(No Model.)

C. E. NIELSEN.

PLUMB LEVEL.

No. 420,242. Patented Jan. 28, 1890.

Fig. 1.

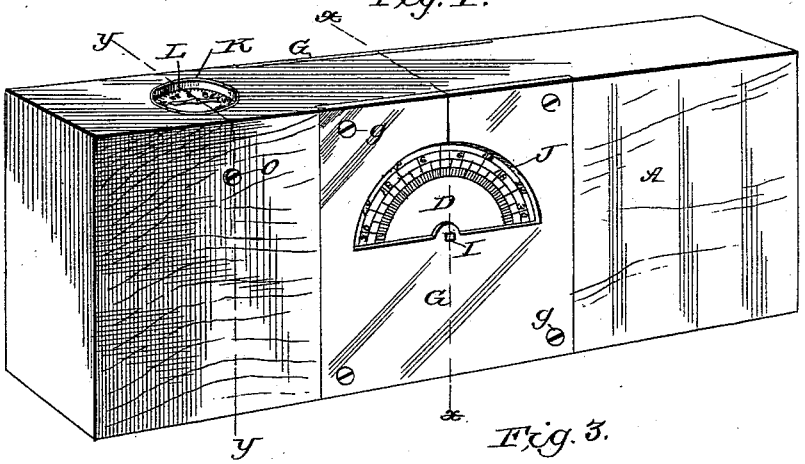


Fig. 2.

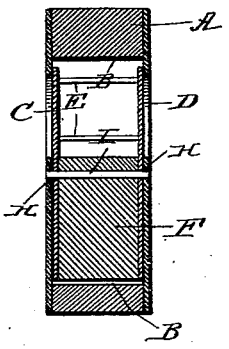


Fig. 3.

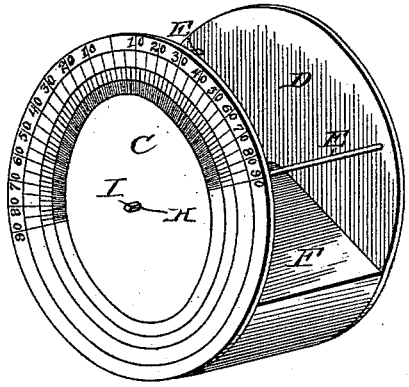


Fig. 4.

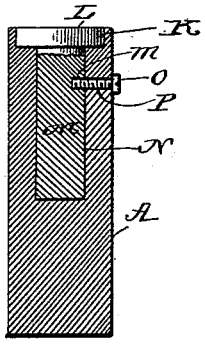
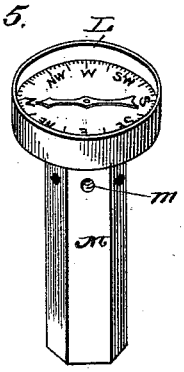


Fig. 5.



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CARL EMIL NIELSEN, OF SALT LAKE CITY, UTAH TERRITORY.

PLUMB-LEVEL.

SPECIFICATION forming part of Letters Patent No. 420,242, dated January 28, 1890.

Application filed January 30, 1889. Serial No. 298,141. (No model.)

To all whom it may concern:

Be it known that I, CARL EMIL NIELSEN, of Salt Lake City, in the county of Salt Lake, Territory of Utah, have invented a new and useful Improvement in Levels, of which the following is a specification.

My invention consists in a new and improved automatic compass-level, which will be hereinafter fully described and claimed.

Referring to the accompanying drawings, Figure 1 is a perspective view of my new and improved automatic compass-level. Fig. 2 is a transverse sectional view taken on line *x x* of Fig. 1. Fig. 3 is a detail view showing the weighted dial-plates removed from the level-bar. Fig. 4 is a transverse sectional view taken on line *y y*, and Fig. 5 is a detail view of the removable compass.

The same letters of reference indicate corresponding parts in all the figures.

The objects of my invention are to dispense with the fragile spirit-level commonly employed, to supply a level that can be constructed at a less cost than the levels of this class now employed, and that will be more exact and definite in showing the condition of a wall or any given object, and less liable to get out of order, as well as to be more readily repaired when damaged by a fall or otherwise; also, to produce an instrument that will determine true levels, straight plumbs, and correct compass-lines in building, and also the angles in mining, and the height and distance of buildings, and other objects.

Referring to the several parts by letter, A indicates the wooden frame or bar of the level, which is of the usual rectangular form. This frame is formed with the large central opening B, in which the weighted dial-plates are contained.

C and D indicate the two circular dial-plates, preferably formed of thin metal plates, one of the said disks being marked with the degrees, so that it can be used for engineering work, while the other is marked with fractional divisions, the smallest being one twenty-fourth of an inch, the whole dial being covered in each case with the marks. The two dial-plates are connected and braced by the short transverse rods E, and between the lower part of the two dial-plates is secured a weight F, as shown. It is obvious that the two dials may be marked with any scales desired.

The weighted dials are held in place in the bar-frame by two thin metal side plates G G, which are secured in place by small screws *g g*. The weighted dial-plates have a central aperture H, and through this passes an axle I, which is immovably secured at its ends in the side plates G G, and the weight and dial-plates turn on the stationary axle I. By mounting the dials in this manner they are caused to move easily and without vibration, and the parts will not wear out readily. The side plates are cut away in a half-circle above their central line at J, the same size as one-half of the dial-plates, so that when the side plates are secured in position one-half of the dials can be seen at a glance on each side of the level, as shown in the drawings.

In one end of the level-frame is an opening K, in which I seat a compass L, which is formed with an octagon-shaped stock M, which fits down in an opening N, extending down from the larger opening K, the opening N being octagon-shaped in cross-section.

The compass-stock is formed with threaded apertures *m* in several of its faces, and the compass is held in place by a retaining-screw O, passing through a transverse aperture P in the side of the level-frame and entering one of the apertures *m* in the compass-stock.

It will be seen that the compass can be readily removed when not in use and carried in the vest-pocket to prevent its being broken by accident.

In use when the end of the level-frame is raised, according to the inclination of the wall or other surface, the weight in the lower part of the dial-plates will hold the dials in one position, causing them to turn on the axle as the end of the level-frame is raised, and the user can readily read the figures on the dial which is in use as they reach the straight lower edge of the opening in that side plate, as will be clearly seen by reference to Fig. 1 of the drawings. The exact angle, level, or plumb-line can thus be obtained, while by consulting the compass L the relation of the building-lines to the points of the compass can be at once determined or the variation of any fence or other supposed stand-

ard. Thus it will be seen that I furnish an instrument that when constructed according to fixed rules will be exceedingly serviceable to architects, engineers, carpenters, masons, and all mechanics engaged in the construction of buildings, and also to miners, farmers, and others, while at the same time this instrument is simple and strong in construction, has no spirit-level to break, will not get out of order, and can be constructed at a comparatively small cost. By the use of my new and improved level distances can be determined, and the level is thus exceedingly useful to surveyors.

It will be seen that the compass is both adjustable and removable, as, owing to its octagon-shaped stock, it can be adjusted as desired. The height of any building or distance of any object can be readily taken by raising or lowering the end of level until it points at the height or object, and then calculating from the scale.

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

1. The combination of the level-frame having the round and octagonal opening near one end, and the compass having the octagonal bottom stock, and adapted to be set in the level-frame at different angles, substantially as set forth.

2. The combination of the frame having the round and octagonal end openings, the compass having the apertured octagonal stock, and adapted to be set in the level-frame at different angles, and the retaining-screw, substantially as set forth.

CARL EMIL NIELSEN.

Witnesses:
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