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EXPOSURE METERS
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FIG. 2

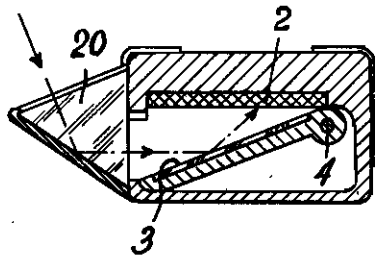


FIG. 3

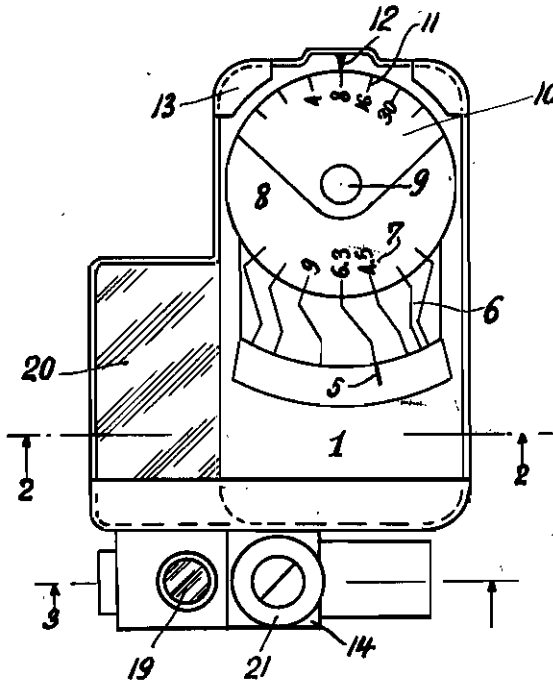
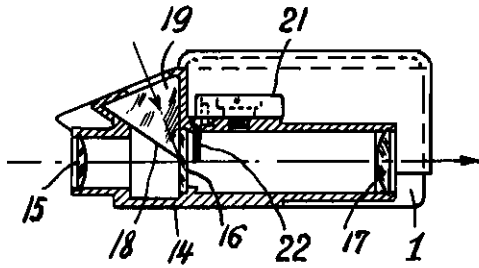


FIG. 1

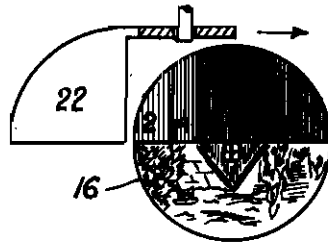


FIG. 4

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EXPOSURE METERS

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Application filed June 3, 1941

My invention relates in its broad aspects to the problem of photographing objects of rather low overall brightness such as indoor scenes, paintings, sculptures, carved furniture etc. exhibited in rooms, art-studios and the like where only reduced day-light and conventional light sources or illuminating means including candles, electric incandescent lamps etc. are available and where more brilliant illumination of the objects by magnesium light or flash light of high intensity is not desired for specific considerations.

The invention relates more particularly to improvements in instruments for determining the optimum exposure under the aforesaid light conditions, namely in cases, where photo-electric exposure meters of known design by reason of their limited sensitiveness cannot be used.

The principal object of the invention is to provide a structurally improved photo-electric exposure meter enabling the operator—on photographing objects of low brightness—to quickly and accurately determine the optimum exposure in accordance with the individual lens-stop selected and the grade of sensitivity or "speed" of the particular film employed.

Other objects of the invention intimately connected with the former and advantages obtained will become apparent to practitioners in this field as the prescription proceeds.

The nature and scope of the invention are briefly outlined in the appended claims and will be more thoroughly understood from the following specification taken together with the accompanying drawing in which

Fig. 1 is a plan showing diagrammatically and by way of an example a photo-electric exposure meter cooperatively associated with an optical exposure meter;

Fig. 2 is a cross-section vertically taken through the photo-electric exposure meter on line II—II in Fig. 1 and seen in the direction of the arrows;

Fig. 3 is a cross-section vertically taken through the optical exposure meter on line III—III in Fig. 1 and seen in the direction of the arrows;

Fig. 4 in its lower section shows the image of an object to be photographed as seen by the operator on looking through the eye piece of the optical exposure meter and in its upper section a comparison element, provided therein in the form of a gradually shaded grey wedge of known design, bearing indication numbers, and also an adjustable light screen cooperatively associated with said comparison element.

The invention enables the owner of a photo electric exposure meter to use his instrument

under precarious light conditions by attaching thereon an auxiliary exposure meter of the optical type. The latter may be of a very simple form, since an artificial light source is not required. In a known manner use is made of the prevailing light to give comparison lighting. Instead of determining the intensity of the prevailing lighting by means of a special photometer using a photo-sensitive paper, as it is the case with arrangements known so far, a photo-electric exposure meter of conventional design may be used to advantage in the present case, as the instrument is no longer to be directed on to the object but on to the brightest spot of its surroundings. In order to achieve this, a reflecting surface is provided in front of the photo-electric cell and in front of a light comparison element, provided in the optical exposure meter, so as to give to both the same amount of incident light, coming from the same direction.

If the photo-electric cell is arranged in a different plane to that of the comparison element, it may be necessary to provide further reflecting surfaces or the one of the latter must be arranged in a different position to that of the comparison element. The reflecting surfaces may be conveniently made inclinable.

In the comparison field it is most advantageous to use as comparison element a grey wedge constituting of a plurality of steps or sections bearing indication numbers which represent multiplications factors relatively to the values of the exposure time scale of the photo-electric exposure meter. When the darker grey steps of said wedge have to be used, the light penetrating through the brighter steps might impair the comparison measuring operation. In order to avoid this, an adjustable light screening shield is fitted in front of the grey wedge. Referring now to the drawing, wherein an embodiment of the invention is illustrated by way of an example, the photo-electric cell 2 of the photo-electric exposure meter 1, when in normal use, receives light from the mirror 3, swinging around the axis 4. The galvanometer pointer 5 moves over the scale 6, to which the values of the lens stop scale 7 may be set by rotating the disc 8. With this disc the graduated sector 10 for the shutter speeds 11 swings around the same axis 9, both being coupled by arresting elements (not shown). The setting of the scale is read on the index 12.

The optical exposure meter is attached to the above described photo-electric exposure meter by means of a frame 13. The optical exposure meter consists of a lens 15, forming an image in the

plane of the grey wedge 16, and of an eye-piece 17. The gray wedge receives light from the reflecting surface 18 of the prism 19, hereinafter called "primary reflecting means." A similar prism 20 of equi-lateral cross-sectional shape, hereinafter called "secondary reflecting means," is attached to the auxiliary arrangement in such a way, that it fits in front of the photo-electric cell 2, when the frame 13 is brought into position. The light screening shield 22 can be adjusted in front of the grey wedge by actuating the knob 21.

In order to measure a particularly dark object before taking a photograph, the optical exposure meter is directed on to that object. After having compared the light intensity, the respective indi-

cation number of the grey wedge is read of, the intensity of which equals that of the object. The value thus ascertained is multiplied by the exposure time, indicated by the index-mark 12 and brought about by the selection of any desired lens stop and its setting in relation to the indication of pointer 5. In other words, the light intensity indication numbers of said comparison element are empirically so chosen as to complement as multiplication factors the shutter speed and lens stop indication numbers of the photo-electric exposure meter. In the example illustrated with the lens stop or diagram setting of 6.3, an exposure of 64 seconds is found by multiplying 8×8 .

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