(No Model.)

F. SCHAEFER.

LEVEL AND KEY SEAT RULE.

No. 516,024. Patented Mar. 6, 1894.

Fig. 1

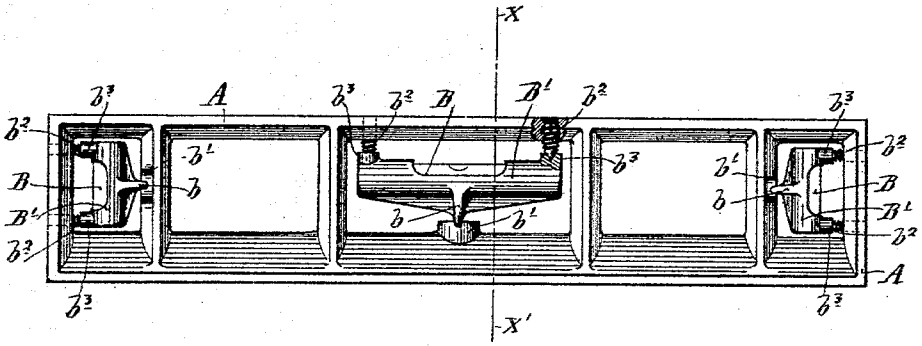


Fig. 2.

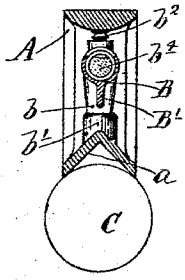
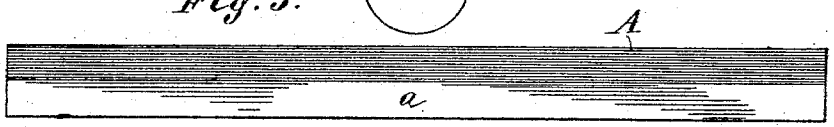


Fig. 3.



Witnesses.
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LEVEL AND KEY-SEAT RULE.

SPECIFICATION forming part of Letters Patent No. 516,024, dated March 6, 1894.

Application filed January 13, 1893. Serial No. 458,255. (No model.)

To all whom it may concern:

Be it known that I, FRED SCHAEFER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in a Combined Level and Key-Seat Rule; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an efficient combined level and key-seat rule.

My device is hereinafter fully described and the novel features of the construction are defined in the claims.

In the drawings, like letters referring to like parts,—Figure 1 is a side elevation of the device. Fig. 2 is a vertical section taken on the line X X′ of Fig. 1, showing the device in position on a shaft; and Fig. 3 is a bottom view of the device shown in Figs. 1 and 2.

A is the level frame, of skeleton rectangular form, which is preferably made with top, bottom and end straight edges. The bottom of the level frame is constructed with a longitudinal V-shaped groove *a*, running the entire length of the frame. This groove is an important feature, of my invention, the purpose of which will presently appear. As shown, the level frame carries three level tubes B, the central member of which co-operates with the top and bottom straight edges and with the V-shaped bottom groove in taking levels and the end members of which co-operate with said straight edges, in taking plumb lines of vertical bodies. These level tubes B are secured by cement or otherwise, without requiring any special care as to accuracy, in corresponding tube boxes B′. The tube-boxes B′ are, on the other hand, supported in the frame with means for accurate adjustment. The means, which I prefer, for this purpose and have shown in the drawings, consists of the following novel construction. Each tube box has a knife edged fulcrum lug *b*, projecting from its inner surface and working in a V-shaped fulcrum block *b′* on the level frame. Set-screws b^2 work through seats in the rim of the level and have conical points which engage corresponding seats on the outer surfaces of the tube-boxes, on opposite sides of the fulcrum lug, preferably at or near the ends of the boxes, as shown at b^3. The set-screws b^2 will, therefore, hold the fulcrum lug *b* in its seat *b′* and the tube-box B′ and tube B in any desired adjustment relative to the level frame necessary for the proper alignment. The heads of the set-screws b^2 are countersunk in the rim of the level frame, so as not to impair the straight edges thereon.

It is obvious, that the peculiar construction and engagement of the set-screws b^2, with the tube-boxes, not only serve to level the boxes and tubes with the straight edges of the frame, but also serve to prevent the longitudinal and lateral motion of the said boxes and tubes. In virtue of the conical points on the set-screws and the corresponding seats on the ends of the boxes, with which said points engage, the boxes cannot move lengthwise nor roll laterally. In other words, this construction both serves to align and hold the boxes in their proper position, in respect to the level frame, and in respect to the fulcrum of the tube-box.

The level tubes are charged with any suitable fluid b^4.

C represents an ordinary shaft.

The use of the device, as thus constructed, is evident.

By means of the various level tubes both horizontal and perpendicular positions of bodies may be indicated; the outer or lower edges of the V-shaped edge serving as a straight edge when applied to flat bodies and serving, when applied to a round body such as a shaft, to position the level-frame longitudinally, parallel to the axis of the shaft. This latter function of the V-shaped groove is important; but the said groove serves a still more important function as a key-seat rule. When the level is applied to a shaft, as just described, the engaging edges of the V-shaped groove will be parallel with the axis of the shaft and either of the same may be used as a straight edge to mark off the key-seat on the

shaft. The field and demand for such a device, for lining shafts and marking key-seat are very large.

My level is, of course, capable of the general uses to which any ordinary level is applied; and, in addition, is adapted to the especial uses and purposes hereinbefore set out.

The article can be made as cheaply as the ordinary level.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a level, the combination with the level frame, of one or more adjustable tube boxes, each provided with a fluid tube, and each tube box being fulcrumed on the level frame, by means of a fulcrum lug depending from its central portion and engaging a transversely grooved fulcrum-block on the level frame, and adjustably held in position by a pair of set screws, working in said level frame, and engaging the other opposite ends of the tube box, substantially as described.

2. In a level, the combination with the frame A, of the tube-boxes B′ containing the level tubes B and provided with the central fulcrum lugs b on their under surfaces engaging with the fulcrum-blocks b' on the frame and the set-screws b^2 working through the rim of the frame and having conical points engaging corresponding seats on the upper ends of the level-box tubes, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRED SCHAEFER.

Witnesses:

JAS. F. WILLIAMSON,

FRANK D. MERCHANT.