March 13, 1951 S. TUMMINELLO 2,545,321

PLUMB POINT LOCATOR

Filed Sept. 4, 1947

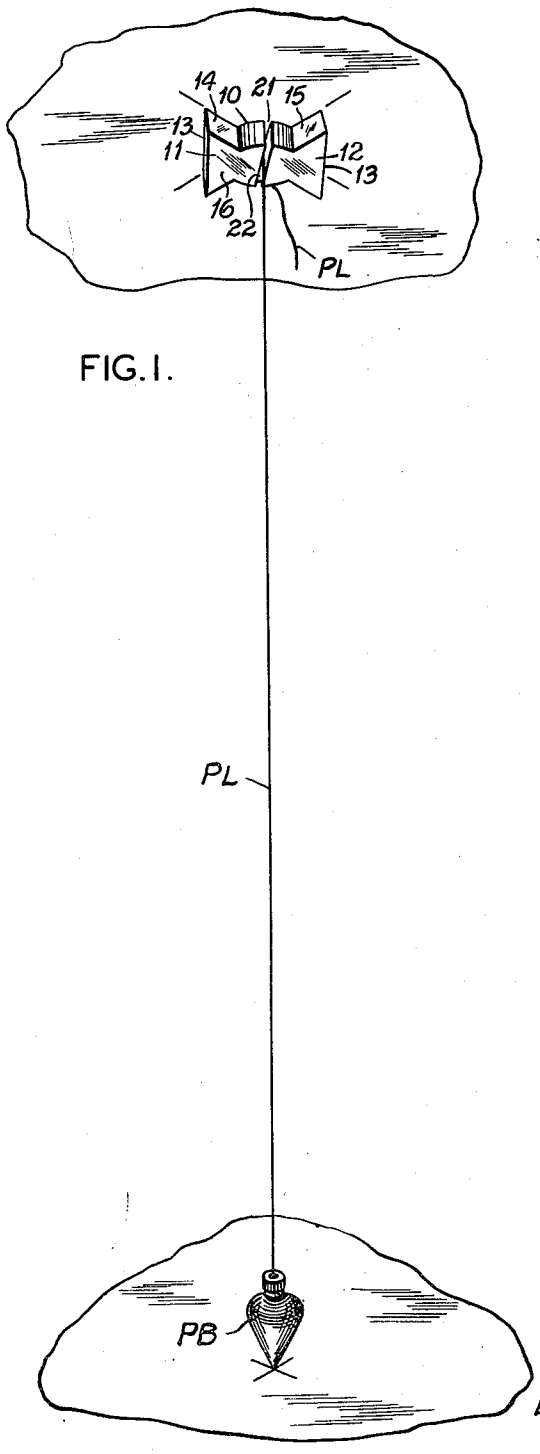


FIG. 1.

FIG. 2.

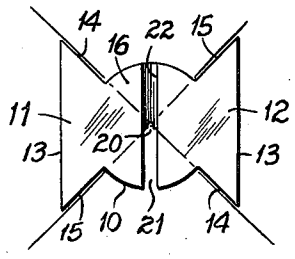


FIG. 3.

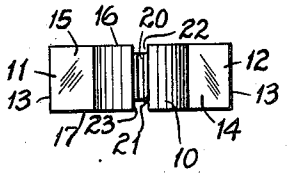
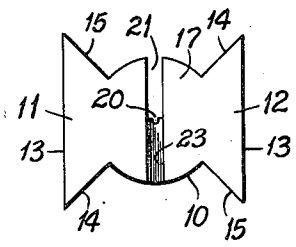


FIG. 4.



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PLUMB POINT LOCATOR

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6 Claims. (Cl. 33—75)

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This invention relates to plumb point locators, and more particularly to improved devices for establishing with geometric exactness, the point of intersection of a plumb line with a horizontal surface such as a ceiling.

Under many conditions in the building industries and trades, it is highly desirable for structural reasons, as well as for reasons of appearance of vertical building elements, whether interior or exterior, to be sure that such structures are erected with exactly vertical axes or along truly vertical planes. Heretofore, as far as is known to this applicant, there has been no device available to the trade, nor any susceptible of ready production, of such nature as to enable an exact indication of a plumb point, for example, on a ceiling or like horizontal surface. Usually the upper end of a plumb line is supported by the thumb or other digit, and the determination of the exact point where the axis of such line intersects the surface is subject to the personal equation, hence to considerable error which is likely to be aggravated with increase in the vertical span between the floor and a ceiling element or the like. The present invention accordingly, has, as its primary objective, the attainment of a small low-cost device to obviate errors in the determination and indication of plumb points, as hereinafter defined.

Yet another object of the invention is attained in a low-cost instrument for the noted purpose, which need be of no great size, which may easily be carried in the pocket or tool kit of the user, and which is practically indestructible in nature.

A still further object of the invention is attainable in a device which serves the dual purposes of a plumb line holder, and of an instrument for enabling, with suitable marking or scribing, a geometric location of a plumb point or plumb line axis.

The foregoing and many other objects will become more apparent from the following detailed description of a presently preferred embodiment of the invention, particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is an isometric view of a plumb line attached to the improved locator, and showing one manner of its usage;

Fig. 2 is a top or plan view of the locator, somewhat enlarged;

Fig. 3 is a side or edge elevation of the locator, and

Fig. 4 is a bottom plan view thereof.

The term "plumb line" as herein employed, has

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reference to the well-known combination of plumb bob such as PB, to which is attached a flexible cord, wire, or like tension member PL, and may be of any of the well-known types employed by artisans, engineers, or others concerned with the establishment of a true vertical relation of the various elements of building or other structures. The term "plumb point" as herein employed is utilized in the sense of a point of intersection of the plumb line, as an intangible, as produced vertically, with a ceiling or similar horizontal or approximately horizontal element above or below the line.

Referring now by characters of reference to the drawing, a conveniently produced and low-cost embodiment of the locator is a body in the nature of a block prepared by molding or machining to exhibit the characteristics and features now to be described. The article may be produced of a single piece of metal, usually of aluminum, magnesium or other metals or alloys characterized by light weight, and of non-corroding character. Alternately, a highly satisfactory low-cost article may be produced as by compression molding or otherwise, of any of the numerous suitable plastic materials available to the trade for similar purposes. In such case the molding dies are carefully and accurately formed so as to impart a similar accuracy to the molded article.

The preferred form of body or block includes a central portion 10, shown as circular in plan and modified by a pair of opposite diametral extensions 11 and 12. Each such extension appears, in plan, as a frustrate triangular or quasi-triangular member, characterized by an outer base 13 and converging sides 14 and 15, the corresponding elements being similarly numbered on the two opposite extensions.

The thickness or depthwise dimension of the body is a matter of choice, but should be sufficient to make for ease in utilization of the edges resulting from the sides 14 and 15, as straight edges for and in marking or scoring, as will later appear. With this in view, a depth or thickness of the block of the order of one-half to three-quarters inch is preferred. Each of the faces, including a top face 16 and a bottom face 17, is of a flat or planar characteristic, so that, as will later appear, the device may be readily shifted as by sliding movement along a horizontal surface, for example that of a plastered ceiling. Exactly normal, within reasonable limits of ease of production, to the surfaces 16 and 17 are the faces located at 13, 14 and 15. It will further

appear from the dotted lines indicating extensions of the faces 14 and 15, that each plane includes the axis and exact center of a vertical cord channel or bore 20, which is, by preference and as shown, located in the exact center, each way, of the block.

It will now have appeared that the plane of faces or facets 14, and that including faces 15, intersect in the exact center of the plumb line as definitely located thereby. By preference, although not of necessity, the two base portions, edges and faces 13 are parallel, and to each, the plane 14—14 and likewise the plane 15—15 bear a 45 degree relation.

As a convenience and facility for introduction of the cord of the plumb line fully into channel 20, the central body portion 10 is provided with a radial slot 21, which extends from the periphery inwardly to and into the channel 20, and width of slot 21 being by preference the same as the diameter of the channel or bore 20, were the latter fully circular in section. As will now be observed, the slot 21 permits lateral application of the locator to and over the plumb line and, otherwise stated, enables the lateral insertion of the plumb line to its seat as the locator is held stationary.

As making for further convenience in usage of the device, it is a preference to provide as undercut from the face 16, a recess 22 extended radially of the circular portion 10. The recess 22 extends outwardly from the open end of channel 20 to the periphery or perimeter of the center part of the body. The width and depth of recess 22 is such as fully to receive the unused or inactive extension of the plumb line, and to permit the face 16 to be held flat against the ceiling or like surface without causing the locator to rock upon the excess part of the line. A similar groove or recess 23 is undercut from the opposite face 17 of the body block. The grooves 22 and 23 may be used alternately, but it has been found highly desirable to extend the excess line from channel 20 through recess 22 thence downwardly and into recess 23, the remaining end of the line being temporarily attached as by a clip (not shown) to that part of the active line depending from channel 20. Thus the device will serve as a line holder or support, as well as a plumb point locator.

It will have been observed that, while it is advisable that the planes 14—14 and 15—15 intersect in and include the axis of channel 20, the relation between the planes is not critically the order of 90 degrees. It is, of course, advisable that the angle subtended be uniform on the opposite sides of the center point or axis of the device. The underlying feature of the structure is that a pair of straight edges be so located that when a line is scribed along each, there will be enabled a geometric establishment of a point of intersection of the line or the cord axis with a surface at a right angle thereto for example a ceiling.

The manner of usage of the locator is thought now to have become fully apparent, but there may be included for completeness, a typical example of usage: Assume that it be required to erect an interior partition. It is of course desirable as good engineering practice, sound structure and good appearance, to be assured of its exactly vertical characteristic. A center or bounding line is scribed or marked on the floor. Near one end of the proposed partition the locator, with the determined length of plumb line depending therefrom, is placed against the ceiling, with an end portion of the cord or line occupying channel 20. The locator is then slidably moved over a portion of the ceiling in a direction transversely of the proposed partition until the bob point falls directly over the floor line. With the locator now held in position, markings are applied to the ceiling or other adjacent surface along at least a pair of the straight edges or facet portions 14 and 15, and preferably along each of such facets. The locator is then removed and lines 14—14 completed, then similarly the lines 15—15. The now continuous lines 14 and 15 will intersect in the exact center or axis of the cord or line occupying channel 20. A single such determination will locate the center of a columnar support, but if a structure of some linear extent, such as a partition be contemplated, a series of such operations are conducted, and the full line when thus established, is exactly parallel to and directly vertically above the lower line.

It should be noted that the device is useful as an aid in extending a vertical line to determine plumb points in or on either a subjacent element such as a floor, or in a superjacent structure such as a ceiling, if either of such points be initially known. If, for example, the ceiling line or point is established, it will now be observed from the foregoing example that by using the locator in one or a series of positions at floor level, and by locating the bob point directly above the top opening of the channel 20, the floor points may accurately be determined.

The foregoing examples are only a few of the many applications of the locator, from which it will appear that the several objects above stated and implied, are fully realized. Many of the terms used herein, such as "floor" and "ceiling" are not to be understood as restrictive of fields of usage. Furthermore, although the invention has been described by particularized reference to a single selected embodiment, the specific nature of the description should not be taken as limiting the scope of the claims hereunto appended, in view of the many possible structural variants.

I claim as my invention:

1. In a plumb point and line locating device, a body formed as a deep block and arranged to be applied against and readily shiftable along a horizontal surface such as a ceiling, the body being provided with a depthwise normally vertical channel for the reception of a plumb line, and the body being exteriorly shaped on opposite sides of said line channel, to provide a pair of planar straight-edge portions the produced planes of which include the axis of said vertical channel, whereby the straight-edge portions are utilizable for scribing a ceiling or other surface in a manner to produce from said scribing an accurately located plumb point.

2. In a plumb line locator, a body in the form of a block of substantial thickness, adapted to be placed against and slidably movable over a ceiling or like surface, the body having a central, depthwise vertical channel through which a plumb line is extended, the body being formed to provide at least a pair of facets formed as outside faces of the body block along angularly related normally vertical planes intersecting the axis of the line channel.

3. In a device for accurately locating a point of intersection of a plumb line with a ceiling, floor or like horizontal surface, a body in the form of a block of substantial depth, and providing a line holder, a center channel for the plumb line, extending depthwise and vertically

through the body, and a pair of external, vertical faces adapted for use as straight-edges, said faces being in vertical planes at mutual angles of the order of 90 degrees, and each said plane intersecting the axis of the center channel.

4. In a device for accurately locating the intersection of a plumb line with a ceiling, floor or like surface, a one-piece body of substantially even depth or thickness throughout, the body including a center portion of circular horizontal section and opposite diametral extensions therefrom, each of a frusto-triangular aspect, the sides of each extension providing vertical facets for use as straight-edges in scribing lines on a ceiling, floor or like surface, said facets of each extension being angularly related substantially at 90 degrees, said center portion having a depthwise center bore therethrough which is of vertical trend, and adapted to serve as a cord channel or recess for an end portion of a plumb line used therewith, the body being recessed from one side, inwardly to said center channel or passage, to enable lateral application of the device to and over the plumb line, the body being provided with opposite flat planar faces adapted selectively for engagement with and slidable movement over a ceiling, floor or like surface for accurate location of the plumb line and plumb point, each of said planar faces of the body being recessed to provide a cord groove extending from one margin inwardly to the cord channel, the diagonally opposite marking facets of the respective extensions, being located in planes which when produced, extend through the axis of the said cord channel of the body, whereby upon completion of marked lines parallel to each of the marking facets, and upon removal of the device from a predetermined position, the production of said lines will result in their intersection in the plumb line axis.

5. In a plumb point and line locator, a body block adapted to be placed against and slidably movable over a ceiling, floor or like surface, the body block having a central, depthwise, vertical channel through which a plumb line is extended, the body being externally formed to provide at least a pair of outside faces on the block, said faces lying in angularly related, normally vertical planes intersecting in the axis of the line channel, the body block being provided with a side-open slot of a width at least equal to the diameter of said vertical channel, the slot terminating inwardly in the said channel, and permitting the body to be applied laterally to a plumb line.

6. In a plumb point and line locator, a body block adapted to be placed against and slidably movable over a ceiling, floor or like surface, the body block having a central, depthwise, vertical channel through which a plumb line is extended, the body being externally formed to provide at least a pair of outside faces on the block, said faces lying in angularly related, normally vertical planes intersecting in, and both including the axis of the said line channel, the body block being provided with a side-open slot of a width at least equal to the diameter of said vertical channel, the slot terminating in said channel, and permitting the body to be applied laterally of a plumb line, the body being provided with an accurately planar face constituting a surface slidably engageable with the ceiling or like surface on which the plumb point is to be located, and provided with a cord groove opening into said planar surface and extending from an outside margin of the body block to one end of said vertical channel, the cord groove being of such proportions as fully to accommodate a portion of the plumb line.

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