PATENT SPECIFICATION

411,737

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COMPLETE SPECIFICATION.

Photographic Film Cameras.

We, VOIGTLÄNDER & SOHN AKTIENGESELLSCHAFT, a joint stock company organized under the Laws of Germany, of 7, Campestrasse, Brunswick, in the State of Brunswick, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to photographic film cameras, and more particularly to cameras of the box type, in which the film spools are mounted in chambers provided at either side of the light passage and at the rear of the front wall of the casing, and in which further a finder is provided above the said light passage, which finder comprises a finder lens located above the camera lens in the front wall of the casing, a reflector disposed at an angle of substantially 45° at the rear of the said finder lens, and a focussing screen disposed horizontally above the said reflector.

One of the objects of the improvements is to provide a camera of this type which is compact in form, and with this object in view the invention consists in providing a finder reflector which is reduced in breadth at its front and bottom ends, so that room is spared at either side of the bottom part of the reflector and the film spools may be mounted close to the front part of the light passage and with their top ends laterally of the finder chamber. Further, room is spared at the reduced front part of the reflector for providing chambers above the spools and laterally of the finder chamber in which spool operating members such for example as the film winding key may be located.

As the film spools are thus disposed close to the light passage they project with their outer portions but slightly beyond the outlines of the casing, and the chambers receiving the same are closed at their outer sides by hinged lids which are slightly bulged outwardly to accommodate the spools.

Another object of the improvements is to provide mirrors by means of which certain readings such as the position of the iris-diaphragm and the shutter operating mechanism may be made from above and by the operator looking downwardly and on the focussing screen.

Other objects of the improvements will appear from the following description.

In the accompanying drawings

Fig. 1 is a front elevation showing the camera, some parts being broken away to show the manner of mounting one of the film spools and the film winding key,

Fig. 2 is a sectional elevation taken on the line 2—2 of Fig. 1,

Fig. 3 is a sectional plan view taken on the line 3—3 of Fig. 2, and

Fig. 4 is a partial sectional plan view taken on the line 4—4 of Fig. 1.

The outer case or body of the camera comprises a front wall 2, four walls 12 connected with the front wall and flaring outwardly and rearwardly therefrom to provide the light passage 13, and a partition 15 extending at an angle of 45° from the top part of the light passage 4 rearwardly and upwardly to the top of the case, said partition providing a finder chamber 14. In circular holes 3 and 4 made in the front wall 2 of the case tubes 5 and 6 are shiftable in axial direction on which lenses 7 and 8 and their tubes 7^1 and 8^1 are supported. The lower lens 8 is the exposure lens, and it cooperates with an iris-diaphragm the setting member 9 of which projects forwardly in front of the shutter housing 10 of the objective. At the rear end of the light passage 13 a frame for guiding the film 11 is provided, the said film being in position for being acted upon by the light-cone emanating from the lens 8.

To the partition 15 a reflector 15^1 is secured by means of which the rays emanating from the finder lens 7 are reflected upwardly and on a focussing screen 16 secured to and closing the open top part of the camera case. The said screen may be inspected through a collapsible hood 17 of known construction. The lens 7, the reflector 15^1 and the screen 16 provide the finder.

The tubes 6 and 5 of the camera and finder lenses 8 and 7 are rigidly connected with each other by a plate or frame 18 by means of which simultaneous axial dis-

placement of both lenses is ensured. The said frame or plate is formed with a forwar 'ly directed flange 22 embracing the len 7 and 8 and their mountings. At the rear of the frame or plate 18 a slide 19 is mounted on the front wall 2 of the case in suitable guide ways, such as pins 19^1 fixed to the front wall 2 of the case and engaging in vertical slots of the slide. The said slide is formed with elongated cut-out portions 30 and 31 permitting the passage of the tubes 6 and 5 therethrough. At either side of the mounting 7^1 of the lens 7 and the shutter housing 10 of the lens 8 the slide 19 is made integral with ears 20 formed with inclined cam slots 21 engaging pins 23 secured to and projecting from both sides of the mounting of the lens 7 and the shutter casing 10 of the lens 8. Therefore, when the slide 19 is shifted upwardly or downwardly, the lenses 7 and 8 and the parts associated therewith are simultaneously shifted in axial direction inwardly and outwardly.

For thus shifting the slide 19 a disk 24 is provided which is located at the front side of the wall 2 of the case, and which is mounted on an arbor 25. At the rear of the disk 24 a disk 26 is secured which is provided with an eccentric pin 27 engaging in a slot 28 of an ear 29 projecting laterally from the slide 19. Therefore, when the disk 24 is rotated such rotary movement is transmitted to the disk 26 and the pin 27 carried thereby, so that the slide 19 is shifted upwardly or downwardly. The said disk 24 is provided on its cylindrical face with graduation marks cooperating with a mark or pointer 32 carried by the front wall 2 of the case, the said graduation marks being provided with figures indicating the distance to which the lenses have been set by shifting the same inwardly or outwardly.

In the preferred construction shown in the figures the disks 24 and 26 and the shaft 25 are rotated through the intermediary of bevel gear wheels 34, 35 from a mill disk 36 mounted in the side wall of the case and projecting laterally therefrom. Thus the lenses 7 and 8 may be set from the side of the case in the proper positions corresponding to the distance of the object and while the operator inspects the image of the object produced on the focussing screen 16. The adjustment of the lenses 7 and 8 may be read from the graduation marks made on the disk 24 and the pointer 32, and it is not necessary for the operator to inspect the disk 24 from the front side of the camera.

The film spools 37 are disposed close to and at the rear of the front wall 2 of the case and laterally of the front part of the light passage 13, and they are mounted in spool chambers 38 bounded by the vertical side walls 12 of the light passage 13 and by lids 39, 39^1 hinged to the front wall 2. The lid 39 is made integral with a portion 40 adapted to cover the rear side of the bottom part of the case and the film 11, as is shown in Figs. 3 and 4, and the lid 39^1 is formed with a flange 40^1 adapted to overlap the margin of the portion 40 when the lids are closed. Thus, the spool chambers 38 and the light passage 13 are closed in a light-tight way. The lids 39 and 39^1 are bulged outwardly at 42 to accommodate the outer portions of the spools 37. In each of the spool chambers 38 there are two rollers 44 on which the film 11 is guided.

The spool chambers 38 are closed at their top ends by horizontal partition walls 45, and above the said partitions chambers 46 are provided which are open at the sides of the camera. In one of the said chambers the film winding key 50, and in the other chamber a lever 47 are mounted. The lever 47 is fixed to the spool centre 48 of the feed spool, which centre is passed through a bore made in the partition wall 45 and is adapted to be retracted by means of the lever 47. The winding centre 48 is passed through a bore made in the other wall 45 and it has a ratchet disk 49 secured to its top end, which is engaged by a spring-pressed pawl 51 carried by the film winding key 50. In the normal position the said key is located within the chamber 38, as is shown in Fig. 3, and when it is turned in the direction of the arrow *a*, the pawl 51 imparts rotary movement to the ratchet wheel 49 and the winding centre, whereby the film is wound on the spool. When the key 50 is turned in the opposite direction the pawl 51 slides on the ratchet disk 49 without acting on the spool.

By mounting the film spools in the manner described the dead spaces included between the lateral parts of the front wall 2 and the adjacent parts of the vertical walls 12 of the light passage are used for disposing the spools therein. In a similar way the space 52 included between the partition 15 and the top wall of the light passage 4 is used for mounting certain parts therein. For example, an additional photographic film spool 54 may be stored within the said chamber, which film spool is held in position between a pair of leaf springs 53. Laterally of the reflector 15^1 chambers 73 are provided which may be used for keeping a yellow screen or a subsidiary lens therein. The chamber 52 is closed at its rear by a lid 55 hinged to the rear part

of the case. After the lid 55 has been opened the spool 54 and thereafter the yellow screen and the subsidiary lens may be removed. However, separate lids may be provided for closing the chambers 73 located laterally of the reflector 15^1.

Finally, also the chamber located below the lower partition wall 12 may be used for storing certain parts therein, in which case the said space is closed by a hinged lid 57.

As has been stated above, the graduation marks provided on the disk 24 may be inspected from above. In order to enable the operator to inspect also the adjustment of the iris-diaphragm and the shutter from above, the setting member 9 which embraces the shutter casing 10 carries an inclined mirror 58 which is formed at its middle with a mark 59 located in front of graduation marks 60, and a similar mirror 63 is provided for permitting inspection of the adjustment of the shutter from above. The shutter is set according to the desired time of exposure by means of a rotary ring 61. Graduation marks 62 provided on the said ring cooperate with the mirror 63 which is fixed to the shutter casing, and which is likewise provided with a mark 64. When the operator looks from above on the mirrors 58 and 63 he can read the graduation marks 60 and 62 by means of the mirrors 58 and 63 respectively.

At the bottom of the case an internally screw-threaded nipple 66 is provided by means of which the camera may be mounted on a stand. The lower spool centres are extended outwardly to provide feet 65, and the length of the said feet is equal to that of the nipple 66, so that the camera may be placed with the said parts on a table or other support.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A roll-film box camera, comprising a finder chamber above the exposure chamber having an inclined reflector, and upright film spools located laterally of the exposure lens at the rear of the front wall of the case, in which the inclined reflector (15) of the finder is reduced in breadth at its front and bottom part according to the shape of the light cone, and in which the chamber provided laterally of the bottom part of the reflector (15) is used for mounting the top part of the film spools and the bearings thereof.

2. Camera as claimed in claim 1, in which the film spools (37) which are located in lateral cavities (38) of the case partly protrude laterally beyond the side walls of the case, the lids closing the said cavities being bulged outwardly to accommodate the outer parts of the film spools.

3. Camera as claimed in either one of claims 1 or 2, in which above the cavities (38) for the film spools cavities (46) are provided in the case, which are open at their outer sides, and which are located laterally of the finder chamber (14), the said cavities (46) having the operating members of the film spools mounted therein.

4. Camera as claimed in any one of claims 1 to 3, in which the lids closing the film spool receiving chambers are hinged (at 41) to the sides of the front wall, (2) of the case and are provided with rear extensions (40, 40^1) closing the rear part of the camera in a light-tight way.

5. Camera as claimed in any one of claims 1 to 4, in which for driving the film spool a lever (50) is rockingly mounted coaxially of the said film spool, which lever protrudes laterally from the cavity (46) containing the same and acts in one direction only on the spool centre (48) through the intermediary of a pawl and ratchet mechanism.

6. A photographic camera, as claimed in claim 1, in which the member for setting the diaphragm of the exposure lens and/or for controlling the time of the exposure are equipped with a mirror or mirrors (58, 63) inclined so that the positions of the said setting member or members may be read from above.

7. Camera as claimed in claim 6, in which the setting member (9) of the iris-diaphragm is provided with a mirror (58) which is movable in front of stationary scale marks (60).

8. Camera as claimed in claim 6, in which a stationary mirror (63) is provided in front of movable scale marks (62) of the shutter mechanism.

9. A roll-film box camera as claimed in claim 1 in which in the chamber at the rear of the inclined reflector (15) means are provided for storing a spare film spool (54), the said chamber being adapted to be closed by a lid (55).

10. Camera as claimed in claim 9, in which the chambers (73) provided laterally of the reflector (15) are provided for storing a front lens, a yellow screen or the like.

11. A roll-film box camera as claimed in claim 1, in which the spool centres located at the bottom of the case are extended downwardly to provide feet (65) cooperating with the nipple (66) for mounting the case on a stand for placing the camera on a suitable support.

12. Camera substantially as herein described and for the purpose set forth.

Dated this 19th day of October, 1933.

MARKS & CLERK.

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Fig. 1

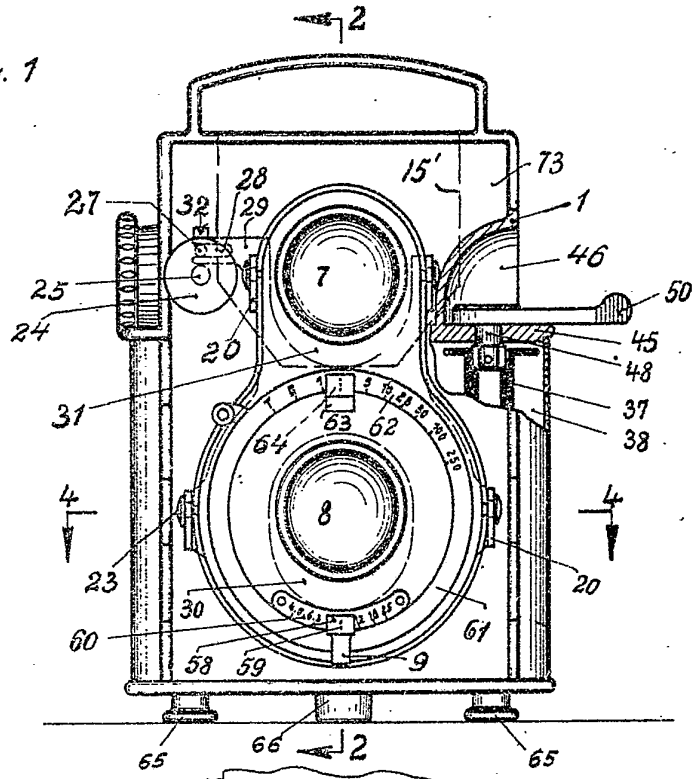

Fig. 2

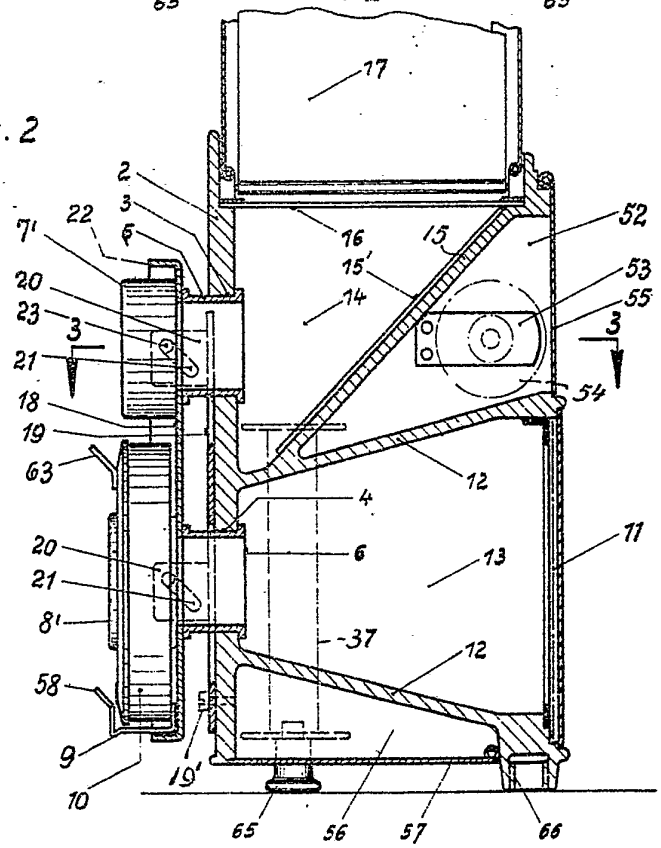

Fig. 3

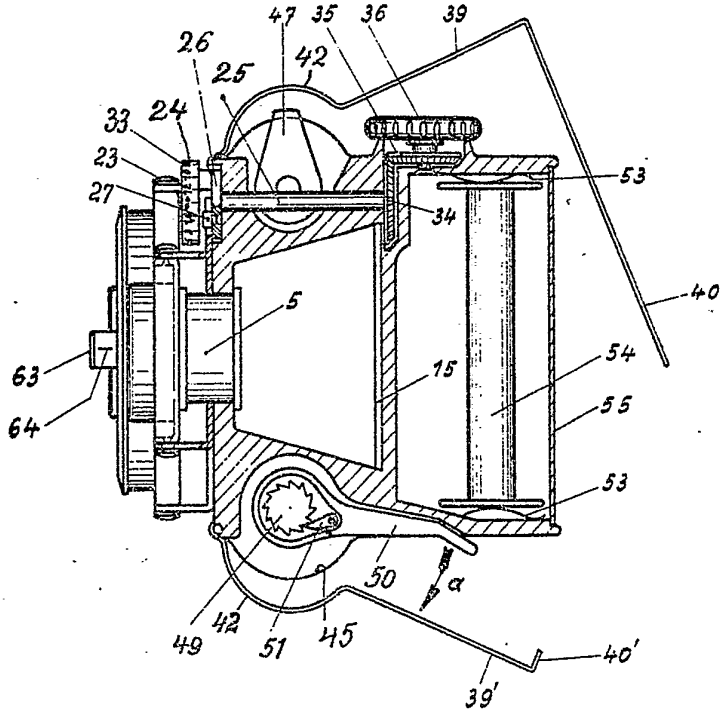

Fig. 4

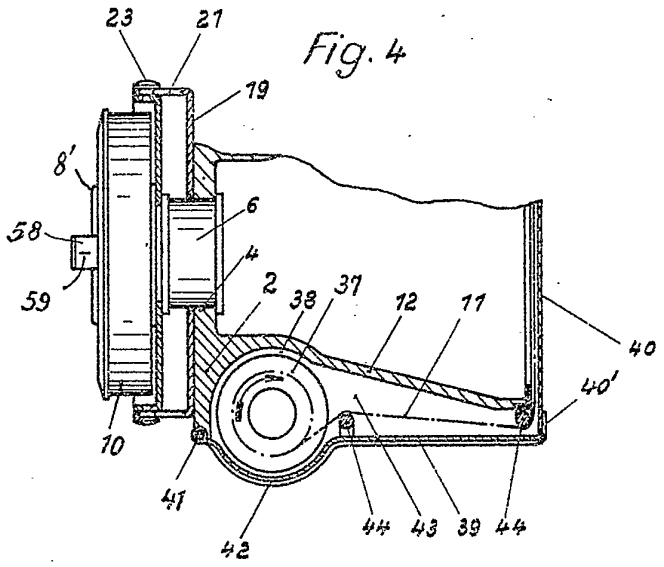

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Fig. 1

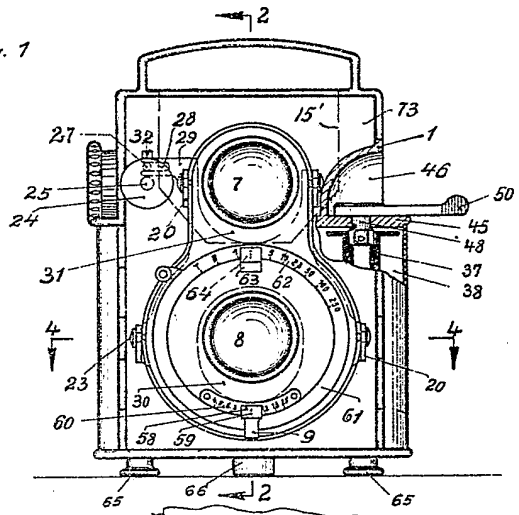


Fig. 2

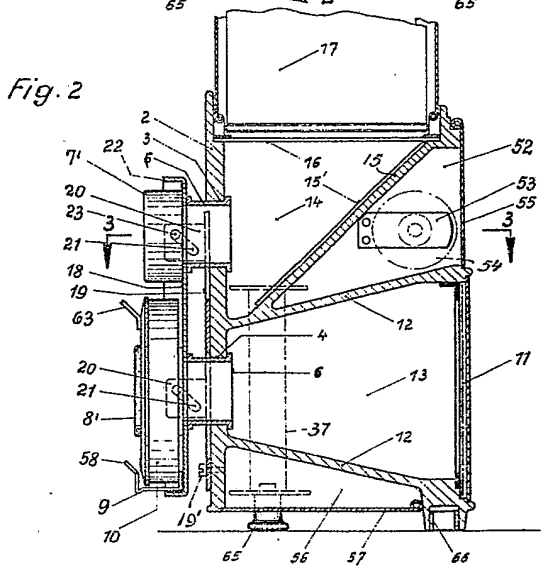


Fig. 3

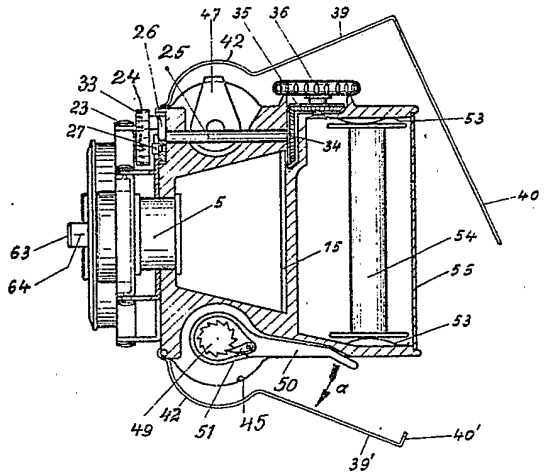
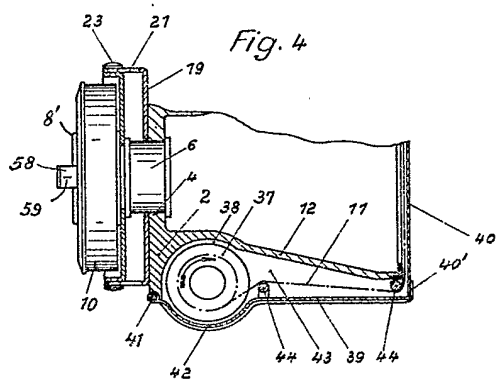


Fig. 4



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