Nov. 9, 1954 K. DEEG ET AL 2,693,743

PHOTOGRAPHIC FOLDING CAMERA

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Fig.1

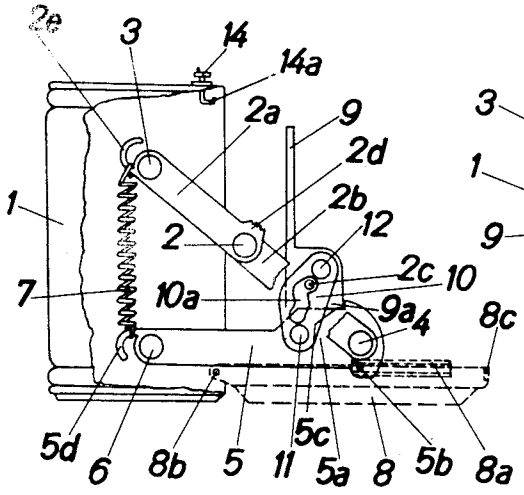


Fig.2

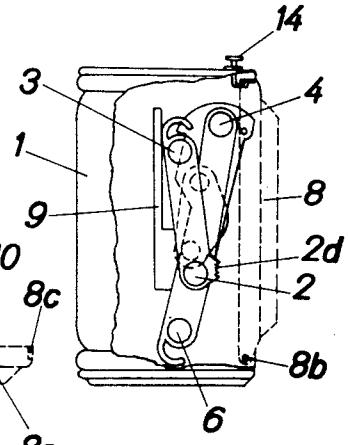


Fig.4

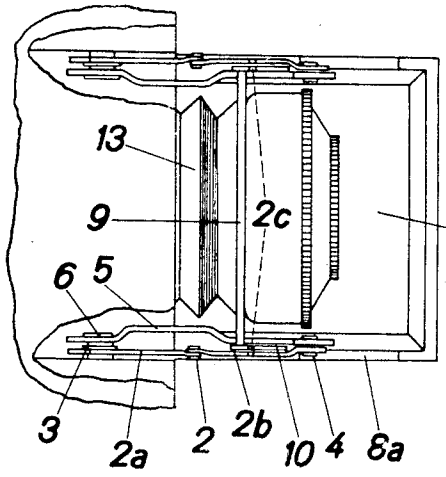
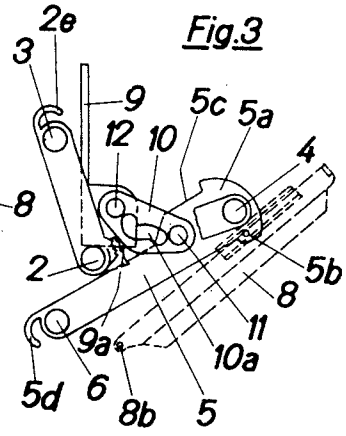


Fig.3



INVENTORS:
KARL DEEG
WILLY KADEN
BY Stanley Weller
ATTORNEY:

United States Patent Office

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PHOTOGRAPHIC FOLDING CAMERA

Karl Deeg, Munich-Unterhaching, and Willy Kaden, Munich, Germany, assignors, by mesne assignments, to Agfa Camera-Werk Aktiengesellschaft, a corporation of Germany

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4 Claims. (Cl. 95—40)

This invention relates to a photographic camera of the type having a folding struct system for establishing the lens-carrying front plate in the ready position, and more particularly to such a system which is capable of supporting such plate without the necessity of a pivotal connection to the baseboard of a camera.

It is common practice to attach one end of a pair of folding struts of such cameras pivotally to the camera body and to similarly connect the other to brackets which are fixed to the baseboard. The baseboard hinge, in this construction, is utilized to set up the lens. For the erection of the lens two links are used which links are controlled by the forward folding struts and which are pivoted to the brackets on the baseboard. In the case of lenses of short focus it is obvious that it is unsuitable to depend upon the baseboard hinge for the setting up of the lens.

An object of the present invention is to provide a folding strut system for folding cameras adapted to establish in operative position the lens-carrying front plate of lenses of even short focal with a minimum or no tipping of said plate and a minimum of strain upon the bellows of such cameras.

A further object thereof is the provision of folding strut means capable of supporting in operative position the lens-carrying front plate of a folding camera without the need to incorporate the camera baseboard in the load-bearing structure thus established.

A still further object thereof is to provide such a strut system which dispenses with the baseboard as a carrier element for the folding struts, limiting the function of such baseboard to the provision of a cover for the lens, and if desired, a lateral guide means for the principal erection elements.

These and other objects are accomplished by providing, in the preferred form, a pair of laterally spaced strut assemblies each including a folding strut consisting of a forward and a rear element, pivotally connected, the latter being pivotally connected proximate its rearmost end to the interior of the camera body while the former is pivotally connected proximate its front end to a further strut, a rear portion of said further strut being in turn pivotally connected to the interior of the camera body at a point spaced from the pivot of the rear element of the folding strut Means may be provided to locate a detent member on one of the elements of the folding strut to prevent an angular distance between said elements in excess of 180 degrees.

Additionally, in the preferred form a forward part of said further strut is constructed as a support for the lens front when in the ready position. A link may be provided between said further strut and the lens carrying front plate to establish the latter in the ready position, said link being itself positioned by means attached to the forward folding strut. The link pivot on said further strut may be in a rear vertical plane relative to the link pivot on the lens carrying front plate, so that in opening or closing the camera the link passes over-center with respect to its pivot on said further strut. The over-center movement may be utilized to lower the lens carrying front plate into the ready position or to raise it therefrom. Significantly, the strut assembly may be so dimensioned that on opening or closing the camera the lens carrying front plate moves substantially in a straight line.

The positioning of the link may be effected by providing the same with a guide slot penetrated by a pin

mounted on the inside of the forward folding strut. This slot may be shaped so that, in the ready position, the pin is subject to a friction lock therein, which lock can be released by infolding the folding struts.

The camera may have a hinged baseboard with a sliding attachment to said further strut. A releasable catch may be provided between the camera body and baseboard and a tension spring may connect the extreme rear ends of the two struts which are pivoted in the camera body, which spring, on release of the baseboard, positively urges the strut assembly into the ready position.

Other objects and a fuller understanding of the present invention may be had by referring to the following expanded description and claims, taken in conjunction with the accompanying drawings which illustrate a preferred embodiment thereof, it being understood that the foregoing statement of the object of the subject invention and the summary thereof are intended to generally explain the same without limiting it in any manner.

Fig. 1 is a side elevation of a folding camera, embodying the strut system of the present invention, in the extended position, portions of the camera body being broken away, and other portions of the camera being omitted so as to permit ready inspection of the strut system. For purposes of clarity, the camera cover is shown in dashed outline.

Fig. 2 is a similar view thereof in the closed or collapsed condition.

Fig. 3 is a similar fragmentary view thereof showing only the strut system (and the dashed cover) in a semi-collapsed condition.

Fig. 4 is a plan view of said camera, portions of the camera body over the rear portions of the strut assemblies being broken away to reveal such portions.

Referring to the drawing, the preferred form of the present invention there illustrated comprises a camera body **1**, having identical laterally spaced strut assemblies including a set of rear elements or rear folding struts **2***a* of a pair of folding struts **2** which are pivotally connected to camera body **1** at points **3**. The corresponding front elements or forward struts **2***b* are linked at the pivots **4** to the further or base struts **5** constructed in the form of brackets at **5***a*. Struts **5** are pivotally mounted on studs **6** in the interior of the camera body and are urged by tension springs **7** extending between terminal hooks **2***e* and **5***d* on rear folding strut **2***a* and further strut **5**, respectively, into the position shown in Fig. 1. On the under portion of brackets **5***a* are provided pins **5***b* which slide in guides **8***a* of the baseboard **8**. The hinge of the baseboard to the camera body is indicated by **8***b*.

Brackets **5***a* have a horizontal supporting surface **5***c* upon which, in the ready position, the lower portion **9***a* of the lens support or lens-carrying front plate **9** comes to rest and upon which it is pressed by tension springs **7**. Lens-carrying front plate **9**, on opening the camera (see Fig. 3), is erected through the agency of links **10**, which are pivotally mounted at one end on base struts **5** at the points **11** and at the other end on lens-carrying front plate **9** at the points **12**. Pins **2***c* on inner sides of forward folding struts **2***b* engage in curved slots **10***a* of the links **10** and, on opening and closing the camera, control the lens-carrying front plate **9** in such a manner that, at the commencement of the collapsing movement, owing to the over-center movement of links **10** with respect to pivots **11**, portion **9***a* of lens-carrying front plate **9** is raised from top surfaces **5***c* of brackets **5***a*, being then moved back in a straight line, or practically in a straight line, into the camera body. Curved slots **10***a* are of such a form that the lens-carrying front plate **9** is rigidly maintained in the ready position by links **10**. The frictional locking of lens-carrying front plate **9** by guide slots **10***a* and the pins **2***c* can be released by the folding of folding struts **2**. To facilitate manipulation of the relatively short folding struts **2**, lugs **2***d* preferably having serrated or roughed surfaces, are provided on the rear folding struts **2***a* in the vicinity of the hinge points. The bellows **13** is not greatly stressed in the folding movement since its axis of symmetry remains in substantially the same position during this folding movement. The opening of the camera is effected positively by pressure

on the release knob **14**, which releases the hook **14***a* from catch **8***c* of baseboard **8** and in this manner allows the springs to come into action.

The invention is not limited to a spring-operated folding-strut camera or to a camera with a transverse baseboard. The same erection system can also be used in the case of a vertical construction of the camera or of the baseboard. It is also possible to dispense with spring **7** and to manually move baseboard **8** out of camera body **1**. Additionally, the baseboard may be dispensed with, since the folding struts, in combination with base struts **5** and camera body **1**, form triangular linkages which secure lens-carrying front plate **9** in its final position.

Although the subject invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous additions and changes in the details of construction, combination and arrangement may be resorted to without transcending the scope of the invention as hereinafter claimed.

What is claimed is:

1. In a folding camera having a camera body and a base board hinged thereto, a lens support extending into the camera body, a foldable strut assembly for advancing and retracting the lens support, said assembly comprising a pair of folding struts the rear parts of which are pivotally mounted in the camera body, a pair of base struts pivotally mounted in the camera body rearwardly of the hinged connection of the base board with the camera body, the forward parts of said folding struts being pivotally connected directly to the forward parts of said base struts, links one end of which are attached to the base struts inwardly of the pivotal connection between the outer ends of the folding struts and the base struts, the other end of the links being attached to the lens support while the middle of the link is pivotally and slidably connected midway the length of the outer end of the folding struts, the rearward pivotal mounting of the folding strut members and the base struts being in spaced substantially vertical relation, the base struts at their outer ends having projecting pins that engage into grooves on each side of the base board to control the position of the base board.

2. The structure according to claim 1, wherein the connection between elements of the folding struts when in an extended position lies adjacent the forward edge of the camera body.

3. The structure according to claim 1, wherein the base struts have on their outer ends upper surfaces which are parallel to the hinged base board when the same is extended and the lens mount has attached thereto brackets having a lower surface which engages the surface of the base strut to erect the lens board.

4. The structure according to claim 1, wherein the ends of the folding struts and the base struts beyond their pivotal mountings in the camera body are connected by a tensioning member, normally tending to extend the strut assembly and the base board of the camera.

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