No. 897,251. PATENTED AUG. 25, 1908.

T. S. GRAVES.

FILM HANDLING DEVICE.

APPLICATION FILED FEB. 11, 1908.

Fig. 1.

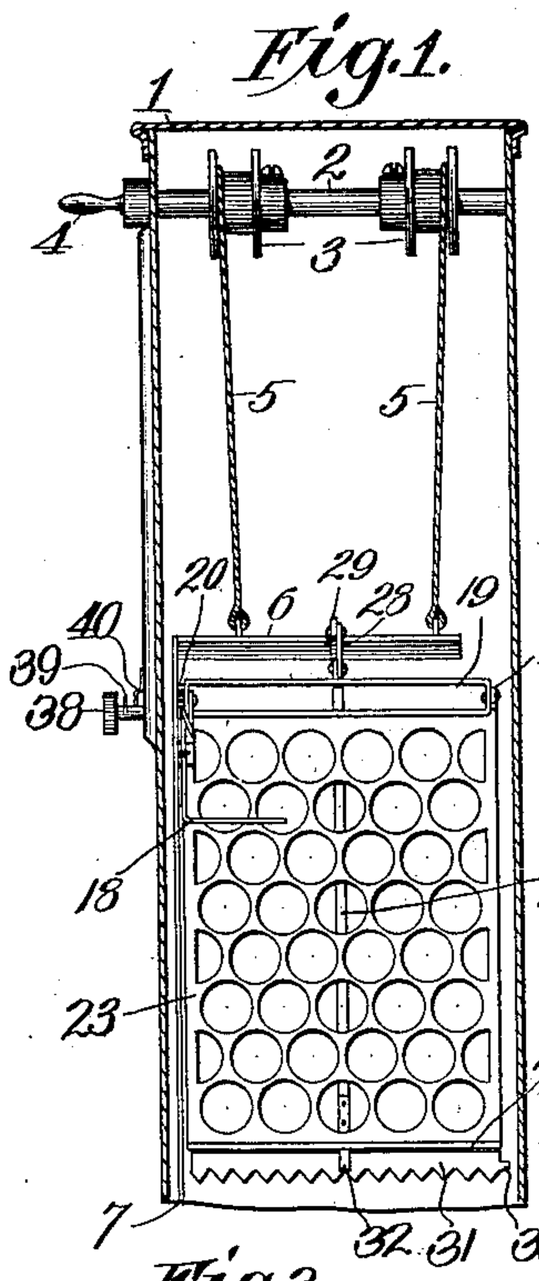


Fig. 4.

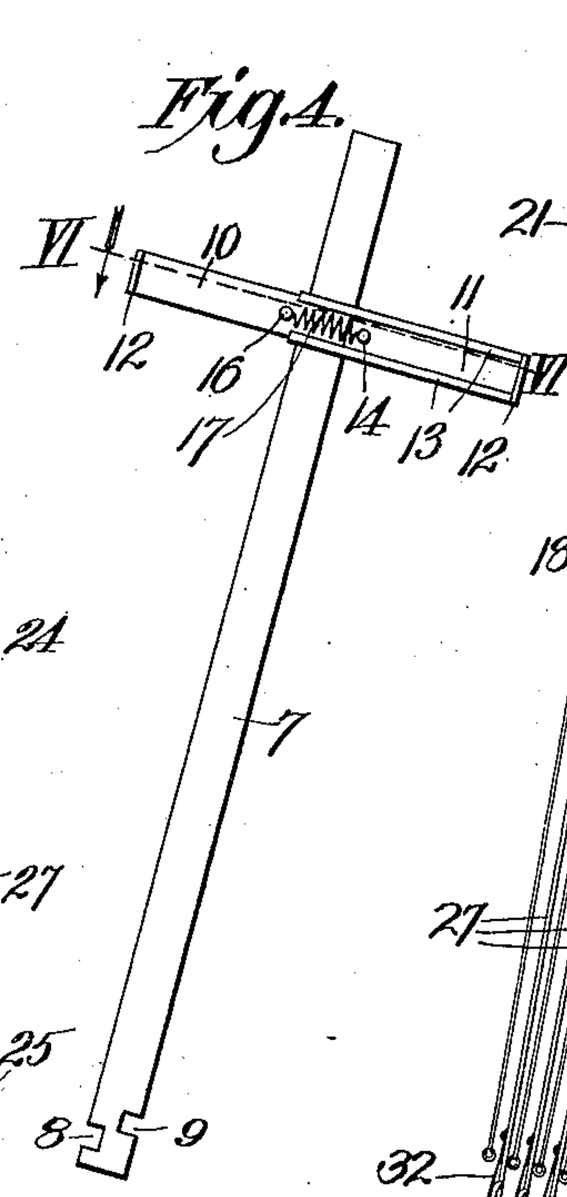


Fig. 2.

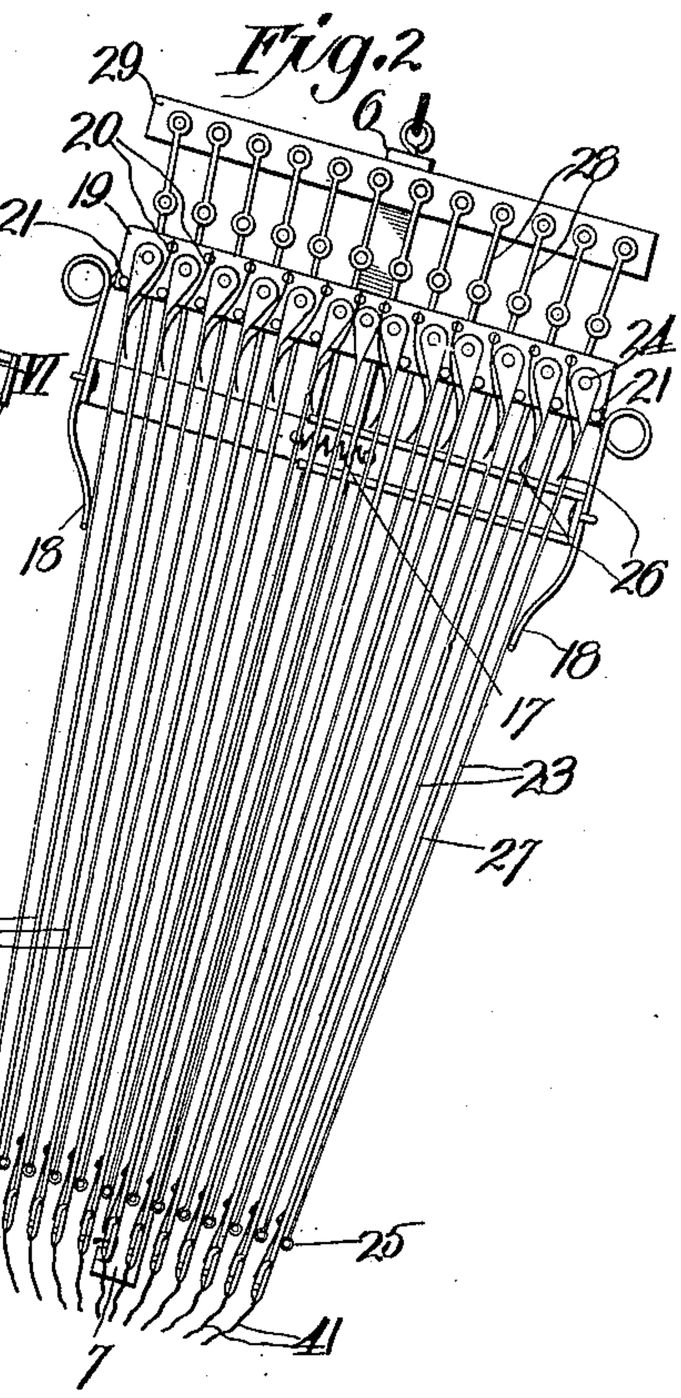


Fig. 3.

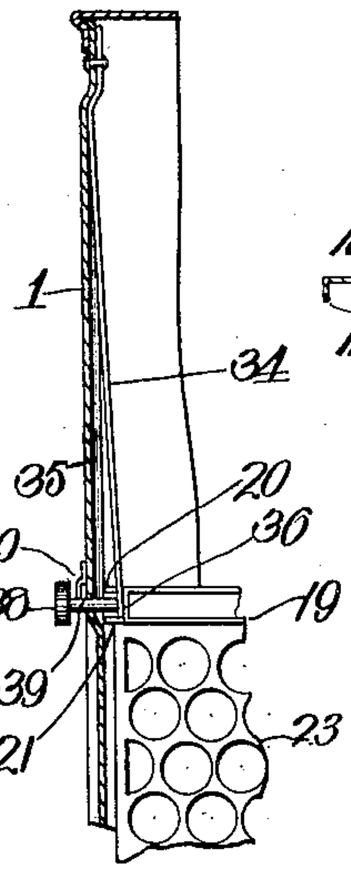


Fig. 6.

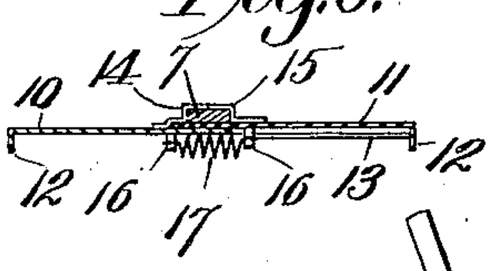


Fig. 7.

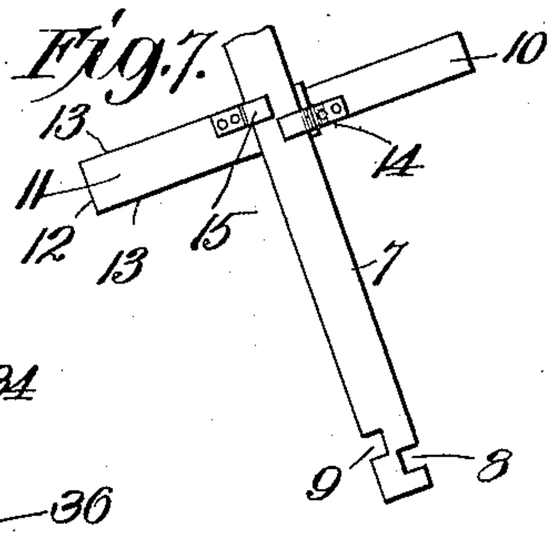


Fig. 5.

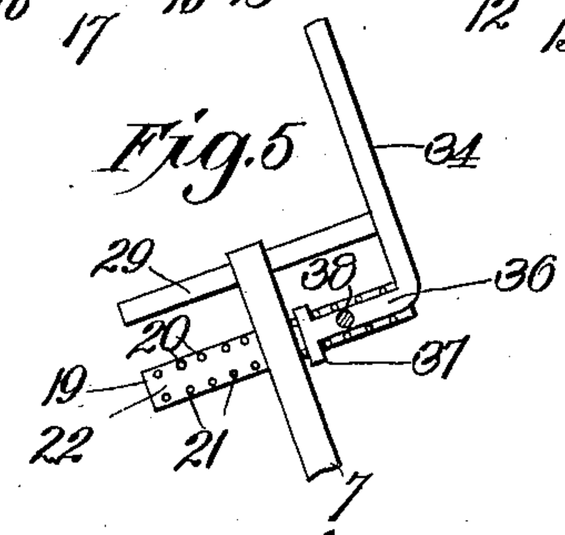


Fig. 8.

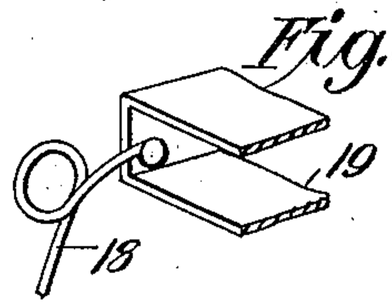
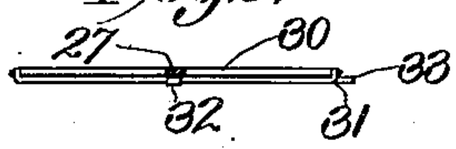


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS S. GRAVES, OF WESTON, MISSOURI.

FILM-HANDLING DEVICE.

No. 897,251. Specification of Letters Patent. Patented Aug. 25, 1908.

Original application filed November 4, 1907, Serial No. 400,560. Divided and this application filed February 11, 1908. Serial No. 415,305.

To all whom it may concern:

Be it known that I, THOMAS S. GRAVES, a citizen of the United States, residing at Weston, in the county of Platte and State of Missouri, have invented certain new and useful Improvements in Film-Handling Devices, of which the following is a specification.

This invention relates to film handling devices and more especially to devices for use in film pack developing apparatus of the character disclosed in my copending application for patent on photographic developing machine filed Nov. 4, 1907, Serial Number 400560, of which this is a divisional application, and my object is to produce a device of this character by which the films of a film pack may be withdrawn from the carton and then deposited in and withdrawn from the developing and fixing solutions and the water.

A further object is to produce a device of this character which is adapted initially for engagement with the tabs of the films for the purpose of withdrawing the latter from the carton.

A still further object is to produce a device of this character provided with means for underlying the films thus detached from the carton for the purpose of reliably retaining the same should they become accidentally or otherwise detached from the said tabs.

A still further object is to produce means for guiding the device in its movement toward or from the film pack carton.

A still further object is to provide a device of this character capable of swinging from an operative position with relation to the film pack to an operative position with relation to the solution or water tank and vice versa.

Another object is to produce a device of this character embodying a series of sliding clamps and means for holding the non-sliding portion in fixed relation to the film pack during the sliding action of such clamps.

With these general objects in view and others as hereinafter appear, the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawing, in which—

Figure 1, is a vertical section of a suitable support or casing equipped with a film handling device embodying my invention. Fig. 2, is an enlarged view of a film handling device detached from its support. Fig. 3, is a section of the support in the plane of a channel formed therein for the reception of the device for holding the film holding device proper in one of its operative positions. Fig. 4, is a detail view of a part of the film holding device. Fig. 5, is a view of the opposite side of a part of the device shown in Fig. 4, a tube forming part of the film handling device, and the device shown in Fig. 3 for holding the film holding device in the operative position shown in Fig. 3. Fig. 6, is a section on the line VI—VI of Fig. 4. Fig. 7, is a view of the opposite side of a part of the device shown by Fig. 4. Fig. 8, is a detail perspective view of a part of the film handling device. Fig. 9, is a detail of another part of the film handling device.

In the said drawing where similar reference characters identify corresponding parts, 1 indicates a suitable support such as a casing. 2 is a shaft journaled therein and provided with a pair of drums 3 and a crank handle 4 for operating the shaft.

5 are cables secured to the drums and attached to the lower ends of the cables is the horizontal arm of an angle bar, consisting of said horizontal arm 6 and a downwardly extending arm 7, the latter having notches 8 and 9 in its edges in different planes.

A contractible bar consists of two members 10 and 11 fitting slidingly together and provided at their remote ends with outwardly projecting ears 12, the member 11 being bent back at its margins to provide grooved guideways 13 for the reception of member 10. This contractible bar is adapted to fit against arm 7 of the angle bar and to secure it slidingly on the last-named bar it is provided with a clip consisting of angle plates 14 and 15 for respective engagement at times with the notches 8 and 9 as hereinafter explained. The members are also provided with similar pins 16 connected by retractile spring 17, the power of the spring normally holding the angle plates forming the clip pressed yieldingly against the opposite edges of arm 7 and ready to force said angle plates into the notches 8 and 9 respectively at the proper time and secured about midway their length to ears 12 are a pair of springs 18.

19 indicates a rectangular tube or guide-frame underlying and extending at right an-

gles to arm 6 and provided at each side with an upper series of pins 20 and a lower series of pins 21, the space between said pins at one side of the tube forming a guideway 22 for a purpose hereinafter referred to.

23 indicates a series of flat foraminous plates underlying the tube and provided at their upper corners with ears 24 arranged between the pins 21 projecting from the tube, and pivoted to the sides of the latter. The plates 23 are beaded at their lower ends, at 25, and to hold them yieldingly spaced apart, springs 26 are secured to pins 20 and bear outwardly against the plates at opposite sides of the central one, it being understood also that springs 18 at their outer ends are secured to and preferably within tube or frame 19 and engage the outermost plates 23 for the purpose of yieldingly pressing plates 23 together for a purpose which is hereinafter explained, when the spring 17 contracts the bar composed of members 10 and 11.

27 indicates a series of bars, twelve in this instance, of rectangular form in cross section by preference, and extending slidingly through the tube or frame 19 between the foraminous plates 23, said bars converging downwardly and having their upper ends pivotally connected by links 28 to a bar 29 secured to cross arm 6. The lower ends of the bars 27 form stationary jaws 30 and pivoted to said jaws are movable jaws 31, springs 32 carried by the rods and holding the jaws normally closed, the movable jaws by preference having finger pieces 33 at one end to permit them to be swung away from the stationary jaws when desired.

To hold the film holding device with the cables 5 normally extending downwardly and forwardly from the drums, I employ a spring bar 34 which by preference is secured to the support or casing 1 and through its resiliency tends to lie snugly in the correspondingly formed channel 35 in the inner face of the support or casing, said spring bar being equipped at its lower end with an arm 36 adapted to fit in the guideway 22 (see Fig. 5) formed by the pins 20 and 21, outward of the ears pivoted to the corresponding side of the tube 19, the said arm terminating in a head 37 to fit between two of the upper and two of the lower pins to guard against the device swinging back to a position vertically below the drums.

38 indicates a push pin fitting in the support or casing and adapted when pressed inward to force the lower end of the spring bar 34 into the guideway in the adjacent side of the tube 19 as shown in Fig. 3, and to fasten the pin in such position it is provided with an arm 39 to be turned under a clip 40 secured to the support or casing.

When the device is in operative position the parts are arranged substantially as shown, that is with the slidable clamps formed by jaws 30, 31, projected below the lower or beaded ends of plates 23 in order that the upper ends of the tabs 41 attached to the films, not shown, in the usual or any preferred manner, may be secured between said jaws. Now when the films are free to be withdrawn from the pack, the operator grasps handle 4 and turns it in the proper direction to wind the cables thereon, this action resulting in drawing bars 27 upward through the tube 19 until the jaws 30 and 31 have attained such elevation that the lower ends of the films are above the beaded ends 25 of plates 23. As this position is attained notches 8 and 9 of the arms 7 of the angle bar, which of course moves upward with parts 27, come opposite plates 14 and 15 which are immediately forced into said notches by the springs 18, the spring 17 coöperating with the springs 18 in effecting the contraction or shortening of the bar composed of the slidable members 10 and 11. In the operation described the springs 26 are overcome because collectively they are weaker than springs 18, the result being plates 23 swing together until their lower or beaded ends are in engagement. When this is accomplished the push pin 38 is withdrawn to permit bar 34 to spring out of engagement with the pins of the tube and thus permit the latter with the connected parts to swing rearward and eventually hang vertically below the shaft 2. The crank 4 is then reversed to lower the device with the films carried thereby and thus immerse the latter by successive operations in the developing, solutions, the fixing solutions and water, the tank or receptacle to contain such solutions and the water being omitted because it forms no part of the invention. It will be noticed in this connection that should the films become detached from the tabs through the softening of the usual adhesive substance which unites them to it and common in film pack construction, the films cannot either drop out of the device or become doubled or crumpled up therein and thus ruined, the beaded ends 25 preventing the escape of the films and the proximity of the foraminous plates guarding against the films wrinkling or crumpling between them, it being understood that the plates are of the foraminous type to give ready access to the films of the solution or the water, though it is not absolutely necessary that foraminous plates be employed.

From the above description it will be apparent that I have produced a film handling device possessing the features of advantage enumerated as desirable and I wish it to be understood that I do not desire to be restricted to the exact details of construction shown and described as obvious modifications will suggest themselves to one skilled in the art.

Having thus described the invention what

I claim as new and desire to secure by Letters Patent, is:—

1. A film handling device, comprising a series of movable plates held yieldingly spaced apart, a series of slide bars between said plates and provided with film-tab engaging means at one end, means for sliding said bars until their tab-engaging means are disposed near the ends of the plates opposite from the ends to which said means were originally adjacent for the purpose of disposing the films wholly between said movable plates, and means for overcoming the resistance tending to hold said plates spaced apart to force them together as the sliding action of the bars ends.

2. A film handling device, comprising a series of movable plates held yieldingly spaced apart, a series of slide bars between said plates and provided with film tab engaging means at one end, means for sliding said bars until their tab engaging means are disposed near the ends of the plates opposite from the ends to which said means were originally adjacent for the purpose of disposing the films wholly between said movable plates, an automatically contractible bar, and means attached to said bar for pressing the plates toward each other as the sliding action of the slide bars terminates.

3. A film handling device, comprising a series of slide bars equipped with clamping jaws at their lower ends, guiding means for said bars, a series of plates pivotally suspended from said guiding means and arranged alternately with respect to said bars, means to slide the bars upwardly between the plates, and means for yieldingly forcing the lower ends of the plates together after the bars have been raised a predetermined distance.

4. A film handling device, comprising a series of slide bars equipped with clamping jaws at their lower ends, guiding means for said bars, a series of plates pivotally suspended from said guiding means and arranged alternately with respect to said bars, a bar pivotally linked to the upper ends of said slide bars, means to move said bar upwardly to slide the slide bars upwardly between said plates, and means for yieldingly forcing the lower ends of the plates together after the bars have been raised a predetermined distance.

5. A film handling device, comprising a series of slidable bars provided with clamping jaws at their lower ends, means for guiding said bars in their sliding action, a series of plates pivotally pendent from said guiding means and arranged alternately with respect to said bars and terminating above the clamping jaws of the latter, springs tending to hold said plates in parallel relation, more powerful means tending to cause them to converge downwardly, a bar movable with the slide bars and provided with notches in its lower end, and an extensible and contractible frame consisting of two bars slidingly connected together and provided with angle plates engaging the last-named bar, means for sliding said bar and the first-named slidable bars upward, and means to contract the slidable frame when the notches of said bar register with said angle plates to permit said more powerful means to force the lower ends of the plates together.

6. A film handling device comprising a guiding means, a spring clamp to hold the guiding means stationary, and a series of rods extending slidingly through the guiding means and provided with clamps at their lower ends.

7. A film handling device, comprising a guiding means, a spring clamp to hold said guiding means stationary, a series of rods extending slidingly through the guiding means and provided with clamps at their lower ends, and a series of plates pivotally pendent from the guiding means and arranged alternately with respect to said rods.

8. A film handling device, comprising a guiding means, a spring clamp to hold the guiding means stationary, a series of rods extending slidingly through the guiding means and provided with clamps at their lower ends, a series of plates pivotally pendent from the guiding means and arranged alternately with respect to said rods, means to slide said rods upward, and means to automatically press the lower ends of said pivoted plates together after said rods have been slid upward.

In testimony whereof I affix my signature, in the presence of two witnesses.

THOMAS S. GRAVES.

Witnesses:
W. C. Polk,
Chas. H. Hillix.