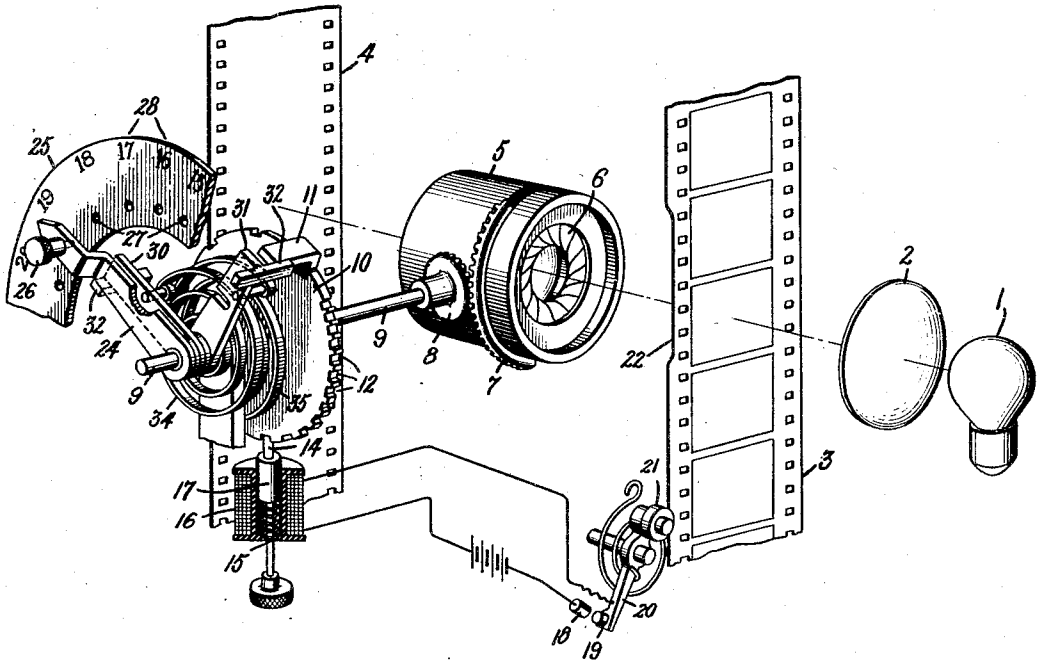
Oct. 17, 1933. A. J. BRADFORD 1,931,128

FILM PRINTING MACHINE

Filed Jan. 24, 1931



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Patented Oct. 17, 1933 1,931,128

UNITED STATES PATENT OFFICE

1,931,128

FILM PRINTING MACHINE

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Application January 24, 1931. Serial No. 511,037

5 Claims. (Cl. 88—24)

My invention relates to film printing machines which are provided with adjustable apertures for regulating the amount of exposing light. Machines of this character heretofore constructed for making prints of motion picture films which were of such a character that changes in light were required for different parts thereof were provided with means under the control of the negative film for stopping the machine whenever a point is reached at which a change in light is required. The operator has then made the proper change in the light aperture and restarted the machine. Such a procedure is objectionable since it causes a loss of time and extra wear on the machine due to frequent starting and stopping. Moreover, when the machine is used to print a sound record at the same time as a picture record, stopping of the machine before the end of the film is reached causes a fogged spot in the sound record which results in an unpleasant noise when the record is reproduced. My invention has for its object the provision of an improved film printing machine which is simple, efficient and avoids the above noted objections. In accordance with my invention I have provided the machine with an aperture presetting apparatus, semiautomatic in character, by which the operator may pre-set the apparatus for the next change in aperture adjustment and when the proper time for the change is reached the machine will automatically make the adjustment for which it was preset.

My invention will be better understood from the following description taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claims.

Referring to the drawing in which the single figure represents an embodiment of my invention applied to an optical printer, light from the lamp 1 is concentrated by the condensing lens 2 on the film 3, such as a negative, from which the print is to be made. Between the negative 3 and the print film 4 is the objective 5 by which an image of the negative is formed on the film 4. The apparatus above described is shown in a more or less diagrammatic manner, the enclosing casings, masks and film driving apparatus being purposely omitted in the interest of clearness in the illustration. Associated with the lens 5 and in the present case having the same mounting is the iris diaphragm 6 by means of which the amount of exposing light is controlled. The iris diaphragm is adjusted by means of the gear segment 7 meshing with which is the pinion 8 mounted on the shaft 9. Secured to shaft 9 is the actuating disc 10 having the forwardly extending ear 11 and a series of peripheral notches 12. This disc 10 is retained in various adjusted positions by the detent 14 which is normally held in engagement with one of the notches in the disc by the spring 15 but which is adapted to be electromagnetically withdrawn therefrom by the coil 16 acting upon the magnetic plunger 17 carried by the detent. For closing the circuit of the coil 16 I have shown a film controlled switch having cooperating fixed and stationary contacts 18 and 19, the latter contact being carried by the spring pressed arm 20. Carried also by this arm is the roller 21 which is arranged to engage one edge of film 3, this edge being shown as provided with a notch 22 which is of such a depth that when the roller drops into the notch the contacts 18 and 19 are closed. The film 3 is provided with a notch such as shown at 22 at each point thereof at which a change in the setting of the diaphragm is required. Loosely mounted on the shaft 9 is the pre-setting arm 24, the outer end of which is shown pointed and cooperates with the scale and detent plate 25. Arm 24 also is provided near its outer end with the spring pressed detent 26 which is adapted to engage in any one of a plurality of openings 27 thereby retaining the arm against displacement and in a position pointing to one or another of the several indicia 28 which refer to various degrees of diaphragm opening. Also loosely mounted on shaft 9 are the two arms 30 and 31 each having at its outer end a cross bar 32 of sufficient length to overlap the presetting arm 24 and the ear 11 on disc 10, it being noted that the cross bars 32 are arranged respectively at opposite sides of the arms 30 and 31. Two spiral springs 34 and 35 each have their inner ends secured to the shaft 9 and their outer ends attached by short pins to the respective arms 30 and 31. These springs are under a certain amount of initial tension so that when the disc 10 is released by detent 14, it will be moved in one direction or the other so as to bring the arms 24, 30 and 31 and the ear 11 into alignment.

In the operation of the apparatus when the printing operation is started the pre-setting arm 24 is set to the proper point on the scale to give the desired exposure for the first section of the film. The disc 10 may be released by manually closing the contacts 18 and 19 or if desired by manually withdrawing the detent 14. At any time during the printing of this first section of the film the operator resets the arm 24 to give the exposure desired for the next section of the film.

The setting of the diaphragm, however, does not change immediately since the disc 10 is retained by the detent 14 until the next section of the film is reached when the roller 21 dropping into a notch, such as shown at 22, closes the circuit of coil 16 to thereby withdraw the detent 14. Upon withdrawal of the detent 14 the disc 10 is free to be rotated by one or the other of the springs 34—35 to rotate the disc 10 to a position in which the ear 11 thereon aligns with the arm 24 and thus adjusting the iris diaphragm to the new setting.

It will be seen that by reason of this construction the presetting arm 24 may be moved in either direction to change the setting of the diaphragm, the double spring arrangement always causing the disk 10 to follow the presetting arm when released by the detent 14. It may be found desirable to employ suitable means to dampen the movement of the disk 10 and to provide cushioning means between the ear 11 and the cross bars 32 to reduce noise and vibration.

I have chosen the particular embodiment described above as illustrative of my invention and it will be apparent that various modifications may be made without departing from the spirit and scope of my invention which modifications I aim to cover by the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. Aperture presetting apparatus for a film printing machine comprising an aperture varying member, means for retaining said member against movement, a pair of resilient members between the aperture varying member and the retaining means having initial tension and tending to rotate the aperture varying member respectively in opposite directions, a presetting member arranged to increase the tension of the respective resilient members when moved in opposite directions and means controlled by the film for releasing said retaining means.

2. Aperture presetting apparatus for a film printing machine comprising an aperture varying member, means for retaining said member against movement, a pair of springs under initial tension between the aperture varying member and the retaining member tending respectively to move the aperture varying member in opposite directions, a movable presetting member arranged to be retained in any one of a plurality of positions and having means for increasing the tension of the respective springs in response to movement of the presetting member in one direction or the other and means controlled by the film for releasing the retaining means.

3. Aperture presenting apparatus for a film printing machine having an iris diaphragm comprising a rotatable member operatively connected with said diaphragm, a retaining device for said member, a rotatable presetting arm, means comprising a plurality of springs each having one end secured to the rotatable member arranged to move the member in either direction to cause it to follow the arm, and means controlled by the film for releasing the member.

4. In an optical film printing machine having an iris diaphragm, presetting apparatus for said diaphragm comprising a rotatable member operatively connected with said diaphragm, a detent for said member, a rotatable presetting arm having means for retaining it in a set position, a pair of springs each having one end operatively connected with said member and having their opposite ends arranged to be moved by the presetting arm, and film controlled means for withdrawing the detent.

5. In an optical film printing machine having an iris diaphragm, presetting apparatus for said diaphragm comprising a shaft operatively connected with said diaphragm, a disk secured to the shaft and having detent notches therein, a detent arranged to engage in said notches, means controlled by the record film for withdrawing the detent, a plurality of arms loosely mounted on said shaft, a plurality of spiral springs each having one end secured to the shaft and having their opposite ends connected with the respective arms, a presetting arm loosely mounted on said shaft, a cooperating scale, and a detent carried by the presetting arm arranged to engage said scale, said first mentioned arms having end portions arranged respectively to engage opposite sides of the presetting arm and said disk.

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