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HAND SETTING DEVICE FOR ROTARY RESPONSE MECHANISMS IN PHOTOGRAPHIC CAMERAS

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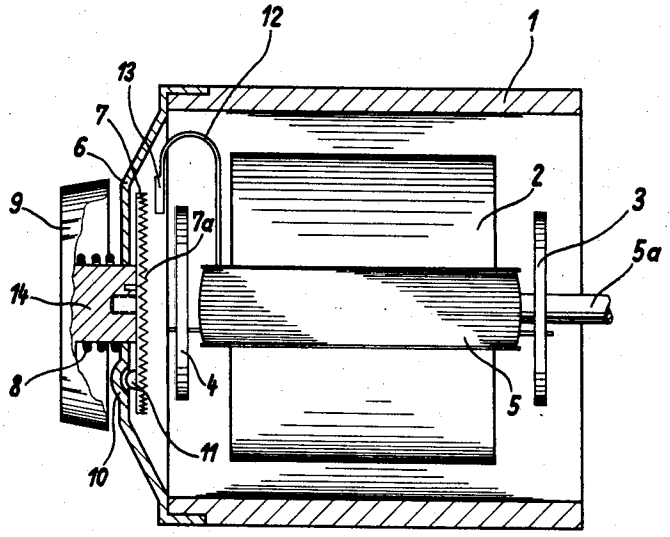


Fig. 1

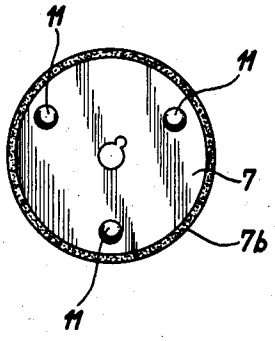


Fig. 2

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HAND SETTING DEVICE FOR ROTARY RESPONSE MECHANISMS IN PHOTOGRAPHIC CAMERAS

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8 Claims. (Cl. 74—625)

This invention relates to exposure control in photographic cameras, and more specifically to a hand setting device by means of which indicating and control elements which are directly operated by a rotary response mechanism, can in addition be set by hand when particular circumstances demand. Such a case arises for example when, in order to obtain special desired effects, the diaphragm blades of a camera are to be set by hand to a value which is other than that which corresponds to the prevailing lighting conditions and which is automatically set by the response mechanism.

It is an object of the present invention to provide a hand setting device for a rotary response mechanism, which occupies only a small space, is simple in construction and which will effectively and efficiently perform the purposes for which it is intended.

Another object of the invention is to provide a hand setting device which can be coupled to the rotary response mechanism in any position, thus rendering it unnecessary to first set the response mechanism or the hand setting device itself back to their initial positions.

A further object is to provide a hand setting device which, by virtue of the omission of a limitation of the angle of rotation, is of particularly advantageous construction, and in which the response mechanism is not mechanically overstressed during adjustment by hand.

Still another object of the invention is to provide a hand setting device which permits not only adjustment of the rotary response mechanism but also a clamping action for retaining a setting obtained from the response mechanism.

According to the invention, a hand setting device for a rotary response mechanism accommodated in a housing and having current-responsive means rotatable in response to electric current fed to said response mechanism, comprises a cap-like member closing the housing at one of its ends and defining an aperture coaxial with the axis of rotation of the current-responsive means, an axially displaceable shaft projecting through said aperture, an adjusting knob mounted on the outer end portion of said shaft, an entrainer disc mounted on the inner end portion of said shaft, a pressure spring surrounding said shaft between the cap-like member and the knob to urge said knob away from said cap-like member and said entrainer disc into engagement with said cap-like member, and a resilient arm attached with one of its ends to said rotatable current-responsive means and having a bent prism-shaped free end adapted to establish positive connection with said entrainer disc on axial displacement of said adjusting knob, shaft and entrainer disc against the action of said pressure spring.

The entrainer disc can have a flanged edge finely serrated like a crown wheel, or have a roughened border zone, to ensure a good entraining action of the free end of said resilient arm.

A preferred embodiment of the invention is illustrated by way of example, as applied to an electric current-responsive mechanism, in the accompanying drawing, in which:

Fig. 1 is a longitudinal cross section through a current-responsive mechanism provided with a hand setting device incorporating an entrainer disc;

Fig. 2 is an elevational view of a modified form of construction of an entrainer disc as seen from the right hand side of Fig. 1.

As shown in Fig. 1, a core magnet current-responsive mechanism of ordinary construction, comprising an iron short-circuit cylinder **1**, a core magnet **2**, current feed spirals **3** and **4** and a rotary coil frame **5**, has an axle **5***a* which connects the response mechanism to indicating and control elements (not shown) to be operated. The cylinder **1** forming a housing for the current-responsive mechanism is closed at one of its ends by a cap-like member **6**. On the inner side of this cap-like member **6** there is arranged an entrainer disc **7** with a finely serrated flanged edge **7***a* resembling a crown wheel. The rear side of this disc **7** bears against the inner side of the cap-like member **6** and the central portion of the retainer disc **7** is mounted on the inner end portion of a shaft **14** which passes through a central aperture in the cap-like member **6** and carries on its outer end portion an adjusting knob **9** loaded by a pressure spring **8** surrounding said shaft **14** between the cap-like member **6** and the adjusting knob **9**.

The cap-like member **6** is provided with recesses **10** uniformly spaced on the periphery of a circle and in which protrusions **11** formed on the entrainer disc **7** resiliently engage.

A resilient arm **12** is fixed with one of its ends to the rotary coil frame **5** and has a bent over prism-shaped free end **13** located opposite the finely serrated edge **7***a* of the entrainer disc **7** at a short distance therefrom.

If the knob **9** is turned by hand, the protrusions **11** slide out of their recesses **10** against the pressure exerted by the pressure spring **8**. As a result the entrainer disc **7** is moved slightly towards the rotary coil frame **5** so that the serrated edge **7***a* comes into engagement with the prism-shaped end **13** of the resilient arm **12** and causes this also to turn together with the rotary coil frame **5** and the indicating and control elements connected therewith. The knob **9** is held in any position by the pressure spring **8**, and consequently so are also the rotary coil frame **5** and the indicating and control elements connected therewith. The rotary response mechanism is released when the hand setting device is once again put into the rest position. If, in a response mechanism, a maximum angle of rotation of about 90° is assumed, any desired angle within this 90° can be set because the recesses **10** and the protrusions **11** are arranged at a sector angle of 120° in relation to each other.

The arm **12** is of such resilient construction and the serrations of the entrainer disc **7** are so fine that the prism-shaped end **13** of the arm **12** slides resiliently over the serrations when rotation of the coil frame **5** is prevented by a part of the response mechanism bearing against an end stop. As a result, the response mechanism is reliably protected against mechanical overloading without it being necessary to limit the angle of rotation of the knob **9** and the entrainer disc **7**.

When the knob **9** of the hand setting device is turned to the left or right, the response mechanism is similarly turned without it being necessary to take into consideration the position the response mechanism has actually assumed in accordance with the current flowing therethrough.

It will be seen that the hand setting device gives not only an adjusting action on the rotary response mecha-

nism and the associated indicating and control elements but also a clamping action for retaining a setting obtained from the response mechanism, or set by hand. In the embodiment shown in the drawing, it simply requires finger pressure on the knob 9 against the pressure of the spring 8 to press the retainer disc 7 against the end 13 of the arm 12 and so clamp the rotary coil frame 5 in the position it had momentarily assumed corresponding to the the current flowing through.

In practice, this clamping action can be very useful, for example in conjunction with a diaphragm regulator for a cine camera as follows: Suppose the photographer wishes to take a shot of a tower by first directing the cine camera at the bottom of the tower and then slowly traversing the camera upwardly.

At the beginning of the shot the diaphragm, which is set via the axle 5*a*, will be set correctly in accordance with the measured light value. As the photographer slowly traverses the camera upwardly during the shot, in most cases the brightness of the increasing amount of sky falling within the picture angle of the camera will exceed that due to the tower, so that the diaphragm aperture will automatically be made smaller. The result of this will be that the important part of the picture, namely the tower, will become increasingly under-exposed.

If on the other hand a camera is used having a diaphragm regulator incorporating a hand setting device in accordance with the invention, it is only necessary to apply finger pressure to the knob 9 at the beginning of the shot. In this way the automatic response mechanism is prevented from actuating the diaphragm during the progress of the shot and the diaphragm setting will remain the same during the shot in spite of the changing proportions of light.

Instead of using a retainer disc having a flanged edge finely serrated like a crown wheel, it is also possible to use a flat retainer disc having a roughened border zone 7*b*, as shown in Fig. 2, for engagement with the prism-shaped free end 13 of the resilient arm 12.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim:

1. A hand setting device for a rotary response mechanism accommodated in a housing and having current-responsive means rotatable in response to electric current fed to said response mechanism, comprising, a cap-like member closing the housing at one of its ends and defining an aperture coaxial with the axis of rotation of the current-responsive means, an axially displaceable shaft projecting through said aperture, an adjusting knob mounted on the outer end portion of said shaft, an entrainer disc mounted on the inner end portion of said shaft, a pressure spring surrounding said shaft between the cap-like member and the knob to urge said knob away from said cap-like member and said entrainer disc into engagement with said cap-like member, and a resilient arm attached with one of its ends to said rotatable current-responsive means and having a bent prism-shaped free end adapted to establish positive connection with said entrainer disc on axial displacement of said adjusting knob, shaft and entrainer disc against the action of said pressure spring.

2. A hand setting device as claimed in claim 1, wherein a finely serrated flanged edge is provided on the entrainer disc.

3. A hand setting device as claimed in claim 1, wherein a roughened border zone is provided on the entrainer disc.

4. A hand setting device as claimed in claim 1, wherein the face of the entrainer disc adjacent said cap-like member is provided with protrusions arranged on the periphery of a circle and corresponding to recesses defined by said cap-like member, said protrusions being adapted to be forced out of said recesses, when said adjusting knob is turned, to effect said axial displacement of said adjusting knob, shaft and entrainer disc against the action of said pressure spring.

5. A hand setting device for a rotary response mechanism accommodated in a housing and having current-responsive means rotatable in response to electric current fed to said response mechanism, comprising a cap-like member closing the housing at one of its ends and defining an aperture coaxial with the axis of rotation of the current-responsive means, an axially displaceable shaft projecting through said aperture, an adjusting knob mounted on the outer end portion of said shaft, a circular entrainer member mounted on the inner end portion of said shaft, a pressure spring surrounding said shaft between the cap-like member and the knob to urge said knob away from said cap-like member and said entrainer member into engagement with said cap-like member, and a resilient arm attached with one of its ends to said rotatable current-responsive means and having a free end adapted to establish positive connection with said entrainer member upon axial displacement of said adjusting knob, shaft and entrainer member against the action of said pressure spring.

6. Apparatus for manually setting a rotary camera diaphragm operating mechanism accommodated in a housing and having current-responsive means rotatable in response to an electric current fed thereto, comprising a member closing the housing at one of its ends and defining an aperture coaxial with the axis of rotation of the current-responsive means, an axially displaceable shaft projecting through said aperture, manual adjusting means mounted on the outer end portion of said shaft, an entrainer disc mounted on the inner end portion of said shaft, resilient means for urging said shaft in an axial direction outwardly with respect to the housing, and a resilient member attached at one of its ends to said rotatable current-responsive means and having a free end adapted to establish positive connection with said entrainer disc upon axial displacement of said manual adjusting means, shaft and entrainer disc against the action of said resilient means.

7. A manual setting device for a rotary response mechanism in a housing including camera diaphragm operating means rotatable in response to an electric current fed thereto; comprising an axially displaceable shaft in alignment with the axis of rotation of said current-responsive means and projecting through an aperture in said housing, an adjusting handle mounted on the outer end portion of said shaft, a circular entrainer member mounted coaxially with said shaft, means including a pressure spring surrounding said shaft for urging said shaft, handle and entrainer member away from said rotatable means, and a resilient arm member, one of said members being fixedly mounted on said shaft and the other of said members being fixedly mounted on said rotatable means, said resilient arm member having a bent free end adapted to establish positive connection with said entrainer member upon axial displacement of said adjusting handle, shaft and entrainer member against the action of said pressure spring.

8. A manual setting device according to claim 7, wherein said entrainer member has a roughened circular zone and the free end of said resilient arm has means thereon for positively engaging said roughened zone.

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