

(No Model.)

H. GREEN.
SPIRIT LEVEL.

No. 449,609.

Patented Mar. 31, 1891.

Fig. 1

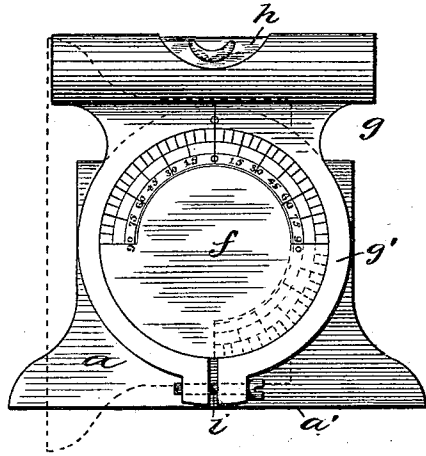


Fig. 2

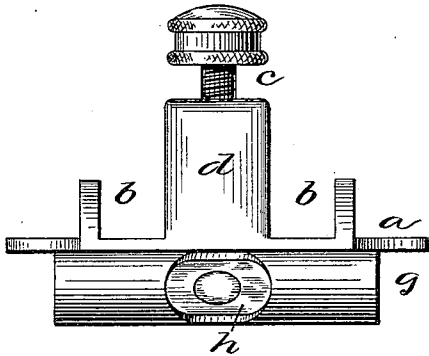
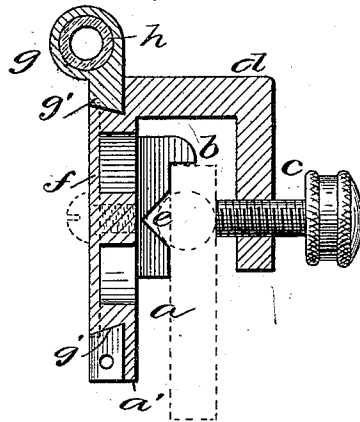


Fig. 3



Witnesses:
Arthur B. Jenkins,
John P. Healy

Inventor,
Henry Green, by
Harry P. Williams,
att'y.

UNITED STATES PATENT OFFICE.

HENRY GREEN, OF HARTFORD, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO JOHN J. TOWER, OF NEW YORK, N. Y.

SPIRIT-LEVEL.

SPECIFICATION forming part of Letters Patent No. 449,609, dated March 31, 1891.

Application filed August 5, 1890. Serial No. 361,032. (No model.)

To all whom it may concern:

Be it known that I, HENRY GREEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Spirit-Levels, of which the following is a full, clear, and exact specification.

The invention relates to the class of pocket spirit-levels, or spirit-levels which are adapted to be attached to a straight-edge, a boring-tool, or similar articles, or to be used to level, plumb, or determine the angle of inclination of small objects.

The object of the invention is to provide a simple and cheap instrument of this class wherein the spirit-frame can be evenly and easily moved and located in position to read from the scale the desired information without the loosening and fastening of clamp-screws and without any wear upon the parts which will impair the efficiency of the level.

Referring to the accompanying drawings, Figure 1 is a side view of the instrument, showing in full lines its position when in use as a level, and the position of the parts in dotted line when it is used as a plumb. Fig. 2 is a top view. Fig. 3 is a vertical central section.

In the accompanying views, the letter *a* indicates the back plate, which is preferably formed of brass, with a straight-edge *a'* along its base. Projecting from the rear of this plate upon each side are a pair of ears *b*, that are provided with a straight-edge and lug against which the back and side of a rule may be clamped and held by means of a clamp-screw *c*, that fits a threaded socket through the end of the annular finger *d*, that also projects rearward from the back of the plate, in order to provide an extended base for the tool when it is used to level long objects. These ears are also provided with central V-shaped notches *e*, into which the shank of a boring-tool may be clamped by the set-screw when it is desired to utilize the device for determining the proper direction of a hole that is to be bored. A central boss *f* is formed on the front of the plate, and upon

the periphery of this is loosely fitted the annular rim *g'* of the frame *g*, which bears any ordinary spirit-glass *h*. A portion of the annular rim *g'* is split, and the ends of the split portion are held together by means of a screw *i*, which passes through threaded sockets in lugs on the ends, so that the rim may be made to bind with any degree of friction upon the periphery of the boss on the back plate. The periphery of the boss may be undercut to hold the rim in place, or a plate may be secured by means of a screw to the face of the boss, with its edges slightly overlapping the inner edge of the rim to hold it in place upon the boss, as indicated in dotted outline in Fig. 3, and the face of the boss or this plate, if used, is preferably graduated into degrees near its edge, which degrees will register with an index-line upon the edge of the rim of the glass-frame, so that the difference of degree of inclination between the back plate and the spirit-glass frame may be read. The split rim or strap may be clamped with any degree of tightness by means of the screw upon the periphery of the boss, which presents a large bearing-surface which will not wear away so that the parts will become loose, and the frame may be readily rotated to any desired degree. As the friction between the parts is even and firm, there is no need of a clamp-screw to bind and set the parts in position when adjusted, and which works loose when the frame is rotated in one direction, or which tightens when the frame is rotated in the opposite direction, and which is liable to move the parts and change the reading of the index when it is being tightened.

I claim as my invention—

1. In a spirit-level, in combination, a back plate having a circular boss on one face, a frame holding a spirit-glass, with a split annular rim encircling the boss, and a clamp-screw joining the split ends of the rim of the frame, substantially as specified.

2. In a spirit-level, in combination, a back plate having a circular boss with an undercut edge on one face, a frame holding a spirit-glass, with a split annular rim encircling

the periphery of the boss, and a clamp-screw joining the split ends of the rim of the frame, substantially as specified.

3. In a spirit-level, in combination, a back
5 plate having a circular boss on one face and a rearward-projecting angular arm bearing a clamp-screw on the opposite face, a frame holding a spirit-glass, with a split annular

rim encircling the boss, and a graduated plate attached to the boss, with its edges overlying the edges of the rim, substantially as specified.

HENRY GREEN.

Witnesses:

H. R. WILLIAMS,
ARTHUR B. JENKINS.