No. 891,347. PATENTED JUNE 23, 1908.

R. KROEDEL.

ENLARGING CAMERA.

APPLICATION FILED FEB. 25, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

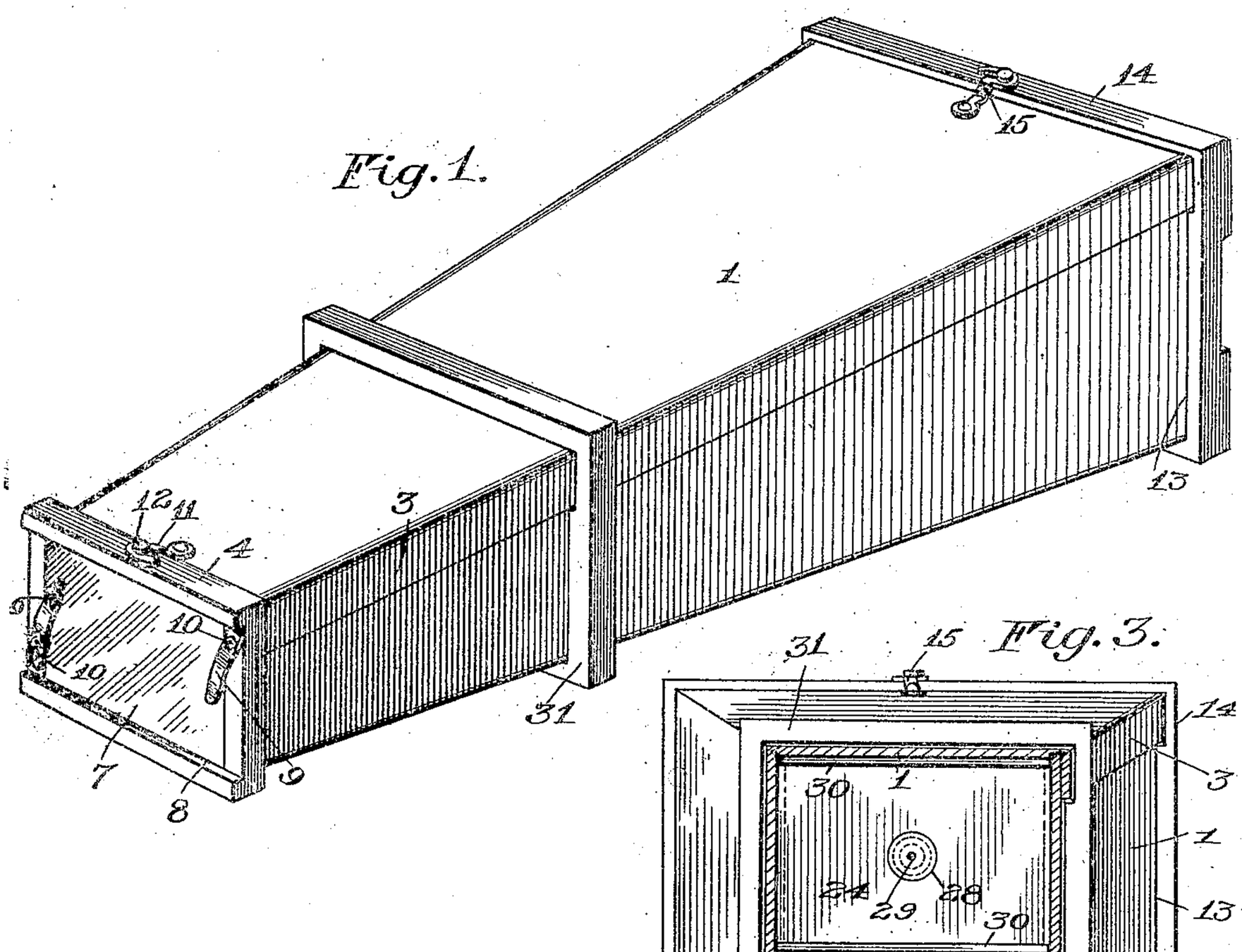
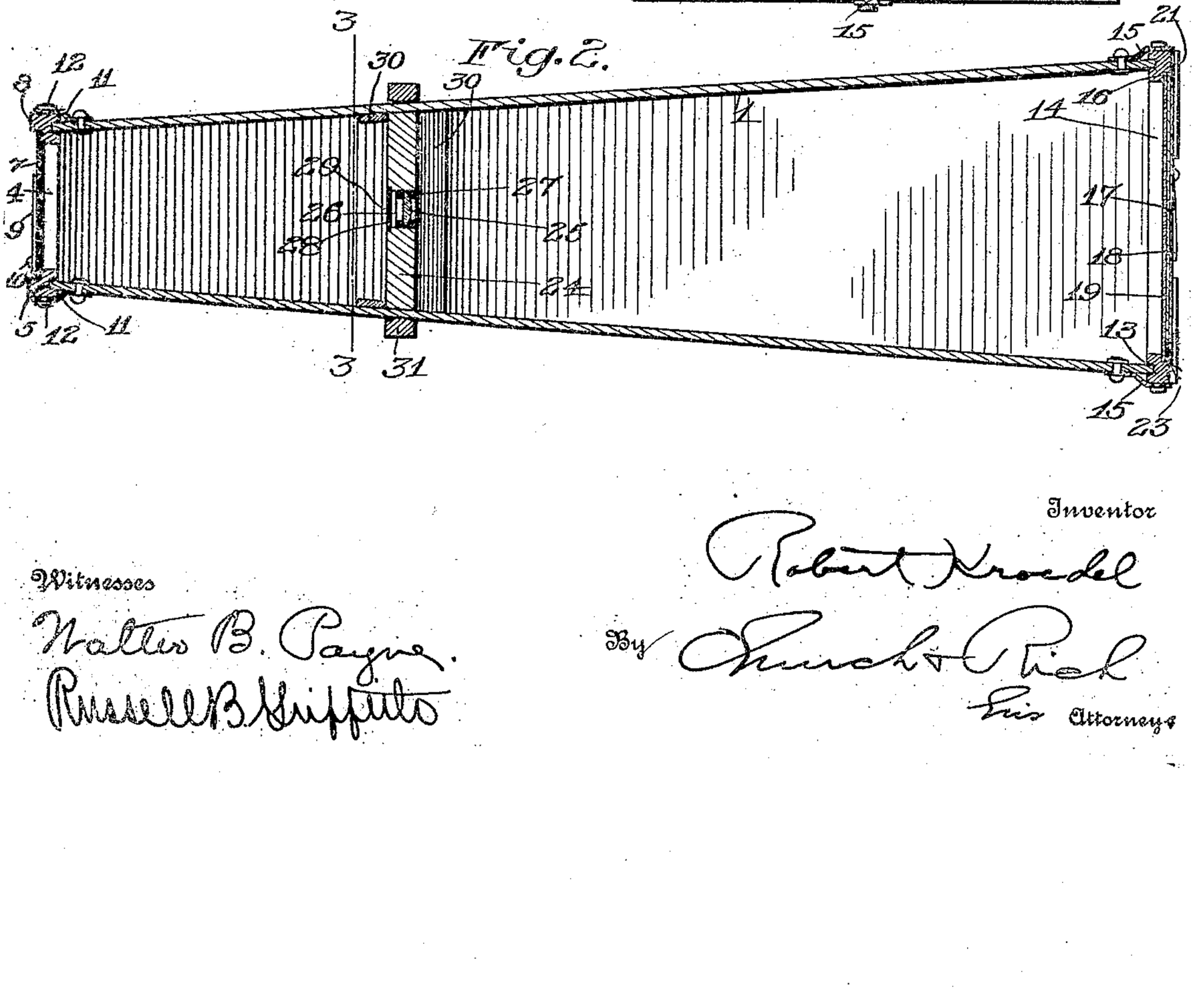


Fig. 3.

Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

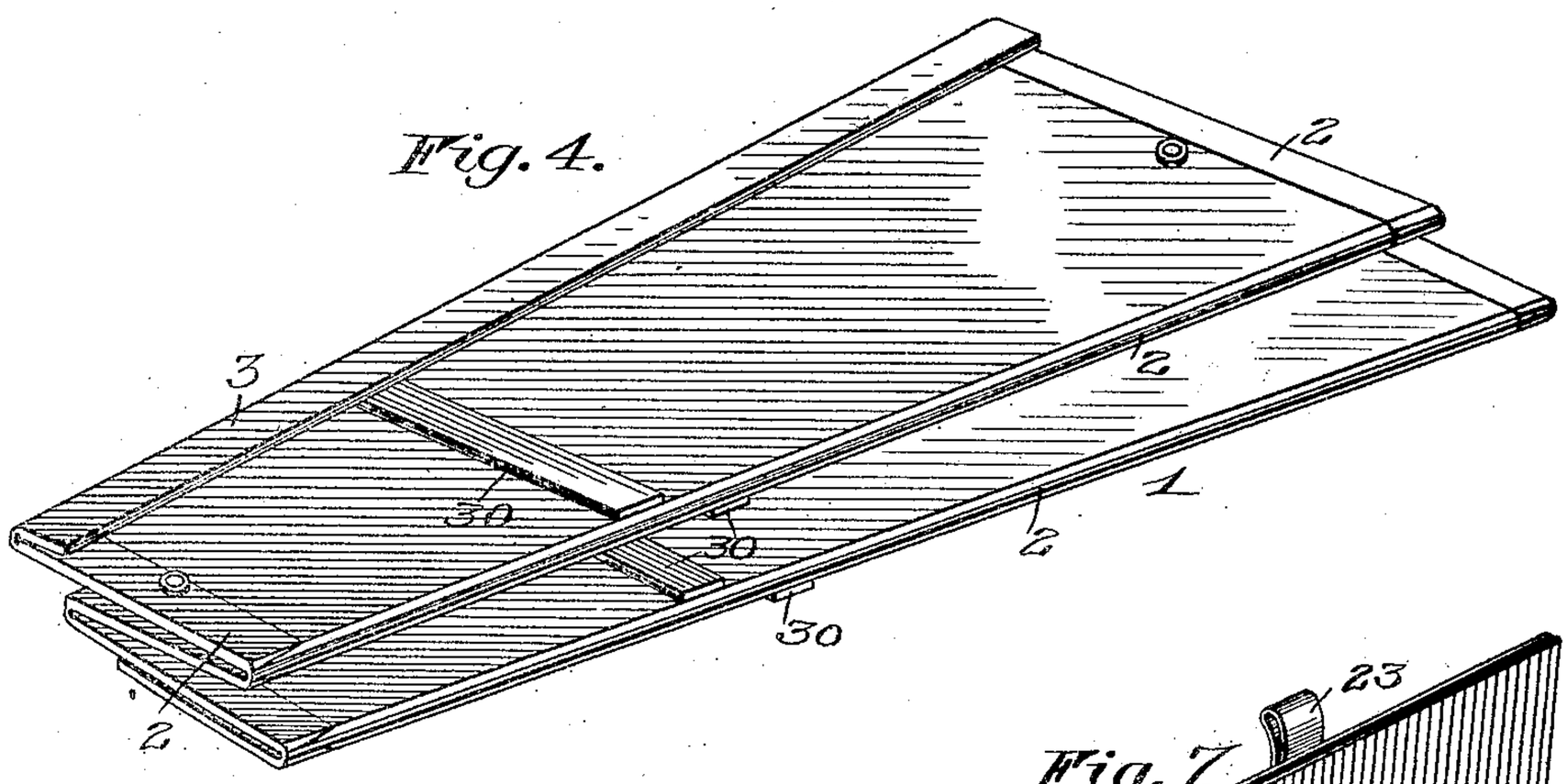


Fig. 5.

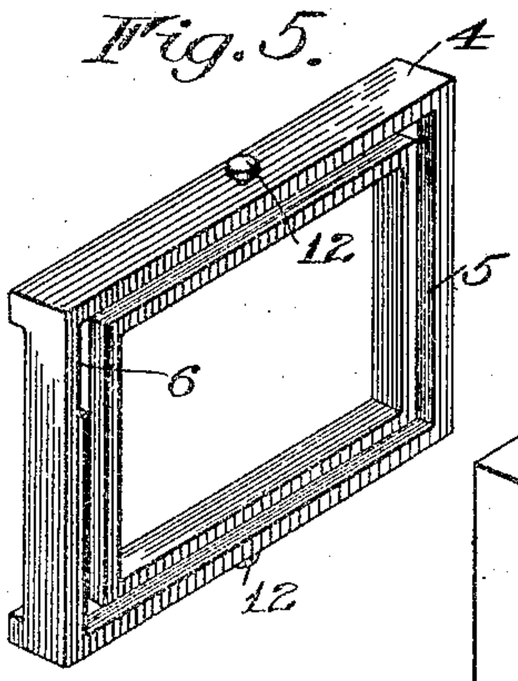


Fig. 6.

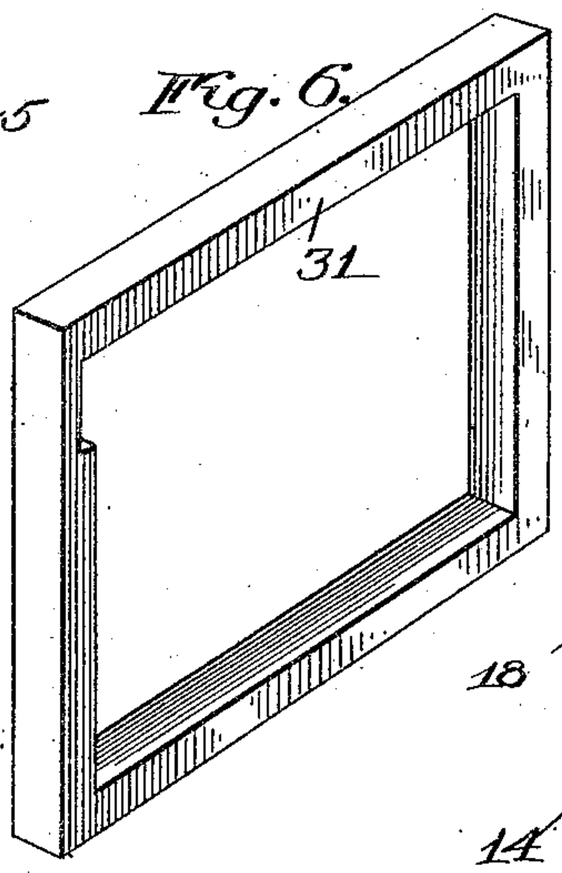
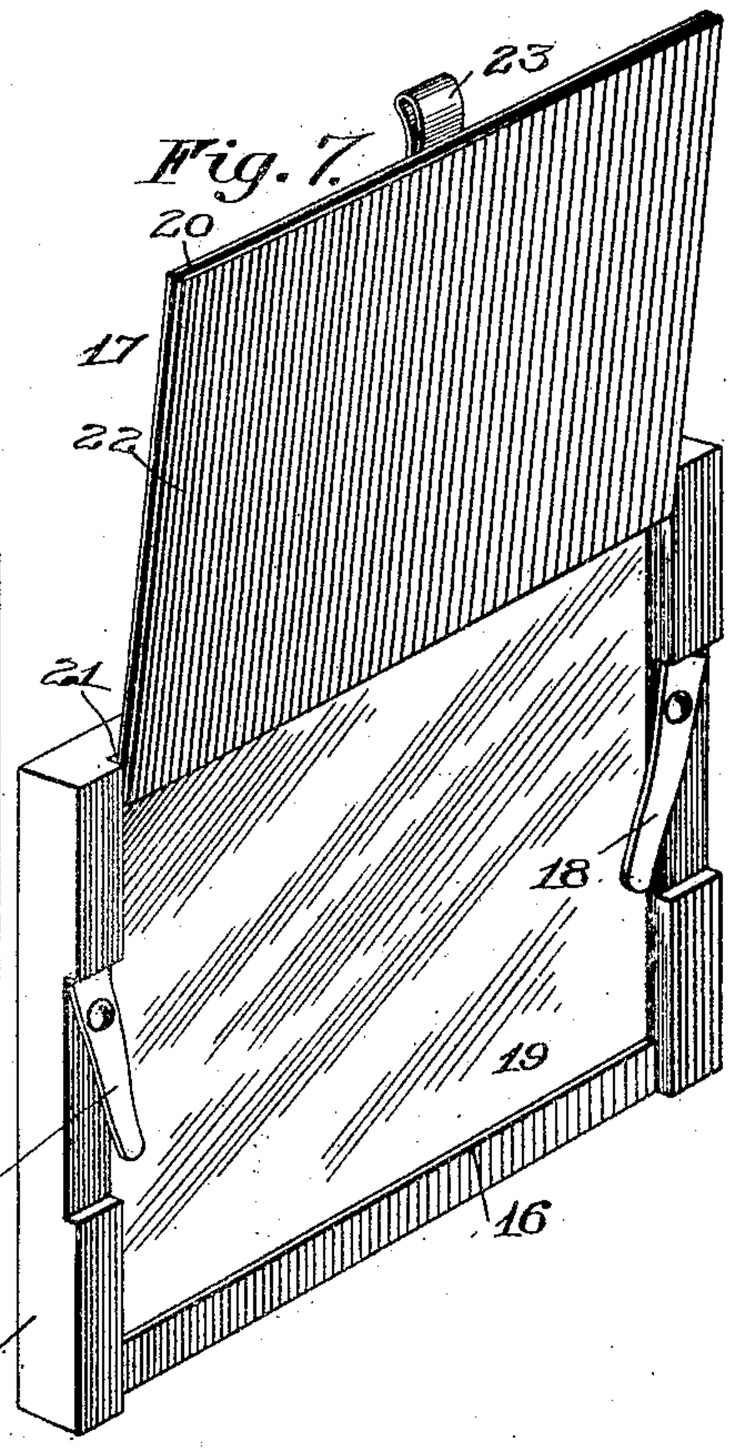


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ENLARGING-CAMERA.

No. 891,347. Specification of Letters Patent. Patented June 23, 1908.

Application filed February 25, 1907. Serial No. 359,074.

To all whom it may concern:

Be it known that I, ROBERT KROEDEL, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Enlarging-Cameras; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of the specification, and to the reference-numerals marked thereon.

My present invention relates to photographic cameras and particularly to the type which are used for the purpose of making enlarged prints or reproductions of negatives, that is, reproductions having larger proportions than the original, and it has for its object to provide a light and efficient device of this nature having few parts and those of a construction permitting them to be readily detached and packed in small compass for convenience in shipping or handling and as easily restored or assembled from the knock down state. Further objects of my invention are to materially reduce the cost of production and the complexity of such devices to a point at which they will satisfy the requirements of operators of inferior skill and may be obtainable by them at a low price.

To these and other ends the invention consists in certain improvements and combinations of parts, all as will be hereinafter more fully explained, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a perspective view of an assembled camera constructed in accordance with my invention. Fig. 2 is a longitudinal central vertical section thereof. Fig. 3 is a transverse vertical section on the line 3—3 of Fig. 2. Fig. 4 is a detail perspective view of the casing or body portion, and Figs. 5, 6 and 7 are similar views of each of the remaining major parts, the figures being arranged to show them on the sheet in their relative positions when assembled.

Similar reference numerals in the several figures indicate similar parts.

A camera constructed in accordance with my invention embodies generally a collapsible tubular box or casing preferably of a tapering form, the adjoining edges of the faces or sides of which are hinged to permit of their being folded each against the other; a frame removably fitted to one end thereof for the reception of the negative or original; a similar frame at the other for the reception of the sensitized material upon which the outline is to be reproduced; an intermediate wall having a lens aperture and devices for holding the several parts in position when assembled and preserving the rigidity of the structure as a whole.

Referring to the drawings, 1 indicates the tubular body or casing which is preferably rectangular in cross section and tapers toward one end. It is preferably formed of a series of sections composed of sheets of cardboard or similar light but sufficiently stiff material of proper shape, each constituting one side of the tube, which may be conveniently hinged together at their proximate edges by a continuous covering of textile fabric or other pliable material 2 so that the casing may be folded at these points and collapsed to the position shown in Fig. 4. To obtain a secure and light tight joint at the meeting of the free edges of the end sections when the device is assembled, one of them is provided with a hinged flap 3 which is lapped over on the outside as shown in Figs. 1 and 3.

Over the smaller end of the casing is fitted a removable rigid frame 4 provided on its rear or inner side with a channel or groove 5 shaped to receive the ends of the sections, said channel being suitably enlarged to accommodate the flap 3 as at 6. This frame constitutes a holder for the negative or original which, if flexible, is retained between two plates of glass 7 removably secured in a rabbet 8 on the outer side of the frame by the pressure of spring fingers or buttons 9 pivoted to the frame at 10, or if rigid as for instance a photographic plate, the other plates may be dispensed with, or it may be held by the superposition of only one of them as will be understood. The frame may be conveniently held in place by hooks 11 pivoted to the body and engaging studs 12 thereon.

The opposite or large end of the body portion or casing fits similarly within a groove 13 on the inner side of a frame 14 which may be removably secured in such position by a hook 15 similar to the fastening device of the other. The sensitized sheet upon which the print is to be made is held therein against a flange, formed by a rabbet 16, by a hinged door 17 secured in closed position by pivoted fingers or buttons 18, or it may be retained

between such a door and a transparent plate 19 fitted to the rabbet. The door is preferably formed of metal or other inflexible material to insure an even or flat contact with the sheet and I have found that an efficient and cheap construction is obtained by making the body from a metal plate indicated by 20, Fig. 7, to the outer side of which is secured a flexible covering similar to the covering 2 of the body, an extension 21 of which is secured to the upper part of the frame to form the hinge connection while to the inner side of the plate is secured a covering 22 of soft material such as cotton flannel to prevent a harsh contact with the sensitized material. At the lower edge of the door is provided a tab 23 as a finger hold during manipulation.

Mounted within the body or casing intermediate the frames or holders in a screen 24 is a lens 25 of any suitable type. The lens must, of course, be arranged in proper focal relation to each of the frames with reference to the degree of enlargement desired and the length of the body is therefore proportioned accordingly as will be understood. In the present instance, I have shown the screen and lens support as consisting of a wooden partition block provided with a central recess 26 within which the lens is held between a pair of rings or bushings 27. On one side thereof is a plate 28 let into the block and provided with an aperture 29 in alinement with the axis of the lens, which plate performs the ordinary functions of a diaphragm in giving definition to the image. The screen is held against movement longitudinally of the body by projections in the form of cleats 30 staggered, one upon each of the sections forming the latter, so that they engage upon alternate sides of the screen in rotation when the body is formed about it while an exterior band or hoop 31 frictionally engaging the outer surface is wedged down from the smaller end of the body to the plane of the screen to insure a light tight connection between the two.

The operation of the device is too obvious to require explanation, the manner of inserting the materials having been indicated during the description of the parts and the further operation of simple exposure to the light being conducted as is usual. The construction and design herein set forth materially cheapen the cost of manufacture and render devices of the kind available at a moderate price, for the simple uses of amateurs possessing photographic instruments of a relatively low grade.

I claim as my invention:

1. In an enlarging camera, the combination with a tubular body portion formed of relating movable sections, each extending integrally throughout the length of the body, of a frame at one end thereof for holding the original, a frame at the other for holding the sensitized material and a lens support located within said body portion intermediate the frames said frames and support being adapted to be folded against one or more of the sections.

2. In an enlarging camera, the combination with a tubular body portion composed of sections hinged at their lateral adjoining edges, of a removable holder for the original at one end thereof, a removable holder for the sensitized material at the other, a removable lens support located within said body portion intermediate the holders and means for preserving the tubular form of said body portion when the parts are assembled.

3. In an enlarging camera, the combination with a tubular body portion composed of sections hinged at their lateral adjoining edges by means of a continuous covering of pliable material, of a removable holder for the original at one end thereof, a removable holder for the sensitized material at the other, a removable lens support located within said body portion intermediate the holders and means for preserving the tubular form of said body portion when the parts are assembled.

4. In an enlarging camera, the combination with a laterally collapsible tubular body portion and a lens support located therein, of holders arranged at the ends of said body portion for the reception of the original and the sensitized material respectively, one of said holders embodying a frame having a groove on the inner side thereof within which the end of the body portion is fitted to preserve the tubular form of the latter.

5. In an enlarging camera, the combination with a laterally collapsible tubular body portion and a lens support located therein, of holders arranged at the ends of said body portion for the reception of the original and the sensitized material respectively, one of said holders being removable and embodying a frame having a groove on the inner side thereof within which the end of the body portion is fitted to preserve the tubular form of the latter and means for fastening the frame to the body portion.

6. In an enlarging camera, the combination with a laterally collapsible tubular body portion and a lens support located therein, of holders arranged at the ends of said body portion for the reception of the original and the sensitized material respectively, one of said holders embodying a frame having a groove on the inner side thereof within which the end of the body portion is fitted, to preserve the tubular form of the latter and a rabbet on its outer side for the reception of a plate and means for removably retaining a plate in said rabbet.

7. In an enlarging camera, the combination with a tubular body portion, a lens support located therein and a holder at one end thereof for the original, of a frame arranged at the other end for the reception of the sensitized material and means for retaining the latter in the frame embodying a door composed of a rigid plate having a non-abrasive covering on its inner side and a covering of flexible material on its outer side, said outer covering being extended beyond one edge and fastened to the frame to form a hinge connection with the latter.

8. In an enlarging camera, the combination with a body portion composed of sections hinged at their adjoining edges and folded into a tubular form, said body being provided with inwardly-extending projections, of removable holders at opposite ends thereof for the original and the sensitized material respectively and a lens supporting screen arranged within the body between the holders and engaged upon opposite sides by the projections on the body.

9. In an enlarging camera, the combination with a tubular body or casing tapered toward one end and holders for the original and sensitized material, respectively, at opposite ends thereof, of a lens-supporting screen located between the holders within the casing and engaging the latter on its inner side and a hoop wedged down from the smaller end of the casing and frictionally engaging the outer surface of the latter to tighten the contact between the screen and casing.

10. In an enlarging camera, the combination with a collapsible tubular body or casing tapered toward one end and composed of sections hinged at their lateral adjacent edges and holders arranged at opposite ends thereof for the reception of the original and the sensitized material respectively, of a lens supporting screen located between the holders within the casing and engaging the latter on its inner side and a hoop wedged down from the smaller end of the casing and frictionally engaging the outer surface of the latter to tighten the contact between the screen and casing and preserve the tubular form of the latter.

11. In an enlarging camera, the combination of a laterally-collapsible tube, rigid frames at opposite ends for the negative and sensitized material, and means for clamping the sides in position.

12. In an enlarging camera, the combination of a laterally-collapsible tube, rigid frames at opposite ends thereof, an intermediate perforated partition and means for clamping the sides of the tube upon the partition.

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