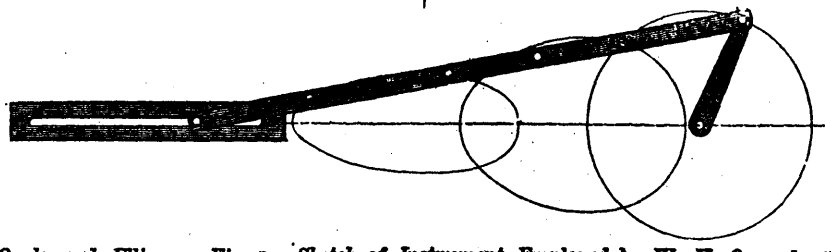
OVALS AND ELLIPSES.

(FROM THE METAL WORKER).

Several months since we published a letter from a correspondent, accompanied by some drawings of ellipses and ovals, which excited the curiosity of many of our readers. The author of the diagrams in question promised at the time to explain the method of their production in a subsequent letter. So far, however, we have had no further communications from him, and therefore in reopening the subject, we present our own ideas, and those of correspondents who have given the matter attention, of how the figures in question were drawn, instead of the solution generally anticipated.



Ovals and Ellipses.—Fig. 1.—Sketch of Instrument Employed by W. H. C. and other Correspondents in the Solution of the Problem.

By examination of the illustrations accompanping the article above referred to, it will be seen that the figures produced are of two kinds, ovals and ellipses. Both styles of figures are presented in series, commencing at one end with but a slight remove from a circle, and concluding at the opposite extremity in a long narrow shape. The explanation acccompanying them gives the information that in the construction of both kinds of figures they are derived primarily from a circle. From these conditions and explanations the conclusion is at once forced upon the mind that the figures are produced by some instrument which in its general characteristics is analogous to the connecting rod in the ordinary form of a steam engine. Whether one set of figures consists of perfect ellipses and the other of a set of ovals, or whether both sets are in reality ovals, we will allow our readers to determine after reading what follows. Upon the face of the matter, it seems extremely probable that the only difference in the forms of the figures produced is in the length of the connecting rod of the instrument by which they are drawn. The inaccuracies incidental to drawing figures by instruments of ordinary construction, to say nothing of the roughness of paper, make it impossible to determine a point of this kind by actual measurement, and more especially so when the figures are so small as in this case. Therefore, we invite particular attention to the following explanation of principles involved in the construction of the shapes named.

Numerous lettters bearing upon this matter have been received from our correspondents in the interval since the article above referred to was published. Various suggestions have been made in them with reference to drawing ellipses by instruments which are different from trammels in construction and principle, and which are more accurate than the method of two pins and a piece of string. Various attempts to explain the construction of the figures in question have been made. The greater number of those who have written us, and among them W. H. C. of Kingsport, Tenn., and D. C. H., of Kingwood, W. Va., describe an instrument with a crank and connecting rod, one end of the latter moving in a straight line, and the other connected with th crank pin. Holes in the rod are made to take the pencil and draw the figures when the crank is turned.

In Fig. 1 we show a sketch of an instrument given by W. H. C. This method of producing ovals doubtless is very old, and has occurred to almost every one who has given the matter any attention. In drawing an ellipse, however, this plan has one fatal defect, in that the figures which it produces are unlike at the two ends. In other words, such an instrument will only make egg ovals and never true ellipses. This is not easily discovered, because in most cases very long connecting rods are used, which greatly diminish the amount of difference between the two ends. One of our correspondents shows in his letter an instrument where the rod is no less than eleven times as long as the crank.

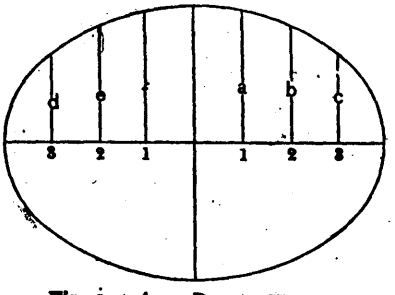
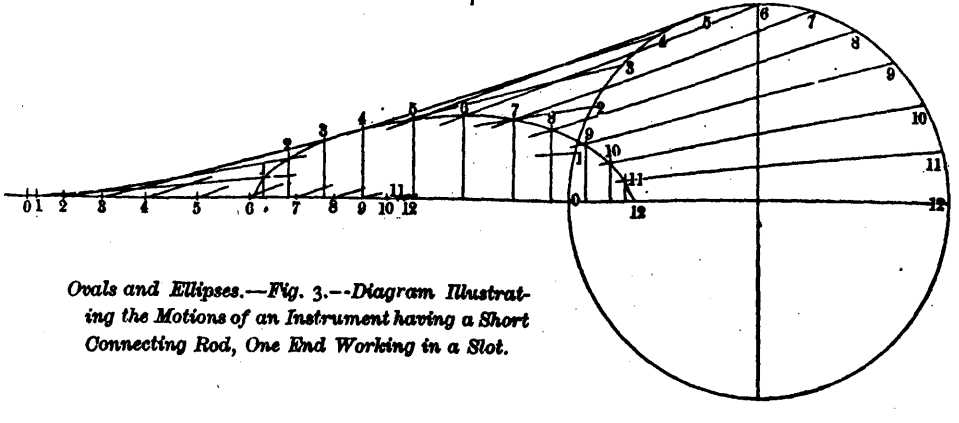


Fig. 2.—A 45-Degree Ellipse.

An ellipse is a figure obtained by making a section of a cylinder at an angle to its center line. Its two halves, whether taken on the long or short diameter, are alike in all respects. The ellipse may be also described as a circle seen in isometric perspective.



Ovals and Ellipses.—Fig. 3.—Diagram Illustrating the Motions of an Instrument having a Short Connecting Rod, One End Working in a Slot.