(No Model.) 3 Sheets—Sheet 1.

J. SHANNON.

DISSOLVING SHUTTER FOR MAGIC LANTERNS.

No. 448,825. Patented Mar. 24, 1891.

Fig. 1.

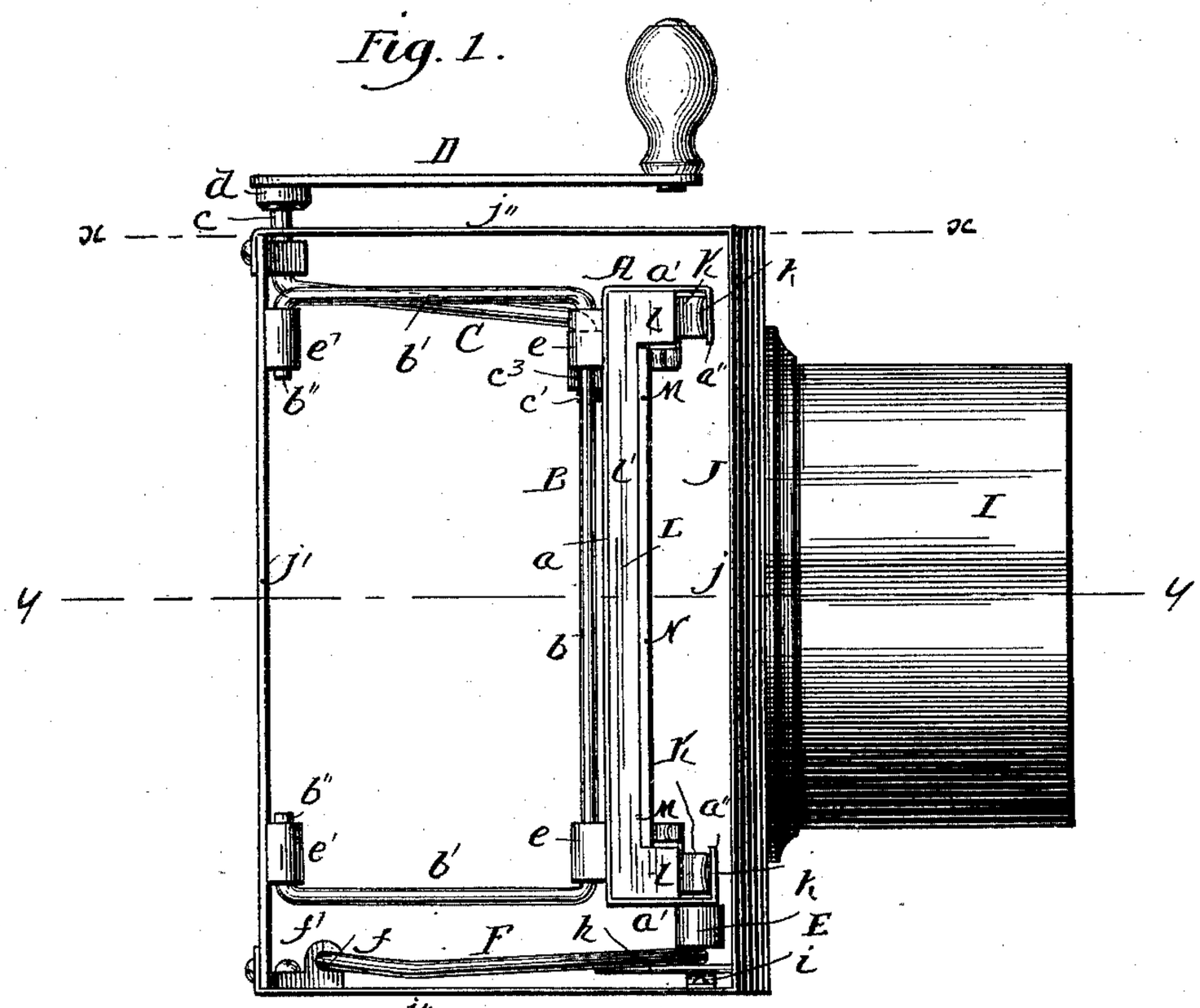

Fig. 2.

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Fig. 3

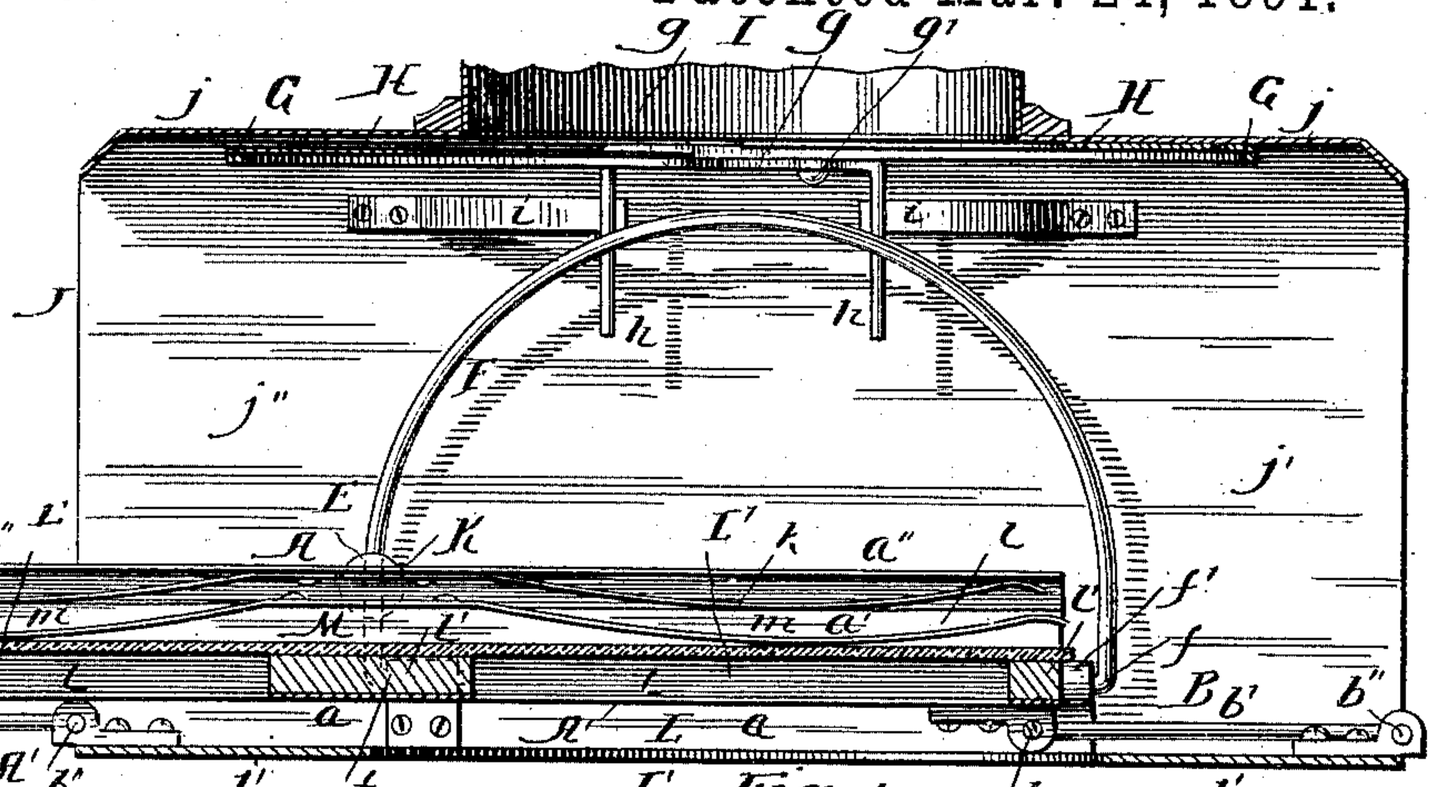

Fig. 5

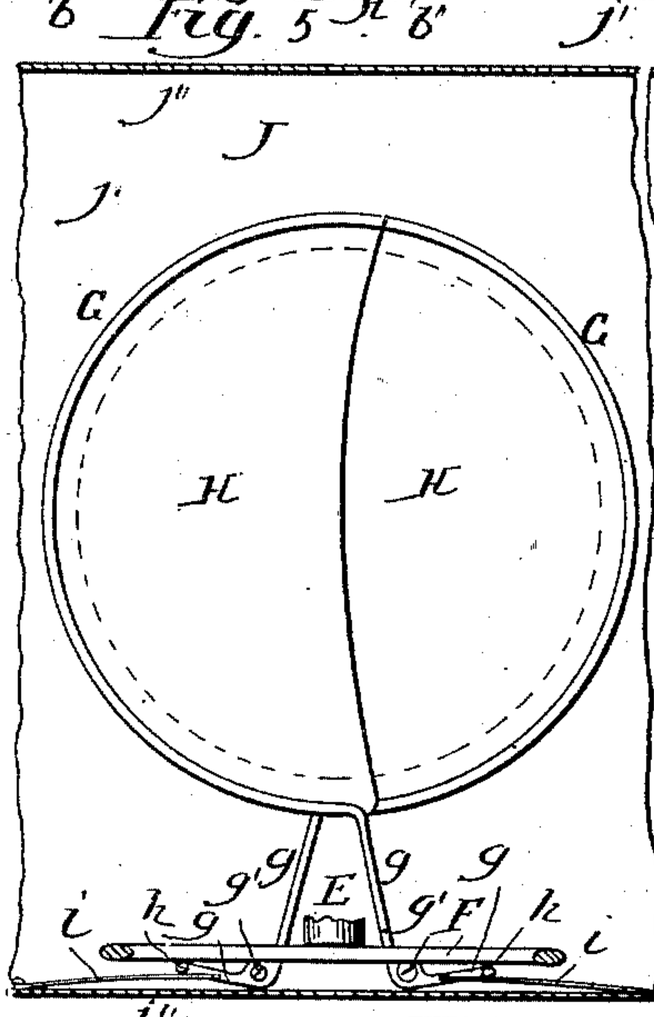

Fig. 4.

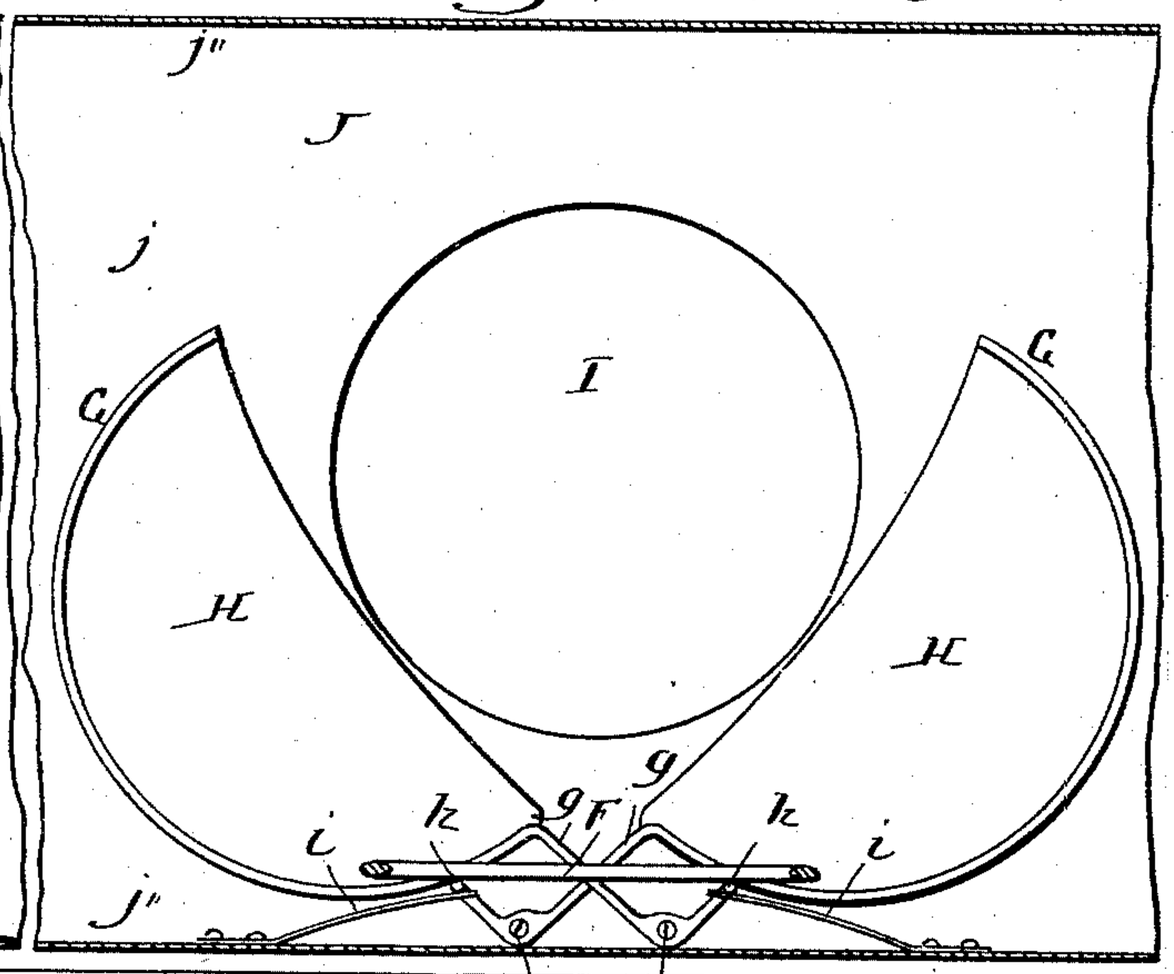

Fig. 6

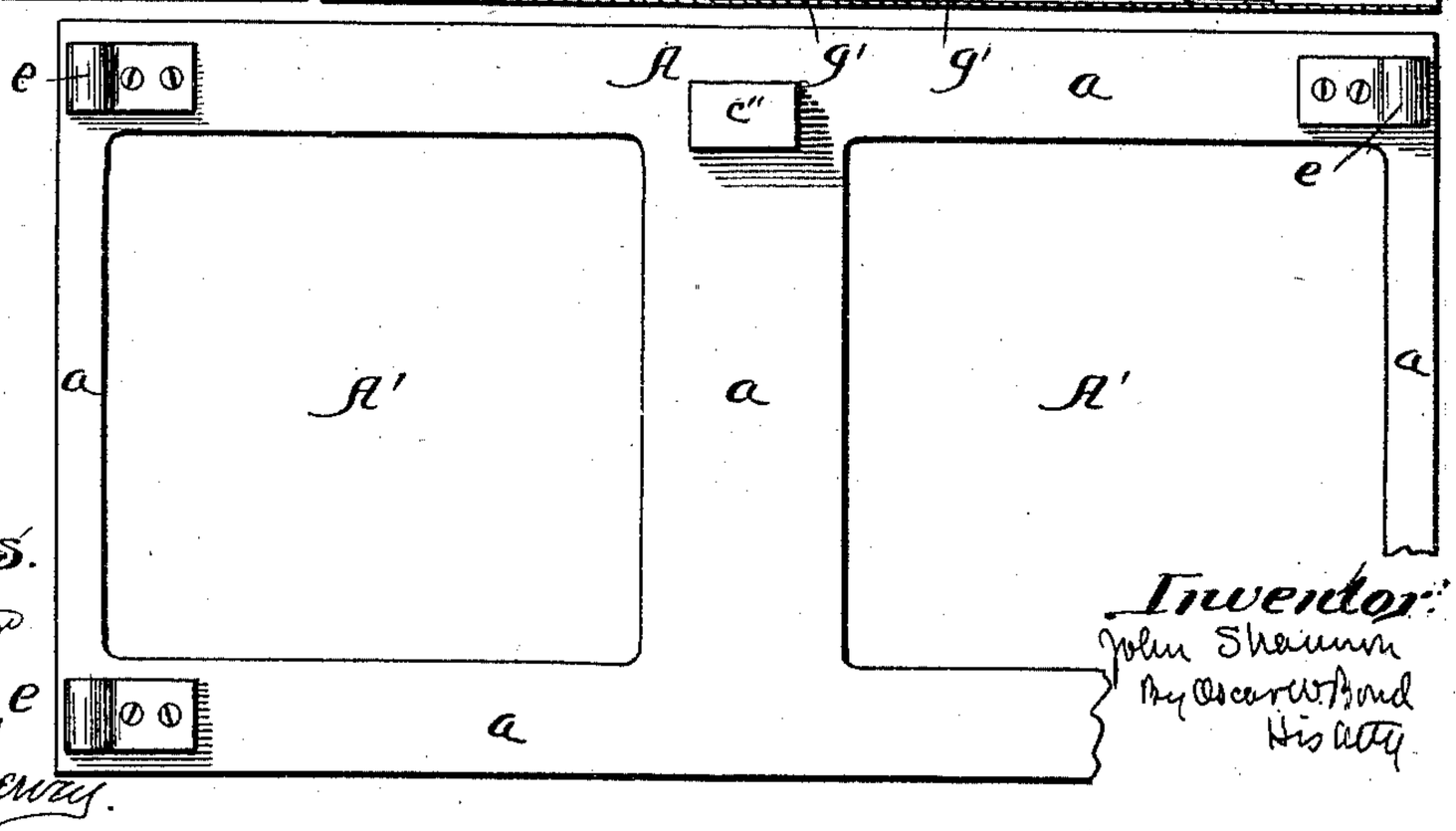

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Fig. 7.

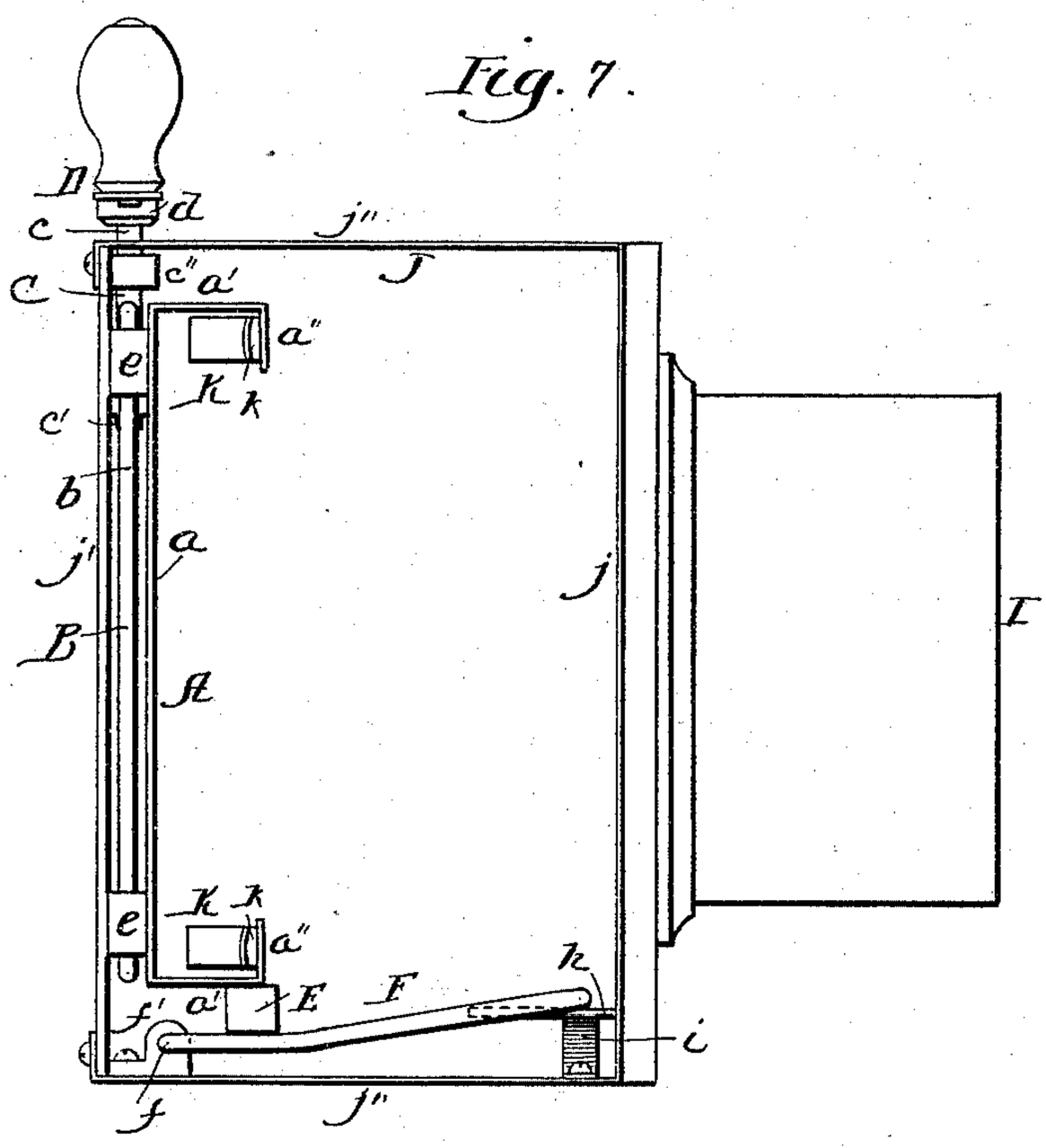
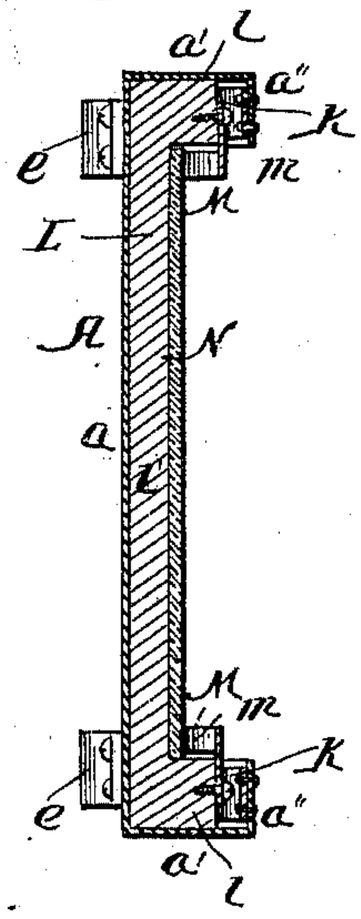


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN SHANNON, OF WIXOM, MICHIGAN.

DISSOLVING-SHUTTER FOR MAGIC LANTERNS.

SPECIFICATION forming part of Letters Patent No. 448,825, dated March 24, 1891.

Application filed December 4, 1889. Serial No. 332,600. (No model.)

To all whom it may concern:

Be it known that I, JOHN SHANNON, a citizen of the United States, residing at Wixom, in the county of Oakland and State of Michigan, have invented certain new and useful Improvements in Dissolving-Shutters for Magic Lanterns; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is an end elevation; Fig. 2, a horizontal section on line *x x* of Fig. 1, looking down; Fig. 3, a horizontal section on line *y y* of Fig. 1, looking down, showing the movable frame swung to one side; Fig. 4, a vertical longitudinal section showing the shutters open; Fig. 5, a similar section showing the shutters closed. Figs. 6, 7, and 8 are detail views hereinafter described.

It is now the practice in order to obtain a dissolving effect with magic lanterns to employ a double lantern, and such an effect is required in many cases in order to properly show or illustrate the subject being presented, and this invention has for its object to produce or obtain a dissolving effect by the use of a single lantern, and have such effect perfect in every respect, and a further object is to enable the plates to be changed without having such change visible; and to this end the invention consists in providing dissolving-shutters, either opaque or translucent, actuated through the medium of a swinging frame, which frame carries the plates; in providing a swinging frame moving in the arc of a circle at the rear of the shutter and carrying the plates, for one plate to be carried in the range of the condenser at one end of the frame while the other end of the frame is carried to the side in position for the removal of one plate and the insertion of a new plate; in providing the swinging arms supporting the frame which carries the plates and a swinging rod by which and a suitable handle the frame is swung on the arc of a circle, and in the several parts and combination of parts hereinafter described, and pointed out in the claims as new.

In the drawings, A represents the frame, made of brass or other suitable material, formed into shape to have a back *a*, with windows or openings A′, a top and bottom piece *a′*, each with a turned edge *a″* to form a channel at the top and bottom of the frame A for receiving a wooden frame carrying the plates. The frame A is of a length to receive a plate on each side of the center for each plate to be in front of the opening or window A′, as shown in Fig. 3.

B are arms, one for each end of the frame A, each arm having a vertical portion *b* and a top and bottom *b′*, having the outer end *b″* turned to form a pivot or trunnion, and each arm *b* can be made of round wire or other suitable material.

C is a rod located at the center of the frame A and at the rear side of the top of the frame, and having one end *c* turned upward and its other end *c′* turned downward, as shown.

D is a lever or handle having at its inner end a socket *d* to receive the end *c* of the rod C for attaching the lever or handle securely to the rod, and the outer end of the lever or handle D has a knob or finger-piece, by which the handle or lever can be moved. Each arm B has its vertical portion *b* mounted in ears *e*, attached to the back *a* of the frame A, and the pivot end *b″* of each arm B is mounted in an ear *e′*, attached to the inside of the case, in which the frame and arms are located, and the end *c* of the rod C is supported or mounted in an ear or box *c″* on the inside of the back of the frame case, and the end *c′* of this rod C is supported or mounted in an ear or box c^3, attached to the outer face of the back *a* of the frame A, so that the frame is supported at the end by the arms *b*, which arms can swing in the arc of a circle from the pivots *b″*, and at the same time the pivotal connection of the arm B to the frame A permits the frame to describe a movement in straight planes with the swing of the arms B, and such movement is had through the connecting-rod C and its lever or handle D.

E is a foot attached to the bottom plate *a′* of the frame A, at the center of such plate longitudinally.

F is a yoke of a semicircular shape, and made of wire or other suitable material, and

forming a track over which the foot E can pass. Each end of this yoke F is turned inward to form a pivot *f*, and each pivot *f* is mounted in an ear *f'*, attached to the inner face of the bottom of the case, as shown in Figs. 1 and 2.

G are arms of a semicircular form, made of wire or other suitable material, each arm having its lower end *g* extended and turned at an angle to the body of the arm, and attached by a pin or pivot *g'* to the inner face of the front of the case, and the outer end of each end *g* is turned inward to form a rest *h*, against which the yoke G bears, and below each rest *h* is a spring *i*, attached at one end to the bottom of the case for the free end to bear upwardly against the rest *h*.

H are shutters, one for each arm G, and attached to its arm in any suitable manner, and each shutter is of a semicircular shape with its inner edge formed on the arc of a circle, as shown in Figs. 4 and 5, and these shutters can be made of opaque or translucent material, as may be desired. The arms G are pivoted at each side of the center of the opening in the condenser, and each arm describes a half-circle by which the shutters are closed together or thrown apart so as to close or open the condenser.

I is the tube for the lens, the opening through which is opened or closed through the shutters H.

J is a case in which is located the operating devices, which case may be made of any suitable material to have a front *j*, a back *j'* with a circular window or opening J', as shown in Fig. 3, which centers with the tube I and a top and bottom *j''*, with the end left open for the projection of the plate-frame at either end. The ears *e'* are attached to the back *j'* of this case, as is also the box *e''*. The ears *f'* are attached to the bottom *j''* of this case, as are also the springs *i*, and the shutters through their carrying-arms G are pivoted to the front *j* of this case J. The frame A is located within the case J, with the arms B and the rod C, and this frame moves in the space between the front and back of the case on the inside.

K is a spring attached to the flange *a''* at the top and bottom of the frame A for its ends *k* to lie within the space between the flange *a''* and the back *a*.

L is a frame corresponding in shape to that of the frame A and made of wood or other suitable material, having a top and bottom piece *l*, and connecting-pieces *l'*, one at each end and one in the center, to form windows L', whereby when the frame L is in the frame A a window L' is in front of a window A'.

M are springs, one attached to the top and bottom piece *l* of the frame L, for the arms *m* to lie on each side of the center of the frame, as shown in Fig. 3.

N are the ordinary display-plates, having thereon the pictures to be displayed. Each picture is held in place by the arms *m* of the springs M, and the frame L is held in place in the frame A by the arms *k* of the springs K, as shown in Figs. 1 and 3.

The case J is to be attached to the lantern by any suitable means, and when attached the apparatus is ready for use, and in use a picture N is inserted in the frame L at one end of such frame, and a second picture is inserted in the frame L at the other end, and such pictures are held in place by the action of the springs M. The frame L is slipped into the frame A, between the springs K and the back *j*, and is held in place by the action of the springs K. The frame A is carried to one side, as shown in Fig. 3, bringing the picture at that end of the frame A lying within the case in front of the window or opening J' in line with the condenser, and such picture is displayed upon the screen in the usual manner. The operator, when the picture has been displayed sufficiently, turns the handle D to carry the end of the frame A which was within the case outside of the case, which brings the picture in the other end of the frame A in position for display, and at the same time the picture which has been displayed is removed from the frame and a new picture inserted for display by the operator through the crank D carrying the frame A back to its original position, and when in this position the picture which has been displayed and is in the projected end of the frame A in Fig. 3 can be removed and a new picture inserted. It will thus be seen that the picture at one end of the frame A is brought into view, and at the same time is projected and is in position for the withdrawal of a picture and the insertion of another, as such withdrawal and insertion are at one side and out of range of the lantern, by which means the changing of the pictures is had without being observed. The carrying of the frame A to either side causes the foot E, which is located at the center of the frame A, to describe an arc of a circle corresponding to the swing of the frame A through the connecting-arm B and rod C, and this foot E in its travel rides over the yoke F, pressing such yoke down, and the downward movement of the yoke bears down on the pins *h*, gradually raising the arms G and carrying the shutters H each inward until the center of the yoke F is reached, at which point the arms G have been carried to the limit of their inward movement and the shutters H closed, and with the continued travel of the foot E on the yoke F to the completion of the movement of the frame A the yoke is gradually released from the pressure of the foot, allowing the spring *i* to act and raise the pin *h*, carrying outward the arms G and opening the shutters H.

The opening and closing of the shutters H are coincident with the travel of the frame A—that is, as one end of the frame is being carried from its in position to its out position the foot E acts and gradually closes the shutter with the withdrawal of the picture from

view—and such closing of the shutter and withdrawal of the picture are gradual until the center of the yoke F is reached by the shoe E, at which time the shutters H are wholly closed, and with the travel of the shoe on the opposite side of the yoke the shutters are gradually opened, and at the same time the picture which has been placed in the projected end of the frame A is gradually brought into view with the opening of the shutters to be in full view when the shutters are opened, at which time the picture is in full position. It will be seen that while the foot E describes a semicircle traveling over the yoke F the frame A, as a whole, is carried forward and sidewise, at the same time carrying the picture at either end forward and sidewise, so that this movement, in connection with the closing and opening of the shutters H, produces a dissolving effect, and such effect must occur with each change of the frame A in projecting the frame.

The frame A is carried in a horizontal plane, and the foot E, attached to the bottom of the frame, has its bottom face carried in a horizontal plane on the arc of a circle described by the foot by reason of its location at the longitudinal center of the frame A. The yoke F is pivoted at its rear end to have its upper face at the rear in the same horizontal plane as the bottom of the foot E, and this yoke F has a slight upward inclination from its rear to its front, so that the travel of the foot over the forward part of the yoke forces the yoke at its forward part down, and such depression of the forward portion of the yoke closes or carries inward the pins *h*, closing the shutters H, and such closing will be gradual by the gradual depression of the yoke, and will continue until the foot E reaches the center of the yoke and passes around on the opposite side, gradually releasing the pressure on the forward part of the yoke for the springs *i* to raise the yoke at its forward end through the pins *h*, moving the pins apart and gradually opening the shutters, and it will thus be seen that the opening and closing of the shutters is one to produce a dissolving effect.

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

1. A frame for receiving and displaying pictures in a magic lantern, such frame having an advance and sidewise movement in either direction for bringing its ends alternately in position for display purposes, substantially as specified.

2. A frame having a movement forward and back and endwise in either direction and adapted to receive pictures for display, in combination with a movable shutter actuated through the movements of the frame, substantially as and for the purposes specified.

3. The frame A, adapted to receive pictures for display in a magic lantern, in combination with the swinging arms B for supporting the frame and giving the frame forward, back, and end movement, substantially as and for the purposes specified.

4. The frame A, adapted to receive pictures for display in a magic lantern, and swinging arms B, carrying the frame A, in combination with the actuating-rod C for giving the frame forward, back, and end movement, substantially as and for the purpose specified.

5. The frame A, adapted to receive pictures for display in a magic lantern, and swinging arms B, carrying the frame A, in combination with the actuating-rod C, and handle D for moving the frame forward, backward, and endwise, substantially as and for the purposes specified.

6. The frame A, swinging arms B, and foot E, in combination with the yoke F for moving the cut-off shutters in a magic lantern, substantially as specified.

7. The frame A, swinging arms B, foot E, and yoke F, in combination with the arms G, each carrying a shutter H for opening and closing the shutters, substantially as and for the purposes specified.

8. The frame A, swinging arms B, foot E, and yoke F, in combination with the arms J, each carrying a shutter H, and springs *i* for operating the shutters, substantially as and for the purposes specified.

9. The frame A, and swinging links B, in combination with the springs K, frame L, and springs M for holding pictures for display in a magic lantern and enabling the pictures to be changed, substantially as and for the purpose specified.

10. A frame adapted to receive pictures for display in a magic lantern, and swinging links carrying such frame, in combination with movable shutters actuated through the movements of the frame, substantially as and for the purposes specified.

11. A frame adapted to receive pictures for display in a magic lantern, and swinging links carrying such frame, in combination with a depressing-yoke, and movable shutters actuated by the yoke from the movements of the frame, substantially as and for the purposes specified.

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Witnesses:
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WM. M. RHEEM.