Feb. 14, 1933. H. NAGEL 1,897,273

PROJECTION SCREEN

Filed Sept. 30, 1930

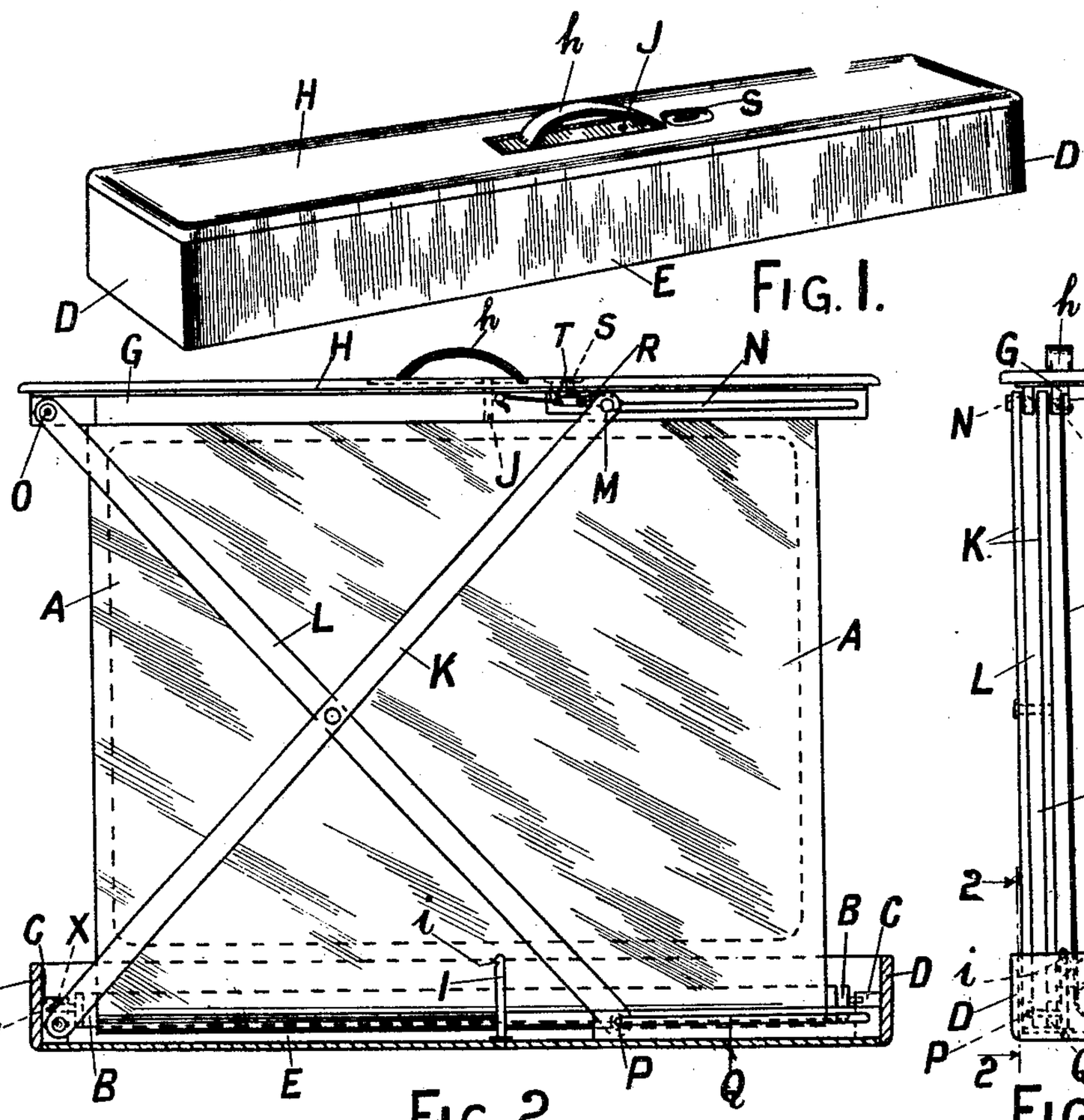

FIG. 1.

FIG. 2.

FIG. 3.

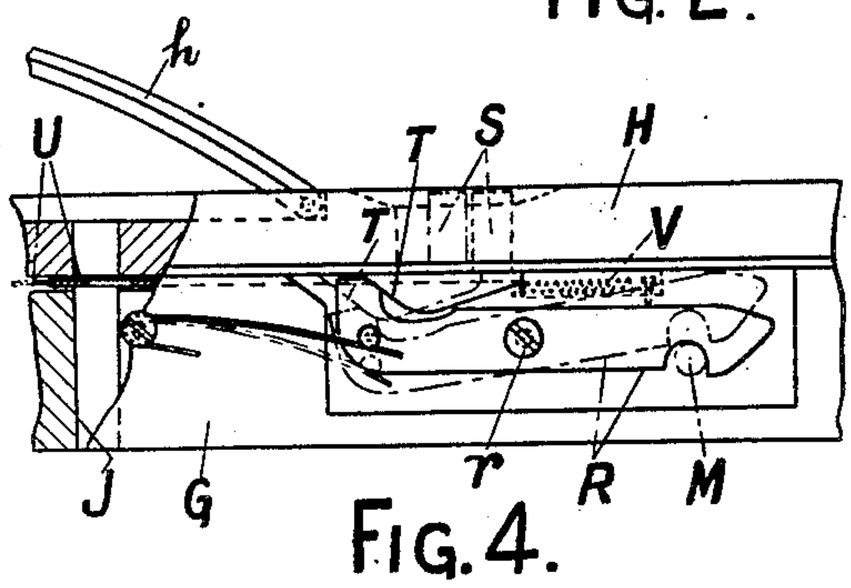

FIG. 4.

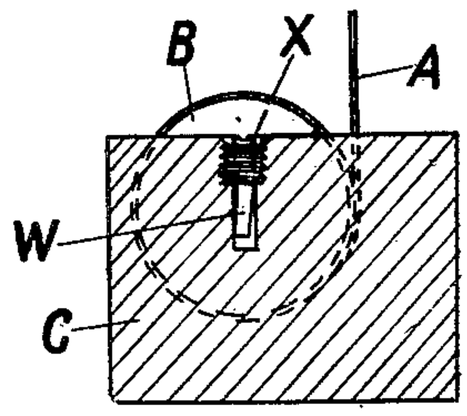

FIG. 5.

Inventor:
Hugo Nagel
By
Penine Davis Marvin & Edmonds
attorneys

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UNITED STATES PATENT OFFICE

HUGO NAGEL, OF LONDON, ENGLAND, ASSIGNOR TO ROBERT FORGIE HUNTER AND ARTHUR BLACKBURN, BOTH OF LONDON, ENGLAND

PROJECTION SCREEN

Application filed September 30, 1930, Serial No. 485,442, and in Great Britain September 15, 1930.

This invention relates to improvements in projection screens and the like of the roller blind type and has for an object to provide an improved construction which, when the screen is in collapsed position, provides an exceedingly compact and conveniently portable holder, the auxiliary parts of the screen forming a container therefor. A further object is to provide an improved construction of stretching device for holding the screen in extended position.

In accordance with a feature of the invention the roller of the projection screen is mounted for rotation within and between the side walls of a box while the free end of the screen is attached to a member which in the rolled up position of the screen serves as a lid for the box, the stretching device for the screen coming wholly within the box in the collapsed position of the screen. In accordance with a further feature of the invention the stretching device for the screen comprises a pair of pivoted struts connecting the lid member and the box, such struts being pivoted to one another about midway of their length and each of the struts being pivoted at one end either to the lid member or to the box body and slidable at the other end in a guide in the box body or in the lid, so that on unrolling the screen the struts may move into extended position holding the screen open. The struts are held in their position with the screen extended by means of a catch on the lid member engaging the strut sliding in the guide therein.

A finger piece for releasing the catch is preferably provided with an extension adapted when the lid is moved into closed position to engage with one or more upstanding projections on the bottom of the box body which serve to guide the lid into position, the extension thus serving as a lock to hold the box closed. The same finger piece may thus be operated to release the lock holding the box closed permitting the screen to be unrolled and also, when the screen is extended, to release the extended strut held by the catch when the screen is to be rolled up. Normally the box will form a base for the screen but where the screen is to be hung from a wall the box body will be provided with clips for this purpose and the screen will depend therefrom.

One embodiment of the invention applied to a projection screen is illustrated by way of example in the accompanying drawings, in which Fig. 1 shows the apparatus in its closed position forming a box. Fig. 2 is a rear elevation showing the projection screen in extended position partly in section on the lines 2—2 of Fig. 3, while Fig. 3 is an end elevation of Fig. 2. Fig. 4 is a detail to enlarged scale of the catch and locking mechanism, while Fig. 5 is a detail of the roller mounting.

Referring to the drawing, A indicates the usual projection screen of canvas, linen or the like adapted to be wound on or unwound from a spring roller B of the usual type. This spring roller is mounted for rotation in blocks C secured within the side walls D of a shallow box E. The free end of the screen A is clamped by a strip of wood or metal F to a cross bar G secured to the bottom of a member H which, when the screen is rolled upon its roller, forms the lid of the box as shown in Fig. 1. The lid member H is formed with a recess in its upper side holding strap *h* by which the apparatus can be carried when in closed position. An upstanding projection I secured to the bottom of the box E co-operates with a hole J in the cross bar G and lid H to guide the lid into its proper position on the box.

The screen is brought into extended position by releasing a catch hereinafter described and by pulling the handle, thus operating a stretching device which in the extended position of the screen holds the screen taut. The stretching device which constitutes one feature of the present invention comprises as shown in Figs. 2 and 3 a pair of pivoted struts K and L adapted to be extended and collapsed. The strut K in the embodiment illustrated is pivoted at one end on one of the blocks C in the box body and at its other end is fitted with a spindle or roller M sliding in a slotted guide N secured to the lower side of the lid H. This strut K is preferably formed of two spaced members between which moves the strut L which is

pivoted at O to the cross bar G of the lid and at the other end is fitted with a spindle or roller P movable in a slotted guide Q secured within the bottom of the box E.

On extending the screen therefore by pulling on the handle the ends of the struts K and L move in their slotted guides N and Q and in the extended position assume the position shown in Fig. 2. They are held extended by means of a spring pressed pivoted catch R which engages beneath the spindle or roller M or the strut K, as shown in full lines in Fig. 4.

To release the catch R there is provided in a recess in the lid H a finger piece S fitted with a cam T. On pushing the finger piece into the chain dotted position shown in Fig. 4 the cam turns the pivoted catch R about its pivot *r* against the action of its spring releasing the roller M and allowing the spring of the screen roller to take control and effect collapse of the screen and close the box. The finger piece S is fitted with a plate like member U extending across the passage J in the box lid H and the plate U is provided with a hole which serves to permit the passage of the upstanding projection I and the sides of which engage the notch *i* in the projection I when the lid is in closed position. A spring V attached to the plate and anchored to the lid serves to permit movement of the plate and ensures that it will act as a catch engaging the upstanding projection I and holding the box closed. With wide screens it may be found necessary to provide two or more upstanding projections I in which case the plate U will be extended to engage the various catches.

Projection screens of canvas or the like sometimes tend to stretch more at one side than at the other and consequently do not remain flat when in extended position. To adjust any inequality in stretch of the screen we preferably provide for adjustment of one end of the roller in its bearings. This adjustment is provided in the embodiment illustrated as shown in Fig. 5 by making the slot W in one of the blocks C in which the spindle of the roller B is mounted of elongated form and providing an adjusting screen X for raising or lowering the spindle.

I claim:—

1. A projection screen comprising in combination with a box for said screen, a roller mounted within the sides of said box, a cover for said box, a projection screen wrapping said roller and attached to said cover, means for stretching said screen, said means comprising a lazy-tongs device comprising a pair of pivoted struts connecting the cover and the box, and positive, separate, mechanical means for holding said stretching device in extended position, said means including a catch in the cover adapted to engage one part of said lazy-tongs device.

2. A projection screen comprising in combination with a box for said screen, a spring controlled roller mounted within said box, a cover for said box, a projection screen attached to said roller and to said cover, means for stretching said screen, said means comprising a lazy-tongs device comprising a pair of pivoted struts connecting the cover and the box, positive, separate, mechanical means for holding the screen stretched, said means releasable to allow the collapse of the screen, and means for guiding the lid into closing position when said releasable means is operated, said guiding means including a projection on the box and a co-acting guide in the cover.

3. A projection screen comprising in combination with a box, a spring controlled roller mounted within said box, a cover for said box, a projection screen attached to said roller and to said cover, means for stretching said screen, screen locking means for locking the screen in stretched position, means for releasing said screen locking means, means for guiding the lid into closing position when the screen locking means is released, said guiding means including a projection on the box and a co-acting guide in the cover, lid locking means for locking the lid in closed position and means for releasing said lid locking means, said last mentioned means being also the means for releasing the screen locking means.

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

HUGO NAGEL.