

No. 793,534.

PATENTED JUNE 27, 1905.

C. A. MULLER.
REFLEX CAMERA.

APPLICATION FILED OCT. 25, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

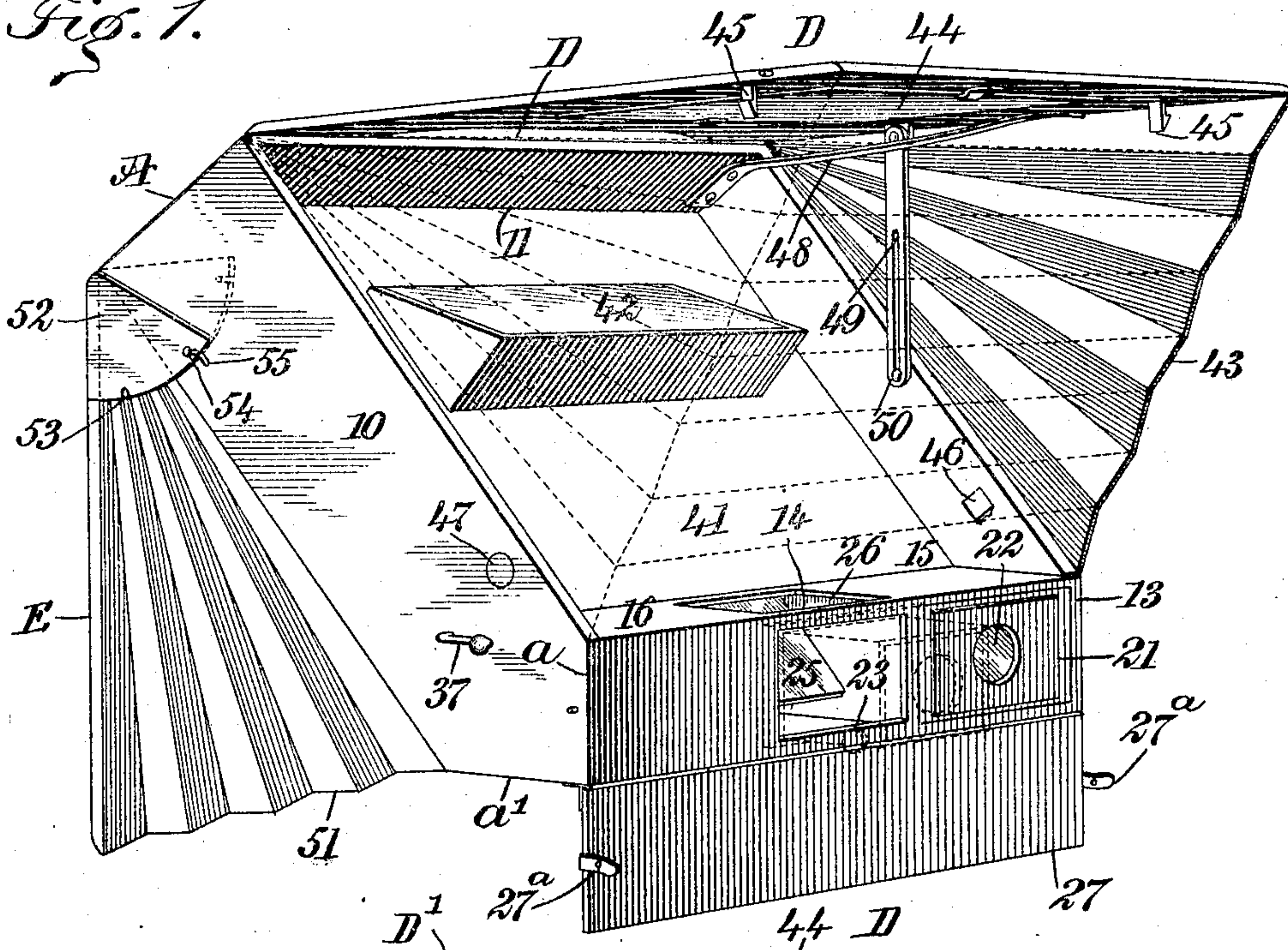
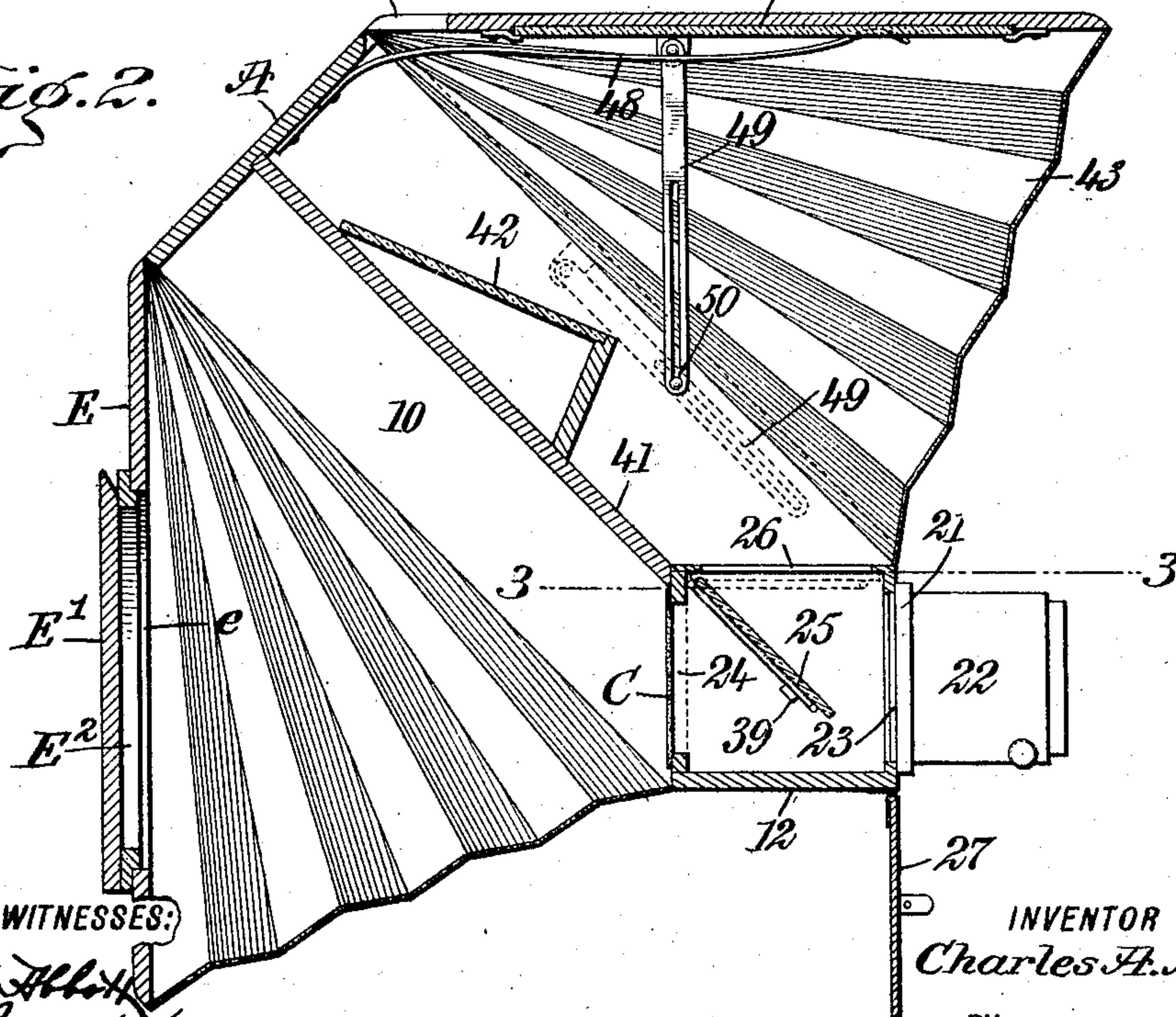


Fig. 2.



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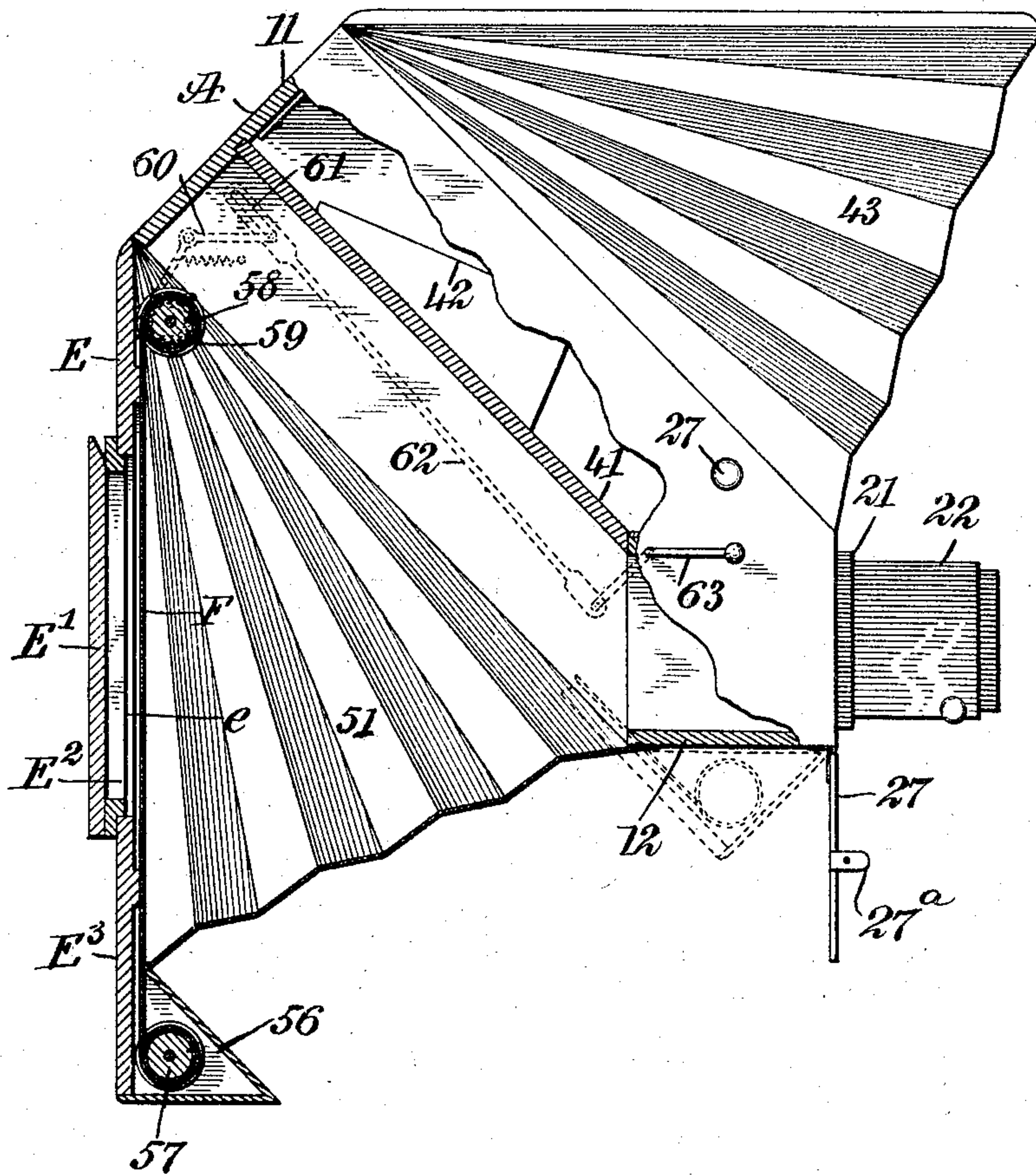
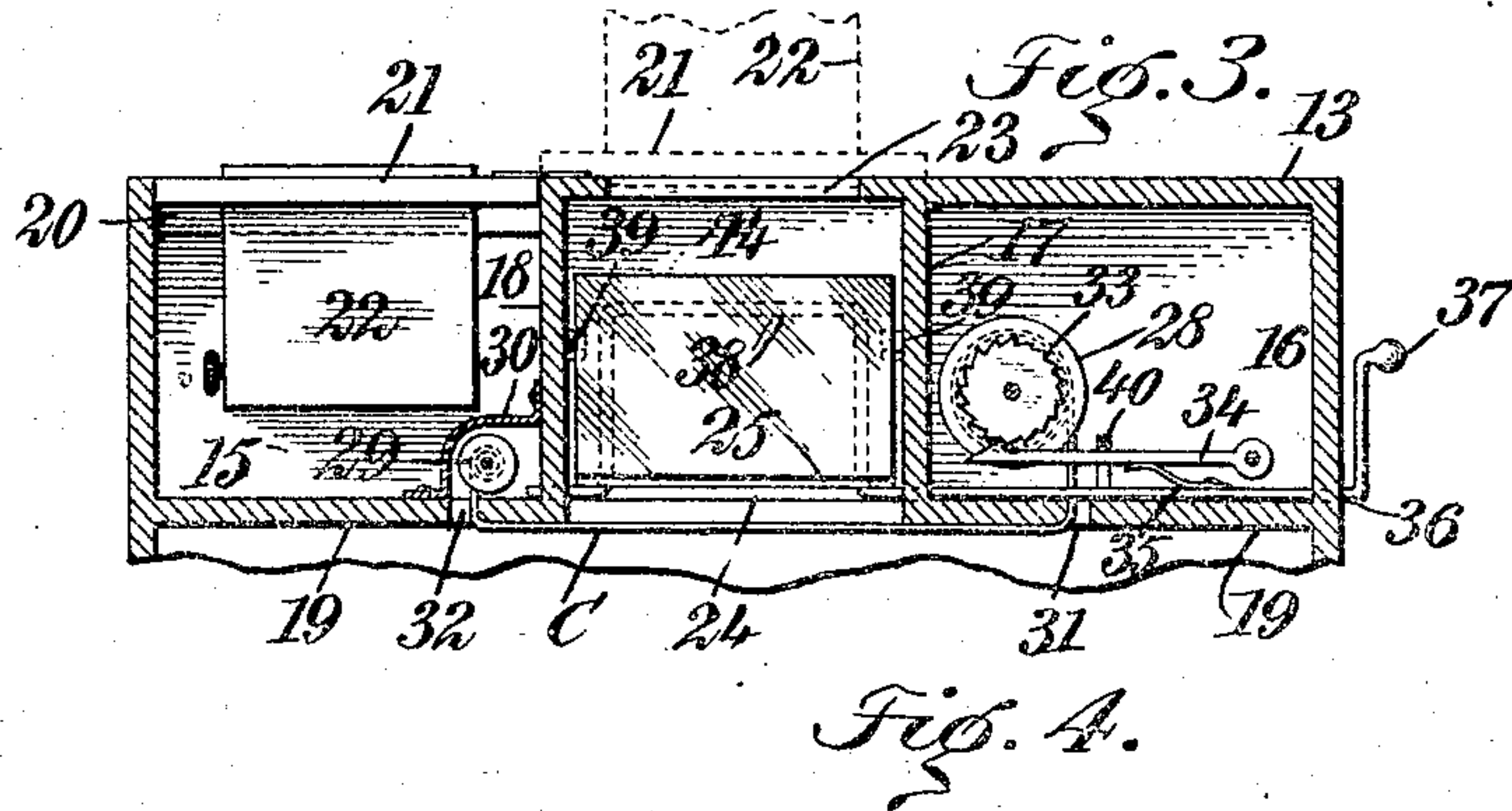
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2 SHEETS—SHEET 2.



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CHARLES A. MULLER, OF NEW YORK, N. Y.

REFLEX CAMERA.

SPECIFICATION forming part of Letters Patent No. 793,534, dated June 27, 1905.

Application filed October 25, 1904. Serial No. 229,899.

To all whom it may concern:

Be it known that I, CHARLES A. MULLER, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Reflex Camera, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a very simple and compact form of camera-box containing a reflex focusing attachment and one which can be marketed at a minimum of cost and which when folded will occupy a minimum amount of room, and, further, to so construct the camera-box that any form of shutter or any type of lens can be employed and so that when the camera is not in use the lens may be swung into a compartment especially adapted for it, and the compartment closed by the lens-board, thus effectually protecting the lens and enabling the front portion of the camera to be without projections.

Another purpose of the invention is to so construct the camera-box that it will be placed at an acute angle to its support in focusing and in taking a picture, the plate being at such time at right angles to the focal plane of the lens and enabling the focusing by means of a reflex attachment to be more conveniently and perfectly accomplished than when the box is laid flat on a support or is held horizontally in the hand.

A further purpose of the invention is to provide a bellows top and bottom for the body portion of the box and means for holding the said parts open and closed, the top being provided with a ground glass and hood or with a sight-opening and reflector employed in connection with reflectors in the body of the box and the back being adapted to carry a support for a plate-holder and a focal-plane shutter, if desired.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the improved camera open for use. Fig. 2 is a central vertical section through the camera, the parts being in the position shown in Fig. 1. Fig. 3 is a horizontal section taken practically on the line 3 3 of Fig. 2; and Fig. 4 is a sectional side elevation of the improved camera, illustrating the application thereto of a focal-plane shutter.

The body A of the camera-box is made quite shallow and is usually substantially rectangular in general contour and comprises parallel side members 10, connected by what may be termed an "upper end" member or board 11; but the forward ends of the side boards or members 10 are inclined from the top and from the bottom forwardly to a line drawn longitudinally and centrally through the said side boards or members, as is particularly shown in Figs. 1, 2, and 3, so that each side board at its forward end is provided with two inclined edges *a* and *a'*, and a bottom board 12 extends from one inclined edge to the other. When the camera-box is in use, it is made to rest on the said bottom board 12, so that the box-body as a whole is given an acute angle to the article upon which it rests, and when the camera is held by hand for the purpose of focusing or of taking a picture the same position of the camera-box is observed. A front board 13 is carried from one inclined edge *a* to the other at the forward end of the side members of the said camera-box, and when the said camera-box is in position for use the said front board 13 occupies a vertical position.

Three compartments are constructed on the bottom board 12 immediately at the rear of the front board 13, which compartments are best shown in Figs. 1 and 3, and consist of a central compartment 14 and two end compartments 15 and 16, formed by transverse partitions 17 and 18, extending from the front board 13, at the front of the camera-box, and a rear partition-board 19. The end compartment 15 is closed except at its front, where an opening 20 is made in the front board 13, and this opening is normally closed by means of a lens-board 21, hinged to the partition 18 separating the end compartment 15 from the

intermediate compartment 14. The opposing end compartment 16 is entirely closed, although the top, for example, may be made removable, or any of the other members thereof may be made removable, for purposes to be hereinafter described. A lens-board 22 of any desired type is secured to the lens-board 21, and when the camera-box is in use the lens-board 21 is carried to the front of the central or intermediate compartment 14 and is made to cover an opening 23 made in the front board 13, as is shown in Figs. 1, 2, and 3, so that the lens is brought in position for focusing or for taking a picture. When the lens is not required, the board is carried over to the compartment 15, and the lens will then be within such compartment and will be out of the way, leaving the front of the camera-box unobstructed by projections. The intermediate compartment 14 is provided with an opening 24 in its rear immediately opposite the front or lens opening 23, and the said compartment 14 is likewise provided with an opening 26 in the top.

Within the compartment 14, at the front of the camera-box and to the rear of the lens when in position relative to the said compartment 14, a mirror or reflector 25 is located, which mirror or reflector in use is given a downward and forward inclination, (shown in Figs. 1 and 2,) and the said reflector or mirror 25 is hinged to the upper rear portion of the said compartment 14. When a picture is to be taken, the reflector or mirror 25 is carried upward and is made to close the opening 26 in the said intermediate compartment 14.

In order that the front of the camera shall be protected, a drop-bar 27 is provided at that point hinged to the bottom board 12, as is shown in Figs. 1, 2, and 4, and this drop or cover board 27 is provided with suitable latches 27^a, adapted for engagement with keepers on the camera-box proper, whereby to hold the said drop or cover board in working position. When the camera is in use, the said cover-board 27 extends downward from the bottom of the box, leaving the front of the box uncovered.

In Figs. 2 and 3 I have illustrated a curtain-shutter C applied to the camera-box, and the curtain of this shutter is attached at one end to a drum 28, mounted to turn in the end compartment 16, and at its other end the curtain is attached to a spring-controlled drum 29, which is mounted to turn in a housing 30, erected in the end compartment 15, the curtain being made to pass out from the compartments through openings 31 and 32 at the rear thereof. A ratchet-wheel 23 is shown secured to the drum 28, and the teeth of this ratchet-wheel are engaged by the head of a pawl 34, pivoted in the compartment 16 and held to place by a spring 35. The pawl 34 is disconnected from the ratchet-wheel when an exposure is to be made, permitting the spring-

controlled drum 29 to act, and such release is brought about just after the reflector or mirror 25 has assumed an upper closing position in the top of the central compartment 14. This action may be brought about by the construction shown in Fig. 3, wherein a crank-shaft 36 is mounted to turn within the camera-box at the front, extending through the compartment 16 and the intermediate compartment 14 and out beyond a side face of the camera-box, where a handle 37 is formed. The crank-section 38 of the shaft 36 is located within the intermediate compartment 14 and is attached to the rear face of the mirror or reflector 25. When the mirror or reflector 25 is in the working position, (shown in Fig. 1,) it rests upon stops 39, which extend from the sides of the intermediate compartment 14, and when the focus has been obtained by turning the handle 37 in one direction the mirror 25 will be carried upward and will close the opening 26 of the said compartment 14, and a keeper 40, which is attached to the shaft 36 in the compartment 16, will exert such action on the pawl 34, as soon as the mirror 25 is seated, as to draw the said pawl away from the ratchet 33 and permit the shutter to work.

A partition 41 is located in the box-body A of the camera, extending from side to side and from the upper rear portion of the compartments at the front of the camera-box to the upper end board 11, and this partition 41 practically divides the camera-box into an upper and a lower compartment, and said partition is parallel with the upper and the lower edges of the camera-box. A second mirror 42 is located in the upper compartment formed by the partition 41 and is supported by said partition in an inclined position, the inclination of the mirror 42 being upward and forward, one end of the mirror being near the central portion of the said partition 41 and the other near the upper end portion of said partition.

An upper cover-board D is hinged to the upper edge of the upper portion of the camera-box A, being adapted to close the otherwise open portion of the upper compartment in the said box, and at the side and forward edges of the said cover-board D one edge of a bellows-hood 43 is secured in any suitable or approved manner, the other edge being attached to the front upper portion of the camera-box and the upper side edges of the same. Thus the upper compartment in the camera-box may be made large or small, as occasion may demand, and when it is desired to focus the said upper cover-board D occupies the upper horizontal position. (Shown in Figs. 1, 2, and 4.) This upper cover-board D is provided with a reflecting focusing-surface 44, which is usually produced by having such surface white or light in color and surrounded by an opaque surface. This upper cover-board D is provided with latches 45, adapted to engage with keepers 46, carried by the camera-box proper,

which keeper is operated by the usual buttons 47 at the exterior of the said camera-box.

A spring 48 normally carries the upper cover-board D to its upper or open position as soon as the keepers are released from the latches 45. This spring is attached to the camera-box at its upper compartment and has bearing against the under face of the upper cover-board D, as is shown in Figs. 1 and 2. The upper cover-board D is limited in its upward movement by a link 49, which is pivoted at one end to the under face of the upper cover-board D, being slotted at its opposite end to receive a pin 50, secured to the inner side face of the said camera-box. Thus the upper cover-board D and its bellows attachment may be quickly carried to working position or compactly folded down upon the body of the camera, the limiting-link 49 at that time folding snugly within the camera box-body, as is shown by dotted lines in Fig. 2.

A sight-opening D' is produced in the upper cover-board D where it is hinged to the upper portion of the body of the camera-box, as is shown in Figs. 1 and 2. In focusing the image is reflected upside down on the reflector 25 and is then reflected in the upper reflecting focusing-surface 44, appearing on this latter surface in proper position, and the image on the upper reflecting focusing-surface 44 appears in proper position on the mirror 42 in the upper compartment of the camera and is there viewed by the operator through the sight-opening D'.

By giving the box the inclination described and shown relative to a support it is possible to obtain the simple arrangement of mirrors or reflectors just described and enables the box to be made very light and very compact and to possess all the qualifications of an expensive reflex camera at comparatively little cost.

A rear or back board E is hinged to the upper rear edge of the camera box-body, and this rear or back board E is connected with the box-body, where it is not hinged, through the medium of a bellows-hood 51, corresponding to the bellows-hood 43, above described. Where the rear or back board E is hinged to the camera box-body a preferably quadrantal plate 52 is secured, having slots 53 produced in its segmental edge, and these slots are adapted to receive a spring-latch 54, having sliding movement in a slot 55, produced in a side of the camera-box, and by means of the plate 52 and the latch 54 the rear board E is held in open or in closed position. When the camera is in use, the rear board E is unlatched and will immediately drop to the perpendicular position, (shown in Figs. 1, 2, and 4,) and this rear board E is provided with an opening e therein, at which the plate-holder E² appears. The rear or back board E is also provided with a clamp E' for the plate-holder of the usual or of any approved construction.

It will be observed that by reason of the

bellows connection between the upper and the rear boards and the box-body of the camera the camera may be folded so as to occupy but little space. In fact, the camera will be exceedingly shallow, the depth being only that of the body proper.

The camera shown in Fig. 4 is of the same construction as has been described, except that the camera is adapted to be used in connection with a focal-plane shutter F, and to thus accommodate the shutter the rear board E is made longer, having an extension E³, and at the end of this extension a preferably triangular compartment 56 is constructed. In this compartment a drum 57 is mounted to turn, one end of the curtain of the shutter being secured to this drum, and the said curtain passes in the ordinary way across the opening e in the rear board E where the plate appears. Above the said opening e the curtain is attached to a spring-controlled drum 58, mounted to turn in bearings carried by the rear board E. This drum 58 is provided with a ratchet-wheel 59, and the teeth of this ratchet-wheel are engaged by a spring-controlled elbow-pawl 60, suitably pivoted in the lower compartment of the body A of the camera-box. One member of this pawl enters and has sliding movement in a slot 61, located at the upper end of a shifting rod 62, which shifting rod at its opposite end is connected with a crank-arm 63, extending out at a side of the body of the camera-box corresponding to the handle 37, attached to the crank-shaft 36. (Shown in Figs. 1 and 3.) This crank-shaft operates the mirror 25 in the same manner as does the crank-shaft 36, heretofore referred to, and while the mirror 25 is being carried to its upper position in the central compartment 14 the slotted portion of the connecting-rod 62 does not act on the elbow-pawl 60; but as soon as the mirror 25 has covered the opening 26 at the top of the compartment 14 the said connecting-rod trips the pawl 60 and releases it from engagement with the ratchet-teeth, the shutter immediately acts, and an exposure is obtained.

I desire it to be understood that any form of lens or shutter may be employed and that any approved mechanism may be used for controlling the reflector 25 and the shutter and for opening the upper and rear boards D and E and locking them. I also desire it to be understood that a ground glass may be placed in the cover-board D instead of a reflector 44 and that a hood may be used in connection with such glass; but the construction shown is that which is preferred.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a reflex camera, a camera-box having a lens-opening, a mirror pivoted at the rear thereof, means for raising and lowering said mirror, a reflecting-surface on the cover of the box above a lens-mirror and at an angle

thereto, and a second reflecting-surface between that of the cover and the lens-mirror and at an angle to both, the sight-opening for the box being at a point between the reflectors.

2. In a reflex camera, a camera-box having a lens-opening, a lens-board having swinging connection with the box and arranged for movement to and from the lens-opening, an adjustable mirror at the rear of the lens-opening, a division-board for the box, covers movable to and from the division-board, a reflecting-surface on one of the covers, and a reflector on the division-board between the lens-mirror and the reflector on the cover.

3. In a reflex camera, a box comprising a body having a division-board, and covers having bellows connection with the body, the said covers being movable to and from the division-board.

4. In a reflex camera, a camera-box having a lens-opening, an inclined lens-mirror at the rear of the lens-opening, a cover for the camera-box, having a reflecting-surface located at an angle to the lens-mirror, and a second mirror within the box, located between the said reflecting-surface and the first-named mirror and at an angle to the reflecting-surface on the cover when said box is in focusing position, said box being provided with a sight-opening directed toward the mirrors and the said reflecting-surface.

5. In a camera, a box-body, a hinged upper, and a hinged rear board, and a bellows connection between the marginal portions of the boards and the marginal portions of the body of the box.

6. In a camera, a box-body having a lens-opening and upper and rear cover-boards having bellows connection with the body, the rear cover-board having an opening therein, and a clamp around the said opening.

7. In a reflex camera, a body-section, an upper cover-board and a rear board, the latter being provided with an opening for the reception of a plate-holder, bellows connections between the said boards and the portions of the box-body they are adapted to cover, the said boards having also a hinged connection with the box-body, a mirror located at the rear of the lens-opening of the box-body, a mirror within the box-body, and a focusing-surface on the under face of the upper cover-board.

8. In a reflex camera, a body-section, an upper cover-board and a rear board, the latter being provided with an opening for the reception of a plate-holder, bellows connections between the said boards and the portions of the box-body they are adapted to cover, the said boards having also a hinged connection with the box-body, a mirror located at the rear of the lens-opening of the box-body, a mirror within the box-body, and a focusing-surface on the under face of the upper cover-board, means for opening the top cover-board, and

devices for holding the upper cover-board and the rear board in open positions.

9. In cameras, a box-body having a bottom portion at an acute angle to its sides, whereby the said box-body occupies an inclined position when in use.

10. In cameras, a box-body having its bottom at an acute angle to its sides and back, and a perpendicular front.

11. In reflex cameras, a box-body having its bottom portion at an acute angle to its sides and back, a cover-board hinged to the upper portion of the said body, a rear board hinged to the upper rear portion of the said body, bellows connections between the body and the two boards, the said box-body being provided with a perpendicular front and a lens-opening therein, a mirror mounted within the body at the rear of the lens-opening, a focusing-surface on the under face of the upper cover-board, means for holding the boards in an open position, the upper cover-board having a sight-opening therein, and a mirror having an inclined position and located between the mirror at the rear of the lens-opening and the focusing-surface on the upper cover-board.

12. In cameras, a camera-box provided with a lens-opening and a compartment adjacent to said opening, a lens-board forming a door for the said compartment, the said lens-board, when the box is in use, being adapted to cover the said lens-opening.

13. In cameras, a box-body provided with a lens-opening and a compartment adjacent to the lens-opening, which compartment has an open front, a lens-board hinged at a side wall of the opening in said compartment, and a lens carried by the said board, adapted to be normally contained within said compartment, the lens-board being adapted to be carried from the said compartment over to a closed position relative to the lens-opening, bringing the lens at such time to working position.

14. In cameras, a box-body provided with a lens-opening and a compartment adjacent to the lens-opening, which compartment has an open front, a lens-board hinged at a side wall of the opening in said compartment, and a lens carried by said board, adapted to be normally contained within said compartment, the lens-board being adapted to be carried from the said compartment over to a closed position relative to the lens-opening, bringing the lens at such time to working position, a front cover-board hinged to the front of the said box-body, latches for the said front cover-board, and means for moving the mirror at the lens-opening to close communication between the said lens-opening and the upper portion of the box-body, as described.

15. In cameras, a box-body which rests in an inclined position when in use and is provided with an upper cover member and a rear cover member, the said members being at right angles to each other when opened.

16. In a reflex camera, a box comprising a body having a division-board, covers having bellows connection with the body and movable to and from the division-board, a reflecting-surface on the inner face of one cover, and shutter mechanism carried by the other cover.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES A. MULLER.

Witnesses:

J. FRED ACKER,

JNO. M. RITTER.