June 9, 1942. C. F. DUTTON 2,285,915

PROJECTING LANTERN

Filed Nov. 29, 1941 2 Sheets-Sheet 1

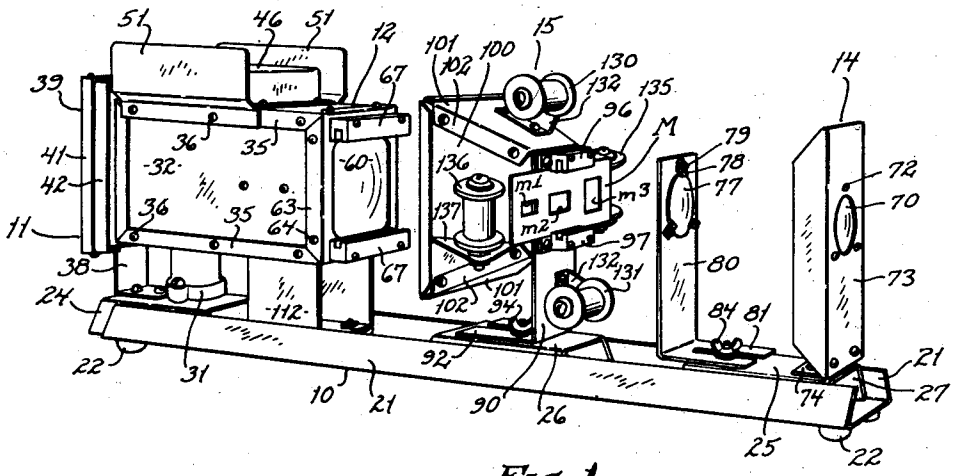


Fig. 1

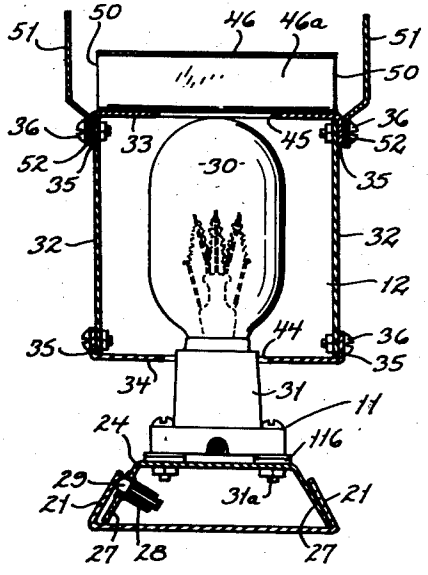


Fig. 4

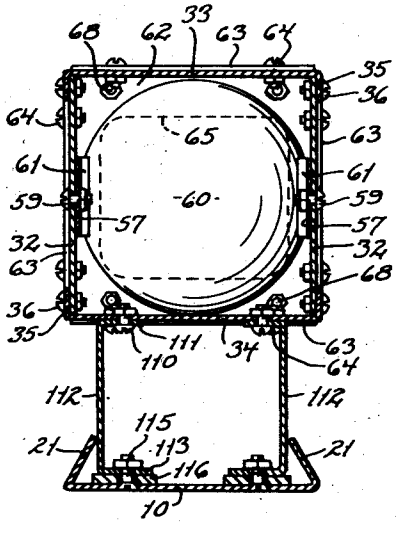


Fig. 5

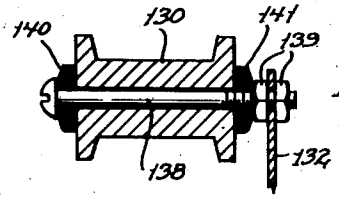


Fig. 6

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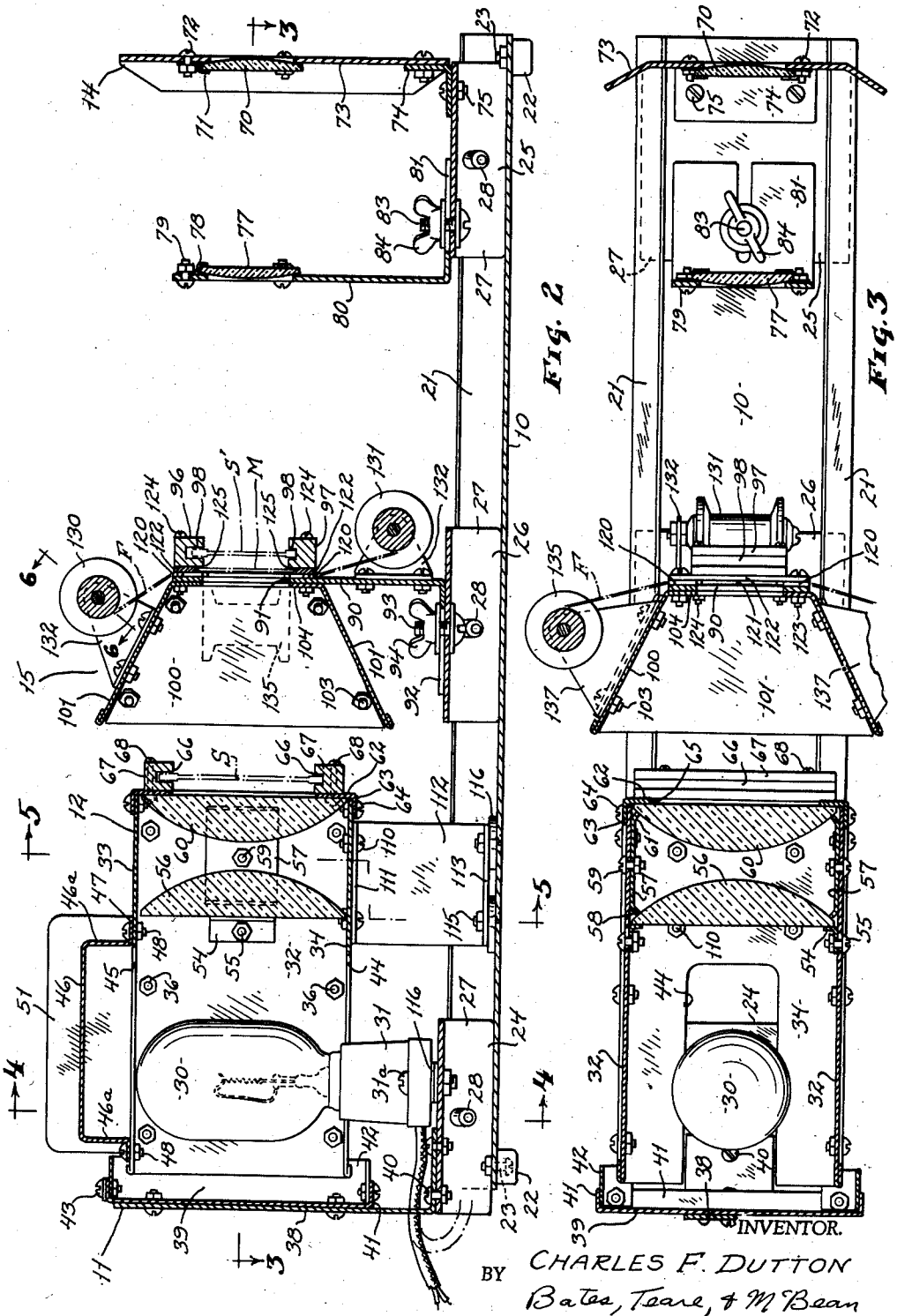


Fig. 2

Fig. 3

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PROJECTING LANTERN

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Application November 29, 1941, Serial No. 421,010

5 Claims. (Cl. 88—26)

This invention relates to a projection lantern and more particularly to a lantern for projecting lantern slides and film onto a screen in the usual manner.

The general object of the present invention is to provide a projection lantern which may be economically manufactured and readily assembled by those unskilled in the art and particularly students in public and other schools.

A more specific object of this invention is to provide a projection lantern composed, for the most part, of flat plate-like members which may be formed and assembled with the use of but a few common tools, and by those having but ordinary skill in such matters.

Another object of the present invention is to provide an improved projection lantern which will be simple to operate, economical to manufacture, and capable of withstanding comparatively rough usage.

Other objects and advantages of this invention will become more apparent from the following description in which reference is had to the accompanying drawings illustrating a preferred embodiment of the invention. The essential and novel features of the invention will be summarized in the claims.

In the drawings, Fig. 1 is a perspective view of my improved projection lantern; Fig. 2 is a centrally located longitudinally extending vertical section through the lantern illustrated in Fig. 1; Fig. 3 is a horizontal section as indicated by the lines 3—3 on Fig. 2; and Figs. 4, 5, and 6 are transverse vertical sections as indicated by the correspondingly numbered lines on Fig. 2.

Referring now to the drawings and particularly to Fig. 1, it will be seen that my improved projection lantern comprises an elongated base 10 having mounted at one end thereof a lamp unit 11 and a combined lamp housing and condenser unit 12. An objective lens unit 14 is mounted at the other end of the base 10, and intermediate the ends of the base is a combined light shield and film holder 15 for a relatively small size film or plate.

The base 10 comprises an elongated flat plate having its longitudinal edges bent upward and inward as at 21 to form a retaining guide trough. Suitable felt or rubber supporting feet 22 are secured to the bottom of the base by bolts 23.

The lamp unit 11, the objective lens unit 14 and the film holder 15 are mounted on respective supplemental bases 24, 25 and 26, respectively. Each supplemental base comprises a flat plate member having its longitudinal edges bent downward and outward as at 27 to coact with the guide flanges 21 of the base and thereby support its respective unit in longitudinal alignment on the base. The supplemental bases are slidable longitudinally of the base 10 to permit adjustment of the various units one to the other. Suitable friction devices such as the spring pressed plunger unit 28, (Fig. 4) are carried by one flange 27 of each supplemental base and are provided with plungers 29 to frictionally retain the various units against inadvertent displacement.

The lamp unit 11, which provides the source of light for the projection of the slide or film comprises a projection lamp 30 of the usual type. The lamp is removably mounted in a lamp socket 31 which is secured to the supplemental base 24 by bolts 31a, which pass through laterally enlarged openings in the base and which may be secured in position by wing nuts if desired. The lamp 30 projects upward from the base 24 into the lamp housing 12. The housing 12 comprises a pair of side plates 32, a top plate 33 and a bottom plate 34. The top and bottom plates are provided with longitudinally extending flanges 35 which are secured to the side plates 32 by bolts 36.

A light shield is mounted on the lamp supporting base at the rear of the housing. As indicated in Figs. 2 and 3, a strap 38 extends upward from the supplemental base 24 and supports a shield 39. The lower end of the strap is bent at right angles to the body thereof and is attached to the base 24 by bolts 40. The shield 39 comprises a rectangular plate having its four edges bent forwardly therefrom to form flanges 41. A shield member 42 is bolted to the flanges 41 by bolts 43 and extends forwardly therefrom, projecting beyond the rearmost edges of the lamp housing 12.

The lamp housing 12 is permanently secured to the base 10. As shown in Fig. 5, the housing is secured by bolts 110 to the upper flanges 111 of a pair of supporting brackets 112, the lower flanges 113 of which are bolted to the base 10 by bolts 115. Suitable shims such as washers 116 are used to adjust the height of the lamp housing, while similar washers may be used to correspondingly adjust the height of the projecting lamp.

Ventilation of the lamp housing is assured by reason of the enlarged openings 44 and 45 in the bottom and top plates respectively of the lamp housing. The opening 45 in the top plate 33 is protected by a light shield. This shield comprises a plate 46 having its ends bent downward as at 46a and then outward providing flanges 47 which

are secured to the top plate 33 of the lamp housing by bolts 48. The escape of light from the open sides 50 of this shield is prevented by a pair of plates 51 which are spaced from the sides 50 and are provided with flanges 52 which are secured to the lamp housing by certain of the bolts 36 heretofore mentioned.

The condensing lenses are mounted at the forward end of the lamp housing 12. As illustrated in Figs. 2 and 3, a pair of angle clips 54 are secured to the sides 32 of the lamp housing by bolts 55. The rear surface of a condensing lens 56 abuts the clips and is retained thereagainst by plates 57 having upturned flanges 58 which abut the forward face of the lens. The plates 57 are secured to the side walls of the lamp housing by bolt 59. The forward condenser lens 60 is positioned against flanges 61 of the plates 57 and is held in contact therewith by the housing end plate 62. The end plate is provided with flanges 63 which are secured to the side walls of the lamp housing by bolts 64. The end plate 62 is provided with the usual rectangular opening 65 for the passage of light to the objective lenses hereinafter to be more fully described.

When the lantern is used with lantern slides or film of a comparatively large size, the slide or film, generally indicated with broken lines at S, Fig. 2, is slid into position in suitable guiding grooves 66 formed in wood blocks 67 which are secured adjacent the upper and lower edges respectively of the opening 65 by bolts 68. These guideways, being of wood, protect the slides from the heat of the condenser housing.

The objective lenses are mounted on the supplemental base 25, as heretofore mentioned. As shown in the drawings, an objective lens 70 is secured by suitable clips 71 and bolts 72 over an opening in a plate 73. This plate is bolted to an angle clip 74 which in turn is secured by bolts 75 to the forward supplemental base 25.

When small slides or small films are used, they are supported by the unit 15 heretofore mentioned, and a second objective lens 77 is used to increase the size of the projected image. This second objective lens is secured over an opening in a plate 80 by clips 78 and bolts 79. The plate 80 has a base flange 81, slotted as at 82 to cooperate with a bolt 83 carried by the supplemental base 26. A suitable wing nut 84 serves to hold the unit in position and facilitates its adjustment relative to the objective lens 70.

The unit 15 which receives the small size film or slide comprises a plate-like member 90, provided with an object opening 91. This plate is supported by a slotted base flange 92, which is secured in position on the supplemental base 25 by a bolt 93. Here again a wing nut 94 is used to facilitate the removal and adjustment of the slide carrier. The small slides are removably carried as at S' by a pair of wooden guide rails 96 and 97, secured to the plate 90 adjacent the top and bottom of the opening 91 therein. Each of these rails is provided with a groove 98 to facilitate insertion and removal of the slides. The unit 15 is provided with a light shield which comprises as shown, a pair of side plates 100 and top and bottom plates 101, the latter being flanged as indicated at 102 to facilitate securing of the various plates together as by bolts 103. The forward end of each of the plates 100 and 101 is flanged inwardly as at 104 to facilitate attachment to the plate 90 heretofore described. The plates 100 and 101 provide a shield which extends from the slide carrier 90 rearwardly toward the lamp housing.

The unit 15 may also be adapted to accommodate rolled films of the usual small sizes, the films being advanced either horizontally or vertically in registration with the opening 91. As illustrated in Figs. 2 and 3, guides for such films F may be provided by four flat corner pieces or spacers 120 which, being located at the corners of the opening 91, thereby define slotted openings as at 121, Fig. 3, between the plate 90 and the two horizontal bars 122, the film being threaded through such openings. Bolts 123, passing through the bars 122, the corner pieces 120, the plate 90, and the flanges 104 of the light shield, retain the parts in rigid assembly. The guide rails 96 and 97, heretofore mentioned, are secured against the outer faces of the bars 122 by means of bolts 124, and as the bars are of less height than either the guide rails or the corner pieces 120, slotted guideways 125 are thereby formed for a mask M illustrated in broken lines in Fig. 2.

The mask M, best seen in Fig. 1, is preferably provided with a plurality of openings corresponding in size to the picture areas of the various films to be used. For example, the opening m' may accommodate 16 mm. film, the opening m^2 may accommodate 32 mm. film, and the opening m^3 may be similar to m^2, but with the longer dimension vertical instead of horizontal. The mask M may be slid manually, within the guideways 125, to the properly selected position.

The rolled films F may be carried by either of two pairs of spools mounted on the unit 15. As illustrated in the drawings, the vertical pair 130 and 131 are carried by brackets 132 bolted to the top plate 101 and to the vertical plate 90, respectively, while the horizontal pair 135 and 136 are carried by brackets 137 secured to the side plates 101 by certain of the bolts 103 heretofore mentioned. A simple and convenient form of mounting is illustrated in Fig. 6, wherein the spool 130 is rotatable on a bolt 138 carried by the bracket 132, the bolt being rigidly positioned by means of lock nuts 139. Resilient washers 140 and 141 confined between the end surfaces of the spool and the bolt head and nut 139 respectively provide sufficient friction to maintain the film at the desired tautness, and yet to allow manual shifting thereof. The spools may be provided with slots or other retaining devices, not shown, to secure the ends of the film.

When large size films or slides are to be projected, the wing nut 94 is loosened and the unit 15 is removed from the base, the films or slides then being mounted in the guides 67 on the lamp housing.

From the foregoing description it will be seen that I have provided an extremely simple construction, which, aside from the lamp, the lamp socket, spools, and lenses, may be constructed from flat plates having suitable flanges to provide for their attachment one to the other. These plates may be easily bent and secured together with simple tools and ordinary skill. Thus, it will be seen that my projection lantern is especially adapted for assemblage by industrial art students at a relatively small cost.

I claim:

1. A projection lantern comprising an elongated base, a lamp support mounted for longitudinal adjustment at one end of said base, a lamp carried by said lamp support, a combined lamp housing and condenser lens support com-

prising a pair of transversely spaced vertically extending flat plates, a top and a bottom plate, said last named plates being provided with longitudinal flanges adapted and arranged to be secured to said side plates to form a rectangular housing, means at one end of said housing to position a condenser lens unit therein, said bottom plate being provided with an opening, to receive said lamp, said top plate being provided with a ventilation opening, a light shield carried by said housing adjacent the opening in said top plate, a light shield carried by said lamp support at one end of said lamp housing, a plate holder at the other end of said housing, and an objective lens unit mounted at the other end of said base for longitudinal movement relative thereto.

2. A projection lantern comprising an elongated base, a lamp support mounted for longitudinal adjustment at the rear end of said base, a lamp housing and condenser lens mounting carried by said base forward of the lamp support, a lamp on said lamp support and extending into said housing, a condenser lens carried by said lamp housing, a pair of slide holding guides mounted on the forward end of said lamp housing to removably receive lantern slides, an objective lens unit at the forward end of said base and adjustable longitudinally thereof, said last-named unit comprising a flat plate member having means thereon to slidably coact with said base, an angle member secured to said base and having an upstanding leg, a flanged vertically extending plate secured adjacent its lower end to said upstanding leg, said plate having an opening therein, an objective lens extending across said opening, and means carried by said plate to retain said lens in position thereon.

3. A projection lantern comprising an elongated base, a lamp support mounted for longitudinal adjustment at the rear end of said base, a lamp housing and condenser lens mounting carried by said base forward of the lamp support, a lamp on said lamp support and extending into said housing, a condenser lens carried by said lamp housing, a pair of slide holding guides mounted on the forward end of said lamp housing to removably receive lantern slides, an objective lens unit at the forward end of said base and adjustable longitudinally thereof, said last named unit comprising a flat plate member having means thereon to slidably coact with said base, an angle member secured to said base and having an upstanding leg, a flanged vertically extending plate secured adjacent its lower end to said upstanding leg, said plate having an opening therein, an objective lens extending across said opening, and means carried by said plate to retain said lens in position thereon, a second vertical plate mounted on said flat plate and having an opening therein, a second objective lens extending across the opening in said second named vertical plate, means to secure said last named lens on the plate, and means whereby said second named vertical plate may be moved toward and away from the first named objective lens.

4. A projection lantern comprising an elongated base, a lamp support at one end of said base, a lamp carried by said support, a housing for said lamp, a condenser lens mounted in said housing, an objective lens unit mounted at the other end of said base and movable toward and away from said housing, a lantern slide holder intermediate said housing and objective lens unit, said slide holder having a supplemental base mounted for movement longitudinally of said elongated base and a vertically extending plate removably secured to said supplemental base and having an opening therethrough, a pair of lantern slide holding guides secured to one side of said plate adjacent the top and bottom of the opening therein, a light shield carried by the other side of said plate and extending toward said lamp housing, said light shield comprising a pair of side plates extending rearwardly and outwardly from the opening in said plate holder and a top and a bottom plate extending rearwardly and respectively upwardly and downwardly from such opening, said plates comprising said shield being bolted together adjacent their longitudinal edges, and being provided with flanges at their forward edges for securement to said slide holder.

5. A projection lantern of the type described, comprising an elongated base and a plurality of supplemental bases, each of said bases comprising a flat flanged plate, the flanges of the supplemental bases coacting with the flanges of the elongated base to slidably secure said bases together, a lamp socket and lamp carried by one of said supplemental bases, a slide carrier unit and light shield unit carried by another of said supplemental bases, a lamp housing unit carried by said elongated base, an objective lens supporting unit carried by another of said supplemental bases, and wherein each of said units comprises flat plate members having flanges to receive bolts to secure said members one to the other and thereby form the respective units.

CHARLES F. DUTTON.