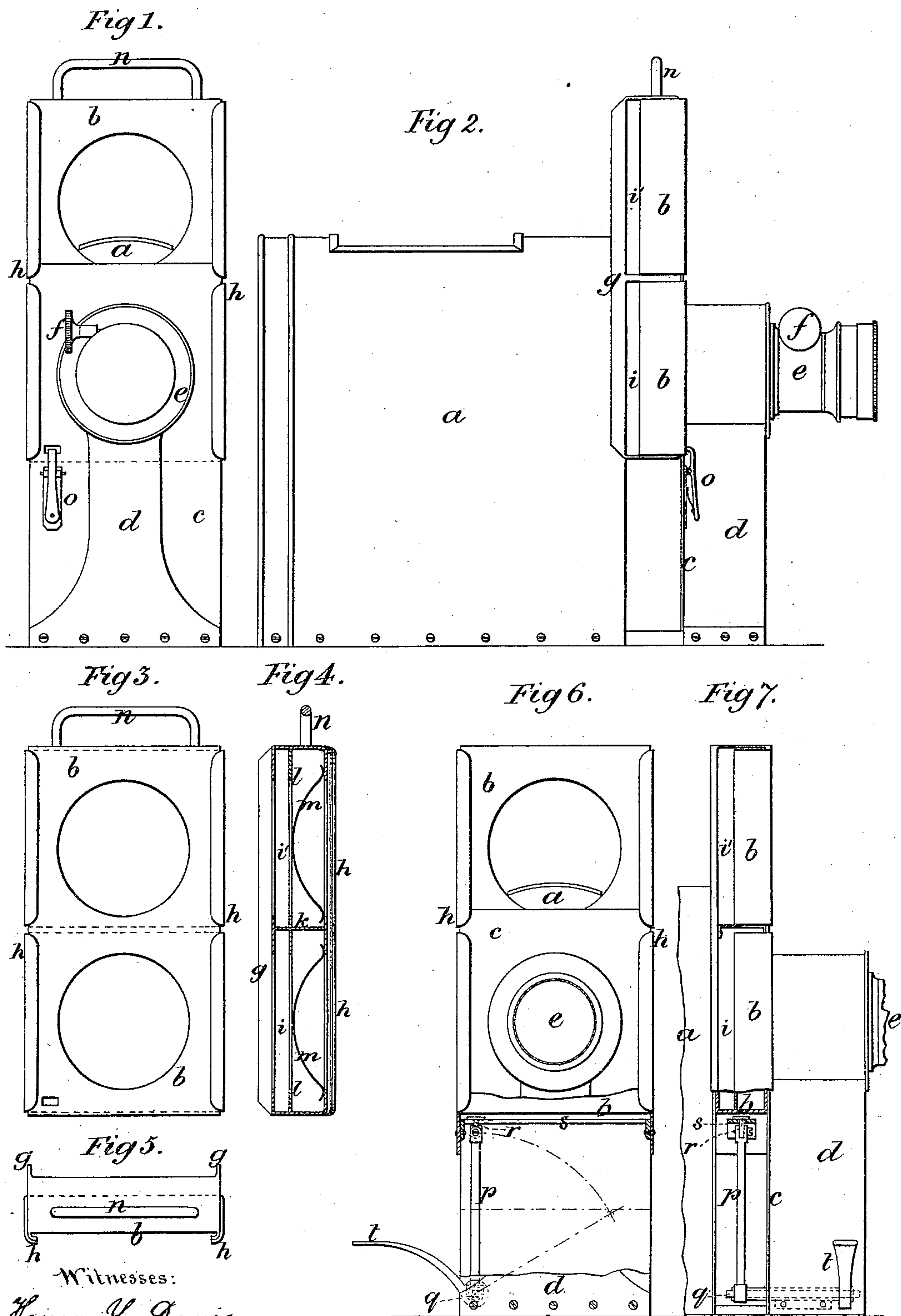


(No Model.)

C. GRAY & H. KEMP.
MAGIC LANTERN.

No. 346,994.

Patented Aug. 10, 1886.



Witnesses:
Harry V. Davis.
Edwin A. Finckel.

Charles Gray, Harry Kemp, Inventors;
by *Wm. H. Finckel* their Attorney.

UNITED STATES PATENT OFFICE.

CHARLES GRAY AND HENRY KEMP, OF LONDON, ENGLAND, ASSIGNORS TO
ALFRED WRENCH, OF SAME PLACE.

MAGIC LANTERN.

SPECIFICATION forming part of Letters Patent No. 346,994, dated August 10, 1886.

Application filed December 29, 1885. Serial No. 186,969. (No model.) Patented in England November 24, 1884, No. 15,440.

To all whom it may concern:

Be it known that we, CHARLES GRAY and HENRY KEMP, subjects of Her Majesty the Queen of Great Britain and Ireland, residing, respectively, at No 11 Crooked Lane, and No. 7 Thavies Inn, both in the city of London, England, opticians, have invented new and useful Improvements in Magic Lanterns, (for which we have obtained Letters Patent in part in Great Britain, No. 15,440, bearing date November 24, A. D. 1884,) of which the following is a specification.

Our invention relates to that portion of magic lanterns and similar apparatus in which the picture or object slides are placed for exhibition, and the object of our improvements is to enable the exhibitor while one picture or object slide is being exhibited to place in proper position in the lantern, above or below the optical axis thereof, a second or other number of slides, whether mounted in frames or unmounted, and contained in the usual "carrier" in readiness to be exposed to the light, without necessitating the withdrawal of the preceding picture-slide from the slide-holder while it is opposite the lens, as is the case with magic lanterns of the ordinary construction provided with a fixed slide-holder.

Now, according to our invention we substitute for the fixed slide-holder usually attached to magic lanterns, and which only holds a single properly-adjusted slide therein, a movable or shifting slide-holder capable of holding at the same time two or more properly-adjusted mounted magic-lantern slides or carriers for unmounted slides, disposed one above another, and of being raised and lowered vertically, or at such an angle across the optical axis of the lantern as will admit of the said slide-holder being conveniently divided by one or more horizontal partitions into two or more compartments, one above another, each of sufficient height to contain a properly-adjusted mounted magic-lantern slide or a carrier for an unmounted slide.

We attain the object of our invention by the arrangement illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation of a magic lantern having our vertically-adjustable

slide-holder applied thereto. Fig. 2 is a corresponding side elevation of the same. Figs. 3, 4, and 5 are separate views of the vertically-adjustable slide-holder detached, here shown as adapted for being shifted by hand direct, and for holding two magic-lantern slides in separate compartments, one above the other, at the same time. Fig. 6 is a front elevation of the lantern with a portion broken away, showing a mechanical arrangement for shifting the slide-holder; and Fig. 7 is a corresponding side elevation and partial section of the same.

Similar letters refer to similar parts throughout the several views.

a is the body of the lantern, which contains the usual lamp and lenses for intensifying the light thereof, which, being well understood, need not be further referred to.

b is our improved movable or shifting slide-holder, the drawings showing it as adapted for holding two slides only, inserted from the side of the lantern, and as arranged to slide vertically between the body of the lantern and a plate, *c*, fixed to the support *d*, which carries the usual adjustable lens-tube, *e*, with its adjusting arrangement *f*. The said vertically-shifting slide holder is by preference formed with longitudinal flanges *g* and *h* at its front and rear sides, engaging, respectively, with the sides of the lantern-body and the edges of the plate *c*, so that it may be guided in its upward and downward movements.

The interior of the shifting slide-holder is divided into two or more separate compartments, *i* and *i'*, (one above the other,) by one or more horizontal transverse partitions or ledges, *k*, which support the picture or object slide or slides contained in the said slide-holder.

l l are the usual yielding plates pressed outward by springs *m m*, for holding mounted picture or object slides or the usual carrier for unmounted slides steady, when inserted into the slide-holder.

n is a handle attached to the top of the shifting slide-holder for raising and lowering the same by hand direct; and *o* is a self-acting spring-catch on the front of the lantern, engaging into a hole or notch in the front of the shifting slide-holder, for the purpose of arrest-

ing its movement and holding in its adjusted position during the exhibition of any particular slide, as shown in Figs. 1 and 2, and for releasing it by the pressure of the finger on the said catch when the slide-holder is to be shifted for the purpose of exposing to the light of the lantern, the succeeding picture-slide already adjusted in its place in the slide-holder above or below the optical axis of the lantern, as the case may be.

The upward or downward shifting of the slide-holder may obviously be effected in various ways, as, for example, by hand direct through the fixed handle *n*, as already described and illustrated in Figs. 1, 2, 3, 4, and 5, or by any suitable mechanical arrangement, such, for example, as that shown in Figs. 6 and 7, where *p* is a lever-arm mounted on a spindle, *q*, and jointed at its upper or free end to a slide, *r*, traversing to and fro along a slotted guide, *s*, attached to the bottom of the vertically-shifting slide-holder *b*. *t* is a thumb-lever fixed on the spindle *q*, for actuating the arm *p* and its slide *r*, and thereby raising and lowering under perfect control the slide-holder, the spring-catch *o* in this modification not being essentially requisite, as the exact range of movement of the slide-holder will be governed by the extent of traverse of the actuating-slide *r* along its slotted guide *s*. The position of the arm *p*, when at about one-half its traverse, and the corresponding position of the bottom of the slide-holder is represented in dotted lines in Fig. 6.

The movement of the slide-holder may obviously, if desired, be made to actuate at the same time a screen or partial obstructer, as is well understood, situate in front of the lens, for the purpose of producing an effect approximating to that of what are known as dissolving views; but we do not claim this as forming any part of our invention.

In using our invention the picture or object slide to be exhibited is placed, for example, in the lower compartment, *i*, of the vertically-shifting slide-holder, so as to be in the optical axis of the lantern, and while this is being exhibited the succeeding picture-slide is introduced into the upper compartment, *i'*, and properly adjusted in readiness for exhibition in its turn by the descent of the slide-holder to the proper distance required, or until arrested by the spring stop or catch, when employed. While this is on view the previously-exhibited picture-slide which has now been brought below the lens is withdrawn and replaced by another in readiness for exhibition by the sudden raising of the slide-holder till it is caught at the proper elevation by the self-acting spring-catch *o*, when employed, and so on, the changing of the pic-

tures being rapidly accomplished by the up-and-down movement of the slide-holder without the objectionable effects on the screen which result from the use of the usual stationary slide-holder, wherein the picture-slides are introduced and adjusted in succession while opposite the lens.

We are aware that it has been proposed to use in connection with magic lanterns movable slide-holders of various kinds shifted horizontally across the optical axis of the lantern, divided into compartments arranged side by side, and containing two or more unmounted picture-slides supported on one and the same horizontal base; but such arrangements are not conveniently applicable for the exhibition of the usual picture-slides inserted horizontally from the side of the lantern or of special slides—such as chromatropes, movable slides, panoramas, and the like—and are moreover both complicated and costly in their construction. Therefore we lay no claim thereto; but

What we do claim as our invention, and desire to secure by Letters Patent of the United States, is—

1. The combination, substantially as shown and described, of the body *a* of a magic lantern or like apparatus, the plate *c* and the vertically-shifting slide-holder, constructed as set forth, with the flanges *g* to engage the sides of the said body and the flanges *h* to engage the edges of the said plate, to permit the aforesaid movement of the slide-holder across the optical axis of the lantern.

2. The combination, substantially as shown and described, of the body *a* of a magic lantern or like apparatus, the plate *c*, and the vertically-shifting slide-holder, constructed as set forth, with the flanges *g* to engage the sides of the said body and the flanges *h* to engage the edges of the said plate, to permit the aforesaid movement of the slide-holder across the optical axis of the lantern, and a slide-holder retaining device, as specified.

3. The combination, with the vertically-shifting slide-holder for a magic lantern or similar apparatus, of the lever-arm *p*, slide *r*, slotted guide *s*, attached to the bottom of the slide-holder, and actuating lever-handle *t*, all substantially as and for the purpose set forth.

In testimony whereof we have signed our names in the presence of two subscribing witnesses.

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Witnesses:

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