

N. R. THIBERT.
PROTRACTOR AND LEVEL.
APPLICATION FILED SEPT. 16, 1907.

942,114.

Patented Dec. 7, 1909.

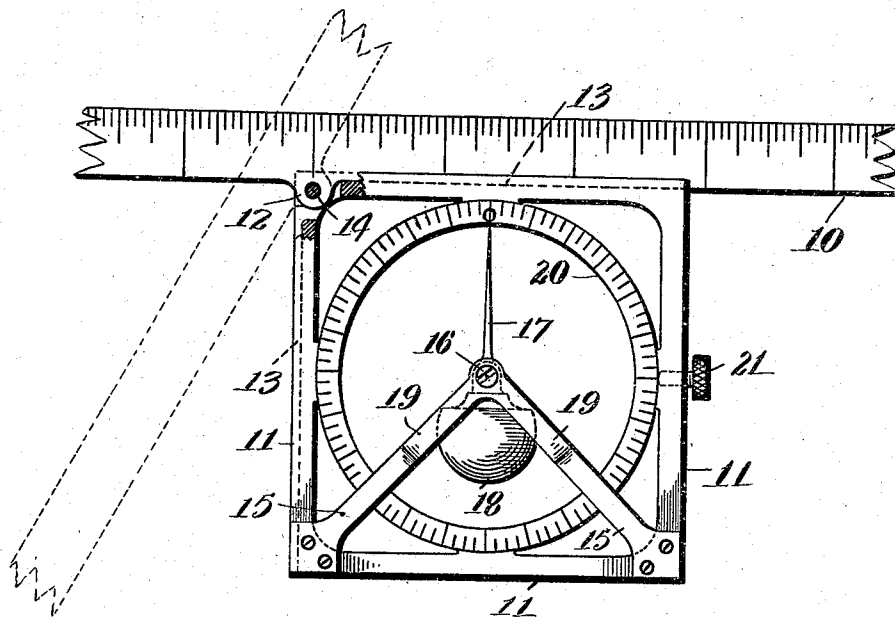


Fig. 1.

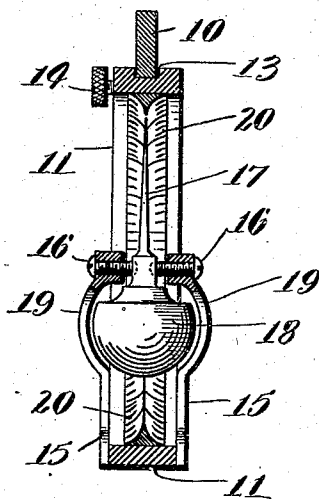


Fig. 2.

Witnesses:

C. F. Mason
C. I. Hartnett

Inventor:
N. R. Thibert.

By Attorneys:
Southgate & Southgate.

UNITED STATES PATENT OFFICE.

NAPOLEON R. THIBERT, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO MATTHEW J. WHITTALL AND ALFRED THOMAS, OF WORCESTER, MASSACHUSETTS.

PROTRACTOR AND LEVEL.

942,114.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed September 16, 1907. Serial No. 393,207.

To all whom it may concern:

Be it known that I, NAPOLEON R. THIBERT, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Protractor and Level, of which the following is a specification.

This invention relates to a combined protractor and level suitable for many purposes, but especially adapted for use in finding angles and laying them out directly on the work.

The principal objects of the invention are to provide a level with means whereby it can be connected with a straight edge in such a way that the combined level and straight edge can be used together in any kind of a position for the purpose of finding an angle or laying it out when found; also to provide such construction that when an angle is found its complementary angle will also be found and be ready to lay out without making any adjustment of the parts. Further to combine these features with a mechanical level which will be of such a nature that it can be set in an easy manner and will not be open to the many well-known objections to the spirit level; and to improve the construction and increase the practicability of the plumb level.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings which show a preferred form of the invention, and in which—

Figure 1 is a plan of an instrument constructed in accordance with this invention, parts being broken away to show interior construction, and Fig. 2 is a central vertical sectional view of the same.

The invention consists of two features, a straight edge 10 which is preferably scaled, and a frame 11 which is provided with the leveling part of the instrument. The straight edge is provided with a projection 12, and the frame is made square and provided with a pair of grooves 12 in two of its sides. These two sides, of course, make a right angle with each other, and at the intersection of the bases of the two grooves is placed a thumb-screw 14 on which the straight edge is pivoted to the frame, this screw passing through a screw-threaded passage in the projection 12. With this construction it will be seen that the straight

edge may be placed in either one of the grooves, in which case the frame will extend at right angles to it, and the device may be used as a square or the like. Moreover, it can be placed at any desired angle as indicated in dotted lines in Fig. 1, and fixed in position by tightening the thumb-screw.

In the use of the device as so far described, it being understood that the frame 11 is provided with a level, the straight edge may be placed at the desired angle with respect to one of the adjacent sides of the frame, this angle being found by computation if desired, but preferably being laid out from the work or drawing. Then it will be seen that the instrument can be applied directly to the work on which it is to be used, and that angle or its complementary angle laid out directly, the parts being left fixed in position and there being no chance for mistake.

The level with which the instrument is provided, and which forms part of this invention will now be described. The frame 11, as has been stated, is of a general square shape, and it is provided with four inwardly extending arms 15 secured to the sides of the frame at the two corners of one edge thereof. Two of the arms on each side meet at the center, and through them are passed a pair of pivot screws 16 which have points and which can be adjusted toward or from each other. On these pivot screws is swingingly mounted a pointer 17 which has a counterweight 18. This counterweight obviously holds the pointer in vertical position irrespective of the position of the frame, and as the arms 15 are bowed outwardly at the points 19 to allow the weight to swing, it will be seen that the instrument may be entirely inverted without interfering with its operation.

On the inside of the frame is mounted a scale 20 which may be of any desired form, but which preferably constitutes a part or the whole of a circle. This scale may be fixed in the frame, but it is preferably circumferentially adjustable so that it may be fixed in proper position with respect to the frame. A set screw 21 holds it in position in the frame after it is adjusted. One of the zero points of the scale is preferably located substantially at the center of one of the sides along which the straight edge is adapted to be placed.

In the use of the instrument it will be seen that the manipulations above described can be carried out in a very effective manner, and that when the straight edge has first been located in horizontal position, making use of the full line position shown in Fig. 1, and bringing the pointer to the zero point of the scale, the straight edge can then be held in this position and the frame moved, the pointer indicating the angle to which it is moved and thus permitting the operator to easily fix his instrument to give the desired angle. It can be used also to measure directly on the work by placing the straight edge against one leg of the angle and one of the edges of the frame against the other. When the angle is of a movable nature, it can be read directly by making one of the legs thereof horizontal or vertical using the plumb level, and otherwise each leg of the angle can be read directly on the scale, and the angle between them easily computed by subtraction.

It will be seen that the ways in which the instrument is adapted to be used, which have been described, are only a few examples of the utility of the device, and that it can be employed in a wide range of operations. It is especially useful in stair-building and other similar kinds of carpenter work.

While I have illustrated and described a particular form of the invention, I am aware that many modifications may be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to the particular form shown, but

What I do claim is:—

1. The combination with a straight edge, of a square frame, means at the corner between two sides for removably and pivotally connecting the frame with the straight edge, a circular scale centrally mounted on the frame with its zero point at the center of one of said sides, a counter-weighted pointer pivoted at the center of said circular scale and a frame supported by the side of the frame opposite said zero point for supporting the pointer at the center of the scale.

2. The combination with a straight edge, of a rectangular frame pivotally connected with the straight edge at one corner of said frame, said frame having grooves along the two sides adjacent to said corner, the bottoms of said grooves intersecting the pivot, and said grooves being adapted to receive the edge of the straight edge, whereby the latter may be swung into either of the grooves, means for clamping the straight edge with respect to the frame, and a plumb level mounted within said frame,

said plumb level comprising a circular scale having a zero point in the center of one of the edges of the frame adjacent to said pivot, and a counter-balanced pointer hung at the center of said scale and supported by said frame from the side opposite said zero point.

3. The combination with a straight edge, of a rectangular frame pivotally connected with the straight edge at one corner of said frame, means for clamping the straight edge with respect to the frame, and a plumb level mounted within said frame, said plumb level comprising a circular scale having a zero point in the center of one of the edges of the frame adjacent to said pivot, and a counter-balanced pointer hung at the center of said scale and supported by said frame, said scale comprising a central ridge having division marks on both sides of the same, and the frame having arms extending from two corners thereof and meeting in the center, said arms being outwardly bent near their inner ends and having adjustable pivots at said ends, and the counter-weight of the pointer being located in the outwardly bent part of the arms.

4. The combination with a straight edge, of a rectangular frame pivotally connected with the straight edge at one corner of said frame, said frame having grooves along the two sides adjacent to said corner, the bottoms of said grooves intersecting the pivot, and said grooves being adapted to receive the edge of the straight edge, whereby the latter may be swung into either of the grooves, means for clamping the straight edge with respect to the frame, and a plumb level mounted within said frame, said plumb level comprising a circular scale having a zero point in the center of one of the edges of the frame adjacent to said pivot, and a counter-balanced pointer hung at the center of said scale and supported by said frame, said scale being located half way between the two sides of said frame, and comprising a sharp central ridge having division marks on both sides of the same, and the frame having arms extending from two corners thereof and meeting in the center, said arms being outwardly bent near their inner ends and having adjustable pivots at said ends, and the counter-weight of the pointer being located in the outwardly bent part of the arms and midway between them.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

NAPOLEON R. THIBERT.

Witnesses:

ALBERT E. FAY,
C. FORREST WESSON.