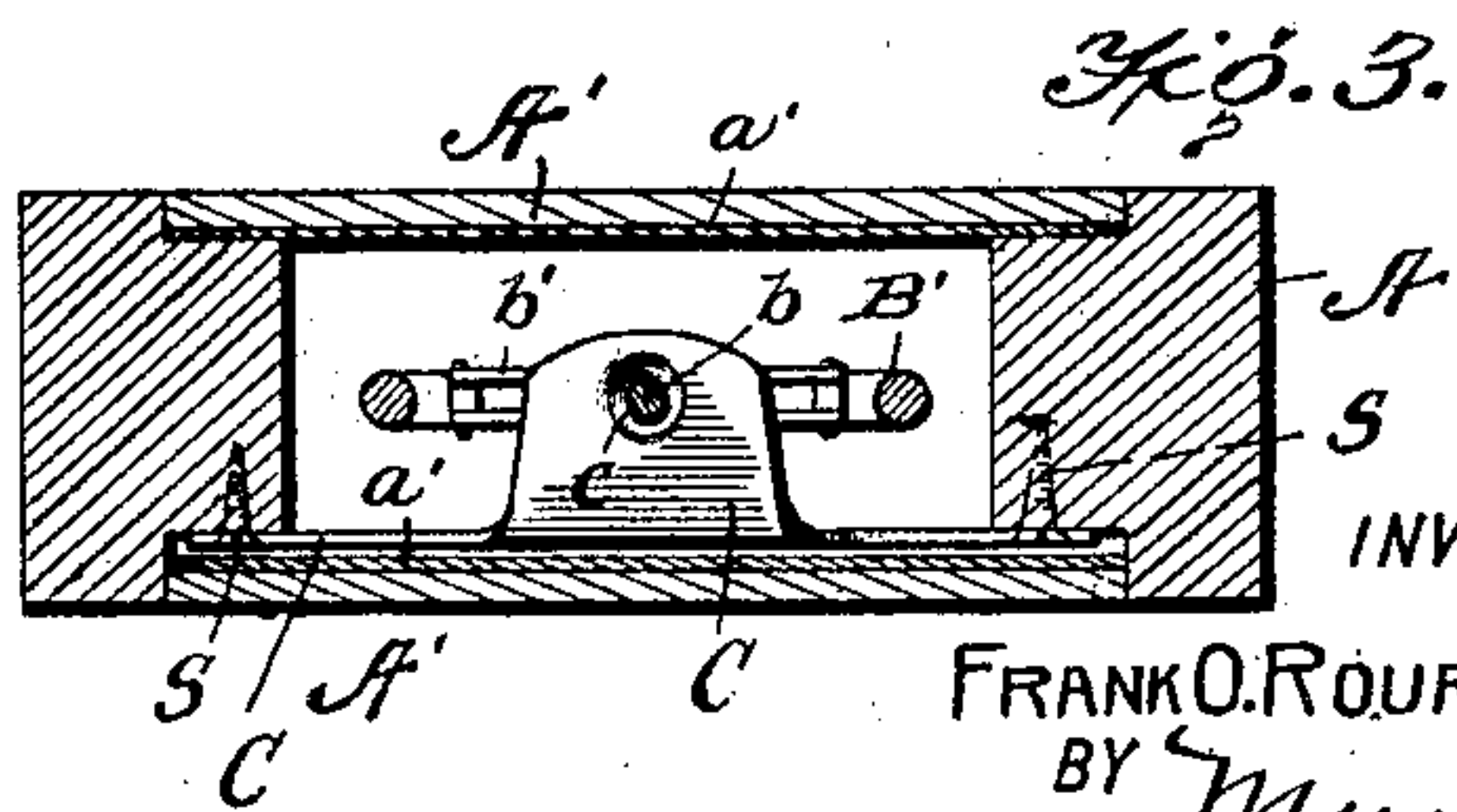
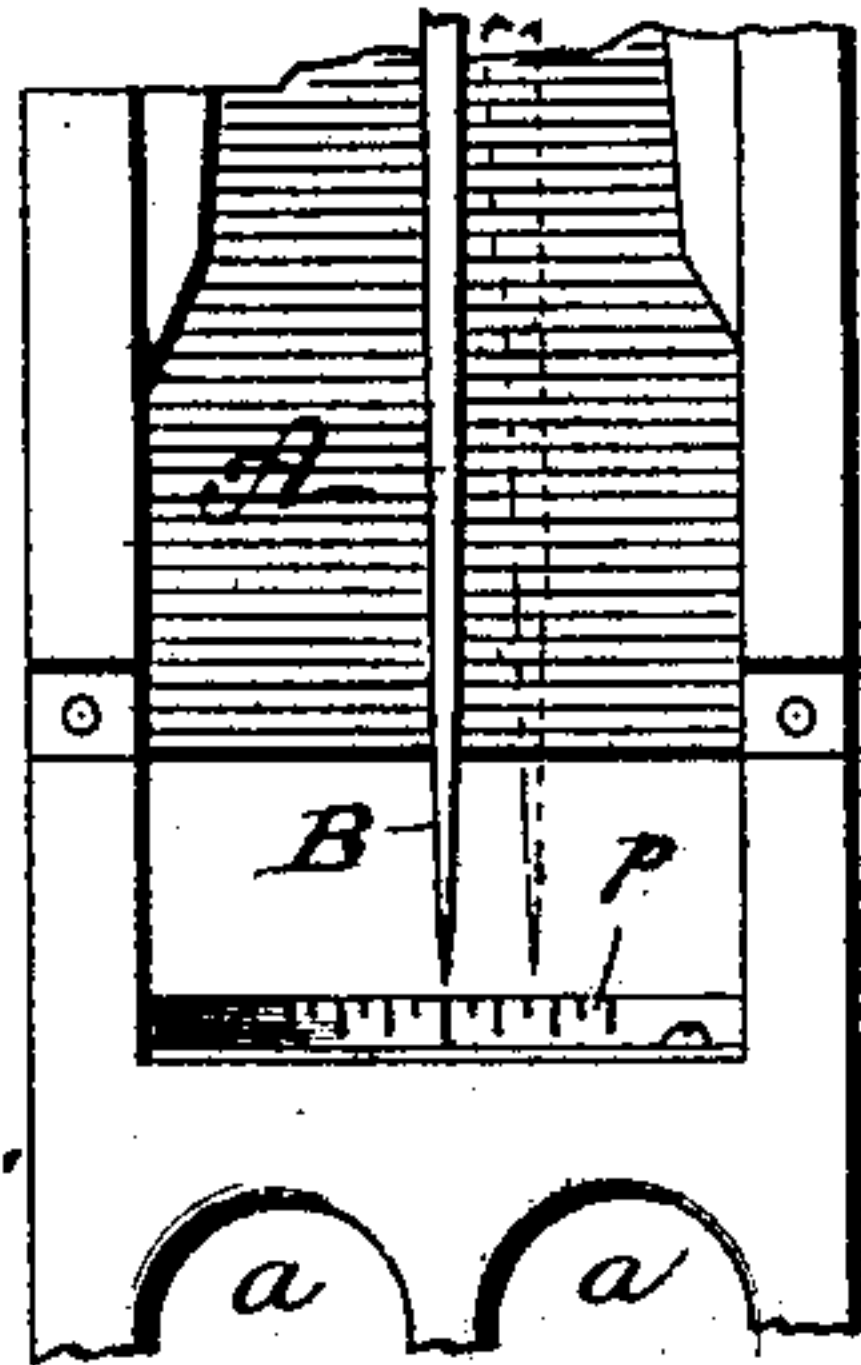
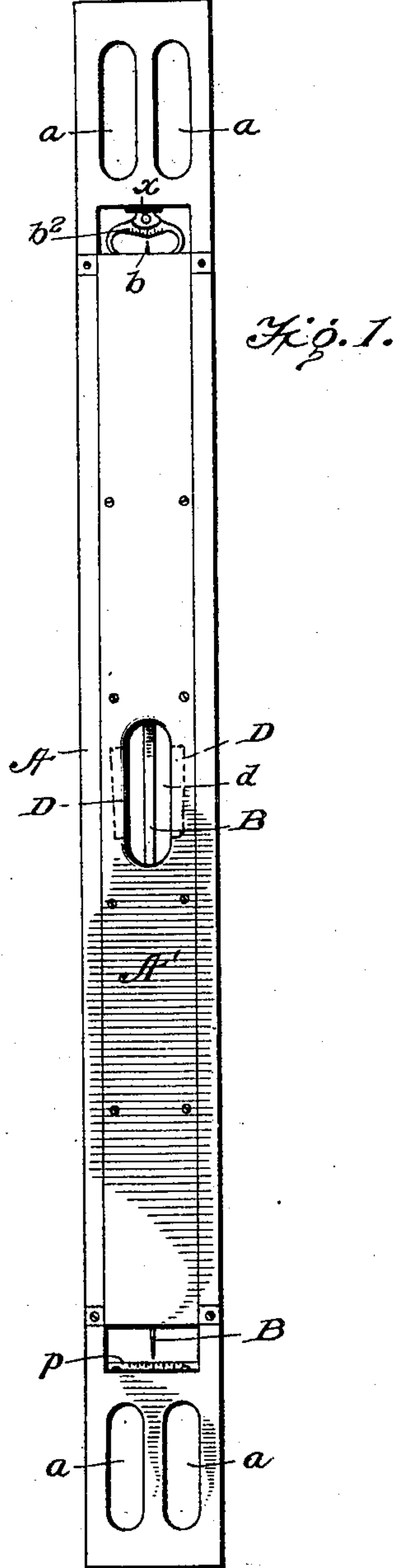
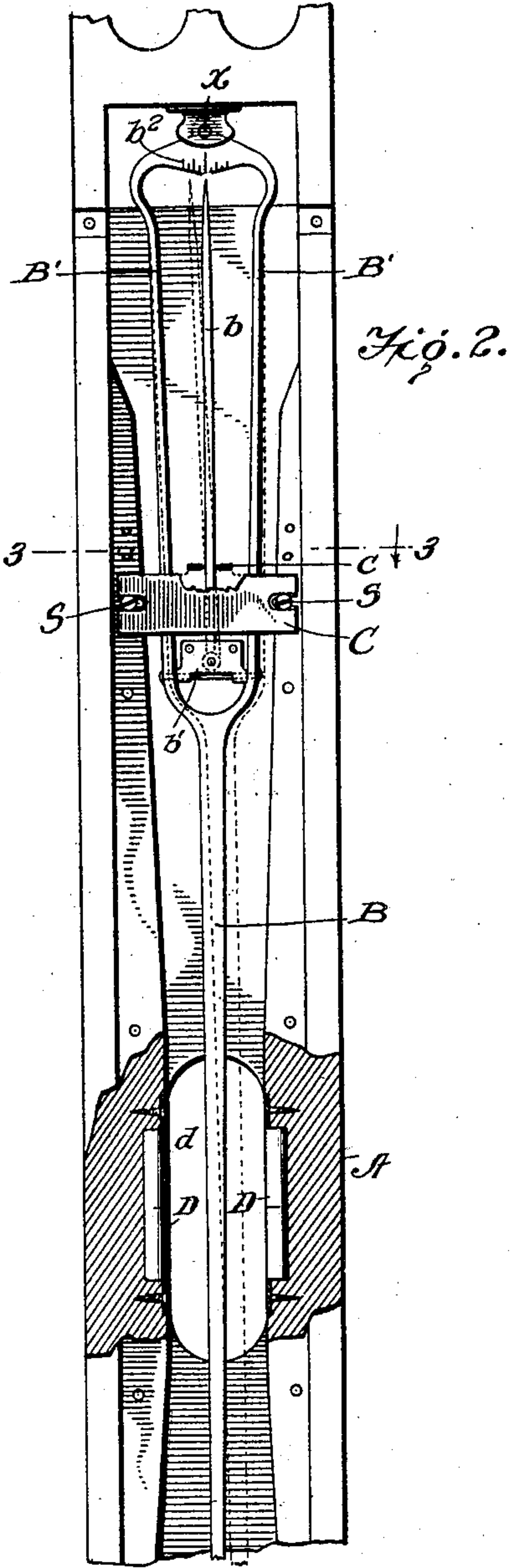


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PATENTED SEPT. 1, 1908.

F. O. ROURKE.
PLUMB AND LEVEL.

APPLICATION FILED OCT. 17, 1907.



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PLUMB AND LEVEL.

No. 897,411.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed October 17, 1907. Serial No. 397,798.

To all whom it may concern:

Be it known that I, FRANK O. ROURKE, a citizen of the United States, and resident of Shawnee, in the county of Perry, State of Ohio, have invented certain new and useful Improvements in Plumbs and Levels, of which the following is a specification.

My invention is in the nature of a novel instrument combining in one structure the functions of both a plumb bob and a spirit level and it consists in the novel construction and arrangement of parts whereby a very convenient and effective tool is provided for the use of brick layers, stone masons, carpenters, and for other uses in building operations.

In the drawings, Figure 1 represents a side view of the instrument. Fig. 2 is an enlarged side view of the middle portions of the instrument partly in section with one of the inclosing panels removed, and Fig. 3 is a transverse section on the line 3—3 of Fig. 2 looking in the direction of the arrow.

In the drawings A represents a wooden bar about four feet long formed at both its ends with two hand holes *a a*. At its intermediate point this wooden bar is entirely cut through to form a rectangular opening extending the greater portion of the length of the bar. This opening is partially closed on both sides by means of removable panels *A'*, which are seated in the rabbeted edges of the middle opening and are secured therein by means of screws. These panels are made of thin pieces of wood provided on their inner surfaces with sheet metal linings *a'*, which sheet metal lining forms a stiffening brace to hold the middle portions of the bar A in a perfectly straight and parallel alinement as against warping or twisting. The side panels *A'* stop short of the rectangular openings in the bar A so as to leave at each end of the said side panels a rectangular opening forming windows as hereinafter described.

Within the elongated middle chamber formed by the slotted bar A and its two side panels there is arranged a pendulum needle B extending the full length of said chamber. This needle B at its upper end is formed with an elongated loop or bow *B'*, which at the top is hung upon a pivotal support *x* attached to the middle of the bar. The upper part of the loop of the needle is formed at *b²* with graduations and the lower end or point of the needle extends to the bottom of the middle

chamber and swings over a subjacent plate *p* at the bottom of the chamber, which plate is also divided into graduations. Within the upper loop portion of the needle B, there is pivoted upon a connection *b'* a supplemental needle *b* projecting upwardly and swinging in the same vertical plane as the needle B, and having its point at the upper end playing over the graduations *b²*. This supplemental needle *b* extends through a hole *c* in a stationary fulcrumed plate C, which is adjustably connected to the main frame by means of slots and screws *s*, so as to be moved up or down lengthwise the bar A. When the bar A is in true vertical position the lower end of the main needle B points to the center of the graduated scale *p* below, and the upper end of the supplemental end *b* points to the middle line of the graduations *b²*. If, however, the bar A be tilted to one side or the other of the vertical line, in that case the needle B swinging about its pivotal support *x* moves over the graduated scale *p* and imparts to the supplemental needle *b* a movement in opposite direction over the scale *b²* above. To make this better understood, in Fig. 2 I have shown in dotted lines the needle B as having moved toward the right as would be the case if the upper end of the plumb should be tilted toward the right. The effect of this movement is through the connection *b'* to swing the lower end of the supplemental needle *b* to the right, and as the fulcrum *c* is stationary, this movement of the lower end of the needle *b* to the right causes its upper pointed end to move to the left as indicated in dotted lines. The points of the needle B below and *b* above are both visible through the openings at the end of the panels *A'* so that the inclination may be read either from the top or bottom of the plumb. The fulcrum plate C is located about an inch and a half from the bottom of the supplemental needle *b* so that a slight movement of the end *b'* of the supplemental needle gives a greatly amplified movement to the upper end of said needle as it moves over the scale *b²*. This movement may be increased or diminished in sensitiveness for a given movement of the main needle B by adjusting the fulcrumed plate C higher or lower and altering thereby the relative leverage of the supplemental needle *b* by shifting its fulcrumed point *c*.

At the middle of the two panels *A'* of the plumb is formed a longitudinal opening *d*

and upon each side of the same and embedded in the inner edges of the side bars of the main frame A are arranged spirit levels D whose longitudinal axes are parallel to the two parallel sides of the main frame A. These spirit levels may be conveniently read from either side through the opening *d*.

Among the several advantages of my combined plumb and spirit level, I may mention the following: First, it is much lighter than the ordinary plumb bob. Second, in case the wind is blowing the needle swings true and without falsification by the wind, while the ordinary suspended plumb bob cannot be used at all. Third, the indication of the deflection is rendered very much more accurate and sensitive by the supplemental needle *b*, whose readings may be carried to any degree of fineness. Fourth, the instrument is much more convenient to handle as it is arranged inside the housing and is always ready for action, while the ordinary plumb bob is arranged on the outside by means of a string and is difficult to control. Fifth, the needles being arranged inside of the housing come to an accurate registration very quickly, while the ordinary plumb bob is very slow to come to its proper line of suspension. Sixth, the ordinary plumb bob can only be read accurately at its lower end, while my improved instrument may be read both at the upper and lower ends which in many instances greatly facilitates the work of the mechanic. Seventh, when building walls at a slight battered angle, the batter of the angle can be accurately established by my needle and a uniform inclination of the wall carried up in an exact angle. Eighth, the instrument can be made very much longer than the ordinary

plumb bob frame without materially increasing the length of the registering needle. 40

I claim:

1. A plumb rule comprising a body frame, a pendulum pivoted at its upper end, a supplemental needle pivoted to said pendulum, and a stationary fulcrum plate inclosing said supplemental needle and giving a reversed movement of the same to that of the pendulum. 45
2. A plumb rule comprising a hollow body frame, a pendulum pivoted therein at its upper end, a supplemental needle pivoted to said pendulum, and an adjustable fulcrum plate inclosing the supplemental needle to vary the throw of the same and to impart a movement to the needle reverse to that of the pendulum. 50
3. A plumb rule comprising a body frame having a longitudinal chamber, a pendulum hung within the same at its upper end and formed at said upper end as a loop, a needle pivoted to said pendulum within the loop, and a stationary fulcrum plate embracing said needle. 55
4. A combined plumb rule and spirit level comprising a body frame with a middle longitudinal opening, spirit levels arranged in the longitudinal opening parallel to the sides of the body frame, a pendulum needle arranged within said opening, and removable side panels formed with middle openings opposite said spirit levels, the needle being arranged between the spirit levels and accessible through the middle opening. 60

FRANK O. ROURKE. 65

Witnesses:

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