

3 Sheets—Sheet 1.

No. 494,854.

Patented Apr. 4, 1893.

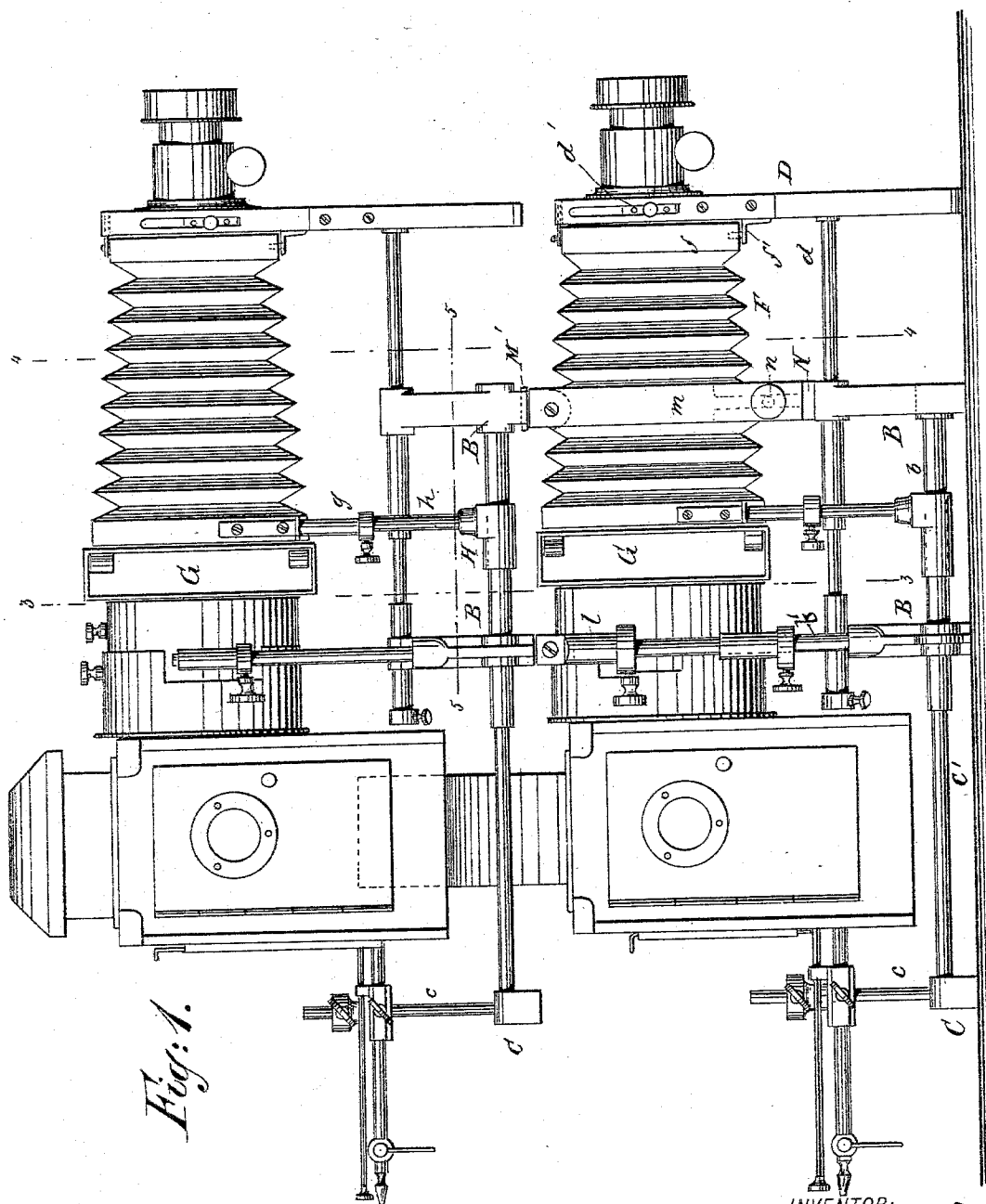


Fig: 1.

WITNESSES:

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INVENTOR:

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Charles Goodyear, Jr.
BY *J. M. [illegible]*

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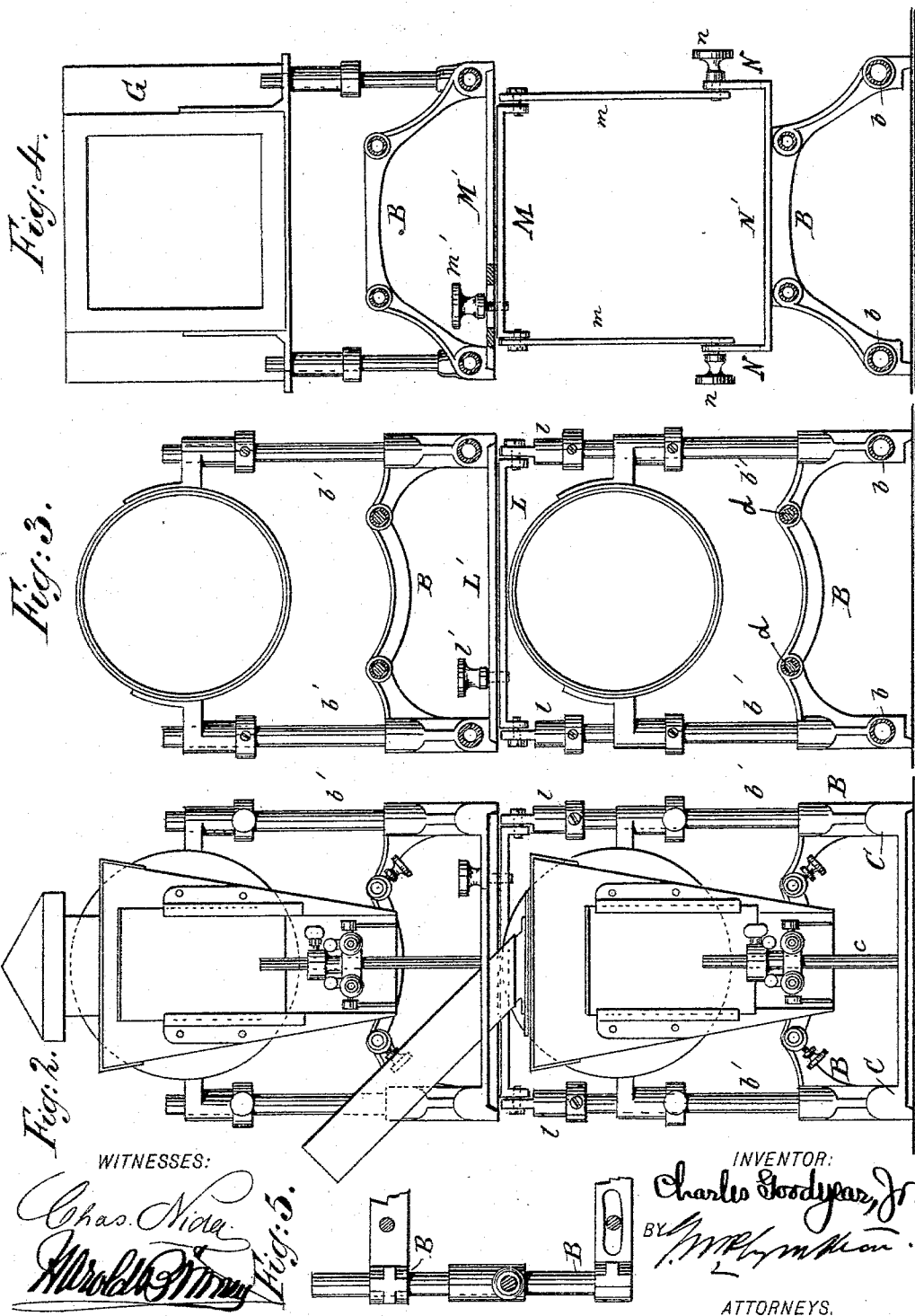
(No Model.)

3 Sheets—Sheet 2.

C. GOODYEAR, Jr.
MAGIC LANTERN.

No. 494,854.

Patented Apr. 4, 1893.



UNITED STATES PATENT OFFICE.

CHARLES GOODYEAR, JR., OF NEW YORK, N. Y.

MAGIC LANTERN.

SPECIFICATION forming part of Letters Patent No. 494,854, dated April 4, 1893.

Application filed April 23, 1892. Serial No. 430,417. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GOODYEAR, Jr., a resident of New York city, New York, have invented new and useful Improvements in Magic Lanterns, of which the following is a description, reference being taken to the accompanying drawings, that form a part of this specification.

The purpose of my invention is to produce a lantern at once rigid, compact, readily adjustable, and easy of operation, and to enable me to couple two or more together for dissolving view work and like uses, and to readily manipulate the lanterns when so adjusted.

To these ends my invention consists in the lantern and in its several parts and attachments constructed, arranged, combined, and used, substantially in the manner hereinafter described, illustrated, and claimed.

In the drawings Figure 1 is a side elevation of two of my lanterns arranged for use with a lime jet and coupled together one above the other. Fig. 2 is a rear elevation of the same, some of the front portions and hence more remote being omitted for clearness. Fig. 3 is a view of the condenser lenses, supporting frames, and rear coupling devices. Fig. 4 is a view of the front couplers and shows in addition the slide box and its supports for the upper lantern. Fig. 5 is a fragmentary section on line 5—5 of Fig. 1 and shows parts of the couplers and part of the frame and sliding supports for the slide box. Fig. 6 shows a single lantern as arranged to be used with an oil light and may be referred to as showing my lantern frame without the coupling devices.

In the drawings, like letters of reference indicate like parts.

What I may for convenience call the stationary part of each lantern frame is shown at B, though of course all parts may be adjusted relatively to the other moving elements. This stationary part consists of a pair of bridge shaped standards connected by two tubular slide rods *b* as shown. From the rear standard at each side, rise the vertical slide rods or post *b'*, which carry the condenser lenses.

The lamp or light of my lantern, of whatever form used, is carried upon a slide rod or

post *c* which rises from a movable standard C connected to the stationary frame B by a pair of rods *c'* which slide within the tubular rods *b* of the frame and permit longitudinal adjustment of the lamp while the lamp itself by means of an adjustable collar, as shown, may be raised and lowered upon the post *c*.

I have arranged for my lantern as used with a lime jet, a special hood of keystone shape which is supported directly upon the condenser lens case and is thus kept in proper relation thereto. This feature, together with the lime jet, I have made the subject of separate application for patent, Serial No. 430,416, filed herewith April 23, 1892.

The objectives of my lantern are carried upon an adjustable standard D, connected with the frame B by the rods *d* that slide within guides in the frame. It will be seen that in my lantern the front and the back extensions run in separate guides, thus enabling me to extend each to the length of the frame B, whereas in many well known forms of extension frames, in which the front and rear extensions co-operate, the total extension of the lantern is limited to double the length of the stationary frame.

Upon the front standard D is adjustably secured, as is frequent in cameras, a lens block or front piece that carries the objectives and forms a front to the bellows F. The bellows at their front portion terminate in a rectangular frame *f*. This frame is provided with circular recesses in its lower side within which fit the retaining pins *f'* that hold it in contact at this point with the lens block. The upper side of the frame *f* is provided with a small pin which engages with a hook *f''* upon the lens block and thus with the recesses and pins *f'* effectively secures the bellows to the block, enabling various sizes of lenses to be used with the same bellows. The vertical adjustment *d'* of the lens block enables me to adjust, at one operation, the height of the lenses and the front part of the bellows. The rear of the bellows is secured to the slide box G and supported by the collars *g*, which are vertically adjustable upon a pair of slide rods or posts *h* carried upon a sliding bridge support H which runs upon the side rods *b* of the stationary frame. This sliding support H,

with its vertical rods *h*, not only serves to adjust longitudinally and vertically the slide box, but is of great use for the support of microscopic and mechanical attachments, which require the most rigid support.

I have now described the construction of my individual lanterns and will proceed to set forth the means by which two or more may be coupled together and adjusted relatively to each other. My coupling devices appear in Figs. 1, 3, 4, 5. The rear coupling device consists of a bridge piece *L*, pivotally secured to two caps *l* adapted to fit upon the heads of the rods or posts *b'* of the stationary frame, and of a co-operating bridge piece *L'* secured to the upper lantern frame directly beneath the foot of the posts *b'*. These two bridge pieces *L* *L'* are secured together by the single thumb nut *l'* that forms a pivotal connection between the two lanterns and permits relative rotation in the horizontal plane, while the connection of the bridge piece *L* with its screw caps *l* allows a vertical angular adjustment of the two lanterns. The front coupler consists of a bridge piece *M'* similar to the piece *L'* and secured to the frame of the upper lantern at the base of the front standard *B* of its stationary frame. This bridge piece *M'* is provided with a curved slot, centered at the thumb nut *l'*, thus permitting the free horizontal adjustment above noted without interference with the thumb nut *m'* that passes through the said slot into the lower bridge piece *M* of the coupler. The lower bridge piece, *M*, is pivotally connected, as indicated in the drawings, with two side pieces *m*, which are provided with thumb nuts *n* running in vertical slots within two uprights or vertical plates *N*, carried by a cross piece *N'* secured to the upper part of the front standard *B*. These vertical slots permit the angular adjustment of the lanterns in the vertical plane; and by the tightening of the thumb nuts *n* the two lanterns may be secured at the desired angle. It will also be seen that when satisfactory horizontal adjustment has been attained, the lanterns may be firmly secured by tightening the nut *m'* (and, when needed, the nut *l'*). In Fig. 5 the relative position of the horizontally adjusting nuts and slot is clearly brought out.

In Fig. 6 is shown my lantern used with an oil lamp known to the trade as the "Parabolon." The greater size of this lamp renders it necessary for me to raise the condenser lenses and consequently the slide box, bellows, and objectives, increasing the size of my lantern as a whole, but these vertical adjustments are not alone useful for this and similar uses, but may to advantage be utilized, when two lanterns are used with lime jets, to remove the upper and lower lanterns as far apart as the adjustments permit, by lowering the lower lantern and raising the upper one. This greatly assists me in diverting the heat of the lower lantern away from the upper one.

Having now set forth the construction of

my lanterns, I will explain a few of the advantages I derive from my invention. I have already shown the manner in which two lanterns may be coupled and used, and it follows that a third or a fourth may be superposed and each coupled with the one beneath it in like manner, while the adjustments of each will in no way be interfered with.

When a lantern has been placed in position for use, the front extension may be drawn out to about the proper length, the back extension then drawn out and the lamp or jet mounted on the post *c*. The lenses, bellows, and slide box, may then all be raised on posts *b'*, *g*, and standard *D*, into alignment at a convenient height, and the light then adjusted by the horizontal and vertical adjustments already set forth. The slide box may now be, in accordance with the relative size of slides and condensers, adjusted relatively to the condenser lenses by means of the horizontal slide *H*. After the lamp or jet has been lighted, the usual rack and pinion movement is used for final focusing. If any mechanical slides or microscope attachments are to be added, the bellows and the objectives, together with the standard *D*, may be entirely removed, or the bellows alone may be detached in the manner heretofore noted. In some cases it is desirable to superpose one lantern slide or device upon another; and to permit this the supports *H* may be run forward and the slide box thereby drawn away from the condensers. In case it be desired to increase the power of the lantern by larger lenses, it is only necessary to detach the condensers and objectives in the way already set forth and to substitute larger ones mounted respectively with sliding collars fitting the posts *b'* and an objective block adapted to run in the standard *D* and to be secured to the front of the bellows.

I have now set forth one form of my invention and the manner in which it may be used; and I claim as my own and desire to secure by these Letters Patent the following:

1. The combination for the purposes set forth, of a stationary frame consisting of standards connected by tubular rods, an extension provided with slide rods running in the said tubular rods, and an extension provided with one or more slide rods running in guides in the said frame, substantially as set forth.

2. The combination for the purposes set forth, of a frame provided with vertical slide rods or posts, and a condenser lens frame or case mounted independently of the objectives upon supports formed to travel upon the said posts, and means for securing the said supports in position upon the said posts, substantially as set forth.

3. The combination for the purposes set forth, of a frame consisting of two standards connected by side rods, vertical slide rods or posts upon one of the said standards, a lens case or frame adjustably supported upon the

said posts, a sliding bridge or stand H traveling upon the said side rods, and vertical sliderods or posts carried upon the said bridge or stand H, substantially as set forth.

5 4. In combination for the purposes described, a frame B provided with vertical slide rods or posts, an extension D provided with guides running in the said frame, an objective supported by, and vertically adjustable upon, the said extension, a condenser lens frame or case provided with supports formed to travel upon the said slide rods or posts, and means for securing the said supports in position upon the said posts, substantially as set forth.

10 5. In combination for the purposes described, an objective, a lens block or head therefor, a support D upon which the said block is carried, a slide box carrier H, a slide box G detachably secured thereto, bellows secured at one end to the said slide box and provided at the other end with a frame constructed to fit against the said head or block, and means for securing the said frame to the said block, substantially as set forth.

15 6. In combination for the purposes described, a stationary frame B for supporting the condenser lenses, and a bridge or slide H traveling on guides in the said frame B and provided with one or more slide rods or posts h, for supporting and horizontally and vertically adjusting various attachments for the lantern, substantially as set forth.

20 7. In combination with the frame of a magic lantern, a slide or bridge H traveling horizontally thereon, a slide box G adjustably secured to the said slide or bridge H, bellows secured to the said slide box, an objective, a carrier block therefor, and means for securing the said bellows to the said carrier block, substantially as, and for the purposes set forth.

25 8. In combination with the frame B of a magic lantern, a slide or bridge H traveling in guides in the said frame and provided with vertical slides or posts h, an adjustable front extension for the said frame, a lens block or carrier supported by but vertically adjustable on the said extension, bellows secured

to the said block or carrier, and sliding supports g for the rear of the said bellows, formed to travel on and be secured to the said slides or posts h, whereby the bellows as a whole, or either end thereof may be vertically and horizontally adjustable, substantially as set forth.

55 9. In combination with the stationary frame of a magic lantern, vertical slide rods or posts h rising from the said frame, a condenser lens and case carried by and vertically adjustable upon the said slide rods or posts, an adjustable rear extension connected with the said frame by sliding guides and provided with a vertical lamp or jet supporting post c, and a lamp or jet carried by and vertically adjustable upon the said supporting post, substantially as and for the purposes set forth.

60 10. A pair of coupling devices for magic lanterns, one of the said devices consisting of a cross piece L, means, as a thumb screw l', for securing the said cross piece to the lantern, and one or more supports l pivotally secured to the said cross piece, and the other of said devices consisting of a bridge piece M' formed to be secured to the base of a lantern, a cross piece M, extensible side supports m pivotally secured to the said cross piece, means for securing the said side supports to a lantern frame, and means, as a thumb screw m' and slot, for adjustably securing the said cross piece M to the said bridge piece M', substantially as set forth.

65 11. A coupling device, for the purposes described, consisting of a cross piece M, adjustable means, as a thumb screw m' and slot, for securing the said piece to the frame of a magic lantern, side pieces or links m pivotally secured to the said cross piece, uprights N and adjustable means, as thumb screws n and slots, for securing the said side pieces to the said uprights.

70 In testimony whereof I have hereunto set my hand this 12th day of February, 1892.

CHARLES GOODYEAR, JR.

Witnesses:

G. M. PLYMPTON,
HAROLD BINNEY.