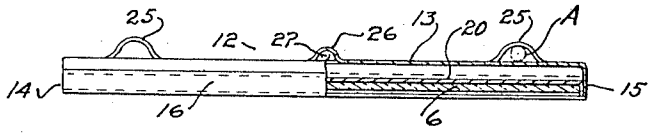
G. WALLACE.

ANGLE FINDER.

APPLICATION FILED MAR. 22, 1913.

1,089,885. Patented Mar. 10, 1914.

Fig. 1



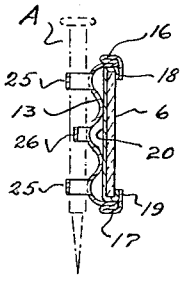


Fig. 3

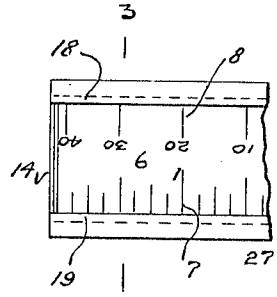


Fig. 2

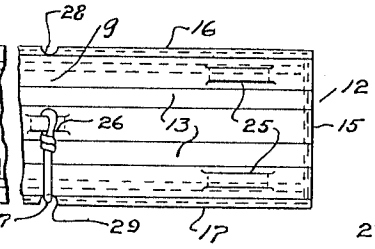


Fig. 2a

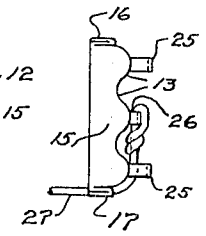


Fig. 4

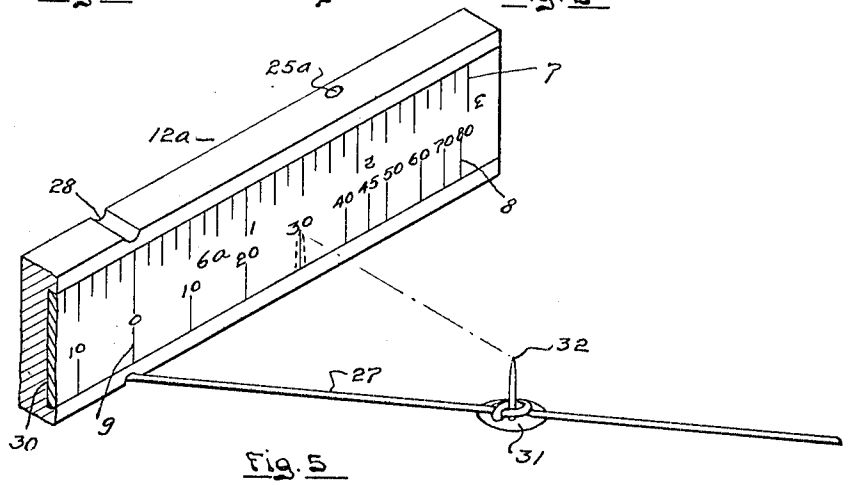


Fig. 5

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ANGLE-FINDER.

1,089,885. Specification of Letters Patent. **Patented Mar. 10, 1914.**

Application filed March 22, 1913. Serial No. 756,170.

To all whom it may concern:

Be it known that I, GUSTAVE WALLACE, a citizen of the United States, and resident of the borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Angle-Finders, of which the following is a specification.

This invention relates particularly to an instrument for laying off lines in angular relation to each other or to a base line.

One of the objects of the invention is the production of a simple angle finding device by means of which a line can be quickly and accurately laid out, either perpendicular to a given line or direction or at any oblique angle thereto.

A further object is to provide a desirable and inexpensive device, which can be conveniently carried in the pocket or in a mechanic's tool chest.

Another object is to provide a graduated reflecting rule of small compass, which can be inserted for use in narrow quarters or behind objects to be measured.

Other objects and advantages will become apparent as the specification proceeds.

With the aforesaid objects in view the invention comprises the improvements and combinations of parts hereinafter described, pointed out in the appended claims, and illustrated in their preferred embodiments on the annexed drawings, in which—

Figure 1 is a partial top plan view and central horizontal section of the preferred form of the device. Fig. 2 is a partial front view of the construction illustrated by Fig. 1. Fig. 2ª is a partial rear view of the same construction. Fig. 3 is a cross-section on the line 3—3 of Fig. 2. Fig. 4 is a side view of the device; and Fig. 5 is a fragmentary perspective view of a modified form of the invention.

In these views the numeral "6" denotes a reflector or mirror of narrow elongated form, which bears a central zero mark and graduations reading right and left therefrom. Preferably there are two scales on the mirror, adjacent opposite edges thereof, each having a central zero mark and one of the scales, 7, reading in inches and fractions of an inch, and the other, 8, corresponding to the projected degrees of a circle. As shown, the scales have a common center line 9 extending across the mirror. All of these marks and designations are preferably scratched or etched into the back of the mirror's reflecting surface to avoid confusing reflections.

The reflector is mounted in and protected by an oblong panel-like frame or holder 12, preferably of sheet metal. The back of this panel is corrugated as shown at 13, for strength and also to guard against damage. The lateral extremities of the frame are bent forward to constitute retaining ends 14, 15, which hold the mirror against longitudinal movement in the holder. The metal of the top and bottom of the frame is folded back and forth to form a plurality of reinforcing plies or ridges opposite the edges of the mirror, as shown at 16, 17, as well as flanges 18, 19 bent over the front edges of the mirror to hold the latter against the back of the frame. These reinforced edges or guards (16, 17) afford desirable base portions to rest on the floor or other surface and enable the device to be used with either side up. They also afford material protection for the reflector, as shocks or jars will in large measure be absorbed by virtue of their construction. Further, to prevent injury to the mirror, a layer of fibrous material 20, such as paper or the like, is placed inside the frame and made to surround the mirror on all sides except the face.

Ears 25 are formed on or attached to the back of the panel 12, near the ends thereof, so as to constitute guides or keepers for pointed spikes or nails A, by means of which the device is fastened to a primary support, such as a floor, or the ground, if the device is used outdoors. A central ear 26 serves as an attachment for a cord 27, the direction of which, as ascertained by the reflection in the mirror in the manner presently described, establishes the line to be laid off. The point of attachment 26 is opposite the common central or zero mark 9 of the scales; and in order to insure that the cord will be drawn away from the front of the mirror exactly at this mark, the top and bottom ridges (16, 17) are provided with notches 28, 29, these notches also enabling the cord to pass freely beneath the frame when the latter rests on either one of its longitudinal edges.

In the form of the invention shown in Fig. 5, the frame 12ª is simply a block of wood recessed at 30 to receive the reflector 6ª, which is identical with the mirror 6.

An important feature of the invention is the provision of a sight in connection with

the cord 27. As shown, this sight may be merely a large headed tack or nail 31, attached to the cord at a predetermined distance from the reflector, its upstanding shank or point 32 forming the sight proper. This sight is located at a point on the cord corresponding to the graduations 8, that is to say, these graduations are the projections of degrees measured on the arc of a circle having as a radius the distance from the mirror to the sight.

In Fig. 5, from which the operations of the device can be apprehended most readily, the device is shown resting on its edge which has the degree graduations 8. In order to lay off any desired angle, the outer end of the cord 27 is shifted until the point 32 of the sight, the proper graduation on the reflector, and the reflection of the sight are all in line. Then the cord is held at the proper angle. In like manner the inch scale may be used. For example, to lay off a line with a pitch of an inch to the yard, a cord one yard long from the mirror is used, or the sight is located on the cord one yard distant. Then when the sight, the reflection, and the inch graduation on the scale 7 are all in line, the correct pitch has been found. To lay off a line perpendicular to another line as a base line, it is only necessary for the operator to lead the cord so that its reflection stands even on both sides of the center mark of the rule.

Another use for the graduated reflector is to measure objects by reflection, when it is not convenient to measure them directly. Thus the rule may be inserted behind an object and the distance between any two points on the back thereof read in the mirror. In a like manner, it can readily be ascertained, if the sides of an object are in square relation with one another. Thus, by simply holding the object close up against the mirror, the reflection in the same will show at a glance how much the sides are out of plumb; but if the sides are absolutely in square, the image in the reflector will only show a straight line.

While certain preferred embodiments of the device have been shown, it will be understood that changes in the form, arrangement, size, proportions and details thereof, may be made without departing from the scope of the invention as defined by the appended claims.

Having described my invention, what I desire to secure by Letters Patent and claim is:—

1. An angle finder comprising a frame adapted to stand with one of its edges on a primary support, a mirror having divisions representing inches and fractions thereof set into said frame, a cord attached at one end to said frame and adapted to be swung therefrom in front of the divisions on the mirror, and a sight on the cord co-acting with said divisions.

2. An angle finder comprising a frame adapted to stand with one of its edges on a primary support, a mirror having a central line running substantially vertically across the face thereof set into said frame, divisions corresponding to inches and fractions thereof extending to the right and left of the central line, said divisions being adjacent the edge of the mirror, a cord attached endwise to said frame in front of the central line of the mirror and adapted to be swung on either side thereof, and a sight on the cord co-acting with said divisions.

3. An angle finder comprising a frame adapted to rest with one of its edges on a support, a mirror having divisions formed on its back surface set into said frame, a cord attached endwise to said frame adapted to be swung laterally in front of the divisions on the mirror, and a sight coöperating with said cord and said mirror.

4. An angle finder comprising a reflector bearing scales of different characters adjacent its top and bottom edges, a cord secured endwise to said reflector and adapted to be swung laterally in front of the mirror in connection with either scale, and a sight on the cord coöperating with said scales.

5. An angle finder comprising a mirror having a zero mark and graduations corresponding to projections of the degrees of a circle combined with a cord connected endwise with the mirror at the zero mark, said cord being movable on either side thereof, and a sight on the cord co-acting with said graduations.

6. An angle finder comprising a panel, a mirror therein bearing an index mark, fastening means with the panel for securing it to a primary support, a cord secured endwise to said panel and adapted to be swung endwise away from the panel at said index mark, and a sight on the cord coöperating with the mark.

7. An angle finder comprising a panel having keepers at the back and carrying a mirror exposed at the front, means engaging the keepers for securing said panel to a primary support, a cord attached at one end to said panel adapted to be swung endwise in front of the mirror, and a sight with the cord co-acting with said mirror.

8. An angle finder comprising a reflecting device bearing an index mark and having a notch in its edge, a cord fastened at one end to the back of the reflecting device adapted to be led through said notch, said cord being movable in front of said reflecting device on either side of the notch, and a sight with the cord co-acting with the index mark.

9. An angle finder comprising a mirror, graduations associated therewith, a cord

connected at one end with the mirror adapted to be moved in front thereof, and a sight secured to said cord so as to be viewed in the mirror in conjunction with said graduations.

10. An angle finder comprising a panel having keepers at the back and carrying a mirror exposed at the front thereof, penetrating devices adapted to be passed through said keepers into an underlying support, a cord secured at one end to said panel adapted to be swung in front of the mirror, and a sight with the cord co-acting with said mirror.

11. An angle finder comprising a mirror, a sheet metal panel holding the same having a corrugated back and top, bottom and end portions bent over to retain the mirror, a cord fastened at one end to the panel adapted to be swung in front of the mirror so as to be viewed in reflection therein, and a sight with the cord co-acting with said mirror.

Signed in the borough of Manhattan in the county of New York and State of New York this 18th day of March A. D. 1913.

GUSTAVE WALLACE.

Witnesses:
H. C. KARLSON,
W. H. GEE.

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