plate 125 and the reel in the cartridge is in proper alignment with a take-up reel (not shown) on the projector when the ribs are in contact with the pads. The projector has a spindle 135 which fits within the core of the reel hub when the cartridge is properly positioned on plate 125. Engagement between the pads and ribs 101, 103 also establishes the axial location and the perpendicularity of the cartridge and reel with respect to the spindle. Proper vertical positioning of the cartridge is established by the bottom of rib 107 engaging the wall defining the bottom of recess 131.

Other means for properly locating the cartridge on the projector comprise feet 137 and 139 on the cartridge laterally outwardly from the ribs 101 and 103. Preferably, the lower part of the side of foot 137 is bevelled as shown at 141 while the corresponding part of foot 139 is perpendicular to the bottom 105 of the cartridge. These feet are adapted to fit into mating recesses formed by bars 143, 145, and 147 which project outwardly from the surface of plate 125 on the projector. The bevelled edge 141 and a corresponding inclined surface 149 of the projector prevent reversed mounting of the cartridge on the projector. Bar 143 has a notch 151 in it to provide a path for film being unwound from the reel inside the cartridge.

The cartridge is held against the surface of plate 125 by clamping means best illustrated in Fig. 4. The clamping means shown comprises a pair of bell crank levers 153 and 155 which are pivoted at 157 and 159, respectively, on the back of plate 125. One arm 153a of lever 153 carries a contact plate 161 at its outer end. The outer end of the corresponding arm 155a of lever 155 is biased against plate 161 by a compression spring 163. The other arm 153b has at its outer end an offset clamping portion 165 which extends through a slot 167 in plate 125 as best illustrated in Fig. 5. The spring 163 acting through lever 153 normally biases the clamp-

ing member 165 against one end of the slot as shown in solid lines in Fig. 5. However, the clamping member can be moved to its dotted line position in Fig. 5 against the biasing force of spring 163 during mounting of the cartridge on the projector as explained later. Similarly, the arm 155b of lever 155 has at its outer end a clamping member 169 which also projects through a slot 171 in a projector plate 125. Clamping member 169 can also be moved against the biasing force of spring 163 during insertion of the cartridge on the projector. The end portions of both clamping members lie in a plane substantially parallel to and spaced from the outer face of plate 125. Preferably, the clamping members each have a bevelled outer surface as shown at 173 in Fig. 5 for the member 165.

Lever 153 has an extension 153c which carries a flange 175, the latter projecting through an opening 177 in plate 125. Normally the flange 175 is biased toward the upper edge of opening 177 by the spring 163. The flange can be moved downwardly by finger pressure to cause pivotal movement of lever 153 against the force of spring 163. This movement is imparted to lever 155 due to the engagement of the arm 155a with the plate 161. As this occurs, the clamping members 165 and 169 are swung away from each other. This unlatches the cartridge so that it can be removed from the projector.

The cartridge is assembled onto the projector plate 125 simply by aligning ribs 101, 103 and 107 with the respective grooves 127, 129 and 131 and then moving the cartridge in a direction parallel to the axis of spindle 135 until the cartridge abuts the plate 125. As this occurs, the bevelled surfaces 117 and 121 on the ribs engage the bevelled surface on clamps 165 and 169, thereby forcing the clamps outwardly away from each other toward the dotted line position shown for clamp 165 in Fig. 5. Inward movement of the ribs continues until the outer faces of the ribs abut the locating pads 133. During this movement the clamp members clear the bevelled surfaces and then snap toward each other under the influence of spring 163 until they reach the position shown in Fig. 5 wherein they are in engagement with the back side of the ribs to prevent removal of the cartridge without first depressing the flange 175. The cartridge can be clamped onto the projector by other suitable means, such as by clamp means adapted to enter other pairs of the openings 109, 111, 113 and 115. Reference is made to Patent Application No. 55365/68 (Serial No. 1,254,705) for a description of clamping means positionable in diagonally opposite ones of the openings.

Figs. 6-8 illustrate modifications of the mounting structure on the projector and on the cartridge. In this embodiment, the cart-

ridge is moved downwardly along face 125 into its mounted position rather than being moved perpendicularly with respect to face 125 as in the previously described embodiment. In order to accommodate the required movement of the cartridge, the spindle is made retractable with respect to plate 125. Fig. 8 illustrates one of the various ways in which this movement of the spindle may be effected. Referring to Fig. 8, the spindle 181 is carried by a pair of bearings 183 and 185 which allow the desired axial movement of the spindle. The spindle is driven by a belt (not shown) trained around a pulley 187 surrounding the spindle. The pulley is carried by a sleeve 189 that is fixed to the spindle by a key (not shown) seated in an axial slot 191 in the spindle surface. This arrangement permits axial movement of the spindle with respect to the spindle driving mechanism, and is described in Patent Application No. 34812/71 (Serial No. 1,261,190) which is also divided from Patent Application No. 55782/68 (Serial No. 1,261,525).

Referring now to Fig. 6, the projector has a chamber 222 which receives a cartridge through its open top. A slot 224 permits film stripping means to enter a cartridge in the chamber. The cartridge mounting structure on the projector comprises a pair of spaced, generally parallel vertically extending rails 223 and 225 forming a substantially channel-shaped recess 227. Two similar rails 229 and 231 form a channel-shaped recess 232, the latter being substantially parallel to recess 227. Both recesses are open at their top and they guide the cartridge into place along the face of the projector plate 125 and establish the position of the cartridge on the projector in the same manner as recesses 127 and 129.

Vertical positioning of the cartridge is determined by three latching and locating members 233, 235 and 237. Members 233 and 235 are positioned laterally outwardly from rails 233 and 231, respectively, near bar 143. Latch members 233 and 235 have notches 233a and 235a which receive the lower portion of cartridge wall 37 at openings 115 and 111, respectively. The upper part of each of latch members 233 and 235 abuts the outer surface of wall 37 to prevent outward movement of the cartridge away from the projector plate.

The latch member 237 is preferably formed in the upper end of rail 229 by providing a notch 237a on the rail. This notch is adapted to receive a portion of the cartridge rib 107. As shown in Fig. 7, the rib 107 is preferably undercut to form a downwardly opening recess 239 which receives the upper end of the latch member 237. This interlocking arrangement prevents outward movement of the upper portion of cartridge part 5. The relative dimensions between notch 130

237a and the recess 239 is preferably such that the lower edge 240 of rib 107 is seated at the bottom of the notch when the cartridge is in the desired vertical position. The latch members 233, 235 and 237 jointly locate the cartridge and the reel therein in the desired vertical plane substantially parallel to the outer face of projector plate 125. While the mounting structure on the projector has been described in terms of a single cartridge mounted on a single plate 125, it will be understood that a plurality of cartridges can be accommodated on the projector or a cartridge carrier by providing the described mounting structure on a series of plates each pair of which is spaced apart sufficiently to accommodate a cartridge therebetween.

A retaining latch is provided for avoiding inadvertent upward or vertical movement of the cartridge along the surface of plate 125. Two constructions of such retaining structures are shown in Fig. 6. These comprise a curved lever arm 241 which is pivoted at 243 intermediate its ends. A lower end of the arm 241 projects through a window 245 in plate 125 and it is adapted to engage cartridge part 3 immediately above the rib 107 of the cartridge. The lower end of this arm is biased toward the cartridge by a tension spring 247 connected to the lever arm beneath the pivot 243. The upper end of the arm projects through an opening 249 in the projector housing. The lever arm is withdrawn from the opening for removal of the cartridge by finger pressure directed against the upper end of the lever.

As an alternative to the retaining structure just described, or in addition to such structure, the cartridge may be held in its mounted position by a latching member 251 pivoted at 253 intermediate its ends. One end of the lever has an offset latch portion 255 which projects through a window 257 in plate 125 and is adapted to be received within an opening 109 in cartridge part 5. The latch member is biased toward the opening by compression spring 259 which bears against the lever 251 between pivot 253 and latch member 255. The other end of member 251 projects from the projector housing. The latch portion 255 is withdrawn from the opening by finger pressure directed against the projecting end of the lever.

During assembly of the cartridge on the projector structure shown in Fig. 16, the spindle is first retracted by exerting finger pressure against flange 197. Flange 197 can be released after collar 205 clears shoulder 207 on latch member 209. Then the cartridge is placed above rails 223, 225, 229 and 231 with the cartridge ribs 101 and 103 aligned with the recesses 232 and 227, respectively. Then the cartridge is moved downwardly along the face of plate 125 until the lower edges of the cartridge are received within

notches 233a and 235a and the upwardly projecting portion of latch 237 is received within the recess 239 on latch 107 with rib portion 240 seated on the bottom of notch 237a. As this movement occurs, the lower end of retaining latch arm 241 and/or the retaining latch member 255 are retracted through plate 125 against their respective biasing forces. When the cartridge is properly located, the lower end of latch member 241 and/or the latch member 255 return to their normal latching position where they prevent inadvertent or accidental upward movement of the cartridge relative to the projector. As the cartridge reaches its lowermost position, its lower edge 105 engages release lever 217 to pull the latch member 209 downwardly, thus releasing the spindle and spring 199 returns the spindle to its normal extended position. Extension of the spindle is limited by engagement of a pin 195 with the end of the slot in plate 193.

Having regard to the provisions of Section 9 of the Patents Act, attention is directed to the claims of Application No. 35781/71 (Serial No. 1,261,526).

WHAT WE CLAIM IS:—

1. A motion picture projector arranged to draw film from a film supply reel contained within a cartridge, the projector being of the kind having film stripping means arranged to enter the cartridge mounted on a wall of the projector and there to engage the leading end of the film, in combination with such a cartridge which has a pair of parallel walls between which the reel is contained with the reel axis perpendicular to these walls and between which the said stripping means may enter the cartridge, one of the said walls of the cartridge having a non-planar surface formation, including a projection or recess, which is adapted to co-operate with a complementary non-planar surface formation, including a recess or projection, on the said wall of the projector to establish the lateral and angular orientation of the cartridge on the said projector wall, and the projector having releasable clamping means adapted to engage the said one wall of the cartridge to prevent any movement of the cartridge that would disengage the said surface formations.

2. A projector and a cartridge as claimed in Claim 1, wherein the surface formation means comprises a rib on the cartridge and a co-operating recess on the projector.

3. A projector and a cartridge as claimed in Claim 2, wherein a second rib on the cartridge extends transversely of the first mentioned rib and is adapted to be received in a second recess on the projector.

4. A projector and a cartridge as claimed in Claim 2, wherein two parallel ribs are formed on the cartridge and a third rib ex-

237a and the recess 239 is preferably such that the lower edge 240 of rib 107 is seated at the bottom of the notch when the cartridge is in the desired vertical position. The latch members 233, 235 and 237 jointly locate the cartridge and the reel therein in the desired vertical plane substantially parallel to the outer face of projector plate 125. While the mounting structure on the projector has been described in terms of a single cartridge mounted on a single plate 125, it will be understood that a plurality of cartridges can be accommodated on the projector or a cartridge carrier by providing the described mounting structure on a series of plates each pair of which is spaced apart sufficiently to accommodate a cartridge therebetween.

A retaining latch is provided for avoiding inadvertent upward or vertical movement of the cartridge along the surface of plate 125. Two constructions of such retaining structures are shown in Fig. 6. These comprise a curved lever arm 241 which is pivoted at 243 intermediate its ends. A lower end of the arm 241 projects through a window 245 in plate 125 and it is adapted to engage cartridge part 3 immediately above the rib 107 of the cartridge. The lower end of this arm is biased toward the cartridge by a tension spring 247 connected to the lever arm beneath the pivot 243. The upper end of the arm projects through an opening 249 in the projector housing. The lever arm is withdrawn from the opening for removal of the cartridge by finger pressure directed against the upper end of the lever.

As an alternative to the retaining structure just described, or in addition to such structure, the cartridge may be held in its mounted position by a latching member 251 pivoted at 253 intermediate its ends. One end of the lever has an offset latch portion 255 which projects through a window 257 in plate 125 and is adapted to be received within an opening 109 in cartridge part 5. The latch member is biased toward the opening by compression spring 259 which bears against the lever 251 between pivot 253 and latch member 255. The other end of member 251 projects from the projector housing. The latch portion 255 is withdrawn from the opening by finger pressure directed against the projecting end of the lever.

During assembly of the cartridge on the projector structure shown in Fig. 16, the spindle is first retracted by exerting finger pressure against flange 197. Flange 197 can be released after collar 205 clears shoulder 207 on latch member 209. Then the cartridge is placed above rails 223, 225, 229 and 231 with the cartridge ribs 101 and 103 aligned with the recesses 232 and 227, respectively. Then the cartridge is moved downwardly along the face of plate 125 until the lower edges of the cartridge are received within

notches 233a and 235a and the upwardly projecting portion of latch 237 is received within the recess 239 on latch 107 with rib portion 240 seated on the bottom of notch 237a. As this movement occurs, the lower end of retaining latch arm 241 and/or the retaining latch member 255 are retracted through plate 125 against their respective biasing forces. When the cartridge is properly located, the lower end of latch member 241 and/or the latch member 255 return to their normal latching position where they prevent inadvertent or accidental upward movement of the cartridge relative to the projector. As the cartridge reaches its lowermost position, its lower edge 105 engages release lever 217 to pull the latch member 209 downwardly, thus releasing the spindle and spring 199 returns the spindle to its normal extended position. Extension of the spindle is limited by engagement of a pin 195 with the end of the slot in plate 193.

Having regard to the provisions of Section 9 of the Patents Act, attention is directed to the claims of Application No. 35781/71 (Serial No. 1,261,526).

WHAT WE CLAIM IS:—

1. A motion picture projector arranged to draw film from a film supply reel contained within a cartridge, the projector being of the kind having film stripping means arranged to enter the cartridge mounted on a wall of the projector and there to engage the leading end of the film, in combination with such a cartridge which has a pair of parallel walls between which the reel is contained with the reel axis perpendicular to these walls and between which the said stripping means may enter the cartridge, one of the said walls of the cartridge having a non-planar surface formation, including a projection or recess, which is adapted to co-operate with a complementary non-planar surface formation, including a recess or projection, on the said wall of the projector to establish the lateral and angular orientation of the cartridge on the said projector wall, and the projector having releasable clamping means adapted to engage the said one wall of the cartridge to prevent any movement of the cartridge that would disengage the said surface formations.

2. A projector and a cartridge as claimed in Claim 1, wherein the surface formation means comprises a rib on the cartridge and a co-operating recess on the projector.

3. A projector and a cartridge as claimed in Claim 2, wherein a second rib on the cartridge extends transversely of the first mentioned rib and is adapted to be received in a second recess on the projector.

4. A projector and a cartridge as claimed in Claim 2, wherein two parallel ribs are formed on the cartridge and a third rib ex-



tending between those ribs, and co-operating recesses are formed on the projector.

5. A projector and a cartridge as claimed in any of Claims 2 to 4, wherein the recesses on the projector are formed by rails projecting above the said projector wall.

6. A projector and a cartridge as claimed in any of Claims 1 to 5, wherein the cartridge is formed with an opening adjacent to the ribs for receiving a locating or clamping member on the projector.

7. A projector and a cartridge as claimed in Claim 1, wherein the releasable clamping means on the projector comprises a movable member arranged to move into an opening in the said one wall of the cartridge.

8. A projector and a cartridge as claimed in Claim 7, wherein the member is spring-biased to its cartridge clamping position and is manually releasable from this position.

9. A motion picture projector for use in the combination of projector and cartridge claimed in Claim 1, the projector having a wall on which the cartridge may be mounted, this wall having a non-planar surface formation, comprising a recess or projection, which is adapted to co-operate with a complementary surface formation on one wall of the cartridge to establish the lateral and angular orientation of the cartridge on the said projector wall, the projector having releasable clamping means movable from the said projector wall to engage the said one wall of the mounted cartridge to prevent any movement of the cartridge that would disengage the said surface formations, and film stripping means arranged to enter the mounted cartridge to engage the leading end of the film therein.

10. A projector as claimed in Claim 9, wherein the releasable clamping means comprises a member spring-biased to its cartridge clamping position and manually releasable from this position.

11. A cartridge for use in the combination of projector and cartridge claimed in Claim 1, the cartridge having a pair of parallel walls between which a reel is contained with the reel axis extending perpen-

dicular to these walls and between which film stripping means of the projector may extend to engage the leading end of the film, one of the said walls of the cartridge having a non-planar surface formation, including a projection or recess, which is adapted to co-operate with a complementary non-planar surface formation on a projector wall to establish the lateral and angular orientation of the cartridge on this wall of the projector, and the said one wall of the cartridge having an opening for receiving clamping means projecting from the said projector wall.

12. A cartridge as claimed in Claim 11, wherein the said surface formation comprises a first rib and a second rib extending substantially transversely of the first rib.

13. A cartridge as claimed in Claim 11, wherein the said surface formation comprises two parallel ribs and a third rib extending between these ribs.

14. A cartridge as claimed in any of Claims 11 to 13, wherein the cartridge is formed of two separable parts each of which includes part of two parallel walls defining the recess for a reel, and wherein the said surface formation is formed on only one of the separable parts.

15. A motion picture projector and a cartridge, in combination, substantially as hereinbefore described with reference to Figs. 1, 2, 3, 4 and 5 or to Figs. 6, 7 and 8 of the accompanying drawings.

16. A motion picture projector having cartridge orienting and clamping means substantially as hereinbefore described with reference to Figs. 3, 4 and 5, or 6 and 8 of the accompanying drawings.

17. A cartridge for a reel of motion picture film, and having orienting ribs and a clamp-receiving aperture substantially as hereinbefore described with reference to Figs. 1, 2 and 3, or 6 and 7 of the accompanying drawings.

L. A. TRANGMAR, B.Sc. C.P.A.,
Agent for the Applicants.

