

PATENT SPECIFICATION

462,764



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COMPLETE SPECIFICATION

Improvements in or relating to Photographic Flashlight Camera Apparatus

(A communication from JOHAN STEENBERGHEM, a Dutch subject, OTTO DIEBEL, a German citizen, HUGO FRAUENSTEIN, a German citizen, EMIL ENGLISCH, a German citizen, HERMANN SCHUBERT, a German citizen, and CONRAD KOCH, a German citizen, trading as Ihagee Kamerawerk Steenbergem and Company, of 24, Schandauer Strasse, Dresden, A.19, Germany.)

I, SIEGMUND SOKAL, of 1, Great James Street, Bedford Row, London, W.C.1, a British subject, 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:—

The present invention relates to photographic flashlight camera apparatus, and more particularly to an improved combination with a camera of an attachment constituting a source of light which will automatically illuminate the object to be photographed, under control of the means employed for operating the camera.

The invention consists in a photographic flashlight camera apparatus comprising a reflex camera having film feeding mechanism, a movable mirror, a shutter and operating means for these elements in combination with a flashlight device, controlling means therefor, and means interposed between the mirror and the said controlling means and co-operating with these two elements in such manner that the flashlight device is electrically energised and put into operation when the mirror is moved into the non-reflecting position, before the shutter is actuated. The preferred form of flashlight device intended to be used according to the invention is an electric light bulb containing magnesium leaf or foil. The mirror is preferably hinged and may be set in focusing or reflecting position, and released from that position when the usual "button" is pressed for the purpose of photographing the object. Preferably an automatically operating light-switch is provided which is controlled by the reflecting mirror, and

which is closed to illuminate a lamp when the reflecting mirror moves to non-reflecting position preparatory to taking a picture. The light-switch is automatically opened and the lamp extinguished when the mirror is again returned to focusing or reflecting position.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to one mode I have thus far devised for the practical application of the principles of my invention, but it will be understood that changes and alterations are contemplated and may be made in the exemplifying structures within the scope of my claims, without departing from the principles of my invention.

Figure 1 is a perspective view from the front, showing the general assembly and arrangement of parts between the lamp and the camera.

Figure 2 is a perspective view of the shade-reflector, in folded, compact position.

Figure 3 is a perspective view of the camera showing the attaching bracket for the lamp attached to the camera.

Figure 4 is a perspective view of the self-contained, portable, flashlight device detached from the camera, and showing its means for connection with the camera and the attaching bracket.

Figure 5 is a perspective view of the detachable bracket employed for fastening the lamp device to the camera.

Figure 6 is an enlarged, detail perspective view of the upper end of the flexible lamp post; and Figure 7 is an inverted, perspective view at the lower end of the flexible lamp post showing its electrical connection or contact for use with the flash light of Figure 4.

Figure 8 is a perspective view at the upper end of the flexible lamp, showing the smaller type of bulb of Figure 4 used in lieu of the large bulb of Figure 1.

Figure 9 is a perspective view in diagrammatic form showing the mechanical connections for transmission

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of movements from the mirror-control device, through the movable mirror to the control devices of the electric lamp.

Figure 10 is a detail view, partly in section, of a conventional electrical switch or lamp switch, showing the relation between the switch lever and the movable mirror, the latter being indicated in dotted lines, and

Figure 11 is a diagrammatic view showing the wiring and switches.

In order that the general assembly and arrangement of parts may be readily understood, reference should be had to Figure 1 wherein the reflex camera as a whole which is indicated by the letter C, is provided with a lens mount C1, and a foldable or collapsible focusing hood C2, the hood being open, and the camera set for an exposure by pressure against the button C5.

As best seen in the detail sectional view of Figure 10, a front wall, preferably the right front wall of the camera, is provided with interior sockets C3 and C4, spaced apart at a convenient distance, and adapted to provide a support for the attaching bracket indicated as a whole by the letter A. The removable or detachable bracket A is preferably a flat plate of non-conducting or insulating material in which two conducting pins A1 and A2 are fixed, with their ends projecting at opposite sides of the plate, and between these pins the plate is slotted as at A3. As indicated in Figure 5, the bracket is reversible, and it may readily be attached to the camera, as in Figure 3, by inserting the ends of the pins into the sockets C3 and C4 where the pins are retained by frictional engagement with the walls of the sockets. In this position the inner ends of the pins A1 project into the interior of a hollow portion of the camera, and the outer portions of the pins project from the front wall of the camera, in position to support a specially constructed, self-contained, portable, flash light device indicated as a whole by the letter B. For use detached from the camera, this flash-light B has a small bulb or lamp B1. For combined use with the camera, this bulb B1 may be used as indicated in Figure 8, and as illustrated in Figure 1, a larger lamp-bulb, as B2, is used to illuminate the object, in each of the three instances the lamp bulb receives its electrical energy from a battery (not shown) but mounted within the housing of the flash light of Figure 4 (see Fig. 11).

As best seen in Figure 4 the flash-light device has a pair of complementary

sockets B3 and B4, in one of its walls, which sockets are adapted to slip over the projecting or exterior ends of the pins A1 of the bracket, and the wall is also recessed at B5 so that the recess will slip over and cover the plate of the bracket. The switch lever B6 of the flash light, which lever projects into the recess B5 (where it is readily accessible from the camera) fits into the slot A3 of the bracket. Preparatory to employing the flash-light device with the camera, the switch B6 of the flash light is closed, as in Figure 11, and then the flash light, as a whole, is attached to the camera and bracket, as in Figure 1. The automatically controlled switch, indicated as a whole by the numeral 8 in Figure 11, is opened by the operation of setting the camera, and it is closed, only when the camera is set for use and the reflex mirror M1 is moved into the non-reflecting position, as will be described.

The small bulb B1 screws into a socket B7 in the top of the flash light device, for use as in Figure 4, but when the attachment is employed with the camera, this bulb is removed, and a flexible, tubular, or hollow lamp post, indicated as a whole by letter P is threaded into the socket. At its lower end this tubular, flexible lamp post is provided with a screw head P1 forming an electrical contact or connection with the battery connections of the flash light device, and this connection is a rigid one, in order that the flexible post may be flexed or bent to desired position in relation to the lens mount of the camera. At its upper end the post terminates in an interiorly threaded thimble P2 and within the thimble is a centrally located contact P3 similar to P1, suitable electrical wiring connecting these two contact points and located within the tubular post.

A detachable socket-head P4 is next threaded into the thimble to make connection with the contact P3, and the enlarged socket P5 of this head is adapted to receive the lamp-bulb B2 as indicated in Figure 1.

The illumined lamp-bulb B2, of course, provides the illumination, or light for the exposure, and in connection with the bulb I utilise a combination shade-reflector for directing the light rays where desired, and for shading the lamp for the convenience of the photographer. This shade-reflector is in the nature of a removable hood, indicated as a whole by the letter H, and is fashioned of light but strong material for mounting at the top of the lamp post and for

enclosing the rear part of the lamp bulb as well as the top part of the bulb. One face of the hood, as H1, is fashioned as a reflector surface for enclosing or partially enclosing the bulb and for reflecting the light rays therefrom, in front of the camera, and upon the image to be photographed. The hood is fashioned of two flat sections of material, such as cardboard, and these sections are hinged together with a fabric-binding or strip H2 that provides for a longitudinal fold in the hood, and for flexing or bending of the hood when mounted on the lamp post. In addition, two or more scores or kerfs H3 are fashioned in the hood sections to facilitate bending or flexing of the hood about the bulb, and finally, the hood is provided with an elastic retaining band H4 passing through holes in the hood and extending across the outer and the inner portion of the folded hood. As indicated in Figure 1, this elastic band is snapped over the bulb and placed around the upper part of the socket head P4, and the elasticity of the band holds the hood in close relationship around and over the desired portions of the lamp bulb, for shading, as well as for light-reflecting purposes.

In Figure 1 the lighting attachment is shown with the post in upright position with the shade-reflector throwing or reflecting the light rays straight ahead, but it will be understood that the flexible lamp post with its fixed base at B7 may be turned or swung to various angles, and that the shade-reflector may also be adjusted, with the lamp bulb as a centre, to various desired positions for the convenience of the photographer.

When the shade-reflector is not in use, it is folded to the compact, flat, shape of Figure 2, and packed or stored in a suitable place, as are also the other detachable and removable elements or devices of the lighting attachment.

As before stated, the lamp is illumined by energy from the battery in the flash-light device, and the current from the battery is controlled through movement of the reflecting mirror M1 of the camera. The mirror M1 controls a lighting switch that is located within the walls of the camera, and this switch comprises the two conductor pins A1 of the attaching bracket and a switch lever. It will be understood that any suitable arrangement may be made for this automatically controlled lamp switch, which is indicated as a whole by the numeral 8 in the diagram Figure 11.

In the conventional form of the switch indicated in Figure 10, as well as in Figure 9, I utilise a switch lever that is

pivoted at 1 on the outer side of a wall of the light chamber indicated as L in the drawings, and this lever is located in a space of the camera at the back of the attached flash-light of Figure 1. The lever is fashioned with an upper arm 2, and a laterally extending pin 3 near the free end of the lever projects through an arcuate slot 4 in the side wall of the light chamber L in position to engage on top of the mirror M1.

The mirror M1, it will be understood is located below the fixed ground glass plate M of the camera, and the mirror M1 is hinged at M2 in the back or rear upper portion of the light chamber L. A spring M3 of the mirror, when permitted to do so, snaps the mirror from lowered position, to the upper position in which it is shown in the drawings, and in this upper position the film is exposed, through the open light chamber L, for the taking of a picture.

Thus, the hinged, spring actuated mirror, when in position for an exposure, and through the use of the pin 3, holds the lever arm 2 in position shown in Figures 9 and 10, and in this position the automatic switch is closed, and the lamp bulb B2 is illumined.

The mirror M1 is swung from focusing or reflecting position, to the non-reflecting position of Figures 9 and 10, by the spring M3, and when the mirror is in this position it holds the switch lever in closed position. When the mirror M1 is swung to focusing position or reflecting position, the switch lever through retaining pin 3 is released by the swinging mirror, and a spring, as 5 pulls the arm 2 of the lever to the rear, the pin 3 moving in the arcuate slot 4 in the side wall of the light chamber L. As the mirror is swung to non-reflecting position, to open the chamber L to the light, the upward swing of the mirror, through the pin 3 swings the switch lever to close the lamp switch and illumine the lamp.

The switch lever is fashioned with an angular arm 6 and this arm terminates in a cam head 7 which is in position to swing into frictional contact with a horizontally movable, spring pressed switch plate 8, and this plate, as indicated in Figure 10 is thereby held in contact with the inner ends of the conductor pins A1, A2 of the attaching bracket. The contact plate 8 is supported by a pair of spaced pins 9, 9, in insulated sockets 10 mounted at the inner side of the front wall of the camera, and springs, indicated at 11, tend to disengage the plate from the ends of the pins A1, A2. Thus, when the swinging mirror M1 swings arm 2 forwardly and upwardly, the arm

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6 and head 7 swing downwardly and forwardly, and the head pushes the plate 8 into electrical and frictional contact with the ends of the conductor pins A1, A2
 5 against the action of the compression springs 11. Conversely, when the mirror swings down to reflecting position and releases lever 2 the spring 5 swings arm 2 downwardly to the rear and thereby
 10 swings arm 6 and head 7 upwardly and to the rear, thus permitting springs 11 to open the lamp switch, and extinguish the lamp.

The operating mechanism of the
 15 camera is so arranged that simultaneously with the winding of the film by the lever 16, the shutter is set and the mirror is moved from the non-reflecting position into the focusing position at
 20 45° to the optical axis and consequently the flashlight release, which is actuated by the mirror is likewise set for operation.

When the button C5 is pressed to
 25 actuate the lever 39, the swinging movement of this lever releases the hinged mirror M1 so that it may automatically swing from focusing position to the non-reflecting position, in which latter position
 30 the lamp B2 is illuminated.

In Figure 9, it will be seen that a pin 42 is provided which projects through a slot in one of the side walls of the light chamber L and this pin bears against the
 35 top surface of the hinged mirror M1 for the purpose of swinging the mirror from non-reflecting position to the reflecting or focusing position. Another pin, or detent, 43 also projects through a slot,
 40 in the wall of the light chamber, below pin 42, to retain the mirror in focusing position. The said pin 42 and the detent 43 are located in position to engage the edge of the mirror opposite
 45 to the edge which contacts with the pin 3 of the electric switch device for the lamp B2.

The detent 43 is mounted on a cam spring-blade 44 fixed at one end to the
 50 light-chamber wall, but exterior of the chamber, and this spring blade is flexed away from the wall to withdraw the detent from the edge of the mirror, thereby permitting the upward swing of
 55 the mirror from reflecting position to non-reflecting position. For flexing the spring blade and releasing the mirror I employ a cam lever 45, which is pivoted
 60 at 46 to the chamber wall, and this lever is fashioned with a cam face 47 in frictional contact with the spring blade. At its upper end the cam lever has a laterally projecting lug 48 against which the
 65 lever 39 bears, and the swinging movement of the lever 39 swings the cam

lever, thereby flexing the spring blade 44 to withdraw the detent 43 and release the mirror.

The mirror M1 is lowered or swung on its hinge to focusing position through the
 70 operation of the rotary shaft 40, which has a lug 49 mounted thereon that turns in a circular path with the shaft and contacts with a lug 50 located in the path
 75 of movement of the rotating lug 49. Lug 50 is carried by a rotary plate 51, which is pivoted at 52 on the outer side of the light-chamber wall, and the pin 42 is also carried by this rotary plate. Thus,
 80 as the lever 16 is swung on its working stroke the rotary plate is turned, and through the instrumentality of the pin 42 the mirror is swung to focusing position, and it is there held by co-action of a pin
 85 53 on the rotary plate and a locking lever 54, which elements are released in suitable manner preparatory to withdrawing the mirror from focusing position.

While I have shown specific details of
 90 construction for transmitting motion from the working stroke of the lever 16 to the mirror M1 for the purpose of swinging the mirror on its hinge, and other details of construction for winding
 95 the film, releasing the shutter, and releasing the mirror, it will be understood that this showing is merely one exemplification of means for controlling the mirror, which mirror controls the
 100 light switch. It will also be understood that the specific details of the light switch, which switch is under control of the mirror, show one exemplification only of the switch arrangement. These
 105 details of construction, and other details of construction may be changed within the scope of my appended claims without departing from the spirit of my
 110 invention.

I am aware that it has already been
 proposed to provide a photographic flash-light camera apparatus comprising a camera combined with a socket for a
 115 flash-lamp to form a readily portable unit and to connect the lamp socket in an electric circuit with a separate portable source of current and with the shutter operating mechanism, means
 120 associated with the shutter mechanism being provided for automatically closing the circuit through the lamp socket and the flash lamp after the shutter has been released. This known construction
 125 suffers from the drawback that since the circuit through the flash lamp is closed after the shutter has been released, there is a considerable risk that the flash lamp will not come into proper illuminating
 130 operation before the shutter has already

completed a portion of its movement, with the result that part of the film will be unexposed or not fully exposed. The construction according to the present invention eliminates this defect by providing that the electric circuit controlling the lamp is closed by the movement of the mirror into the non-reflecting position previous to the operation of the shutter for exposure. The present invention presents the additional very considerable advantage that means for detachably affixing the illuminating lamp and the source of current supply to the camera are provided, which means serve at the same time for furnishing the contacts controlling the closing of the electric circuit through the lamp. Particularly in view of this fact, the automatic switching means provided according to the present invention differ entirely from those employed in the known construction.

I am also aware that it has already been proposed to provide an independent portable flash light apparatus for a photographic camera, wherein the flash light material was ignited by mechanically operating ignition means released by the action of a solenoid connected in a circuit the current through which was controlled by an electric circuit switched on by the movement of the mirror in such manner that the said circuit was closed automatically and the flash light material ignited precisely simultaneously at the instant of releasing the shutter while taking the photograph. In contradistinction to this, it is a principal object of the present invention to provide means whereby the closure of the electric circuit operating the flash light takes place so much in advance of the actuation of the shutter by the mirror that when the shutter is opened the flash light has come fully into operation.

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

1. A photographic flashlight camera apparatus comprising a reflex camera having film feeding mechanism, a movable mirror, a shutter and operating means for these elements in combination with a flashlight device controlling means therefor, and means interposed between the mirror and the said controlling means and co-operating with these two elements in such manner that the flashlight device is electrically energised and put into operation when the mirror is moved into the non-reflecting position before the shutter is actuated.

2. A photographic flashlight camera apparatus, according to claim 1, wherein the movable mirror is a hinged one.

3. A photographic flashlight camera apparatus, according to claim 1 or 2, wherein the flashlight device comprises an exterior electric lamp, and the controlling means therefor consists of a switch, which is closed when the mirror is moved from the focusing position to non-focusing position.

4. A photographic flashlight camera apparatus, according to claim 3, wherein means are provided for detachably affixing the electric lamp to the exterior of the camera.

5. A photographic flashlight camera apparatus, according to claim 3, wherein the flashlight device comprises an electric lamp which is mounted on an adjustable lamp post supported by an electric lighting device, means for attaching the said electric lighting device to the camera, a control switch for the lamp within the camera and co-acting means between the mirror and the switch for closing the latter when the mirror is swung away from focusing position to non-focusing position, being provided.

6. A photographic flashlight camera apparatus, according to claim 5, wherein the elements comprised in the flashlight device form a self-contained portable unit.

7. A photographic flashlight camera apparatus, according to claim 3, wherein the control switch includes an attaching bracket mounted on the camera, and the electric lamp forms part of a portable, self-contained, electric lighting device separably attached to said bracket, a lamp post being mounted on the device, and the lamp mounted on the lamp post.

8. A photographic flashlight camera apparatus, according to claim 7, wherein the attaching bracket comprises spaced attaching pins forming electric conductors and adapted to be seated in spaced sockets provided on the camera and wherein the electric lighting device is provided with sockets adapted to fit over said pins.

9. A photographic flashlight camera apparatus, according to claim 7 or 8, wherein the lamp post is tubular and flexible.

10. A photographic flashlight camera apparatus, according to claim 7, 8 or 9, wherein a detachable shade reflector for the lamp and means for attaching the shade reflector to the lamp are provided.

Dated the 18th day of December, 1935.

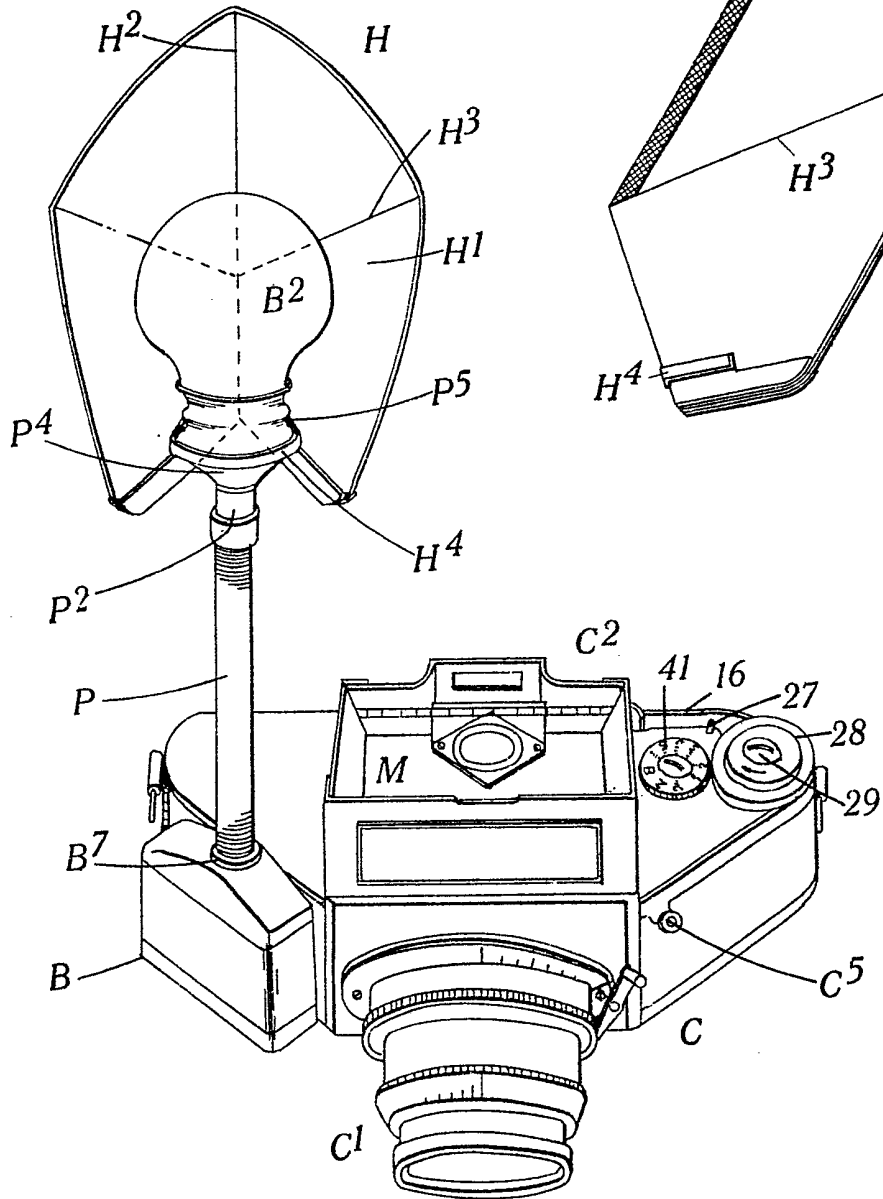
S. SOKAL.

1, Great James Street, Bedford Row,
London, W.C.,
Chartered Patent Agent.

Fig. 1.

Fig. 2.

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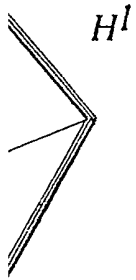


Fig. 3.

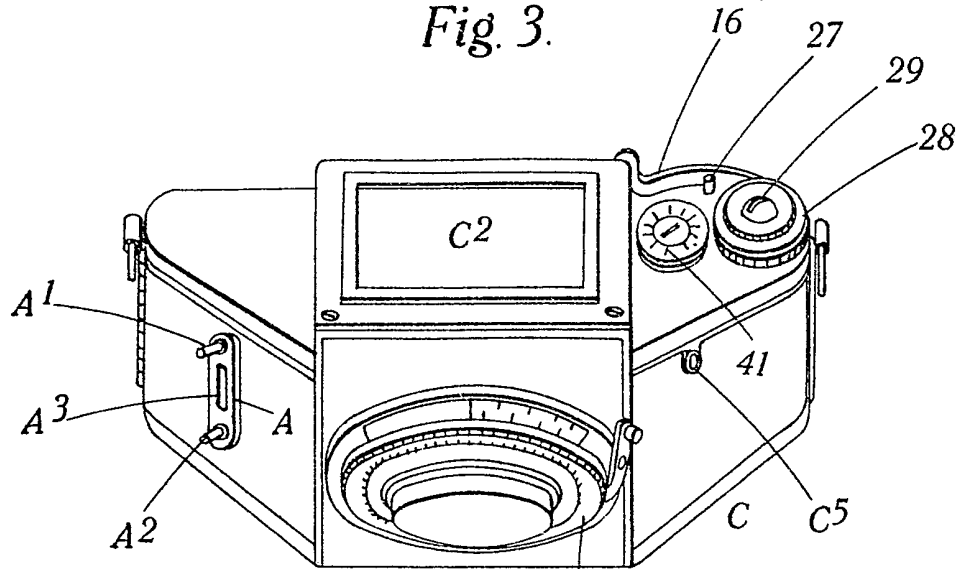


Fig. 4.

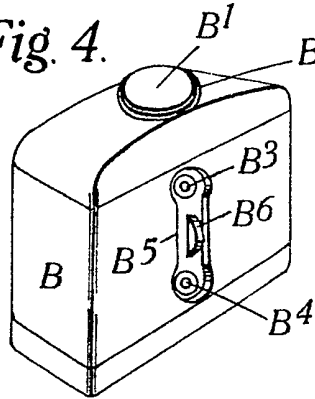


Fig. 6.

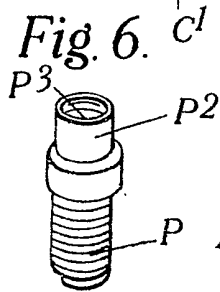


Fig. 5.

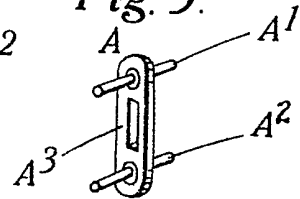


Fig. 8.

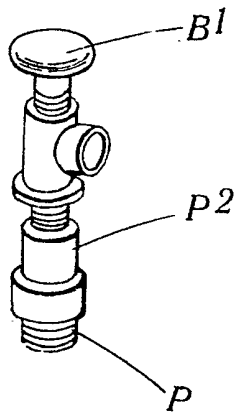


Fig. 7.

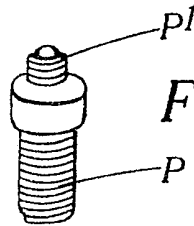


Fig. 11

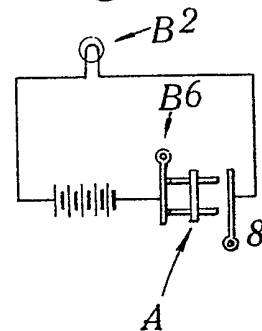


Fig. 1.

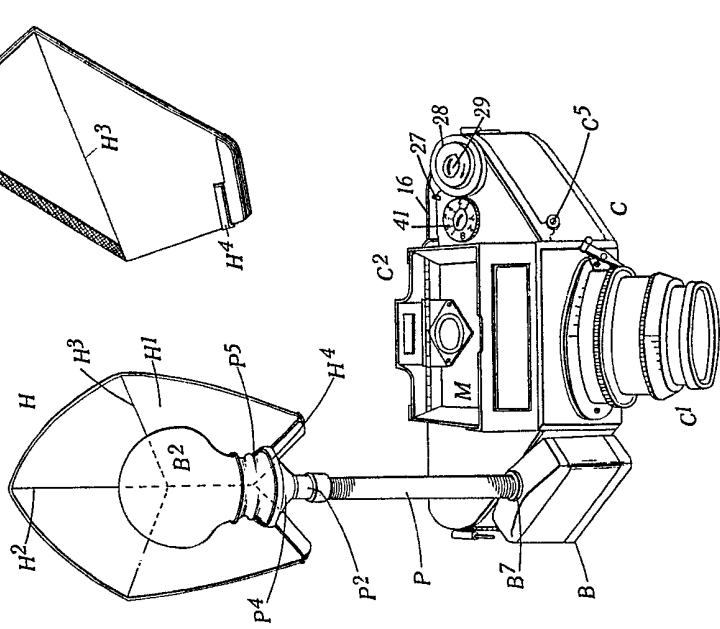


Fig. 2.

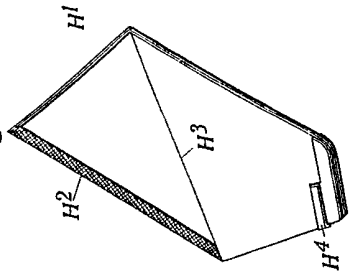


Fig. 3.

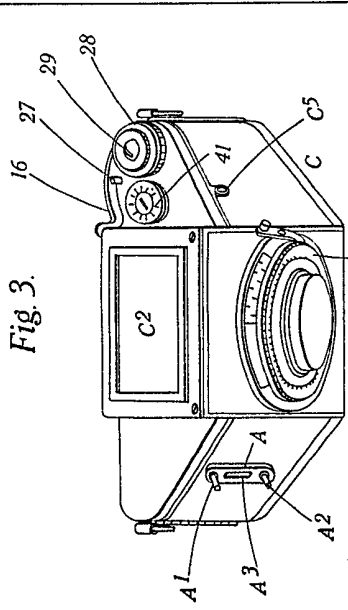


Fig. 4.

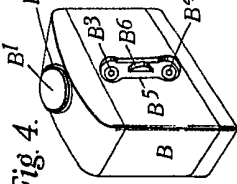


Fig. 5.

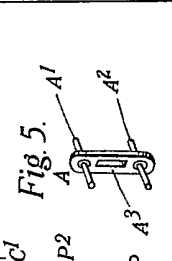


Fig. 6.

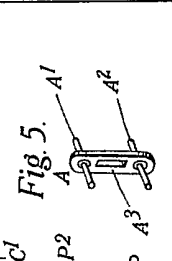


Fig. 7.

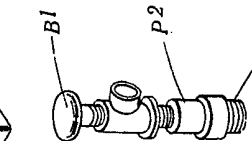


Fig. 8.

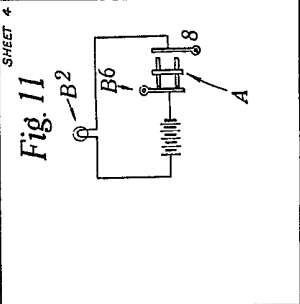
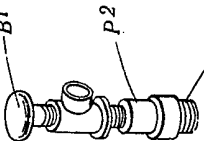


Fig. 11

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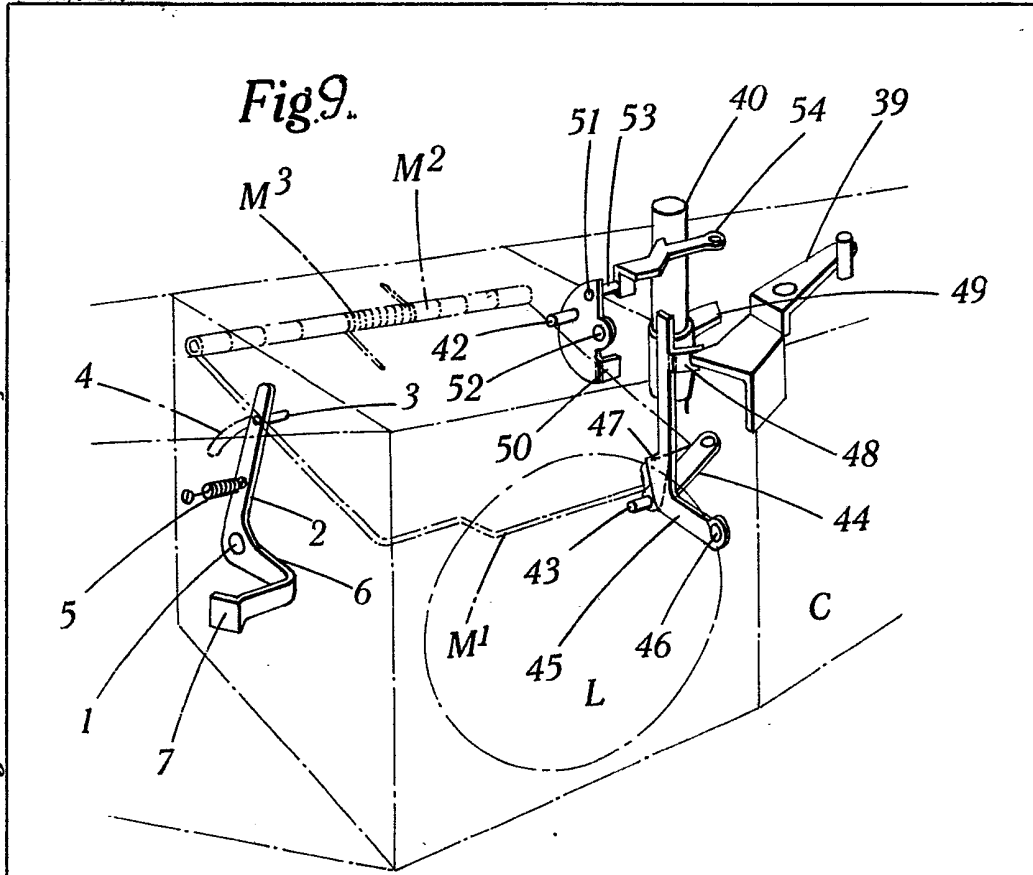


Fig. 10.

