G. F. WYNNE.

APPARATUS FOR CALCULATING PHOTOGRAPHIC EXPOSURES.

APPLICATION FILED MAR. 3, 1915.

1,194,919. Patented Aug. 15, 1916.

FIG. 1.

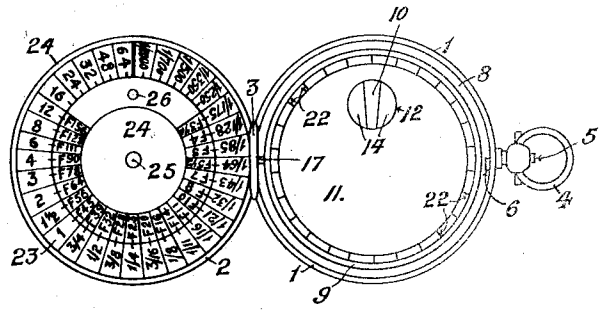


FIG. 2.

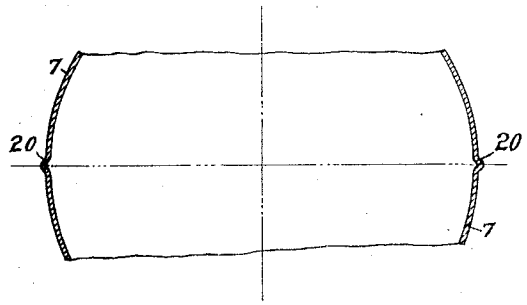


FIG. 6.

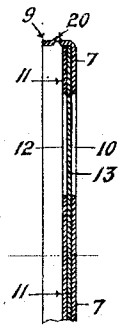


FIG. 4.

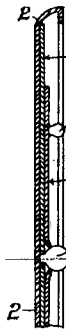


FIG. 5.

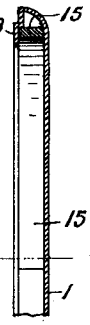
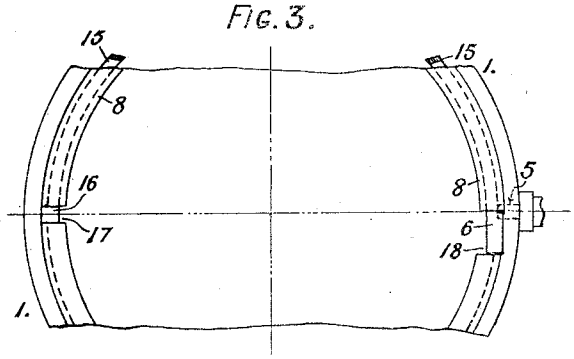


FIG. 3.



Witnesses
Hayes R. Conwell.
F. M. Meyer

Inventor.
G. F. Wynne.
by Jno. Lawrie
Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE FREDERICK WYNNE, OF MINERA, NEAR WREXHAM, WALES.

APPARATUS FOR CALCULATING PHOTOGRAPHIC EXPOSURES.

1,194,919. Specification of Letters Patent. Patented Aug. 15, 1916.

Application filed March 3, 1915. Serial No. 11,930.

To all whom it may concern:

Be it known that I, GEORGE FREDERICK WYNNE, a subject of the King of England, residing at Plas Gwyn, Minera, near Wrexham, in the county of Denbigh, North Wales, United Kingdom of Great Britain, have invented new and useful Improvements in Apparatus for Calculating Photographic Exposures, of which the following is a specification.

This invention relates to apparatus for calculating photographic exposures, of that class in which the light is first tested by an "actinometer," and the photographic exposure calculated from it, and in connection with the actinometer, calculating scales are provided; and the object of the present invention is to provide an instrument of this kind by which the calculations of the exposures can be effected more accurately and rapidly.

The improved apparatus is illustrated in the annexed drawings, in which—

Figure 1 is an elevation, and Figs. 2, 3, 4, 5 and 6 are details.

The instrument or apparatus consists of two half cases, hinged together somewhat in the manner of a "Hunter" watch case, and provided with a closing catch, and release device; and in one half of the case the actinometer part of the apparatus is fixed; while in the other half, the calculating scales are arranged.

The two half cases 1 and 2 are hinged together at 3; and the instrument is adapted to be held or carried by a ring holder 4, in the stem of which the press-pin 5, acting on a spring catch 6 on the inside, for engaging with the rim of 2, is held.

The half case 1 is shown in detail in cross section in Fig. 5; and also in outside view in Fig. 3; while the case 2, with its internal scales, is shown in detail in cross section in Fig. 4. Fig. 6 is a cross section in detail showing the actinometer parts which fit in the case 1, and which are also shown in detail in plan section in Fig. 2.

The actinometer parts comprise a dish-shaped plate 7, the body of which passes into the space within the inturned flange 8 of the case 1. The top edge 9 of the rim of this dish plate 7 is milled or otherwise roughened, and projects above the top of the flange 8.

The dish plate 7 has in it a taper slot or window 10, and within it there is fitted a disk 13 of transparent celluloid or very thin glass; and on top of this transparent disk a disk 11 of opaque celluloid, or other material, having a circular hole or window 12, which comes opposite the taper slot or window 10. The standard tints 14, consisting of dark and light shades, are painted on each side of the taper slot 10. This arrangement enables a neat finish to be effected, the part of the painted actinometer tints showing, being clean cut, and circular.

The sensitive photo paper is placed in the bottom of the case 1; and over it the dish-plate 7 is introduced into the case 1. When the actinometer is exposed to the light a portion of the sensitive paper will be exposed through the transparent disk 13 and the taper slot 10, the paper being exposed till it assumes one or other of the standard tints.

The interposition of the transparent disk 13 over the painted standard tints is most valuable, as it prevents them being soiled by contact with the fingers or in any other way.

The object of milling the top of the rim of the dish plate 7 is so that the friction caused by pressure of the fingers upon it, enables it to be easily turned when it is desired to expose a fresh surface of the sensitive paper.

The catch 6 is on one end of a semi-circular spring 15, extending half around the case 1, under the flange 8; and having its other end at 16, turned up and passing into a gap 17, in the flange 8; the catch 6 on the other end being brought through a gap 18, in the flange 8, and the pin 5 is pressed on to the inside of the spring 15, beneath the flange 8, when it is required to open the case.

The dish-plate 7 is provided with projections 20, (see Figs. 2 and 6) either pressed out of rim of same or formed in any other suitable way, and in introducing the plate into its place in the case 1, after a sheet of sensitive paper has been introduced into the bottom, these projections 20 are passed through the gaps 17, 18, and then the disk is turned around into the position required; and by these means is held within the case. The sensitive paper itself may be held under the lower edge of the spring 15, which will hold it in position, and prevent its turning.

When the light is very bright, it takes only a few seconds for the sensitive paper to color to the standard tint, and consequently, the coloring of this paper, in using the actinometer, to some extent takes place while the disk 7 is actually being turned, and conse-

quently this renders it difficult to gage the exact actinometer time. To avoid this difficulty, there is provided on the outside of the periphery of the opaque celluloid or like disk 11, a number of radial divisions 22, the angle between two neighboring division lines, is the same as the angle of the slot or transparent portion or window 14 between the standard tint parts 15. By means of these divisions, in moving and settling the actinometer to expose a fresh surface of the sensitive paper, two or three fingers may be placed over the opening 10, so as to cover it and the greater portion of the plate, dial 11, so as to protect the sensitive paper from the action of the light, while the dial plate 7 is being revolved a distance equal to the space between two of the radial divisions. When the fingers are placed over the dial in the manner referred to, then the divisions 22 show how far to move the disk. For instance, when the fingers are over the dial, say one of the divisions is opposite the gap 17; then by turning the plate 7 around for a fresh surface of sensitive paper, it is turned until the next division or mark 22 comes opposite this gap 17, when the changing action is complete. The hand may then be instantly removed, and the sensitive surface exposed to the action of the light, and the exact time in seconds actually taken by the paper in coloring to the standard tints, can be accurately and exactly counted.

The calculating scales of the casing 2 (see Figs. 1 and 4) consist of two disks of ivorine, xylonite, celluloid or like material, 23 and 24, the larger, 23, being fixed, say adhered to, the bottom of the case 2, and the smaller one, 24, being arranged on a spherical hub or center pin 25, fixed in the case 2; and this is rotatable around this hub by a knob 26 upon it.

The disk 23 is provided with a scale of actinometer times and exposures in seconds or minutes; while the disk 24 has marked upon it a scale of stops and speed numbers, which operate in connection with the scales on the disk 23, in the well known way.

The disk 24 has a hole in its center, and the edge of the ivorine, or like material around this hole when the disk is snapped on to the center pin is turned slightly outward, as indicated in Fig. 4.

This construction is advantageous for the reason that in practice, scales of stops and speed numbers, according to the different systems, such as "F" and "uniform" systems, "Goerz," and any other system, and also a specially divided scale for exposures of autochromes, can be made interchangeable, simply by taking off one disk 24 containing one kind of scale, and instantly snapping on another disk with a different scale over the knob 25, at any time, as may be required.

With regard to the scales, it is to be understood any scales of different kinds, according to the requirements may be used in place of those illustrated.

What is claimed is:—

1. An apparatus for calculating photographic exposures, comprising a case composed of two dished halves hinged together, the dished halves having inwardly extending flanges which make contact with each other when the two halves are closed together, one of such halves having calculating scales disposed within it below the level of the flange thereon, and the other of such halves having sensitized material and means for holding it in position below the level of the flange thereon, the scales and material facing in the same direction and adapted to be seen both at the same time when the case is open, and the scales facing the material when the case is closed.

2. An apparatus for calculating photographic exposures, comprising a case composed of two dished halves hinged together, the dished halves having inwardly extending flanges which contact with each other when the two halves are closed together; one half having calculating scales disposed within it below the level of the flange thereon; and the other half having sensitized material, and an apertured dished plate adapted to take under the flange thereon for holding the material therein; the scales and material facing in the same direction and both being adapted to be seen at the same time when the case is open, and the scales facing the material when the case is closed.

3. An apparatus for calculating photographic exposures, comprising a case composed of two dished halves hinged together, the dished halves having inwardly extending flanges which make contact with each other when the two halves are closed together; one half having calculating scales disposed within it below the level of the flange thereon; and the other half having sensitized material, and being fitted with a plate which takes under the flange on this half, and is disposed over the material, and is provided with an aperture for exposing part of the material, and is fitted with a transparent disk for closing the aperture in the plate and is also fitted with an apertured opaque disk for closing and opening the aperture in the plate; the scales and material facing in the same direction, and being adapted to be seen both at the same time when the case is open, and the scales facing the material when the case is closed.

4. An apparatus for calculating photographic exposures, comprising a case composed of two dished halves hinged together the halves having inwardly extending flanges one of such halves having calculating scales disposed below the level of the

flange thereof, and the other half having the flange thereof formed with gaps therein; an apertured dished plate formed with projections thereon and fitted within the half case provided with the gapped flange, the projections passing through the gaps and taking under the flange, the dished plate being fitted with transparent and opaque disks for covering and exposing the aperture in the plate; and sensitized material disposed in the half case with the gapped flange underneath the plate; the scales and sensitive material facing in the same direction when the case is open, and the material facing the scales when the case is closed.

5. An apparatus for calculating photographic exposures, comprising a case composed of two dished halves hinged together, the halves having inwardly extending flanges; one of such halves having calculating scales disposed below the level of the flange thereof, and the other half having the flange thereof formed with gaps therein; an apertured dished plate formed with projections thereon and fitted within the half case provided with the gapped flange, the projections passing through the gaps and taking under the flange, the dished plate being fitted with a transparent disk for covering the aperture in the plate, and with an opaque disk formed with an aperture adapted to coincide with the aperture in the plate for exposing the same and provided with division markings for indicating the relative movement of the plate; and sensitized material disposed in the half case with the gapped flange underneath the plate; the scales and sensitive material facing in the same direction when the case is open, and the material facing the scales when the case is closed.

6. An apparatus for calculating photographic exposures, comprising a case composed of two dished halves hinged together, the dished halves having inwardly extending flanges which make contact with each other when the two halves are closed together; one half having an enlarged rounded support which is fitted with disk calculating scales disposed below the level of the flange on this half, one of such scales being snapped on and detachably mounted on such support to facilitate its removal and its substitution by another scale; and the other half having sensitized material, and an apertured dished plate adapted to take under the flange thereon for holding the material therein; the scales and the material facing in the same direction and both being adapted to be seen at the same time when the case is open, and the scales facing the material when the case is closed.

7. An apparatus for calculating photographic exposures, comprising a case composed of two dished halves hinged together, the halves having inwardly extending flanges; one of such halves having an enlarged rounded support which is fitted with disk calculating scales disposed below the level of the flange on this half, one of such scales being snapped on and detachably mounted on such support to facilitate its removal and its substitution by another scale; and the other half having the flange thereof formed with gaps therein; an apertured dished plate formed with projections thereon and fitted within the half case provided with the gapped flange, the projections passing through the gaps and taking under the flange, the dished plate being fitted with transparent and opaque disks for covering and exposing the aperture in the plate; and sensitized material disposed in the half case with the gapped flange underneath the plate; the scales and sensitive material facing in the same direction when the case is open, and the material facing the scales when the case is closed.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE FREDERICK WYNNE.

Witnesses:
SOMERVILLE GOODALL,
FREDERICK OSBORNE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."