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Mar. 20, 1923. 1,448,906

J. ALTSCHULER ET AL

FILM NUMBERING MACHINE

Filed Feb. 3, 1917 2 sheets-sheet 1

Fig. 4.

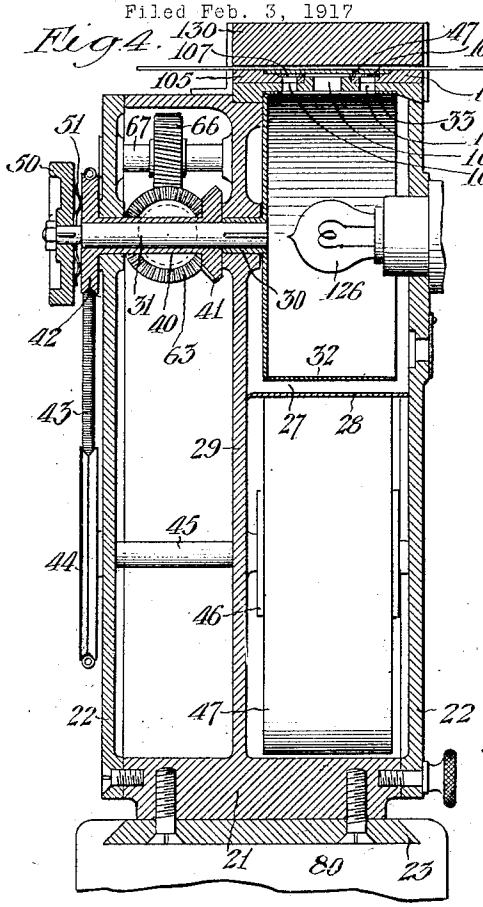


Fig. 1.

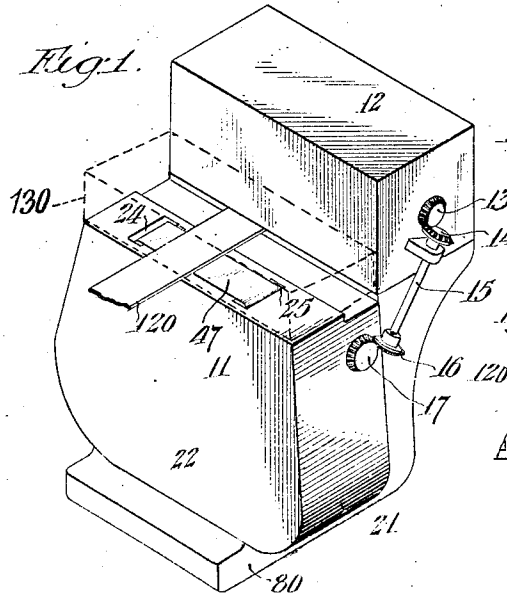


Fig. 5.

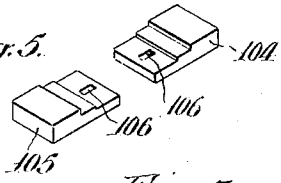
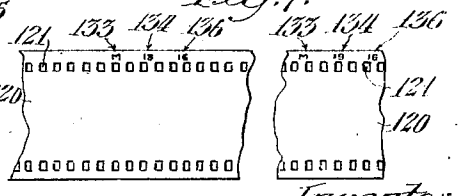


Fig. 7.



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Fig. 3.

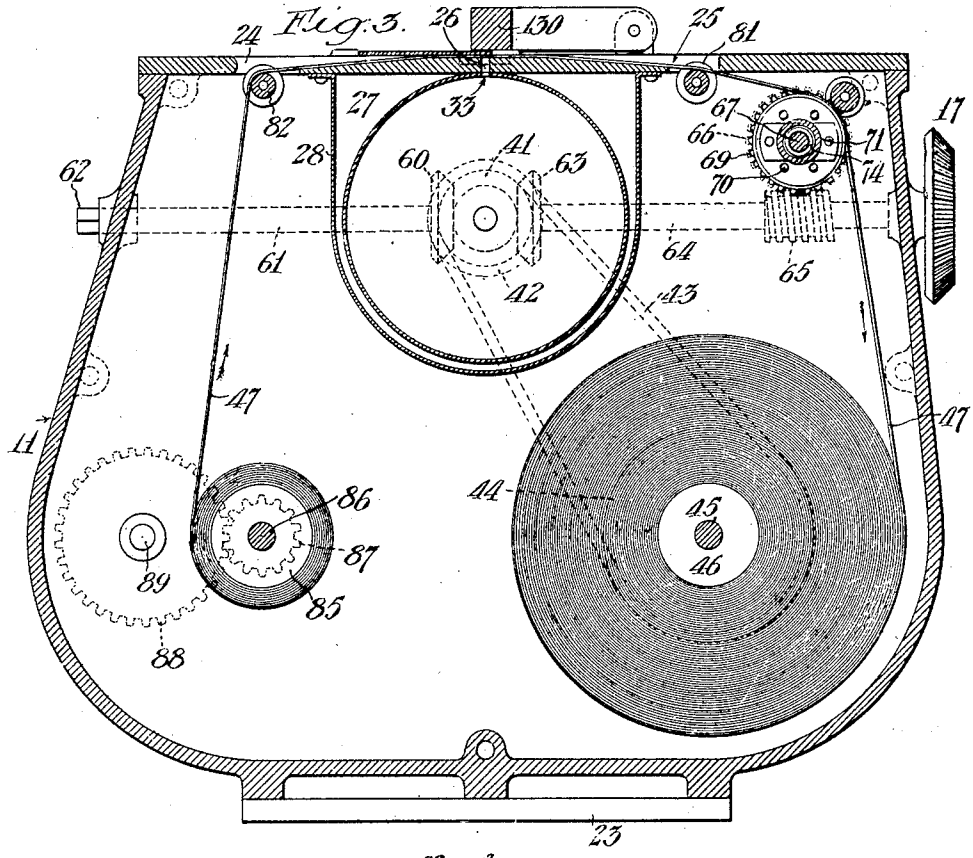


Fig. 2.

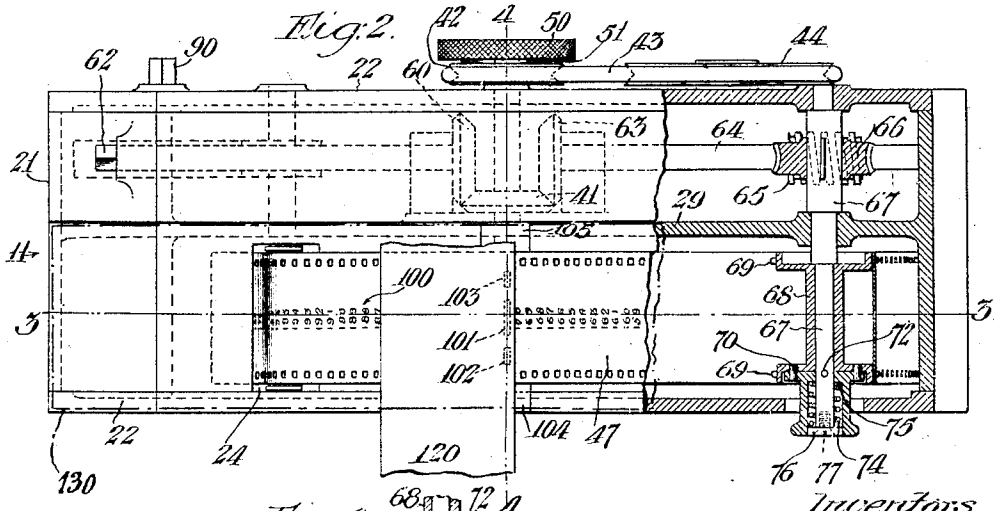
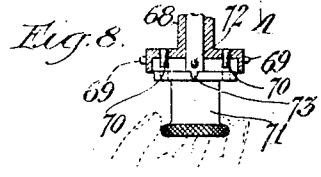


Fig. 8.



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Patented Mar. 20, 1923. 1,448,906

UNITED STATES PATENT OFFICE.

JOSEPH ALTSCHULER AND DEMETRY ISNOW, OF LOS ANGELES, CALIFORNIA, ASSIGNORS TO KEYOGRAPH CORPORATION, A CORPORATION OF DELAWARE.

FILM-NUMBERING MACHINE.

Application filed February 3, 1917. Serial No. 146,856.

To all whom it may concern:

Be it known that we, JOSEPH ALTSCHULER and DEMETRY ISNOW, the former being a citizen of the United States and the latter being a subject of the Czar of Russia, both residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Film-Numbering Machine, of which the following is a specification.

Our invention relates to the art of producing motion pictures, and particularly to the film used in that art. This film is very expensive and is used in large quantities by many of the motion picture producing companies. In the manufacture of pictures, large amounts of film are involved and it is often necessary to discard certain portions or reproduce certain portions. The principal object of our invention is to provide means by which every foot of film can be instantly identified and instantly found.

This we accomplish by giving to each foot of film an identifying mark by which it can be positively identified. The utility of our invention can be best illustrated by considering its use in connection with the production of an actual picture. We will assume that a comedy is to be produced in which there is to be a great deal of rapid action and certain ludicrous situations. In the production of such a comedy many thousand feet of negative film may be taken. From this film a positive film is printed and this film is taken by the director into the projecting room and thrown upon the screen. The director orders it to be cut and arranged, and in so doing discards large portions of it. The re-arranged positive is then used as a model for the cutting and arrangement of the original negative. Where large amounts of the original positive negative have been discarded the cutting and re-arrangement of the negative is an arduous and difficult task, as the action on the two films must be compared to identify the film. In using our invention, a negative film is used in which each foot is given an identifying mark, and these identifying marks are printed on the positive. In producing the reassembled negative, it is simply necessary to compare the marks on the two films, and by duplicating the markings it is possible to immediately produce at a small cost a negative that will print new positives that are an exact duplicate to the positive assembled according to directions of the director.

After the positives have been released and have gone into actual service in the theatre, they are often damaged, and it becomes necessary to order reprints for the injured portion. At the present time this is done by identifying the scene and describing the action of the parts immediately before or immediately after the injured portion, specifying the number of feet needed. By using our invention it is possible to order the injured film by number with a positive assurance that the film sent will agree in every particular with that injured.

A further object of our invention is to provide on each foot of film consecutive serial numbers for the purpose of keeping records and accounting for all of the film.

A still further object of our invention is to mark on each foot of the film a consecutive serial number accompanied by a date.

It is common practice in the motion picture art for the motion picture producing companies to buy unperforated negative film, which they perforate themselves when they are ready to use it, thus taking care of any shrinkage or other distortion of the film in shipment. A still further object of our invention is to provide means for consecutively numbering and dating each foot of film at the time it is perforated, our film numbering device being especially adapted for use in connection with a perforator.

A still further object of our invention is to provide a novel and useful apparatus for accomplishing the above objects, this apparatus being entirely automatic in its action and being very inexpensive to install and maintain.

Further objects and advantages will be set forth more in detail hereinafter, or will be evident to one skilled in the art after an inspection of the drawings in connection with the following specification.

In the drawings, which are for illustrative purposes only:

Figure 1 is a perspective view of our invention applied to a diagrammatically shown perforator.

Fig. 2 is a plan view of our invention.

Fig. 3 is a section on a plane represented by the line 3—3 of Fig. 2.

Fig. 4 is a section on a plane represented by the line 4—4 of Fig. 2.

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Figs. 5 and 6 are perspective views of the dating slides.

Fig. 7 is a view of the film.

Fig. 8 is a detail view of the clutch member as it is being disengaged.

In Fig. 1, the film numbering machine 11 is shown operating in connection with a perforator 12, this perforator forming no part of the present invention and being shown simply as a square box in which suitable mechanism is supposed to be located and suitably driven. The perforator is provided with a bevel gear 13 which meshes with a bevel gear 14 secured to a shaft 15 which carries a bevel gear 16 which in turn is connected to a bevel driving gear 17 on the numbering machine 11. The numbering machine 11 has a case 21 having side covers 22 and having a base 23 which is so shaped that it can slide in a dove-tail groove in a sub-base secured to the perforator 12.

Formed in the top of the case 21 is an exit opening 24 and an inlet opening 25. Located between the openings 24 and 25 is a light slot 26 which opens into a light chamber 27 which is surrounded by a metal case 28. Formed in the center of the case 21 is a central partition 29 to which the case 28 is secured, the case 28 also abutting against one of the covers 22 so as to make a light-tight enclosure. Secured to a sleeve 30, which is rigidly secured to a shaft 31, is a cylindrical shutter 32, this shutter having a light aperture 33 formed axially in the wall thereof, the aperture 33 being of suitable size and shape to register with the light slot 26 when the shutter 32 is in the proper position. Turning freely on the shaft 31 is a sleeve 40, to which a central bevel gear 41 is rigidly secured. The sleeve 40 extends through the side cover 22 and has a band wheel 42 rigidly secured thereon. This band wheel 42 carries a flexible belt 43 which passes over a band wheel 44 carried on a winding spindle 45. This winding spindle 45 carries a reel 46 on which a printing film 47 is wound up. Mounted on the end of the shaft 31 is an adjusting wheel 50, this wheel being provided with a friction spring 51 pressing against the band wheel 42. The spring 51 has sufficient tension so that the wheel 50 and the band wheel 42 move together under normal conditions, but does not have sufficient friction to prevent the wheel 50 from being turned by hand into any position desired independent of the wheel 42.

Meshing with the gear 41 is a bevel gear 60 which is carried on a shaft 61 which terminates in a square head 62 outside the case 21, to which a wrench may be applied if desired. Meshing with the gear 41 on the opposite side of the gear 60 is a bevel gear 63 which is carried on a shaft 64 to which the gear 17 is secured. A worm 65 is also secured on this shaft, this worm meshing with a worm gear 66 which is carried on a shaft 67. Turning freely on the shaft 67 is a sprocket wheel 68, this sprocket wheel 68 having pins 69 on the periphery thereof so placed as to engage the printing film 47 which passes thereover. Secured in the end of the sprocket wheel 68 and projecting axially therefrom are a plurality of pins 70. Sliding axially on the shaft 67 is a clutch member 71. Secured in the shaft 67 is a pin 72, this pin being normally held in a slot 73 formed in the clutch member 71. The clutch member 71 is held in engagement with the pin 72 and with the pins 70 by means of a compression spring 74 which acts against a small shoulder 75 on the clutch member and against a plate 76 secured by means of a screw 77 to the end of the shaft 67. The pins 70 and 72 being engaged by the clutch member 71, the shaft 67 and the sprocket 68 are constrained to move together. When it is desired to disengage the sprocket 68 from the shaft 67, the clutch member 71 is pulled outwardly and turned slightly so that the pin 72 cannot drop into the slot 73. This disengages the clutch member 71 from the pin 70 so that the shaft 67 can turn without turning the film.

In practice, a base 80 is provided, this base 80 forming a part of the perforating machine 12, and the numbering machine 11 being so mounted that it can be slid along in this base due to the dovetails 23, so that the gear 17 can be thrown out of engagement with the gear 60. A roller 81 is provided below the slot 25 and a roller 82 is provided below the slot 24. The printing film 47 is wound off a reel 85 which is mounted on a shaft 86 to which is secured a pinion 87. A gear 88 meshes with the pinion 87 and is secured to a shaft 89 which projects through the side cover 22 of the case and is provided with a square shank 90 on which a wrench may be placed.

The film 47 passes over the light slot 26. Printed on the center of the film 47 are a series of consecutive numbers 100, these numbers being somewhat shorter than the central aperture 101 of the light slot 26. Formed on either side of the central aperture 101 are dating slots 102 and 103. Sliding in the side of the case are two date slides 104 and 105, these slides consisting of a metal member having a slot 106 therein and having a celluloid or glass dating plate 107 secured thereto. Formed on the dating plate 107 are words, letters, or figures, denoting particular days or particular months of a given year. A sufficient number of slides 104 and 105 are provided to cover all the days and months that the numbering machine is to be operated. The negative film 120 to be numbered passes through the per-

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forating machine 12, and passes over the light slot 26 in such a position that the light slot 26 is outside the perforations 121 of that film. Suitable driving means are provided for all the mechanism, and suitable winding or unwinding means are provided for the negative film 120. This apparatus forming no part of the present invention is not illustrated. The two films are held in contact by a hinged and weighted gate 130 as is clearly shown in Figs. 3 and 4.

The method of operation of the invention is as follows:

The perforator being suitably driven, the bevel gear 13 drives the bevel gear 17 through the gears 14 and 16 and the shaft 15. The bevel gear 17 drives the shaft 64, which in turn drives the gears 60 and 41. The shaft 61 turns freely and is not used for any purpose while the machine is operating normally. The gear 41 drives the band wheel 42 through the sleeve 40, and the band wheel 42 drives the adjusting wheel 50 through the springs 51. The wheel 50 drives the shaft 31 which in turn drives the shutter 32. A suitable luminous source, such as an incandescent lamp 126, is placed inside the shutter 32. The belt 43 drives the sprocket 44 and winds up the film 47 in the direction of the arrows. This film passes over the teeth 69 of the sprocket 68 which is driven through the clutch member 71 and the shaft 67 by means of the worm gear 66 of the worm 65. The purpose of the worm 65 and the worm gear 66 and the sprocket 71 is to provide for an accurate movement of the film 47 in synchronism with the movement of the film 120. The film 120 moves intermittently, due to the mechanism in the perforator 12 being held stationary while the perforations are being made, and then being advanced a certain distance for the purpose of making new perforations. The films 120 and 47 therefore move at right angles to each other and in perfect synchronism, the film 47 unwinding from the reel 85 and being passed over the rollers 81 and 82. The gearing is so arranged, that the aperture 33 registers with the aperture 26 at one of the stationary periods of the films and at regular intervals along the film 120. These intervals can conveniently be one foot, but may be longer or shorter if desired.

Whenever the aperture 33 registers with the aperture 26, light from the lamp 126 passes through these apertures and through the celluloid plates 107 and the film 47 to the sensitized emulsion on the film 120. It is to be understood that the film 120 is either fully covered by sheathing, not shown, or the whole operation takes place in a dark room, the latter being the usual method of procedure. The film 120 has therefore printed on its extreme edge a series of symbols, such as those shown in Fig. 7, and these symbols appear when the film is subsequently developed. These symbols are outside the perforations 121 and usually consist of a letter 133 denoting the month, a number 134 denoting the number of feet of film, and a number 136 denoting the day of the month. By this means, each day's run is printed to show the day on which it was perforated and numbered, and each foot of the film is given a consecutive number 134. While the apparatus is shown in connection with a perforator 12, and while the films 120 and 47 are described as being moved intermittently, it is possible to number the film 120 without the use of the perforator 12, it simply being run by the film 47 at a constant speed, the film 47 being driven at a constant speed having a certain ratio to the speed of the film 120. The shutter 32 will then make an exposure at certain definite intervals and the numbers will be printed on the edge of the film. We find that the numbers will be somewhat blurred if the film is run constantly, and prefer the intermittent motion, although a constant speed is possible and practical and is included in the fundamental conception of our invention.

It is necessary that the aperture 33 and the shutter 32 register with the light slot 26 when the numbers 100 on the film 47 are accurately over the aperture. This is readily accomplished by sliding the numbering machine 11 along the base 80, so that the gear 17 is out of mesh with the gear 16, and then placing a crank on the square head 62 of the shaft 61, turning the film 47 until it accurately registers. The shutter 32 is then turned independently of the band wheel 42 by means of the adjusting wheel 50, the friction of the spring 51 being light enough to allow this. The shaft 61 may also be used to actuate the band wheel 42.

If it is desired to rewind the film, the clutch member 71 is pulled outwardly, as shown in Fig. 8, so that the sprocket 68 can turn free from the shaft 67, and the crank is placed on the square end 90 of the shaft 89, the wheel 85 being turned by means of the gears 88 and 87.

We claim as our invention:—

1. A film numbering machine comprising a case having a light slot in the top thereof; a luminous source inside said case; a shutter between said luminous source and said slot, said shutter having an aperture which may be made to register with said slot; a printing film having symbols printed thereon; means for feeding said film across said slot; means for feeding the film to be numbered across said printing film and said slot; and mechanism for so driving said films and said shutter that said aperture registers with said slot at the same instant that each of said symbols registers with said slot.

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2. A film numbering machine comprising a case having a light slot in the top thereof; a printing film having a series of symbols formed thereon; means for feeding said film over said light slot; means for feeding the film to be printed over said printing film; and means for causing light to shine through said slot whenever one of said symbols registers with said slot.

3. A film numbering machine comprising a case having a light slot in the top thereof; a printing film having a series of symbols formed thereon; means for feeding said film over said light slot; means for feeding the film to be printed over said printing film; a luminous source inside said case so placed that the light thereof may shine through said slot; and means for preventing said light from so shining except when one of said symbols registers with said slot.

4. A film numbering machine comprising a case having a light slot in the top thereof; a printing film having a series of symbols formed thereon; means for feeding said film over said light slot; means for feeding the film to be printed over said printing film; a luminous source inside said case so placed that the light thereof may shine through said slot; a shutter for preventing said light from shining through said slot, said shutter having an aperture formed therein; and means for causing said aperture to register with said slot whenever one of said symbols registers with said slot.

5. A film symbolizing machine comprising a casing having light slots, a source of light within said casing, a printing film and a film to be symbolized associated with said casing, and means for superimposing successive sections of said film to be symbolized to successive sections of said printing film in front of said light slots for causing permanent reactions on the film to be symbolized.

In testimony whereof, we have hereunto set our hands at Los Angeles, California, this 24th day of January, 1917.

JOSEPH ALTSCHULER.
DEMETRY ISNOW.