

OBJECT/DOCUMENTATION : 1

We illustrate this slide (1) from the David & Barbara Henry collection and reprint the maker's instructions for its operation; the lettered parts correspond to those

in the advert (2) from the 38th edition of the Catalogue issued by James W. Queen - maker & importer of Optical Lanterns etc., of Philadelphia.

THE CYCLOIDOTROPE

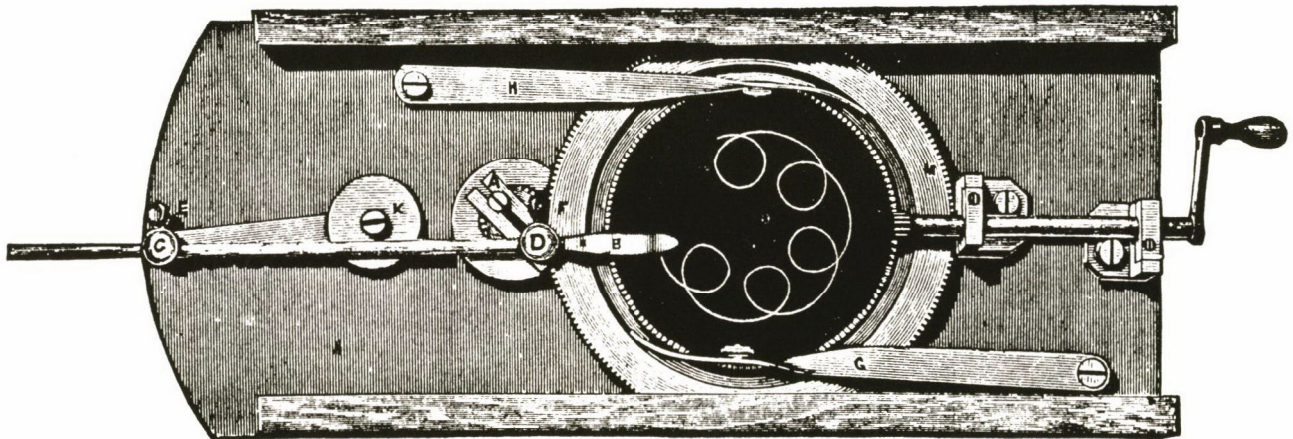
INSTRUCTIONS

The Geometric designs which can be produced by this instrument are varied by the setting of the crank at A and the position of the needle. The needle is carried by the bar B, it passes freely through two points, one on the crank at C, and another at the back centre D; at C and D are screws E, F, to hold the needle bar. The smoked glass is held in place by two springs G and H, upon a bed of India Rubber, and the needle can be fixed at any point by EITHER of the screws E or F: if held by F it must pass freely through C; if held by E it must pass freely through D. ... If the screws E and F are tight, the instrument is LOCKED and CANNOT BE TURNED. Variations are produced by fixing the needle either to strike

the centre, and to move equally or otherwise on each side of it, or to strike on the near, far, or right or left hand side. Further variations are produced by moving the back centre which works on the screw K. Glasses can be smoked over a common candle or paraffin lamp; if the glass has a LITTLE wax rubbed on the surface previous to being smoked, the lines will be all the firmer. The spring at the end of the needle bar can be lifted and supported by something put under, so that it can be seen that the design can be worked on the glass. If the needle when set works over the edge of the glass, the figure can be made smaller by shortening the length of stroke at the crank, or by altering the back centre.

2.

New Mechanical Lantern Slide.



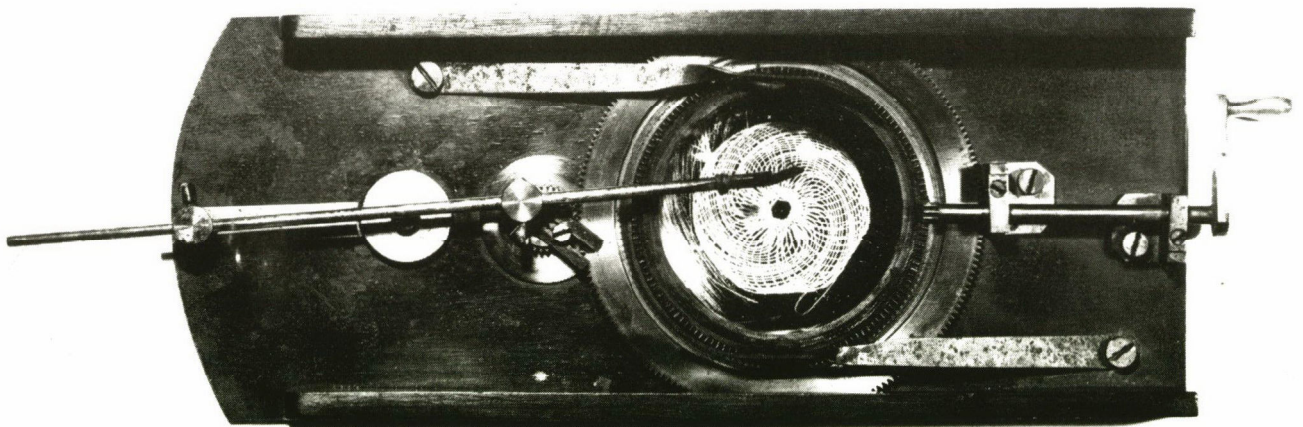
FACSIMILE ENGRAVING OF THE CYCLOIDOTROPE—A MECHANICAL LANTERN SLIDE.

The Cycloidotrope, or the Invisible Drawing Master.

WILL TRACE AN INFINITE VARIETY OF GEOMETRIC DESIGNS UPON THE SCREEN OR UPON PAPER.

Those slides are always pleasing in which there is movement or something is done. This slide is made to carry a circular piece of smoked glass, and upon the handle being turned the design is traced on the glass, showing a white line upon the screen. The pattern is easily varied by a slight alteration of the different adjustments, six in number; as soon as one design is finished it can be removed and another glass introduced. Glasses can be carried ready smoked in a suitable box, supplied with the instrument. Price, 10.00.

1.



The following description of the working of the slide and some of the ways in which it can be used from *Experimental Science* by George M. Hopkins (NY: Munn, c.1889).

THE CYCLOIDOTROPE

The novel and very pleasing and interesting lantern slide shown in the annexed engraving (3) is of English origin. The inventor, Mr. A. Pumphery, of Birmingham, England, is entitled to much credit for having produced a simple device capable of illustrating on a large scale the intricate operation of engine engraving.

The figures shown in the smaller engraving (4) were photo-engraved directly from plates traced in the apparatus. They show some of the simpler forms of curves. By changing the adjustment of the tracing needle or the arms which support and guide it, an infinite variety of figures may be produced.

The ring, which revolves on the plate, is recessed around its inner edge, and lined with soft rubber for the reception of the glass disk, upon which the tracing is to be made. The glass is held in place by the pressure of two springs carrying rollers which bear upon the face of the glass at diametrically opposite points.

The face of the ring has a toothed rim, which is engaged by a small pinion on the crank shaft, and the periphery of the ring is provided with 202 spur teeth, which engage a pinion having 33 teeth and turning on a stud projecting from the base plate.

The spur pinion carries an adjustable crank, the pin of which turns in the crank arm, and is apertured transversely to receive the tracing rod, which may be clamped therein by the thumb screw.

The tracing rod passes through a stud arranged to turn in the end of the movable arm pivoted to the base plate. The tracing rod is hollow, and upon the end which projects over the toothed ring it carries a curved spring, provided at its extremity with a steel tracing point. A wire passing through the hollow tracing rod engages the under side of the curved spring, and lifts the point from the glass.

The glass is prepared for tracing by smoking it over a candle, lamp, or gas jet, or, better, by coating it with collodion, to which some aniline has been added to give it the desired tint.

The glass having been secured in place in the toothed ring in the manner described, the tracing point is let down upon the glass by drawing out the wire in the hollow

tracing rod. The toothed ring is then rotated by means of the crank, when a cycloidal curve will be traced on the glass. By continued rotation the curves will be duplicated; and as the number of teeth in the periphery of the ring is not an exact multiple of the number of teeth in the pinion, the ring will, by differential movement, continually fall behind the movements of the pinion and tracer carried by the crank on the pinion, so that a small space is left between the lines of successive series. By continuing the operation, the lines will intersect, until finally a beautiful, symmetrical network of lines will be formed.

By clamping the tracing rod in the crank pin, an approximately true cycloid curve will be formed; and by clamping the tracing rod in the stud projecting from the adjustable arm, and allowing the crank pin to slide on the rod, curves of another kind will be formed. Moving the arm on its pivot makes another change, and the figure is still further modified by changing the working field of the point from one edge of the glass disk to the other.

To render the tracing still more intricate, opposite sides of the glass disk may be coated with collodion differently colored. For example, red may be used upon one side and blue on the other. The color of the ground when projected on the screen will then be purple. When the tracing is done on the blue side, red lines will appear on a purple ground; and when the tracing is made on the red side, blue lines will appear on the purple ground; and where the tracings of opposite sides of the glass cross each other, the lines will, of course, be white.

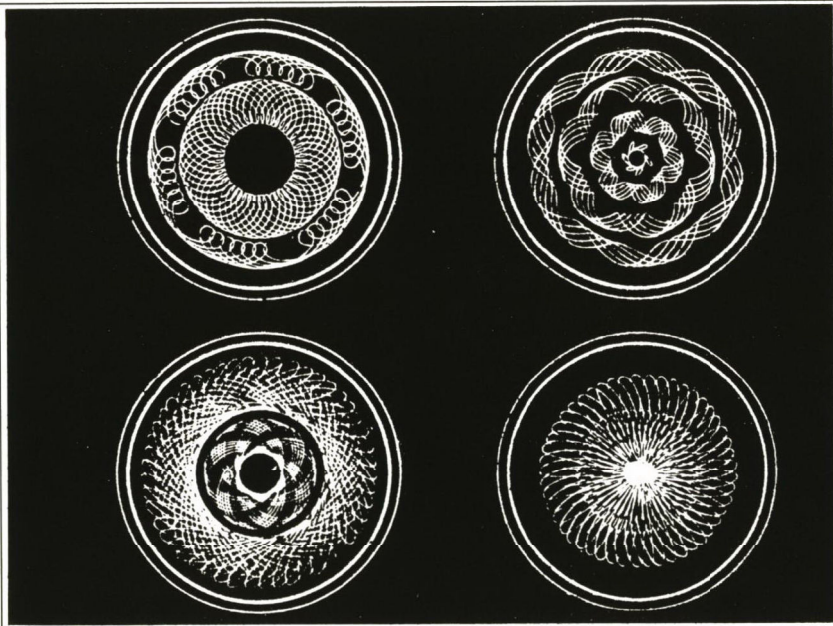
Besides the remarkable effects secured by the use of two colors, the thickness of the glass which intervenes between the two tracings produces a curious optical illusion on the screen. The tracing last made, if in focus, appears to stand out several inches from the screen, and seems to float in the air. Another interesting optical illusion is noticed when, after rather rapid rotation, the disk is stopped. By the bias of the optic nerve the figures appear for a moment to turn backward.

The disks traced in this apparatus produce striking effects when used in a chromotrope in place of the ordinary painted disks.

The final point made above is also taken up in the Queen Catalogue – which devotes a further page (5) to this in its Cycloidotrope advert.

4. Tracings produced by the Cycloidotrope

5. Cycloidotrope and Chromatope



Cycloidotrope and Chromatope.

The glasses which fit the Cycloidotrope also fit the Interchangeable Chromatope Frame, and by this means very pleasing results are obtained.

The designs on the smoked glass are put into the Chromatope Frame, the smoked sides facing each other, and fastened with spring. Some designs make more pleasing figures than others. Nos. 3 and 5 work well together, or No. 3 and a full size like the centre of No. 7. A very pleasing effect, like that of the motion of waves, is produced by making on one glass a line like the one shown in the sketch of the instrument, or such as in the border of No. 4 with No. 3.

The most perfect way of producing the designs is to use a black varnish which is quite opaque, and to cut the figure when it not quite set. Enough has been said to show that the instrument may be used both for showing the designs being made on the screen, and also for making slides.

No. 1—Design produced by one setting.

No. 2—This design is produced by a combination of three settings on the same glass.

