



Date of Application, 4th Oct., 1892—Accepted, 5th Nov., 1892

COMPLETE SPECIFICATION.

An Improved Instrument for Calculating the Duration of Photographic Exposures.

We, Professor JOHN ALFRED SCOTT, of 55 Upper Leeson Street, Dublin, Ireland, and JOHN HOWSON, of Britannia Works, Ilford, in the County of Essex, Manager, do hereby declare the nature of my said invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of our invention is to manufacture an improved form and arrangement of slide rule, for facilitating the calculation of the necessary length of time during which the sensitive plate in the camera should be exposed to obtain a correctly exposed negative.

The various factors which influence the length of photographic exposures are well known, and have been described, more or less fully, in all photographic hand books. They may be classified as follows, viz.:—

1. Speed of plate.
2. Intensity of light during the day and year.
3. Size of diaphragm.
4. Subject.

There are other minor factors which, under some conditions, may affect the result; but, for our purpose, we do not find it necessary to describe them, as their influence is small and their occurrence unusual.

And in order that our said invention may be particularly described and ascertained, reference is hereby made to the accompanying drawing.

a is a plate, which we call the plate circle. This plate is permanently fixed to the outermost plate *e*, so as not to rotate independently. *b*, *c* and *d*, are three concentric rings or plates, each capable of being rotated upon its centre, independently of the others. The plates may be superposed, concentrically, one upon the other, or they may be dovetailed or grooved together, so as to present a flush surface.

The speed values of the plates to be used are marked on the plate circle *a*, as ascertained by careful tests and practical experience. *b* is the date and hour circle, and is inscribed with the logarithmic values, representing the power of the light on the various days of the year and hours of the day, as compiled by the said John Alfred Scott, and embodied in an original paper read at a meeting of the Photographic Society of Ireland on the 8th May 1885, and published in "The British Journal of Photography" of the 15th May 1885, page 318. *c* is the diaphragm circle, which shows the focal value of the various stops used with the lens. *d* is the subject circle, upon which are inscribed the several descriptions of photographic subjects, in the relative values. *e* is the exposure circle.

The drawing shows the instrument set under the following conditions:—

- a*. Ilford. Ordinary plate speed No. 40.
- b*. June. Midday.
- c*. F. 32.
- d*. Subject. Open landscape.

Opposite the subject shown on the circle *d*, the figure 1 second appears on the circle *e*, which indicate that the necessary exposure under the above conditions will be one second.

If the subject is other than open landscape, it is only necessary to look at the marks opposite such other subject, and the length of exposure will be found; for instance, it will be seen that the exposure for groups will be four seconds.

The method of using the instrument is as follows:—The arrow on the date circle *b* is placed opposite the mark on *a* indicating the plate to be used. The

Scott & Howson's Instrument for Calculating the Duration of Photographic Exposures.

date circle is held by the hand in this position, and the arrow on the diaphragm circle *c* is placed opposite the proper date number on *b*. Holding the two circles *b* and *c* as already set, the arrow on the subject circle *d* is placed opposite the indicator on *e* of the diaphragm to be used. The exposure to be given will then be found on the outer circle *e*, opposite the subject mark, as already explained. 5

It will be obvious that the plate numbers on *a*, and the subjects may be varied according to requirements. The date numbers on *b* may also be varied to suit different latitudes.

The various circles may be otherwise arranged, or other circles with different factors may be added or substituted; or the number of circles may be increased or 10 diminished.

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:—

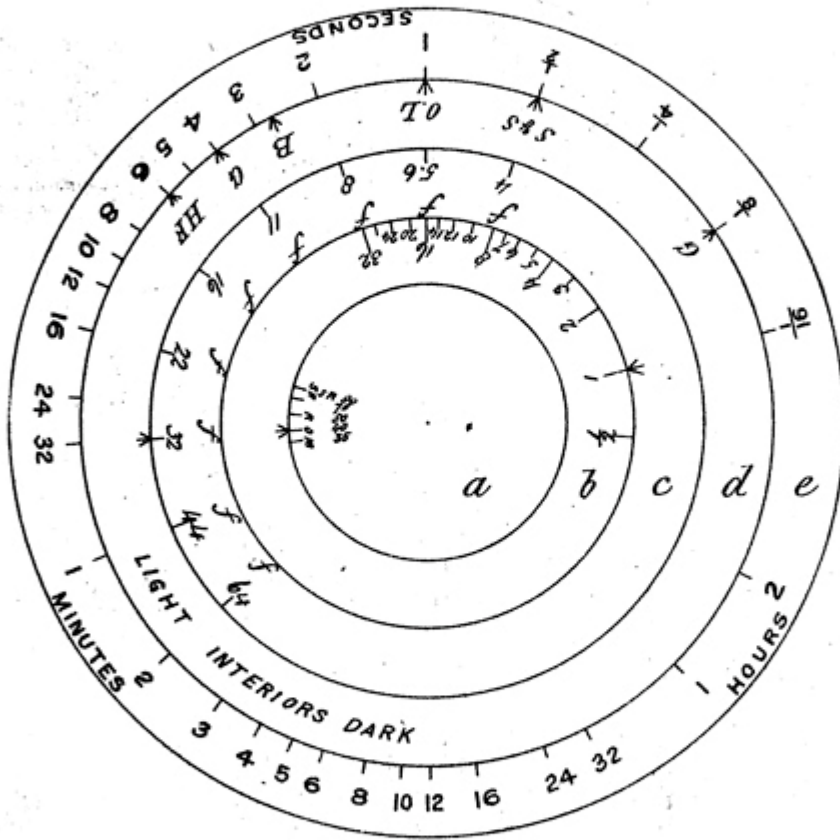
1. An improved instrument for calculating photographic exposures, substantially 15 as herein before described and illustrated by the drawing.
2. In the construction of instruments for the purpose aforesaid, the application and use of concentric circular plates, or a combination of plates and rings, 20 formed of paper, cardboard, metal or other suitable material, whereupon the necessary words, marks, and measurements are indicated and shown, together forming a circular slide rule, substantially as herein before described and illustrated 25 by the drawing.

Dated 3rd October 1892.

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8, Quality Court, London, W.C.; Agent. 25

London: Printed for Her Majesty's Stationery Office, by Darling & Son, Ltd.—1892.





[This Drawing is a reproduction of the Original on a reduced scale]