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CROSS REFERENCE

Oct. 11, 1927. 1,644,791

K. PETSCHENIG

PLOTTING BOARD

Filed Aug. 23, 1926

Fig. 1

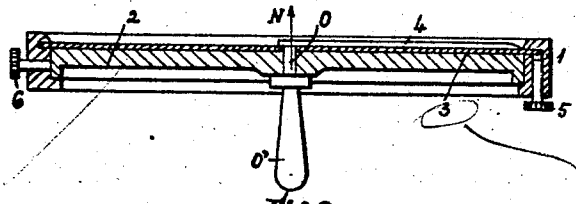
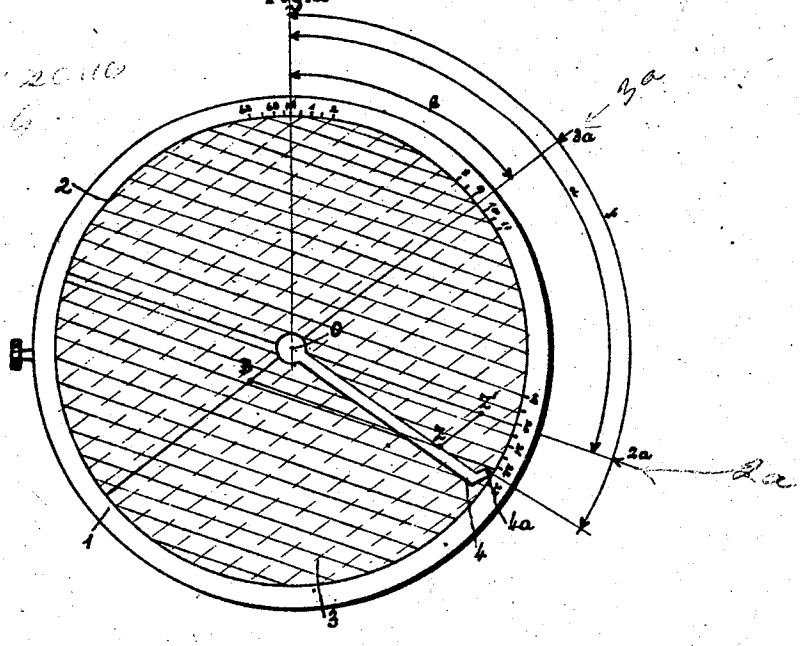


Fig. 2



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UNITED STATES PATENT OFFICE.

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PLOTTING BOARD.

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The subject matter of the present invention relates to that class of apparatus by means of which, the distance and the lateral angle relatively to a predetermined direction (for instance the north south direction), required for firing by hidden machine guns or other ordnances at targets not directly visible to the gunners can be determined, if the lateral angle and distance from a target are known, such angle and distance being determined by an observer stationed laterally of the ordnance for his point of observation.

While in the constructions heretofore known a triangle geometrically similar to the actual triangle is mechanically constructed for which purpose three rules provided with scales and adjustable relatively to each other and two horizontal circular scales are necessary, the elements of the triangle are determined according to the invention by representing the two known sides of the triangle by two lines already drawn of two superposed parallel discs, whereby any eccentric adjustment is disposed with and a very simple and compact construction is obtained in which all parts are rotatable around one and the same centre only one rule provided with scales or divisions and only one horizontal circular scale or division being required.

A constructional form of the subject matter of the invention is illustrated by way of example in the accompanying drawing.

Fig. 1 is a section on a diameter of the apparatus.

Fig. 2 is a plan view thereof.

In the cylindrical bore of the ring 1 provided on its upper face with a horizontal circular scale or division, a circular disc 2 serving as a base plate is rotatably mounted and carries in its centre a vertical journal pin O, the handle O′ being preferably an extension of such pin. On the upper face of the disc 2 there is drawn a series of parallel lines, as indicated in full lines for better distinguishing them, they may either be drawn themselves in different colours or the spaces between these lines may be in different colours. The line passing through the centre is provided with an arrow head 2^a.

A second circular disc 3 is adapted to rotate freely in the ring 1 and relatively to the disc 2 is mounted directly above the set of parallel lines. For making the disc 2 visible, the disc 3 must be transparent and is therefore preferably made of celluloid. This disc 2 is provided on its bottom side a series of parallel lines indicated in dotted lines, that of these lines which passes through the centre, being provided with an arrow head 3^a. On the central journal pin a radial distance rule 4 is rotatably mounted which may be either straight or may be suitably curved for taking into account the average deviation of the projectile. This rule serving for determining the lateral angle of the ordnance or gun carries a reading mark 4^a. For independently locking in position each of the discs relatively to the ring 1 the bottom guide rib of the latter is provided for instance with a set screw 5 which permits to clamp the rim of the upper disc 3 against the upper guide rib of the ring while another set screw 6 arranged radially in the ring may be forced against the rim of the base disc 2.

The handling of this apparatus is the following:

At first the following data have to be determined:

1. The horizontal angle α between the observer target direction and the north south direction.

2. The horizontal angle β between the observer gun direction and the direction north south by means of a compass.

3. The distance B Z between the observer and the target.

4. The distance B O between the observer and the gun measured by a range finder.

Now after releasing the discs the adjustment of the angle α is effected by the arrow head 2^a and the adjustment of the angle β by the arrow head 3^a whereupon the set screw 5 is screwed tight. Then by a pencil on the celluloid disc 3 the distance $O Z' = B Z$ is marked on the line O 2^a and the distance O B on the line O 3^a with the aid of the rotatable rule 4. Now the triangle, gun- observer-target is obtained on the celluloid disc as the triangle O, B Z not by actually drawing through B the line B Z parallel to the set of lines on the base disc 2 and through Z′ the line Z′ Z parallel to the set of lines on the celluloid disc 3, but only by imagining these lines to be drawn. The point of intersection Z of these two lines

imagined to be drawn is likewise marked by a pencil and then the radial rule 4 is so turned that the deviation line passes through this point Z. Thus the sought distance O Z is found as the firing distance. The reading mark 4^a of the radial rule is in the tangent of the centre of the deviation line and furnishes the lateral angle of the gun.

Of course, instead of a curved radial rule, also a straight one might be used, the reading edge of which is exactly radial and forms the reading mark. But then obviously the lateral angle of the gun so determined would have to be corrected for the deviation.

Also the two central lines O 2^a and O 3^a might be provided each with a distance scale whereby the direct plotting of the length O B and O Z′ is rendered possible without resorting to the rotatable rule.

What I claim is:

1. In an apparatus for laying ordnance and machine guns for indirect firing, the combination of a horizontal ring, there being a circular scale provided on such ring, a base disc provided with a series of spaced parallel lines and a transparent upper disc provided with a series of spaced parallel lines, the said discs being mounted concentrically on the said ring and being adapted to rotate on such ring the one independently of the other.

2. In an apparatus for laying ordnance and machine guns for indirect firing, the combination of a horizontal ring, there being a circular scale provided on such ring, a base disc provided with a series of spaced parallel lines, and a transparent upper disc provided with a series of spaced parallel lines and of a rule provided with a longitudinal scale and a reading mark for cooperation with the circular scale, the said discs and the rule being mounted concentrically on the said ring and being adapted to rotate on such ring the one independently of the other.

3. In an apparatus for laying ordnance and machine guns for indirect firing the combination of a horizontal ring, there being a circular scale provided on such ring, a base disc provided with a series of spaced parallel lines and a transparent upper disc provided with a seres of spaced parallel lines and of a rule provided with a longitudinal scale and a reading mark for cooperation with the circular scale, the reading edge of the rule being laterally offset according to the average deviation angle, the said discs and the rule being mounted concentrically on the said ring and being adapted to rotate on such ring the one independently of the other.

4. In an apparatus for laying ordnance and machine guns for indirect firing, the combination of a horizontal ring, there being a circular scale provided on such ring, a base disc provided with a series of spaced parallel lines and a transparent upper disc provided with a series of spaced parallel lines, the said discs being mounted concentrically on the said ring and being adapted to rotate on such ring the one independently of the other and means for locking each of the said discs individually to the said ring.

In testimony whereof I have signed my name to this specification.

KARL PETSCHENIG.