Aug. 25, 1931. J. T. HECK 1,820,739

MOTION PICTURE SCREEN FRAME

Filed July 23, 1928 2 Sheets-Sheet 1

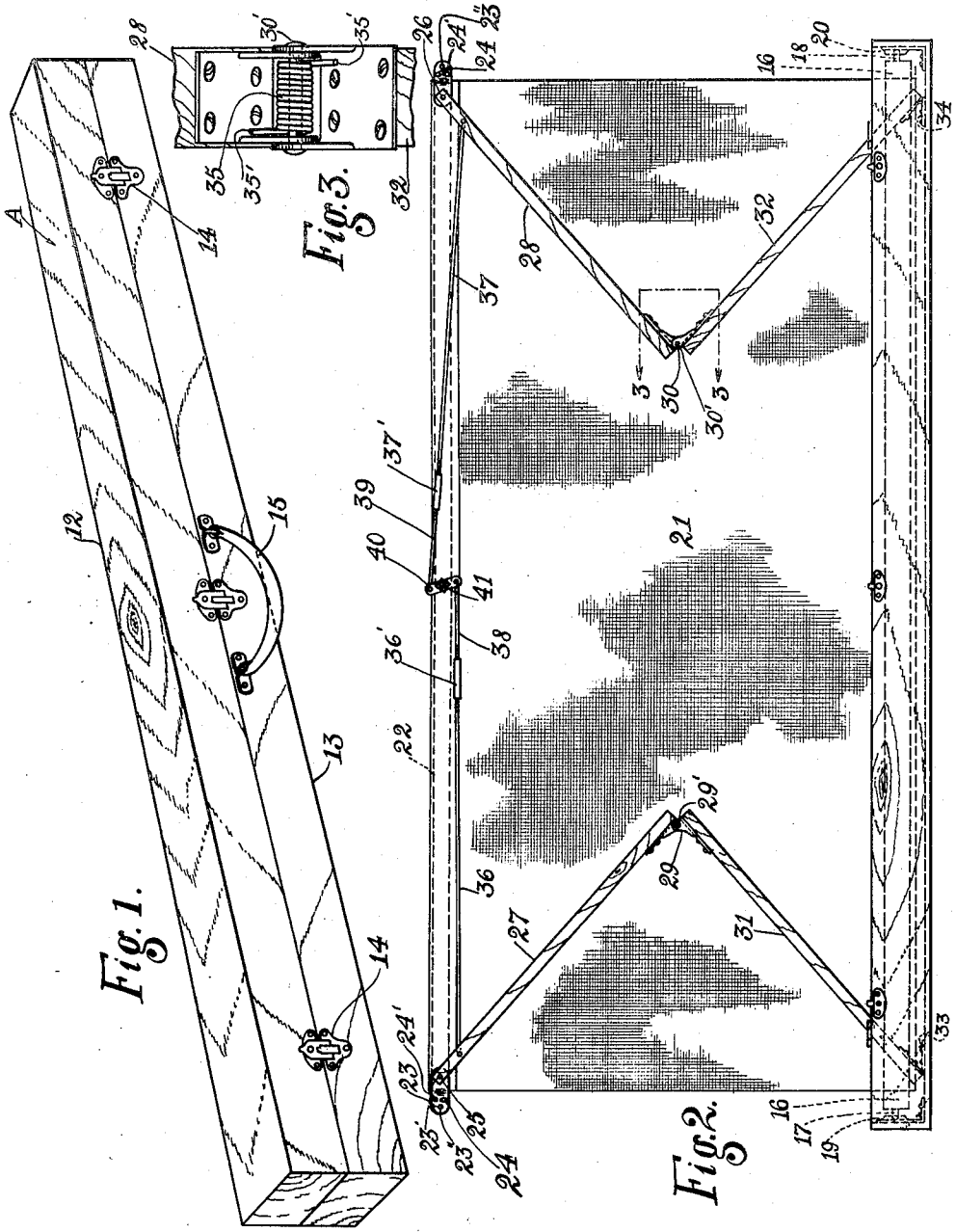


Fig. 1.

Fig. 3.

Fig. 2.

Inventor.
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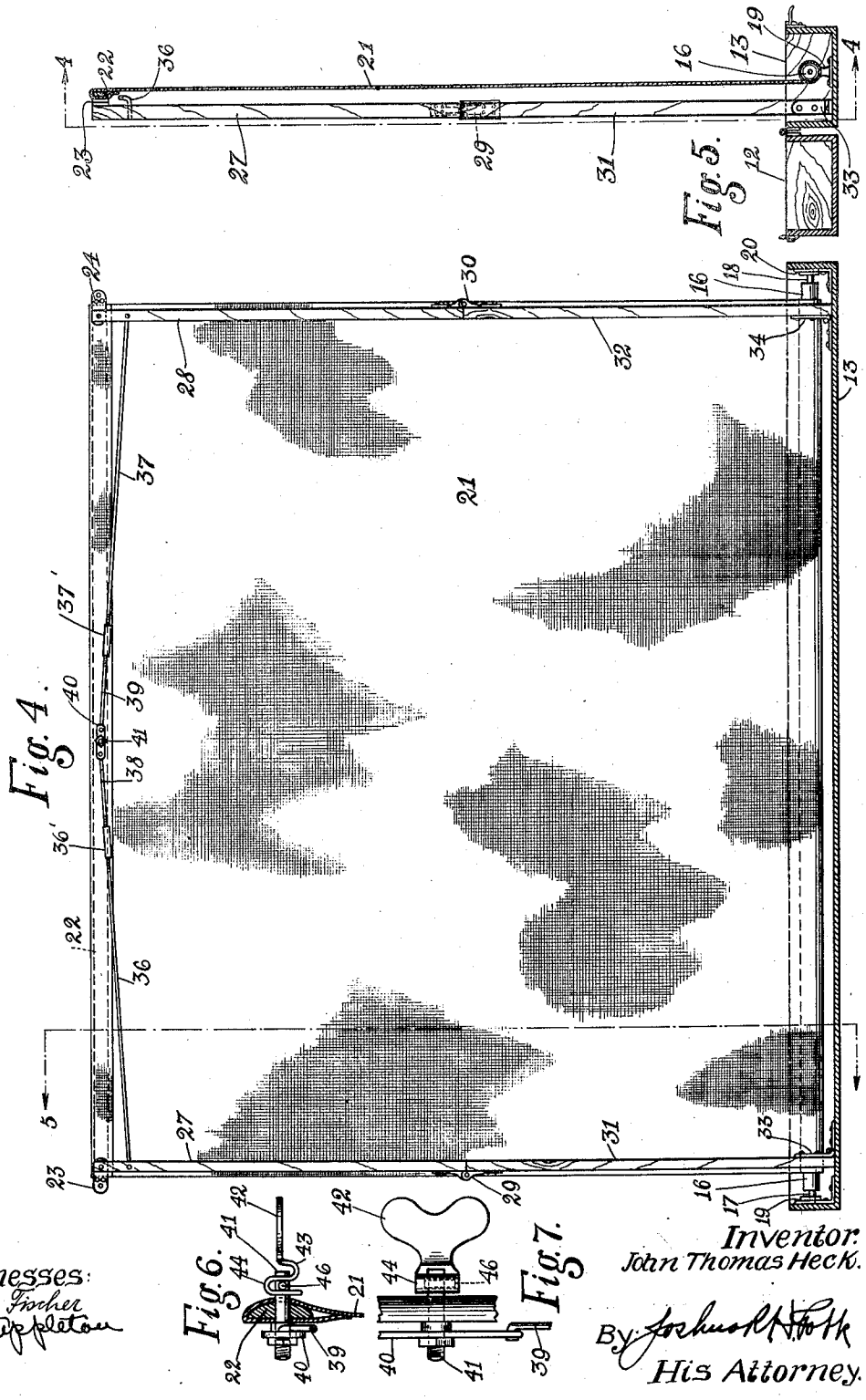
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Patented Aug. 25, 1931 1,820,739

UNITED STATES PATENT OFFICE

JOHN THOMAS HECK, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO DA-LITE SCREEN COMPANY, INC., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

MOTION PICTURE SCREEN FRAME

Application filed July 23, 1928. Serial No. 294,908.

My invention relates to cinematograph screen supporting frames, and more particularly to an improved portable cinematograph of the kind described in U. S. Patent Number 1,800,627 issued April 14, 1931 to Fred P. Heck for improvements in motion picture screens and frames, the entire interest in same being vested in the common assignee of the present application,—the Da-Lite Screen Company, Inc., Chicago, Illinois, a corporation of Illinois.

The object of my invention is to provide an improved device of the kind described embodying certain desired features in the line of a more stable supporting structure together with novel means for locking the frame in raised operative position and for permitting the immediate release of same to stored position within the container.

The invention consists in the combination and arrangement of parts hereinafter set forth with particularity in the specification, reference being had to the accompanying drawings, in which:

Fig. 1 is a perspective view of the container wherein is housed my cinematograph screen supporting frame.

Fig. 2 is a perspective view showing the frame and screen in raised operative position.

Fig. 3 is an enlarged detailed view of the spring hinge mechanism employed, looking in the direction of the arrows on line 3—3 of Fig. 2.

Fig. 4 is a longitudinal sectional view taken on line 4—4 of Fig. 5.

Fig. 5 is a cross section taken on line 5—5 of Fig. 4.

Fig. 6 is an enlarged fragmentary sectional view of the frame locking mechanism.

Fig. 7 is a fragmentary top plan view of the details shown in Fig. 6.

In the drawings wherein similar characters of reference indicate corresponding parts in the several views, A designates the portable container for my invention, the container comprising a lid 12 hingedly secured to the box member 13 by snap fasteners 14, a handle grip 15 serving as means whereby the container and its contents may be conveniently carried by hand.

In the interior of the case A, I provide a spring operated roller 16 of conventional type mounted on pivots 17, 18 seated in the sockets of bracket 19, 20, whereby the screen 21 may be conveniently wound and unwound from the roller 16 into inoperative and operative position respectively, it being understood that the pivot 17 which is secured in the bracket 19 functions for the coiling and uncoiling of the spring (not shown) in the interior of the roller 16.

The screen 21 at its upper end is suitably secured to a slat 22, fastened at its end to brackets 23, having perforations 23′ to accommodate pins or bolts; screwed or otherwise suitably secured in the perforations 23′ and 23″, said pins or bolts serving as fulcrums and additional pairs of slightly elongated perforations or slots 24, which receive pins or bolts 24′, the pins 24′ and elongated perforations 24 permitting when the pins or bolts 24′ are loosened to the extent of the lengths of the elongated perforations or slot 24 an angling adjustment of the brackets about the fulcrums 23″ and consequently permitting adjustment of the screen in order to remove creases, wrinkles, when necessary. The brackets 23 are pivotally connected by pins 25, 26 to the links 27, 28 which are joined by hinges 29, 30 to corresponding links 31, 32, connected to the bottom of the container by additional hinges 33, 34. By inspection of Figs. 2 and 3 it will be observed that the hinges 29 and 30 have pivot pins 29′, 30′ passing through the coil springs 35, the ends 35′ of which are pressed against the sides of the hinge elements in a manner tending to press the links 27, 28 and 31, 32 into unfolded aligned position, as shown in Fig. 4.

The links 27 and 28, as best shown in Figs. 2 and 4 are joined by rods 36, 37, the inner ends of these rods being threaded to receive coupling members 36′, 37′ to which are threadedly joined the short rods 38, 39, the coupling members serving in the capacity of turn-buckles to shorten or lengthen the links 36, 37 with a view to the adjustment of the locking means now to be described. The short rods 38, 39 are joined to a locking trip link or lever 40 centrally secured to a stud shaft

41, the link, when the links 27, 28, 31 and 32 are brought into alignment when the screen is raised to operative position as shown in Fig. 4, lies practically parallel in the same plane to the rods 36, 37, 38 and 39, the frame in this position being maintained comparatively secure, the springs 35, as best shown in Fig. 3 also aiding to maintain these links in upright position and to prevent vibration thereof.

In order to return the frame and screen to inoperative position within the container, I employ a handle of special design 42 having a downwardly projecting portion 43 on the end of which is formed a U-shaped member 44, the convolutions of the latter being centrally perforated to receive the stud shaft 41 which is fastened to the lever 40 whereby when the shaft 41 is manipulated by the handle 42 secured thereon, the lever 40 will swing out of alignment into the position shown in Fig. 2, thereby causing the unlocking of the links 36, 37 and the consequent collapse and return of the frame and screen to the container, the spring actuated roller 16 drawing and winding the screen about its periphery. By inspection of Fig. 6 it will be seen that lost motion is provided by the handle 42, since the latter only performs its operative functions when the U-shaped member 44 is turned sufficiently to cause the engagement of the side thereof with a pin 46 secured at right angles in and projecting from the stud shaft.

The function and mode of operation of my invention has been in large measure indicated from the foregoing disclosure, but will be more fully understood by the following brief explanation:

When it is desired to use the screen 21 for film projection purposes, it will only be necessary to raise the lid 12, grasp the slat 22 on which the screen is fastened, and raise same to the position shown in Fig. 4, the links 27, 28, 31 and 32 then serving to securely maintain the screen in comparatively firm position in a manner to insure a practically non-vibrating back ground for the projected views. The springs 35 as set forth above, aid in maintaining the links in parallel aligned position, the action of these springs becoming more energetic as the link 27, 28, 31, 32 approach an erect aligned position,— these links forming a toggle joint system. When the hand has raised the screen and supporting frame to almost its full height, the spring 35 practically snaps the frame into operative position, also swinging the trip lever 40 into a horizontal position, thereby locking the frame in upright position, as explained above.

It will be observed that with a view to eradicating some of the small wrinkles or puckers which are formed in the screen and which occasionally remain even after the screen is erected into operative position, a slight adjustment of screen 21 may be made by loosening the pins or bolts 24', the first result of which will be to permit the pins or bolts 24' and consequently the slat 22 to drop slightly to an extent limited by the length of slots 24. The slight wrinkles alluded to may be in great measure eradicated by slightly raising or lowering the slat 22 and then tightening up the bolts 24'.

One of the chief difficulties in portable cinematograph screen frames has been the provision of a structure of sufficient firmness to prevent vibration without the employment of a cumbersome weighty construction, which would of course negative the portable features desired. In the present improved device, I have found the construction disclosed provides a firm non-vibrating support for the screen while permitting the raising of the device into locked operative position and the releasing therefrom conveniently and expeditiously.

It will be understood that the device is susceptible of variation and change without departing from the spirit or sacrificing any of the advantages of the construction set forth; hence I do not confine myself to the precise details as set forth, only in so far as they are circumscribed within the scope of the appended claims.

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

1. In a device of the kind described, a cinematograph screen secured to and wound about a spring actuated roller, a supporting slat attached to one end of said screen, a bracket mounted upon each end of said slat, a plurality of hinged links provided with spring means to swing said links into aligned position, a base member, said hinged links connected to said base member and said brackets, and tripping means to releasingly lock the screen in erect, operative position, each of said brackets being pivotally mounted upon said slat for varying the distance between said slat and said base member.

2. In a device of the kind described, a cinematograph screen mounted on a collapsible supporting frame including pairs of resiliently hinged links pivotally attached to a horizontally positioned slat having a plurality of adjustable brackets, said brackets having pivotal adjustment on a fulcrum pin, whereby when said brackets are individually moved about the fulcrum pin as a pivot, the relative distance between the slat and opposite screen support is varied.

3. A projection screen comprising, in combination, a base, a spring operated roller rotatably mounted upon said base, a slat member adapted to serve as an upper screen support, a flexible screen secured at one edge to said slat member and at the opposite edge to said roller, collapsible screen supporting members having continuous operative engagement with said slat member and with

said base, means for maintaining said supporting members in extended position upon elevation of said slat member, and means connected to said supporting members for simultaneously moving said members from extended to collapsing position.

4. A projection screen comprising, in combination, a base, a spring operated roller rotatably mounted upon said base, a slat member adapted to serve as an upper screen support, a flexible screen secured at one edge to said slat member and at the opposite edge to said roller, collapsible screen supporting members having continuous operative engagement with said slat member and with said base, means for maintaining said supporting members in extended position upon elevation of said slat member, a trip rod connected to one of said supporting members, a second trip rod connected to the other of said supporting members, and means for shifting said trip rods toward each other for simultaneously moving said supporting members from extended to collapsing position.

5. A projection screen comprising, in combination, a base, a spring operated roller rotatably mounted upon said base, a slat member adapted to serve as an upper screen support, a flexible screen secured at one edge to said slat member and at the opposite edge to said roller, collapsible screen supporting members having continuous operative engagement with said slat member and with said base, means for maintaining said supporting members in extended position upon elevation of said slat member, a releasing lever pivotally mounted upon said slat member, a trip rod connected to said lever and to one of said supporting members, and a second trip rod connected to said lever and to the other of said supporting members, whereby upon actuation of said lever said supporting members will be moved from extended to collapsing position.

6. A projection screen comprising, in combination, a base, a spring operated roller rotatably mounted upon said base, a slat member adapted to serve as an upper screen support, a flexible screen secured at one edge to said slat member and at the opposite edge to said roller, collapsible screen supporting members having continuous operative engagement with said slat member and with said base, spring means for normally maintaining said supporting members in extended position upon elevation of said slat member, a releasing lever pivotally mounted upon said slat member, and tripping means connected to said supporting members and to said lever and adapted upon actuation of said lever to move said supporting members from extended to collapsing position.

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

JOHN THOMAS HECK.