Jan. 3, 1928. 1,654,801

F. E. GARBUTT ET AL

FILM BRANDING MACHINE

Filed April 26, 1926 3 Sheets-Sheet 1

Fig. 1.

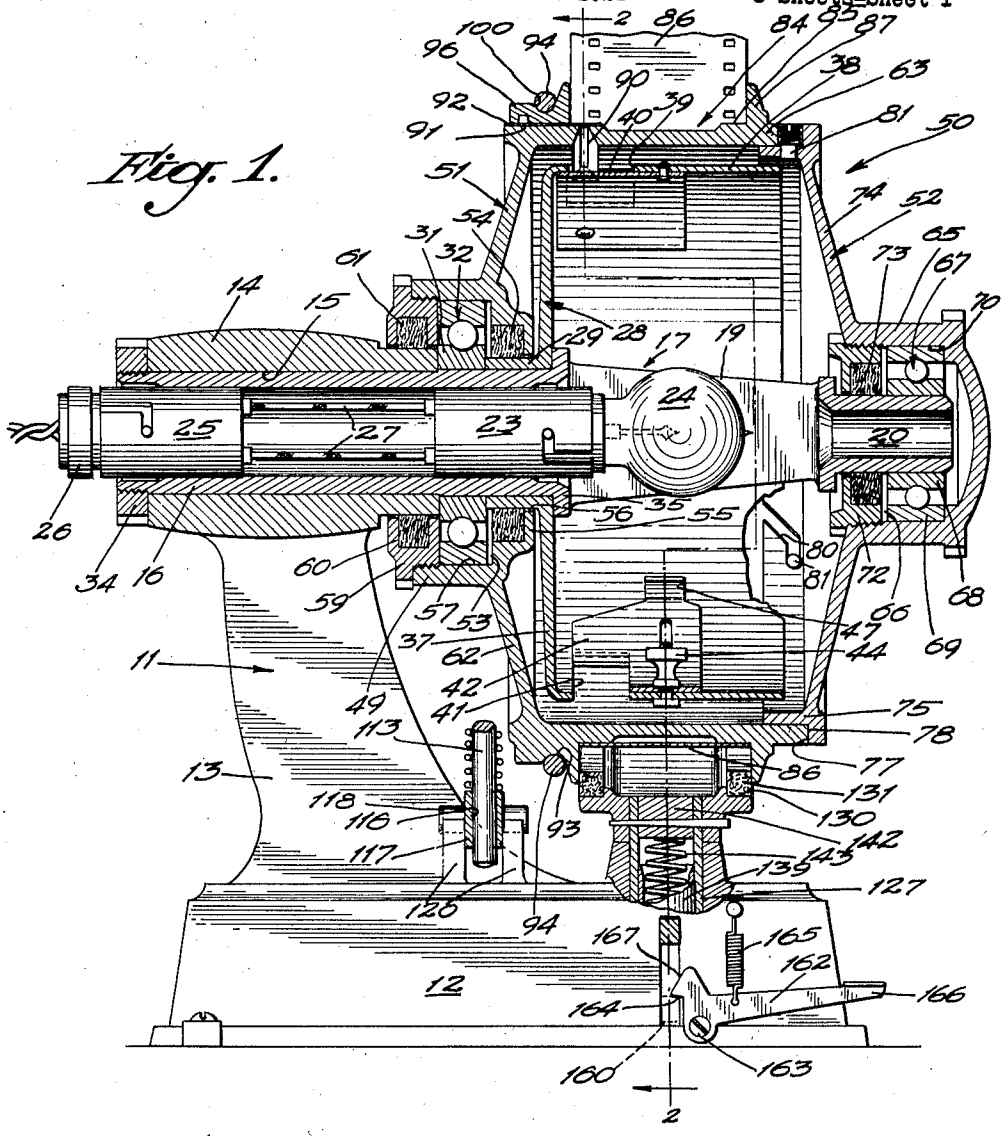
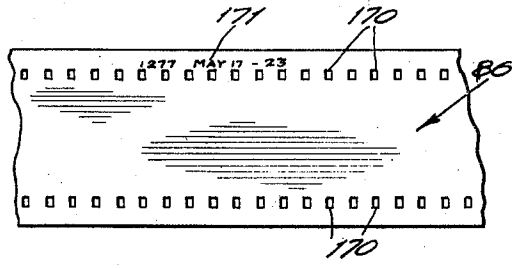


Fig. 4.



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Fig. 3.

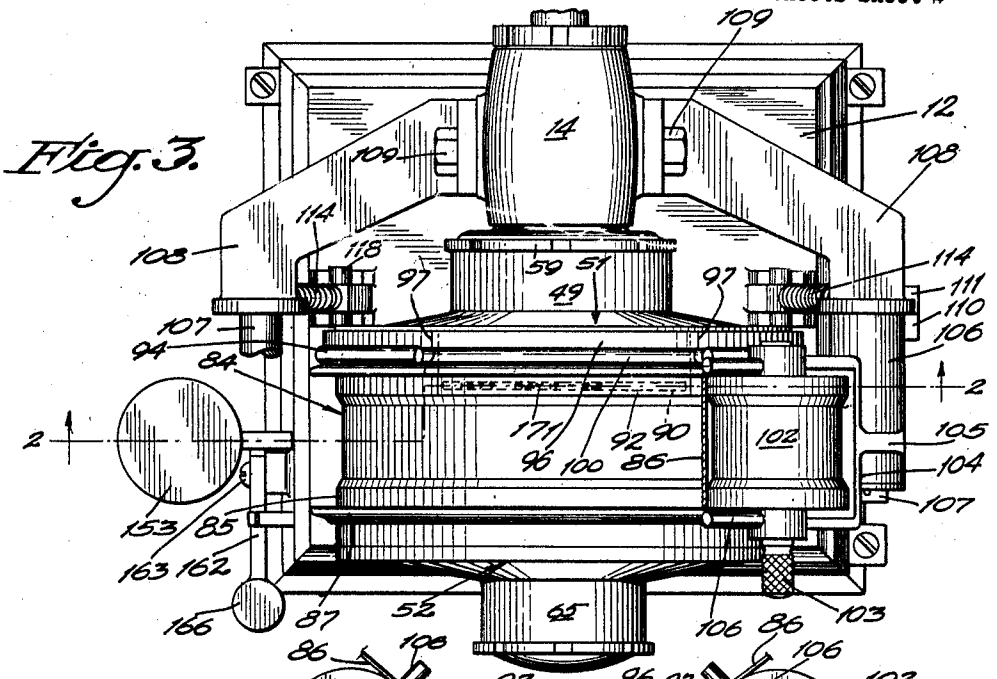
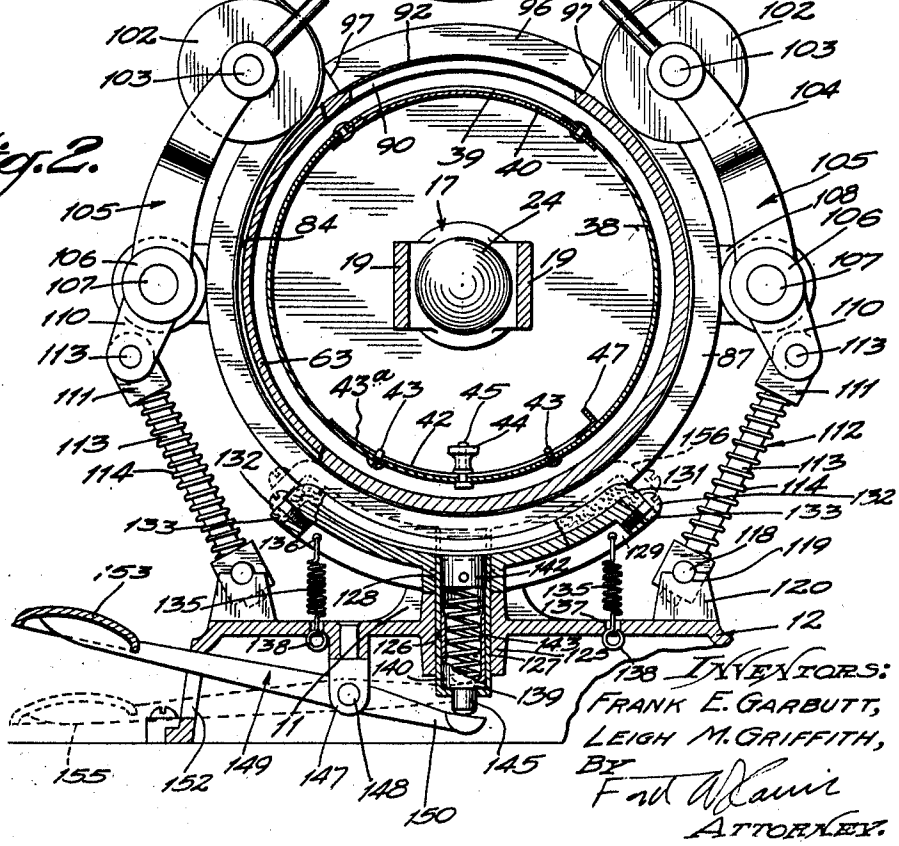


Fig. 2.



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Filed April 26, 1926 3 Sheets-Sheet 3

Fig. 5.

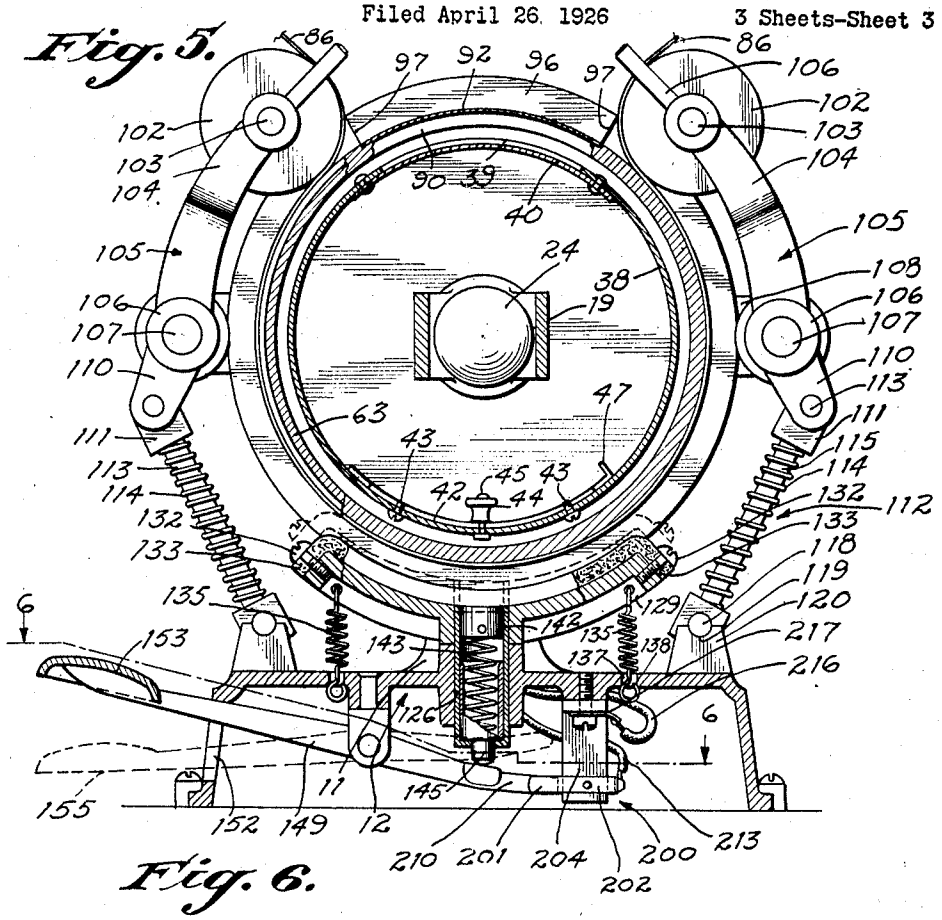
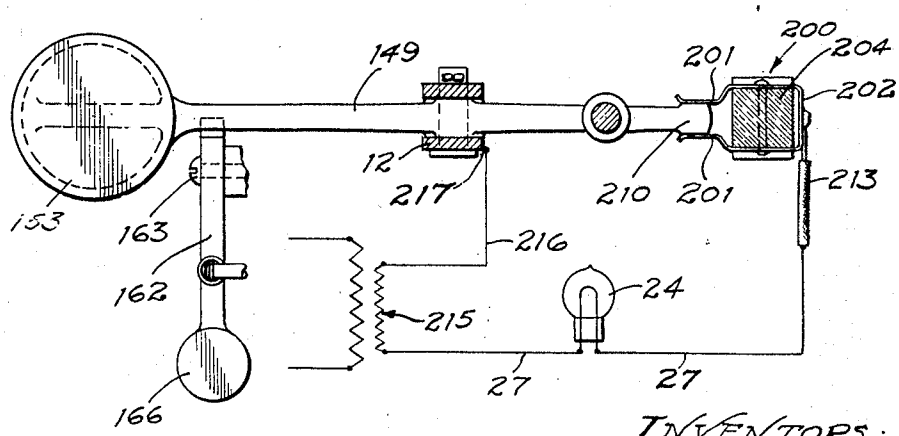


Fig. 6.



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Patented Jan. 3, 1928. 1,654,801

UNITED STATES PATENT OFFICE.

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FILM-BRANDING MACHINE.

Application filed April 26, 1926. Serial No. 104,610.

This invention relates to motion picture film and the marking up of such film for the purpose of identifying it; and this invention relates particularly to a film branding device for photographically marking a film with identifying symbols.

In the motion picture industry large film companies develop film in large amounts. It is highly desirable to keep a close check on the film in regard to the date of developing, the machine in which the film was developed and possibly the workmen in charge of the machine at the time. We have found that such records may be conveniently placed on one edge of the film outside the perforations and that such identification may be photographically impressed thereon preferably immediately before the film enters the developing tanks.

It is therefore a general object of this invention to provide a device for photographically impressing identifying symbols on the edge of a film.

It is a further object of our invention to provide a device of this character which is driven entirely by the film being marked.

It is a still further object of our invention to provide a device of this character in which the film is held tightly in engagement with a rotor of the device.

A still further object of this invention is to provide a device of the character mentioned in which an image plate having images fixed thereon, which are to be impressed on the films, may be readily exchanged when desired.

A further object of this invention is to provide a simple means for removably holding the image plate in place.

It is another object of this invention to provide a device of this character having a light supply means which illuminates the images on the image plate and renders it easy to properly position the images adjacent to an exposure slot of the rotor of the device.

It is a still further object of this invention to provide a device of this character having means for regulating the time of exposure of the film to the identifying images.

It is also an object of this invention to provide a branding device of the character mentioned in which a lamp is surrounded by a lamp housing, and the lamp housing is surrounded by a rotor which is turned by the film passing therearound.

In an automatic film developing machine the film passes continuously through it. When the end of one reel of film being developed is reached it is necessary to quickly splice it with the end of a film of a full reel. It is advisable to clamp the film entering the developing machine while the splice is being made, and we find that a clamp or brake arrangement for this office may be readily incorporated with the branding device of our invention.

It is, accordingly, one of the objects of this invention to provide a film clamping device and more particularly a film clamping device and a film branding device embodied in one structure.

It is another object of this invention to provide a film clamp device or brake which resiliently clamps the film and rotor of the device against motion.

While the film clamp of our branding machine is positioned to clamp the film and rotor of the device against motion, it is desirable that the lamp be extinguished, in order that the heat generated by the lamp will not injure the portion of film held in contact with the rotor while the latter is stopped.

A still further object of our invention therefore is to provide a film branding machine embodying a film clamping device which will open the electrical circuit, energizing the lamp of the machine when the clamping device is set, and which will close this circuit when the clamping device is released.

Other objects and important advantages of this invention will be evinced hereinafter.

Referring to the drawings which are for illustrative purposes only:

Fig. 1 is a vertical cross section taken through a device embodying the features of our invention.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a plan view of Figs. 1 and 2, par-

tially broken away to show certain features.

Fig. 4 is a fragmentary view showing a strip of film having identifying symbols marked thereon by the device of our invention.

Fig. 5 is a similar view to Fig. 2 and shows a form of our invention having means incorporated therewith for opening the lamp energizing circuit when the clamp is set and closing said circuit when the clamp is released.

Fig. 6 is a diagrammatic plan view of the clamp lever taken on the line 6—6 of Fig. 5 and showing the means whereby the lamp circuit is opened and closed by the operation of the clamp lever.

The form of our invention shown in the drawings has a stand 11 which consists of a base 12, an arm 13 which extends upwardly from the base 12, and a hub 14 which is formed in the upper end of the arm 13. The hub 14 is provided with an opening 15 which is formed on a horizontal axis and into which opening 15 a sleeve 16 of a bracket shaft 17 extends. Extending forwardly from the sleeve 16 is a yoke portion consisting of a pair of arms 19 at the forward end of which is a hollow shaft 20. The forward end of the sleeve 16 receives a lamp socket 23 by which a lamp 24 is supported. This lamp 24, as shown best in Figs. 1 and 2, is placed between the arms 19. A plug 25 is carried in the rearward end of the sleeve 16 to which a connector 26 is attached and by means of which electric current is supplied to the plug 25. Extending from the plug 25 to the socket 23 are wires 27 which serve to convey current to and from the socket 23.

Carried at the forward end of the sleeve 16 is a lamp housing 28. The lamp housing 28 has a cylindrical tube 29 which surrounds the inner end of the sleeve 16. Between a rearwardly extended end of the tube 29 and a forward end of the hub 14 is an inner race 31 of a bearing 32. The rearward end of the tube 16 is threaded and a nut 34 is screwed thereupon for the purpose of clamping a lip 35 formed at the forward end of the tube 16 against the light housing 28 for the purpose of securing it and the race 31 tightly in place against the forward end of the hub 14. Extending radially outwardly from the tube 29 is a radial wall 37 and formed at the periphery of the radial wall 37 is a cylindrical wall 38 which surrounds the lamp 24. The upper portion of the cylindrical wall 38 of the lamp housing 28 is provided with an opening 39 across which a window 40 extends. This window is preferably a colored celluloid member which transmits only a small amount of light.

In the lower part of the cylindrical wall 38 there is provided an elongated light aperture 41, the effective length of which is regulated by a shutter 42. The shutter 42 is guided throughout its various positions by pins 43 which extend through a slot 43ª and may be clamped in a desired position by a thumb screw 44 which is screwed onto a threaded pin 45 carried in the cylindrical wall 38. At one end of the shutter 42 there is a projection 47 which may be manually engaged in order to move the shutter 42 into a desired position.

Surrounding the lamp housing 28 is a rotor 50. The rotor 50 includes a casing 51 and a cover 52. The casing 51 has walls 49 forming a concentric cylindrical cavity 53. The narrow, inner portion of the cavity 53 is smaller in diameter than the outer portion and carries a felt ring 54 which contacts an inner annular radial lip 55 which has an opening 56 formed therethrough through which the inner end of the sleeve 16 and the tube 29 extend. The larger portion of the cavity 53 surrounds the ball bearing 32 and an outer race of the ball bearing engages a cylindrical face 57 of this portion of the cavity 53. Screwed into the rearward end of the wall 49, forming the cavity 53, is a felt ring retainer 59 which provides an annular cavity 60 in which a felt ring 61 is carried. Extending outwardly from the walls 49 which form the cavity 53, is a web 62 at the outer end of which a cylindrical wall 63 is formed, which wall 63 extends forwardly and around the cylindrical wall 38 of the lamp housing 28.

The cover 52 has a wall 65 which provides a concentric cavity 66 into which the shaft 20 extends. Surrounding the forward end of the shaft 20 is a bearing 67, an inner race 68 of which engages the cylindrical face of the hollow shaft 20. An outer race 69 of the bearing 67 engages a cylindrical face 70 which surrounds the cavity 66. The inner end of the cavity 66 is closed by a cap 72 which carries a felt 73, the cap 72 and the felt 73 having openings provided therein through which the shaft 20 extends.

Extending outwardly from the wall 65 of the cover 52 is a radial wall 74 at the outer end of which a cylindrical lip 75 is formed. The cylindrical lip 75 is adapted to extend inside the cylindrical wall 63 of the casing 51 and to be in engagement with an inner cylindrical face 76 of this cylindrical wall 63. A radial annular face 77 formed at the outer end of the radial wall 74 is adapted to be in engagement with a forward radial face of the cylindrical wall 63 of the casing 51. The cover 52 is removably retained in place by bayonet catches which consist of bayonet slots 80 formed in the cylindrical lip 75 and pins 81 which are carried at the forward edge of the cylindrical wall 63 and which extend into the bayonet slots 80.

The cylindrical wall 63 of the casing 51

is provided with a film race 84. The film race 84 consists of edge faces 85 which are adapted to be contacted by a film 86 which passes around the rotor 50. Radial edge flanges 87 extend outwardly from the extremities of the faces 85.

An elongated exposure slot 90 is formed in the cylindrical wall 63 so that it extends though the inner film engagement portion 86. This is clearly shown in Figs. 1 to 4. Formed in the cylindrical wall 63 adjacent to the exposure slot 90 is an image plate receiving recess 91 in which an image plate 92 is placed. As shown in the drawings, the image plate 92 extends so that it covers the exposure slot 90. The casing 51 is provided with an annularly semi-cylindrical channel 93 which is formed directly to the rear of the inner or left edge flange 87 of Fig. 1 and resting in this channel 93 is a band 94 which forms a portion of an annulus. A removable section 96 is provided for removably retaining the image plate 92 in place. As will be noted from the drawings, a section of the inner edge flange 87 is cut away and a gap is provided between end faces 97 of the inner edge flange 87. The exposure slot 91 is formed adjacent to this gap and the image plate 92 rests in the gap and in the recess 91 which is formed in this gap. The removable section 96 is placed as shown in the drawings and is adapted to be retained in place by engagement of the band 94 in a channel 100 thereof. As shown in Fig. 3, the band 94 may be rotated so that it does not extend over the removable section 96 and retain it in place, this being provided so that the removable section can be removed and the image plate 92 can be replaced.

The film is held in firm engagement with the race 84 by means of tension rollers 102. These tension rollers 102 are rotatably carried on shafts 103 which shafts 103 are retained by yoke portions 104 of rockers 105. Extending from the ends of the yokes 104 are pins 106 which retain the film 86 in proper alignment on the tension rollers 102 and also serve as a means whereby the rollers may be swung out of the positions shown in the drawings. The rockers 105 are provided with hubs 106 which are pivotally carried on horizontally extending shafts 107. These shafts 107 extend from arms 108 which arms 108 are secured by cap screws 109 to opposite sides of the hub 14 of the stand 11. Extending downwardly from the hubs 106 are arms 110 to which upper enlarged ends 111 of members 112 are pivotally attached by means of shafts 113. Extending downwardly from the enlarged ends 111 are shafts 113 which are surrounded by compression springs 114. The lower ends of the shafts 113 extend through openings 116, provided in blocks 117, the blocks 117 having trunnions 118 which extend horizontally and outwardly therefrom in opposite directions, these trunnions 118 resting in bearings 119 which consist of semi-cylindrical channels in the upper faces of bearing blocks 120. The compression springs 114 are compressed between the upper faces of the blocks 117 and the lower faces of the enlarged end 111 of the members 112. Therefore, the lower arms 110 of the rockers 105 are forced outwardly and the upper yokes 104 thereof are forced inwardly. This causes the friction rollers 102 to firmly hold the film 86 in contact with the film engagement portions 85 of the race 84 formed on the rotor 50.

The film 86 and the rotor 50 may be constrained from movement by a brake arrangement of this invention. As shown in Figs. 1 and 2, the base 12 of the stand 11 is provided with a vertically extending integral tube 125 which provides a vertical cylindrical opening 126. Extending into this opening 126 is a tube 127. The upper end of the tube 127 extends into a hole 128 formed through the central part of a brake shoe 129. This brake shoe, as shown in Fig. 2, is arcuated and conforms to the cylindrical shape of the race 84 of the rotor 50. The shoe 129 is provided with cylindrical edge faces 130 against which leather facings 131 are held, these facings being held in place by screws 132 which extend through ends 133 of the facings 131 and screw into the opposite ends of the shoe 129. As shown in Fig. 1, the facings 131 are positioned so that they may be moved upwardly between the edge flanges 87 and will engage the edge or perforated portions of the film 86 clamping them tightly against the film engagement portions 85 of the film race 84, thus locking the film 86 from movement and the rotor 50 from rotation. The brake shoe 129 is resiliently retained in disengaged position by coil springs 135. These coil springs 135, as illustrated in Fig. 2, connect at 136 to the brake shoe 129 and the lower ends thereof extend through openings 137 formed in the base 12 and have enlarged rings 138 formed on the lower ends thereof which lock their lower ends from upward movement.

Placed in the lower end of the tube 127 is a spring engager 139 having a cup 140. The upper end of the tube 127 is closed by a plug 142 and compressed between this plug 142 and the bottom of the cup 140 is a compression spring 143. Extending downwardly from the cup 140 is a boss 145 of the spring engager 139. Secured to the base 12 is a clevis 147 which carries a shaft 148. Pivotally carried on the shaft 148 is a brake lever 149. An end 150 of the brake lever 149 extends to a point below the boss 145 and in engagement therewith. The other end of

the brake lever 149 extends to the exterior of the base 12 through a slot 152 and is provided with a hand engagement portion 153 by means of which the brake lever 149 is operated. The brake lever 149 may be moved manually into a position indicated by dotted lines 155 in Fig. 2. This causes the end 150 of the brake lever 149 to move the spring engager 139, the tube 127 and the brake shoe 129 upwardly until the brake shoe and facings occupy a position indicated by dotted lines 156 in Fig. 2. By this action the facings 131 are brought into engagement with the perforated portions of the film 86 and will clamp the film and rotor against movement. However, the brake shoe and facings reach the position indicated at 156 before the brake lever 149 reaches the position indicated by dotted lines 155; therefore there is a relative movement between the spring engager 139 and the brake shoe 129, this relative movement serving to compress the compression spring 143. For this reason there will always be a resilient pressure applied against the film and rotor by the facings of the brake shoe.

Referring to Fig. 1, the brake lever 149 may be releasably locked in the position shown by dotted lines 155 in Fig. 2 and by dotted lines 160 in Fig. 1 by means of a catch 162. The catch 162 is pivoted on a pivot 163. A horizontal shoulder 164 is provided by the catch 162 and is adapted to engage an upper face of the brake lever 149 and to retain it in a lower position. The catch 162 is resiliently held in the position shown in Fig. 1 by a coil spring 165 and may be removed from this position by manual engagement with an extending lever 166. As the brake lever 149 is moved downwardly it engages an oblique face 167 which swings the catch 162 so that the brake lever 149 may move downwardly past it. The catch 162 is immediately returned to full line position when the brake lever has moved past it and it will engage the lever, thus releasably retaining it in lower position.

In Fig. 4 we show a fragmentary view of the film 86. This film 86 is perforated near opposite edges thereof, as indicated at 170. Identifying symbols are impressed on one edge of the film in a space between the perforations and the extreme edge of the film, such as indicated at 171 in Fig. 4. These identifying symbols may be of any character.

In Figs. 5 and 6 is shown an added feature of our invention comprising a lamp circuit breaking switch 200 which is associated with the brake lever 149.

The switch 200 has spring contacts 201 forming the arms of a V shaped switch terminal member 202. This member 202 is riveted, as shown, upon the lower portion of a recto-prismoidal shaped column 204 formed of insulating material and secured at its upper end by machine screws 206 to the base 12.

The other terminal of the switch 200 is in the form of a lug 210 formed to extend longitudinally from the inner end of the lever 149. The lug 210 and the contacts 201 are so relatively positioned that when the lever 149 is in its released position, shown in full lines in Fig. 5, the lug 210 is forced between the contacts 201 so as to slightly spread these apart, thus making a good electrical contact between the lug 210 and the contacts 201. The switch 200 is now closed. The switch 200 is included in a lamp energizing circuit 212 which may be traced from the switch terminal member 202 through a conducting wire 213 soldered thereto, which connects with one of the wires 27 which leads to the lamp bulb 24. From the lamp 24 the circuit 212 leads through the other wire 27, through the secondary winding of a transformer 215, which is the source of current in the circuit 212, and thence through a wire 216, which is secured at 217 to the frame 12, through the frame 12 to the lever 149 and through the lever 149 to the lug 210, which is in contact with the contacts 201 of the switch terminal member 202 from which member the above tracing of the circuit 212 commenced.

It is thus obvious that when the lever 149 is moved into its film clamping position, shown by dotted lines 155 in Fig. 5, the lug 210 will be removed from engagement with the contacts 201, thus opening the circuit 212 and causing the lamp 24 to be extinguished. The lamp 24 will remain out until the lever 149 is returned to film releasing position, in which it is shown in full lines in Fig. 5, whereupon the switch 200 will be closed, thus closing the circuit 212 and causing the lamp 24 to be again energized.

It might be well to state at this time that this invention is adapted to be used in conjunction with a film developing machine such as shown in our application entitled Film developing machine, Serial No. 104,609, filed April 26, 1926. In the operation of this invention the film 86 is first extended around the rotor 50 in the race 84 thereof. The tension rollers 102 may be swung out of engagement to permit a threading of the film around the rotor by engaging the pins 106 and swinging them outwardly from the rotor. For each different machine, and each division of workmen, or for each separate series of film reels, it may be desirable to have a particular identifying symbol. The image plate 92 having the images fixed thereon is placed as previously described. The correct positioning of the images over the exposure slot 90 may be easily obtained, since there is a faint light shining through the window 40 which light

passes through the exposure slot 90 and illuminates the portion of the image plate directly thereabove. Therefore, the images are plainly visible and may be properly adjusted. It is, of course, understood that the rotor 50 when placing the image plate 92 thereon is in such a position that the exposure slot 90 is in substantial alignment with the window 40.

When the desirable preliminary adjustments have been made and the film has been extended around the rotor in contact therewith, the film may be moved and at this time the rotor 50 will turn therewith. A light constantly shines through the light aperture 41 when the clamping lever 149 is in releasing position, as shown in Fig. 2. As the rotor 50 revolves, the exposure slot 90 moves into alignment with the exposure slot 41 and light passes therethrough, through the translucent portions of the image plate 91, and photographically impresses the images on one edge of the film in places such as indicated at 171 in Fig. 4. It is obvious that the exposure slot 90 moves into alignment with the light aperture 41 at every rotation thereof. Therefore the film is photographically impressed with identifying symbols at intervals which may be about every foot. The film from our invention herein described may pass to the developing machine where the film is developed, bringing out the images on the frames and also bringing out the images of the identifying symbols, and thus the identifying symbols are permanently fixed thereon.

The effective length of the aperture 41, as previously described, may be adjusted by moving the shutter 42. This is desirable so that the photographic impressions of the indicated symbols will not be over or under exposed. Sometimes the apparatus is run faster or slower than a normal speed for certain reasons, and it is therefore desirable to either lengthen or shorten the effective length of the light aperture 41. To make this adjustment it is necessary to remove the cover 52, which may be easily done, since it is retained in place only by the bayonet catch arrangement which has been already described.

When the end of the film 86 is reached and it is desired to splice another length of film thereinto the brake lever 149 is depressed into the position shown by dotted lines 55 and 60 of Figs. 1 and 2 respectively, and the brake is applied as previously explained. This brake engages the film and exerts sufficient pressure thereon to lock the rotor 50 and the film against movement. When the lamp circuit breaking device illustrated in Figs. 5 and 6 is embodied in our film branding machine, the circuit of the lamp 24 is held open as long as the lever 149 is retained in braking position. After the splice has been made, the catch 162 may be released, thus closing the circuit of the lamp 24 and allowing the film to again move and pass continuously through the device of our invention, and also through the film developing machine or to the apparatus in conjunction with which this invention is being used.

The device of our invention has certain very beneficial advantages. In the first place, the rotor is driven entirely by the film passing therearound. Therefore, there is no necessity for providing separate driving means for the rotor and also there will be no slippage of the film on the film race 84. This is very desirable since film developing machines and such apparatus handling film on spools do not operate at a uniform rate of speed, but must operate faster or slower to compensate for certain exigencies, such as stretch and shrink of the film. Therefore, the rotor must be arranged so that it may fluctuate in speed with the film.

Another feature of the invention is the removability of the image plate 92 and the ease with which it may be removed and be replaced. The feature of providing the window 40 so that a slight amount of light may be had to assist in arranging the images on the image plate in correct position is also very desirable.

The shutter 42, although not absolutely necessary, is advantageous, since the film may pass thereover at various rates of speed. For example, if a certain film has been taken in bright light it may be desirable not to develop it to such an extent as a film which was photographed where there was not so much light. In this case the entire developing machine would run at a high rate of speed and also the rotor 50 would rotate at a higher rate of speed. Therefore, the time that the exposure slot 90 was in alignment with the light aperture 41 would be less and it would, therefore, be desirable to increase the effective length of the light aperture so that a proper exposure of the film to the identifying symbols could be had.

The brake feature of our invention is also very important since it permits the film to be very easily stopped when it is desired to make a splice. It should be understood, of course, that this invention is particularly adapted for use in conjunction with the film developing machine shown in our co-pending application which has been referred to hereinbefore, this film developing machine providing a take-up means by means of which film would still be fed to the developing machine even though the extreme forward end thereof was clamped against motion.

As explained in the specification, the brake shoe exerts a resilient pressure against the

film and not a positive pressure thereagainst. This is desirable since the pressure therefor will always be substantially the same and will be sufficient to restrict the film and the rotor 50 from a movement.

It is quite advantageous to incorporate the brake in the film branding device. Not only is this conducive to economy, but it is desirable to clamp the film at this point.

The lamp circuit switch associated with the braking lever 149 is a great advantage if not an absolute necessity to the safe operation of our branding machine. When the film is clamped against movement through our branding machine for but a short length of time, the circuit breaker would not be necessary. But it is not possible to anticipate just how long each stop in the operation of the branding machine is going to be; therefore, the circuit breaker is essential to remove all danger of damage to the film by the lamp through the operator's forgetting to turn out the lamp when long stops are made.

We claim as our invention:

1. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; and means for removably holding said image plate in place.

2. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; and means for removably holding said image plate in place.

3. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; means for removably holding said image plate in place; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

4. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; means for removably holding said image plate in place; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

5. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; means for removably holding said image plate in place; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

6. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; means for removably holding said image plate in place; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

7. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aper-

ture; an image plate covering said exposure slot; a removable section placed at one side of said film race, adapted to hold said image plate in place; and a band extending around said rotor for holding said removable section removably in place.

8. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; a removable section placed at one side of said film race, adapted to hold said image plate in place; and a band extending around said rotor for holding said removable section removably in place.

9. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; a removable section placed at one side of said film race, adapted to hold said image plate in place; and a band extending around said rotor for holding said removable section removably in place.

10. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; a removable section placed at one side of said film race, adapted to hold said image plate in place; and a band extending around said rotor for holding said removable section removably in place.

11. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; a removable section placed at one side of said film race, adapted to hold said image plate in place; a band extending around said rotor for holding said removable section removably in place; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

12. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; a removable section placed at one side of said film race, adapted to hold said image plate in place; a band extending around said rotor for holding said removable section removably in place; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

13. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; a removable section placed at one side of said film race, adapted to hold said image plate in place; a band extending around said rotor for holding said removable section removably in place; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

14. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with

said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; a removable section placed at one side of said film race, adapted to hold said image plate in place; a band extending around said rotor for holding said removable section removably in place; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

15. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; means for removably holding said image plate in place; and a brake adapted to engage and clamp said film and said rotor from movement.

16. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; means for removably holding said image plate in place; and a brake adapted to engage and clamp said film and said rotor from movement.

17. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; means for removably holding said image plate in place; and a brake adapted to engage and clamp said film and said rotor from movement.

18. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; means for removably holding said image plate in place; and a brake adapted to engage and clamp said film and said rotor from movement.

19. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; means for removably holding said image plate in place; a brake adapted to engage and clamp said film and said rotor from movement; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

20. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; means for removably holding said image plate in place; a brake adapted to engage and clamp said film and said rotor from movement; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

21. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; means for removably holding said image plate in place; a brake adapted to engage and clamp said film and said rotor from movement; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

22. A device of the class described com-

prising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a shutter for regulating the effective length of said light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; means for holding said film in contact with said film race; an image plate covering said exposure slot; means for removably holding said image plate in place; a brake adapted to engage and clamp said film and said rotor from movement; and a window formed in said lamp housing adapted to furnish sufficient light for properly placing said image plate.

23. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; and means for co-ordinately clamping said film against movement and de-energizing said light source.

24. A device of the class described comprising: a light source; a lamp housing surrounding said light source, said lamp housing having a light aperture; a rotor surrounding said lamp housing and having a film race adapted to be engaged by a film, said rotor being rotated by said film and said rotor having an exposure slot formed therein through which light passes when same is in alignment with said light aperture; an image plate covering said exposure slot; and means for co-ordinately clamping said film against movement and de-energizing said light source, said means causing said light source to be energized when said means is caused to release said film.

In testimony whereof, we have hereunto set our hands at Los Angeles, county of Los Angeles, California, this 19 day of April, 1926.

FRANK E. GARBUTT.
LEIGH M. GRIFFITH.