

T. S. GRAVES.  
FILM HANDLING DEVICE.  
APPLICATION FILED MAY 7, 1908.

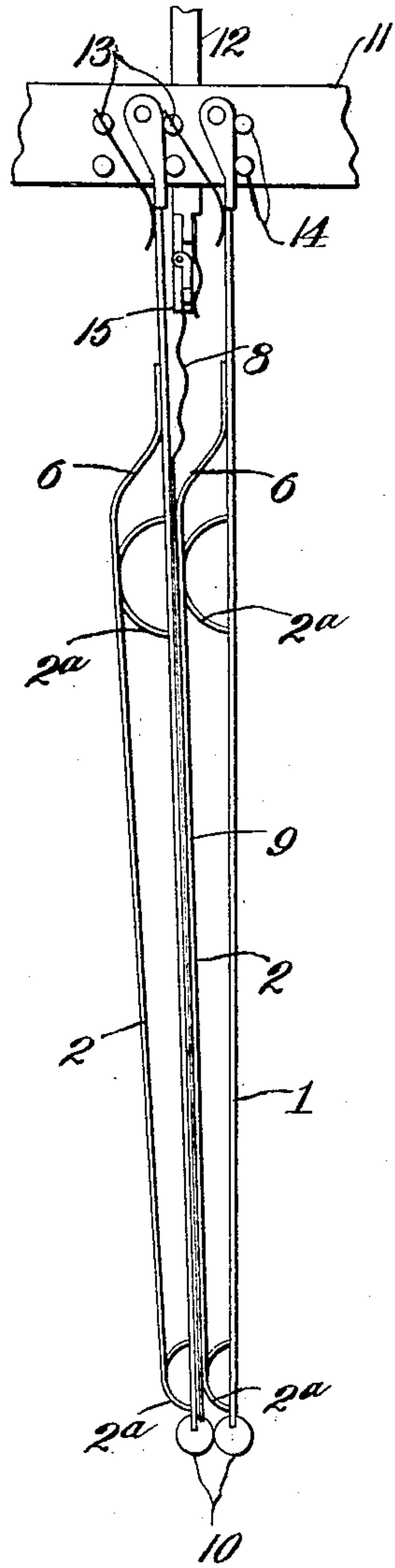
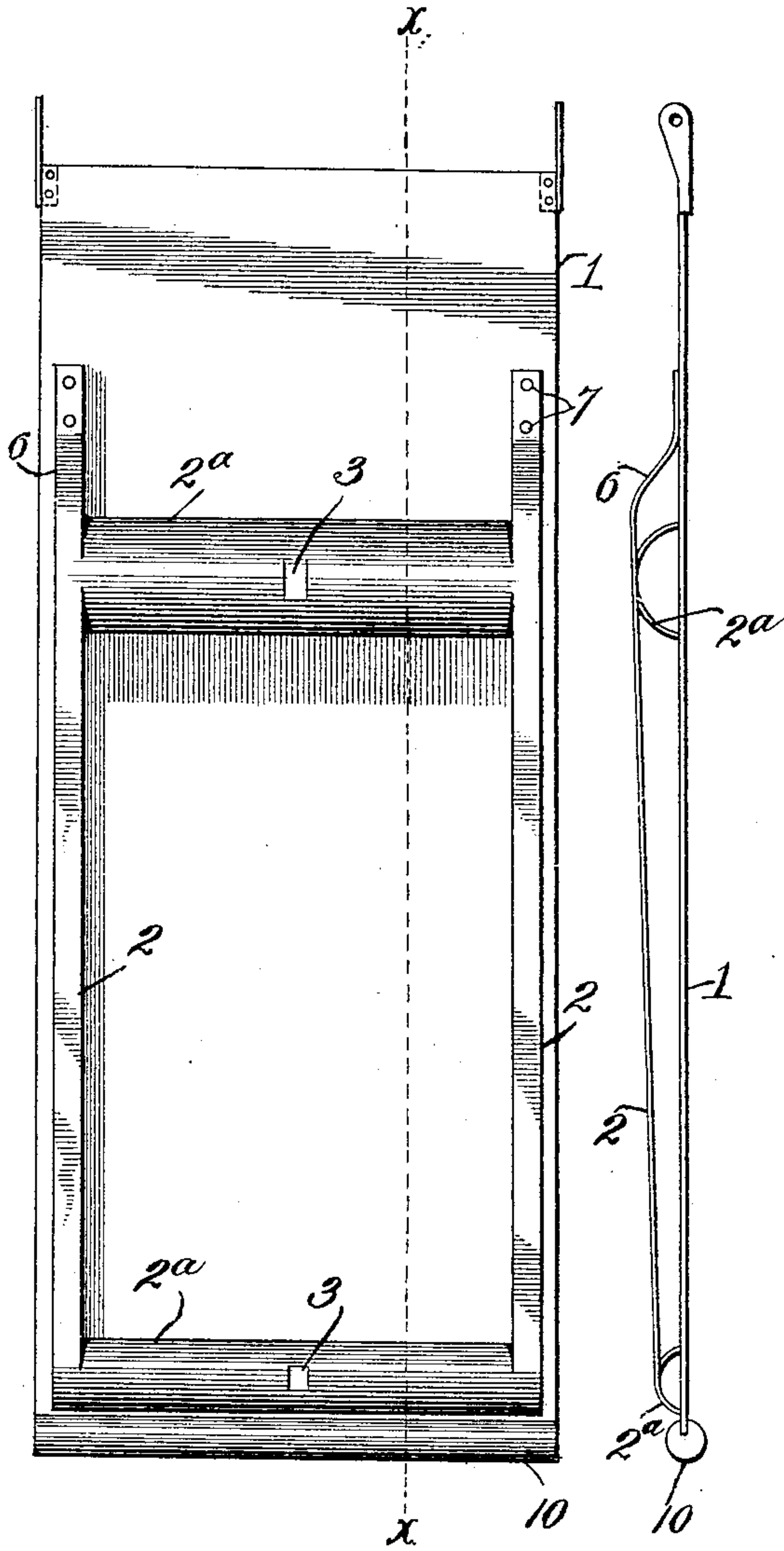
907,037.

Patented Dec. 15, 1908.

Fig. 1.

Fig. 2.

Fig. 3.



Witnesses  
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Inventor  
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# UNITED STATES PATENT OFFICE.

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## FILM-HANDLING DEVICE.

No. 907,037.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Original application filed February 11, 1908, Serial No. 415,305. Divided and this application filed May 7, 1908.  
Serial No. 431,529.

*To all whom it may concern:*

Be it known that I, THOMAS S. GRAVES, a citizen of the United States, residing near 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.

My invention relates to improvements in film handling devices, such as formed the subject of my application for Letters Patent dated Feb. 11 1908 Serial Number 415305 on which patent was allowed under date of Apr. 16 1908, and the object of my improvement is to provide a means by which the film is engaged at the outer edges and held in a perfectly flat plane while being developed, to prevent buckling or curling. These objects are attained by the improvements illustrated in the following drawings, in which:

Figure 1 is a front elevation of a part of a film handling device, with my improvement attached. Fig. 2 is a view on line  $x-x$  of Fig. 1. Fig. 3 is a view showing part of a film handling device with my improvement attached, a film in position, and the manner in which it operates to hold the film in a flat or plane position.

Similar letters refer to similar parts throughout the several views.

The film handling device of which the following is an improvement, and on which application for Letters Patent was filed Feb. 11 1908 Serial No. 415,305, consists of flat metal plates 1, pivoted at their upper ends to a rectangular tube 11, and held in parallel against pins 14 by springs 13.

In operation the ends of the film tabs 8, are engaged by gripping jaws 15, attached to the ends of rectangular rods 12, extending between plates 1. The film tabs 8, with the films 9 attached to them, are then drawn up between the plates 1, and at a predetermined time the beaded lower ends 10, of the plates 1, are brought together by the contractile means as set forth in the before mentioned specification.

All the parts described are substantially the same as those contained in the before mentioned application, excepting the rectangular metal frames 2, attached to plates 1, presently described.

Out of any suitable metal a rectangular frame 2, is made, consisting of two parallel flat strips, or bars, spaced apart, and joined

transversely by two strips  $2^a$ , one at each end of the pair of said parallel strips or bars, said transverse strips  $2^a$ , being grooved or bent longitudinally on their inner sides in the form of a half circle, forming on their outer sides a convex or rounded surface over which the film tabs 8, with the films 9, are easily drawn.

The parallel strips or bars 2 are extended at their upper ends a short distance farther than the transverse connecting strips, and at this point are bent to an angle 6, for a short distance, then bent back parallel to their whole length, the object of this bend being to hold the film depressor 2, away from the plate 1, at its upper end a certain distance varying of course with the depth of the bend. This service is performed at the bottom by the longitudinally grooved or convex strips  $2^a$ , said longitudinally grooved strips having a notch, or hollowed space 3, on its outer surface extending almost through, being spaced exactly in the center to afford a more easy passage for the rectangular rods 12, in their sliding action. The longitudinal grooved strip  $2^a$  at the top of the film depressor is also provided with a similar notch 3, for the same purpose.

The film depressor 2, is attached to the plates 1, of the film handling device, by rivets 7 or by any other suitable means. In constructing the film depressors they could be made out of four separate pieces connected together, but I prefer that they should be die cut from a single piece of metal as set forth in the drawing.

In use the film depressor operates substantially as shown in Fig. 3 which represents a part of a film handling device, with my improvements attached, 8 representing a film tab attached to a film 9 drawn up between the protecting plates 1.

In practice it has been found that the film is liable to curl or buckle under the action of the developer. The object of the film depressor is to prevent this. In operation after the film has been drawn up in place and the lower beaded ends 10, of the plates 1, have been brought together, the film depressor 2 will be brought in contact with the film at its outer edges, also at the top and bottom, pressing it firmly against the opposite plate, and holding it reliably in position, perfectly flat and free from curling, so that the developer can act evenly and freely, over



its entire surface, except the retaining strips around the outer edge which are comparatively small.

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

1. A photographic film handling device, comprising a slide rod, equipped with gripping jaws at its lower end, guiding means for said rod, a series of plates pivotally pendent from said guiding means, and arranged alternately with respect to said rod, a film depressor attached to each plate consisting of a rectangular frame of thin metal formed of two parallel strips or bars, extending lengthwise, said parallel strips or bars being bent to an angle at their upper ends, for a short distance then bent back to a parallel plane, the parallel strips or bars being joined at the bottom, and near the top by two transverse strips or bars longitudinally grooved on their inner sides, to form a convex surface on their outer portion, said longitudinal grooved strips, or bars, having a notch or depression on their convex or outer surface, spaced exactly in the center and extending almost through said longitudinal grooved transverse strips, to afford a space for the sliding rod in its sliding action.

2. A photographic film handling device, comprising a slide rod equipped with film tab grippers at its lower end, guiding means for said rod, a series of plates pivotally suspended from said guiding means, and arranged alternately with respect to said rod,

a film depressor attached to each plate, consisting of a rectangular frame of thin metal formed of two parallel strips extending lengthwise, of said plate, and connected by two transverse strips longitudinally grooved on their inner sides to form a convex surface on their outer portion, said longitudinally grooved strips being made of sufficient depth to hold the film depressor strips away from the plates of the film handling device a certain distance, the depth of the longitudinally grooved transverse strips at the top of the film depressor being somewhat deeper than the depth of the longitudinally grooved connecting strip at the bottom of the film depressor, in order to hold the upper portion of the film depressor away from the plate of the film handling device, a somewhat greater distance than the bottom.

3. A photographic film handling device, consisting of a guiding means, a rod extending slidably through the guiding means, and provided with gripping jaws at its lower end, a series of plates, pivotally pendent from the guiding means, each plate containing a film depressor attached, consisting of a rectangular frame extending outward from said plates, to engage a film at its outer edges, and to hold it to a parallel plane with the sides of the opposite plate.

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Witnesses:

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