

July 10, 1923.

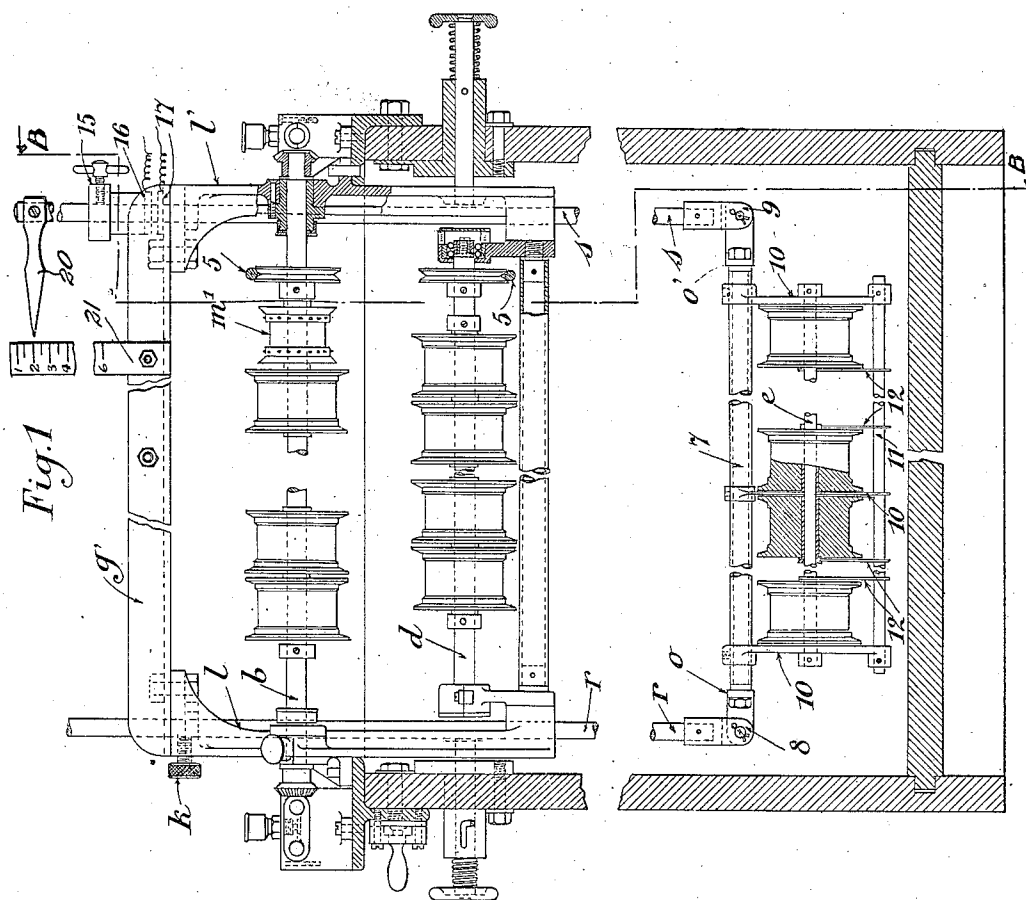
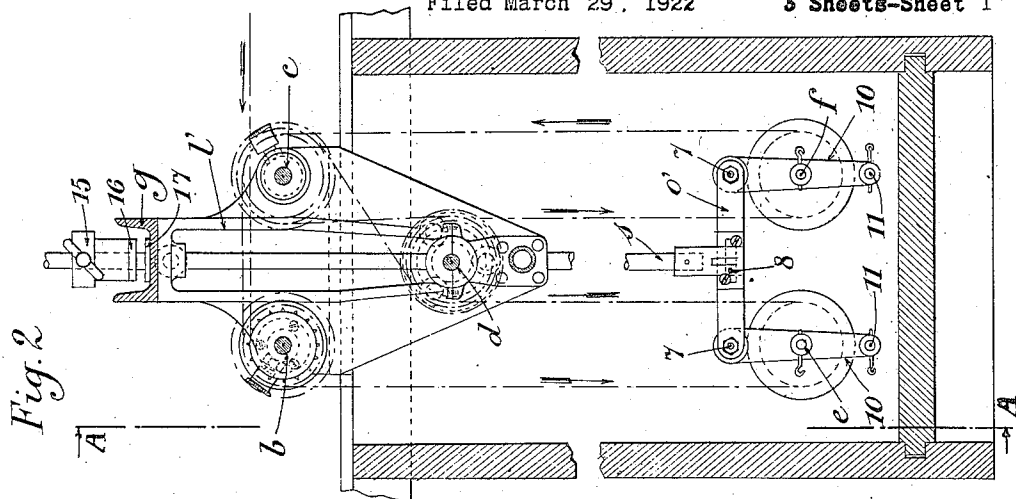
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G. A. SALINS

MACHINE FOR TREATING CINEMATOGRAPHIC FILMS

Filed March 29, 1922

3 Sheets-Sheet 1



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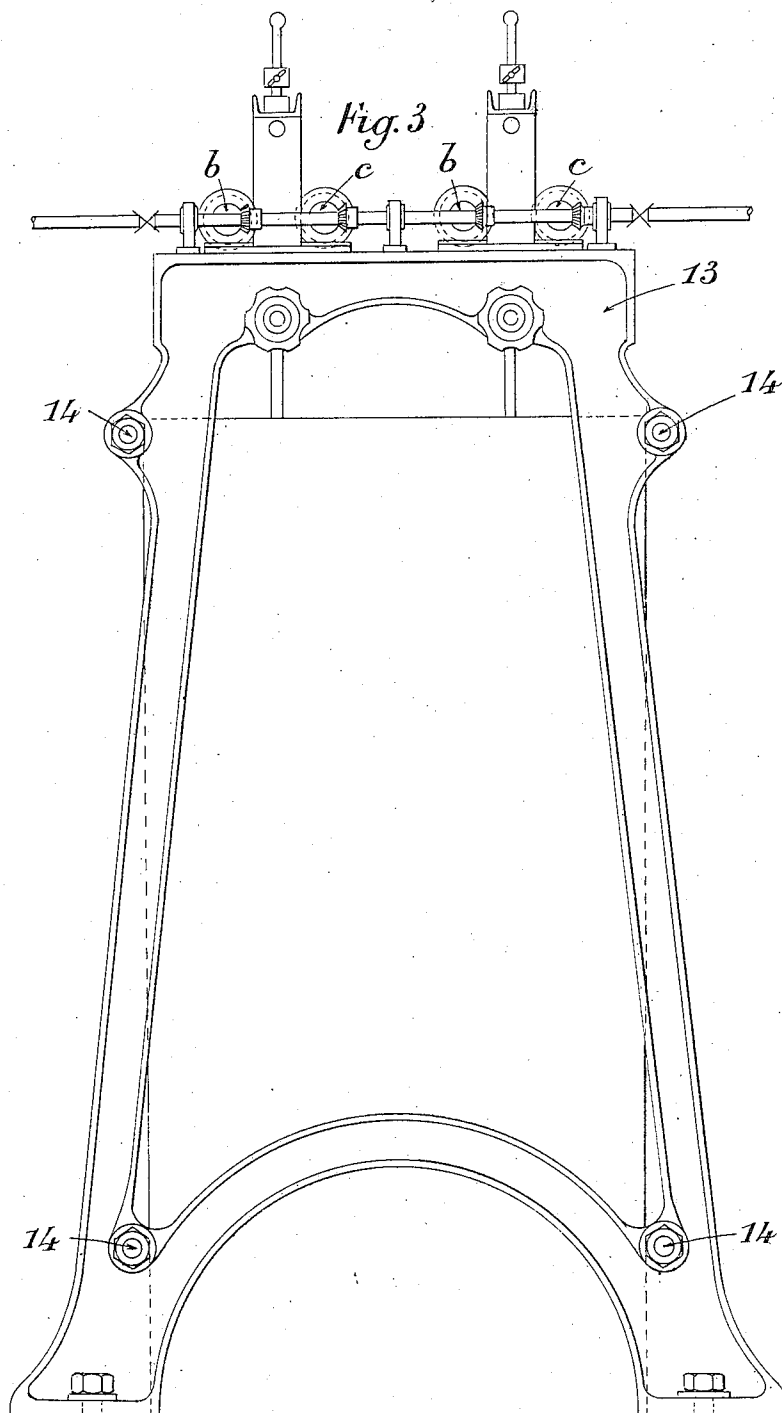
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3 Sheets-Sheet 2



Georges Augustin Salins
INVENTOR;

By *Otto Munk*
his Attorney.

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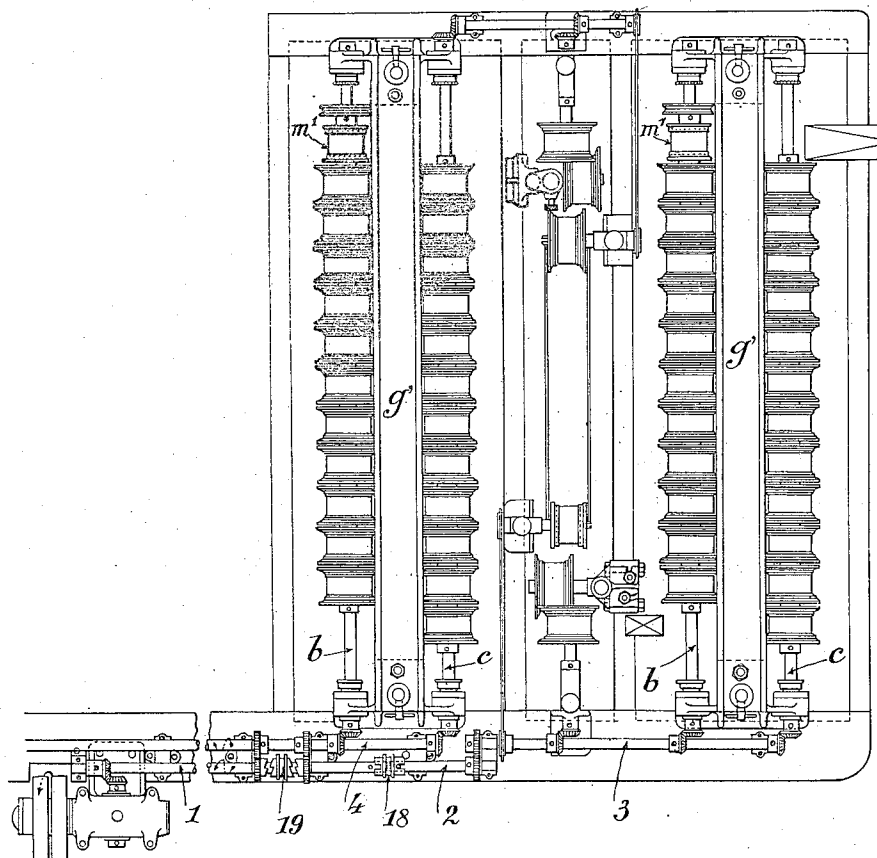
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3 Sheets-Sheet 3

Fig. 4



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UNITED STATES PATENT OFFICE.

GEORGES AUGUSTIN SALINS, OF VINCENNES, FRANCE, ASSIGNOR TO PATHE CINEMA, ANCIENS ETABLISSEMENTS PATHE FRERES, OF PARIS, FRANCE.

MACHINE FOR TREATING CINEMATOGRAPHIC FILMS.

Application filed March 29, 1922. Serial No. 547,716.

To all whom it may concern:

Be it known that I, GEORGES AUGUSTIN SALINS, citizen of the Republic of France, residing at Vincennes, Seine, in the Republic of France, have invented new and useful Improvements in Machines for Treating Cinematographic Films, of which the following is a specification.

This invention relates to improvements in the machine for treating motion picture films described in the U. S. patent application Ser. N° 404764 filed Aug. 20, 1920. These improvements are clearly set forth in the following description.

In the accompanying drawing given by way of example:

Fig. 1 is a view of the improved machine in vertical longitudinal section along the line A—A, Fig. 2.

Fig. 2 is a cross section along the line B—B, Fig. 1.

Fig. 3 is an end view of the frame serving to support the upper reels.

Fig. 4 is a plan view of two elements showing the spare or storage device between these two elements and the arrangement for actuating the shafts.

The new construction comprises in the upper part only three shafts *b*, *c* and *d*. The main upper shafts *b*, *c* are mounted on a level higher than the upper edge of the tanks so that the film can be led directly to or from a roller or feeding drum mounted on said shafts. In this manner, the upper shaft used in the construction according to the prior application above referred to, may be omitted.

In the example of construction indicated, the two upper shafts are each actuated by a pair of bevel gears and the parts of the shaft 1, 2, 3, 4 (Fig. 4) can rotate by means of change-speed devices at different speeds in order to vary during the running the length of film immersed in the different tanks. The intermediate shaft *d* is actuated by a crossed belt 5 connected on the other hand with one of the two upper shafts. The toothed entraining drum *m*¹ which was mounted upon the uppermost shaft, is now keyed to one of the upper shafts *b*, *c*. The upper shafts *b*, *c* instead of being maintained, as in the said prior application by a frame constituting a cover, are maintained by a frame occupying a less space,

formed of two cheeks 1, 1' and cross-braced only by a simple bar *g*'.

The lower part of the reel-holding device is constituted by a rectangular frame comprising two cross rods *o*, *o*' connected together by two longitudinal rods 7. The cross rods *o*, *o*' are hung to two vertical rods *r* and *s* by pivoted yokes or forks 8, 9 (Fig. 1). The shafts *e* and *f* supporting the lower reels are connected with the frame 7 by uprights or arms 10 (Figs. 1 and 2). Said arms are themselves cross-braced by a bar 11 carrying the cheeks 12 for supporting the shafts *e* and *f* between the reels.

The reels or rollers are mounted as follows: the lower reels are loose on the shafts *e* and *f*; the upper reels are mounted by easy friction on the shafts *b*, *c* and *d*. Moreover, the diameter of the reel is slightly greater than that of the entraining drums in such manner that the periphery speed of the former is slightly above that of the drums. In this manner the upper reels will accompany the shafts in their rotation when no effort acts to brake the same. It is readily observed that the only resistance to be overcome by the film in its entraining in the machine is reduced to the entraining of the lower reels, and to overcome this resistance the film is aided by the slight traction exerted upon it in the direction of travel by the upper reels whose periphery speed is slightly superior to the speed of movement of the film in the machine. The diameter of the reels is sufficient in order that the entraining of the reels by friction shall be really effective. The toothed drum *m*¹ serves here only to regularize the output.

Another particular feature which also forms part of the object of the present invention consists in the fact that the support of each element instead of being mounted on the corresponding tank is mounted on a cast iron frame constituted by two uprights 13 placed opposite each other and connected together by tubular members 14 (Fig. 3). The tanks are thus entirely separated from the elements and the change of the same is effected with facility for this reason.

In the element immersed in the developer, the admission feed-drum is provided with an uncoupling device 18 (Fig. 4) which permits of arresting the admission of the band for a certain time, and this reduces the

quantity of film disposed in the developer, which will diminish the time of development. In fact, when the film is stopped at the admission end and continues nevertheless to proceed out of the tank, the lower reels will move towards the upper reels; the milled knob *k* being slightly unscrewed, the rods *r* and *s* will rise by sliding in their supports, and a pointer 20 secured to the rod *s* will indicate on a suitable scale 21 the corresponding time of development. The lower reels being at the desired height, the admission feed drum is again engaged and the rod *r* is secured by means of the milled knob *k*. In the contrary case, a change-speed device 19 (Fig. 4) is used to accelerate the speed of this feed drum and this causes the descent of the movable part of the element.

An indicating signal device is provided in case of breakage of the film; to this effect the rod *s* is provided with an adjustable stop ring 15 (Fig. 1) which carries a contact piece 16 while another contact piece 17 is secured to the fixed frame of the apparatus. Upon breakage of the film, the frame 7 (Fig. 1) will pivot about the fork 8 since the rod *r* is held stationary by *k*, but its fall is stopped by the stop ring before the reels come in contact with the bottom of the tank, and at the same time the contact of 16 and 17 closes the circuit of an electric bell which gives warning of the accident.

The present invention is naturally not limited to the particular constructional dispositions which have been given above solely by way of example.

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

1. A machine for treating cinematograph films comprising a treating vat, two upper longitudinal shafts arranged in the upper part of said vat on a level higher than the upper edge of said vat, an intermediate longitudinal shaft on a lower level than the upper shafts, two lower longitudinal shafts arranged in the bottom of the vat, means for supporting the lower shafts at a variable height in the vat, film supporting rollers placed end to end upon said shafts and so arranged that the film is transported in the longitudinal direction of the vat for a distance equal to the length of one roller during a vertical zig-zag movement of said film from one of the upper rollers to the next adjacent upper roller and means for feeding the film around the rollers.

2. A machine for treating cinematograph films comprising a treating vat, two upper longitudinal shafts arranged in the upper part of said vat on a level higher than the upper edge of said vat, an intermediate longitudinal shaft on a lower level than the upper shaft, two lateral

supports in which the ends of the above shafts are rotatably supported, a longitudinal bracing bar for connecting said lateral supports to each other, two lower longitudinal shafts arranged in the bottom of the vat, means for supporting the lower shafts at a variable height in the vat, film supporting rollers placed end to end upon said shafts and so arranged that the film is transported in the longitudinal direction of the vat for a distance equal to the length of one roller during a vertical zig-zag movement of said film from one of the upper rollers to the next adjacent upper roller and means for feeding the film around the rollers.

3. A machine for treating cinematograph films comprising a treating vat, two upper longitudinal shafts arranged in the upper part of said vat, on a level higher than the upper edge of said vat, an intermediate longitudinal shaft on a lower level than the upper shafts, two lower longitudinal shafts arranged in the bottom of the vat, means for supporting the lower shafts at a variable height in the vat, film supporting rollers placed end to end upon said shafts and so arranged that the film is transported in the longitudinal direction of the vat for a distance equal to the length of one roller during a vertical zig-zag movement of said film from one of the upper rollers to the next adjacent upper roller and a feeding drum on one of the upper shafts, the rollers on the lower shafts being loosely mounted upon said shafts and the rollers upon the upper and intermediate shafts being mounted with a slight friction upon said shafts and having a diameter slightly greater than the said feeding drum.

4. A machine for treating cinematograph films comprising a treating vat, two upper longitudinal shafts arranged in the upper part of said vat on a level higher than the upper edge of said vat, an intermediate longitudinal shaft on a lower level than the upper shafts, two lower longitudinal shafts arranged in the bottom of the vat, two pairs of vertical arms in which said lower shafts are rotatably supported respectively, two longitudinal supporting rods for connecting to each other the upper ends of the vertical arms in each pair respectively, two longitudinal brace rods for connecting to each other the lower ends of said vertical arms in each pair, respectively, two cross bars connecting said rods to each other at the ends, means for supporting said cross bars at a variable height in the vat, film supporting rollers placed end to end upon said shafts and so arranged that the film is transported in the longitudinal direction of the vat for a distance equal to the length of one roller during a vertical zig-zag movement of said film from one of

the upper rollers to the next adjacent upper roller and means for feeding the film around the rollers.

5 5. A machine for treating cinematograph films comprising a treating vat, two upper longitudinal shafts arranged in the upper part of said vat on a level higher than the upper edge of said vat, an intermediate longitudinal shaft on a lower level than the
10 upper shafts, two lower longitudinal shafts arranged in the bottom of the vat, two pairs of vertical arms in which said lower shafts are rotatably supported respectively, two longitudinal supporting rods for connecting
15 ing to each other the upper ends of the vertical arms in each pair respectively, two longitudinal brace rods for connecting to each other the lower ends of said vertical arms in each pair, respectively, two cross
20 bars connecting said rods to each other at the ends, suspending rods for carrying said cross bars, an adjustable stop ring on one of said suspending rods, a contact member on said stop ring, a fixed contact on the vat
25 adapted to engage with the contact member for limiting the descent of the lower shafts in the case of breakage of the film while producing a signal at the same time, film supporting rollers placed end to end upon
30 said shafts and so arranged that the film is transported in the longitudinal direction of

the vat for a distance equal to the length of one roller during a vertical zig-zag movement of said film from one of the upper rollers to the next adjacent upper roller
35 and means for feeding the film around the rollers.

6. A machine for treating cinematograph films comprising a treating vat, two upper longitudinal shafts arranged in the upper
40 part of said vat on a level higher than the upper edge of said vat, an intermediate longitudinal shaft on a lower level than the upper shafts, two lower longitudinal shafts normally situated in the bottom of said vat,
45 means for supporting the lower shafts at a variable height, supporting frames for carrying the upper and intermediate shafts and the means supporting the lower shafts, said supporting frames being mounted inde-
50 pendently of the vats, film supporting rollers placed end to end upon said shafts and so arranged that the film is transported in the longitudinal direction of the vat for a
55 distance equal to the length of one roller during a vertical zig-zag movement of said film from one of the upper rollers to the next adjacent upper roller and means for feeding the film around the rollers.

In testimony whereof I have signed my
name to this specification.

GEORGES AUGUSTIN SALINS.