W. J. NEIDL.

LEVEL.

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1,177,131.

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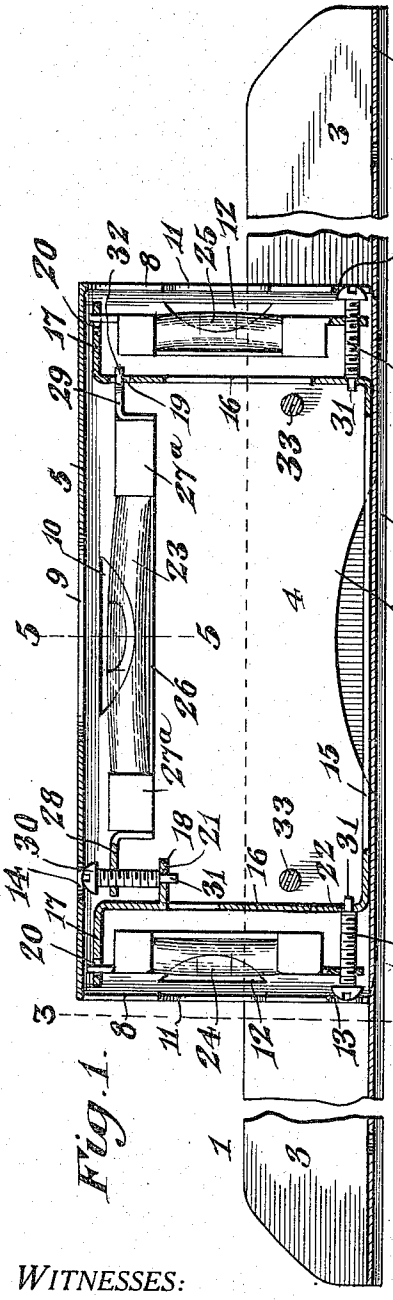


Fig. 1.

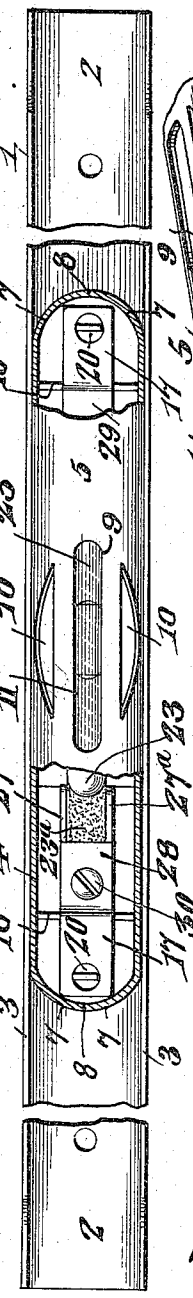


Fig. 2.

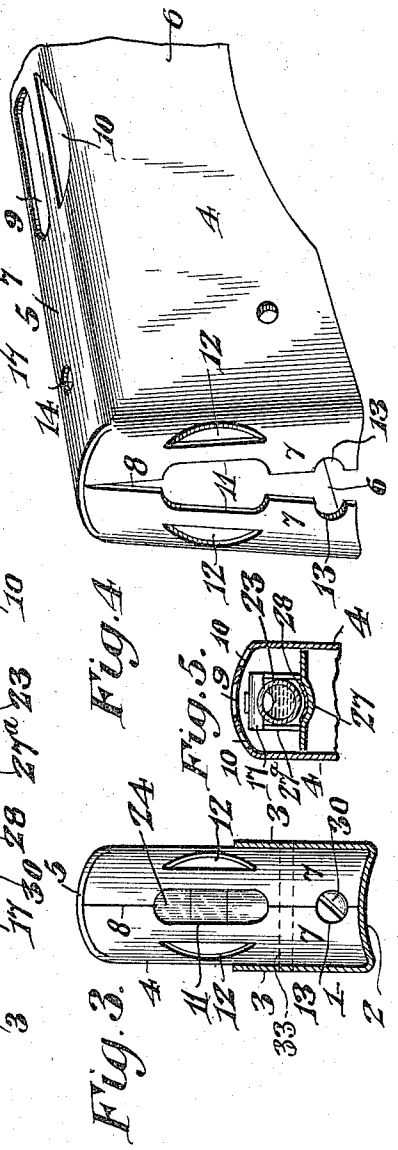


Fig. 4.

Fig. 5.

Fig. 3.

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LEVEL.

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To all whom it may concern:

Be it known that I, WILLIAM J. NEIDL, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented a new and useful Level, of which the following is a specification.

This invention has reference to levels, especially of the type customarily employed by carpenters and other artisans, and its object is to provide a level which may with the exception of the bubble glasses be made wholly of metal, and more particularly of sheet metal of suitable gage bent into appropriate shape, whereby an exceptionally strong implement is obtained, and wherein liability of breakage, or distortion because of warping or the like, is obviated.

In accordance with the present invention there is provided an elongated member which may be struck up from sheet metal into channel form, thereby producing a light and highly resistant body member. Secured to the body member by pins or in some other similar manner is a casing upstanding from the body member to about the usual height of a carpenter's level, so as to accommodate end or plumb glasses as well as the customary longitudinal or leveling glass, with all the glasses inclosed in a casing holding them in place with no other fastening means than pins or the like holding the casing to the body of the level. At the same time provision is made for such adjustments of the glasses as may be found expedient while the parts are all assembled and without the removal of any part whatever.

The casing is so made as to be formed of a single piece of sheet metal bent into appropriate shape and when introduced into the channel body member will automatically grip the latter in a manner to not only hold the bubble glass supports in place but to prevent any looseness of parts, which looseness because of the metal formation of the level would be liable to produce rattling.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification, with the further understanding that while the drawings show a practical form of the invention, the latter is not confined to any strict conformity with the showing of the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention.

In the drawings:—Figure 1 is a longitudinal vertical section of the level with some parts shown in elevation and with the level in position for utilizing the longitudinally disposed leveling glass. Fig. 2 is a plan view of the structure of Fig. 1 with some parts of the level casing broken away to expose interior parts. Fig. 3 is a section on the line 3—3 of Fig. 1. Fig. 4 is a perspective view of a portion of the bubble-glass casing as viewed from one end. Fig. 5 is a section on the line 5—5 of Fig. 1.

Referring to the drawings there is shown an elongated body member 1 of channel form with a concave bottom 2 and substantially parallel side walls 3. The concavity of the bottom of the body member is advantageous in providing a firmer support rendering the level less liable to lateral inequalities. Moreover, the concave bottom serves to stiffen the body member. In describing the bottom as concave such expression has reference to the under side of the bottom, since that portion of the bottom of the body member seen from above is convex as the body member is formed from sheet metal of substantially even gage throughout.

The body member may be long or short in accordance with the purpose for which the level is designed, and at about the middle of the body member there is secured a casing 4 sufficiently elongated to accommodate certain parts of the level and of a height to permit the employment of end glasses for vertical work, while the thickness of the casing from side to side is such that the casing fits snugly between the side walls 3 of the body member 1.

In the production of the casing 4 a single sheet of metal of suitable gage may be employed, so that in the finished casing it has a rounded top 5, sides 6, and ends 7, the latter being formed of like bent-in extensions of the sides 6, so that the bent-in portions meet along an upright center line 8.

The casing 4 is so made that the sides 6 have a normal tendency to spread apart at the edges remote from the top 5, this spread-apart condition being illustrated in Fig. 4, and these sides must be brought together sufficiently to bring the end portions 7 into abutment or substantially so to permit the introduction of the casing between the side walls 3 of the channel member 1.

At a midpoint of the length of the top 5 there are produced a longitudinal slot 9 and side slots 10, while at each end the turned-in ends 7 of the side walls 6 are appropriately notched or recessed, so that the notches or recesses together produce an elongated slot 11, and at each side of the notches so formed are other side slots 12.

Near those parts of the inturned portions 7 which bear upon the bottom 2 in the assembled structure are other matching notches 13, which together permit access to certain parts of the interior of the casing in the assembled structure. Near one end of the top 5 there is a perforation 14 for a purpose to be described.

The level is provided with an elongated strip 15 of sheet metal having at each end a right angle leg 16 terminating in an outturned angular extension 17, while near the extension 17 one leg 16 has a punched out lip 18 directed toward the other extension, and the last-named extension at a higher point than the lip 18 has a perforation 19.

Each outturned extension 17 has near its end a perforation 20. The lip 18 is provided with a perforation 21 and each end extension or upstanding leg 16 has near its point of connection with the strip 15 a perforation 22.

In the structure shown there are three bubble glasses 23, 24 and 25, respectively. The glass 23 constitutes the level glass and the glasses 24 and 25 constitute the plumb glasses.

Each glass is mounted in a carrier, the carriers being alike except as for length, and hence a description of one will answer for a description of the other. The carrier for the glass 23 is, however, somewhat longer than those for the glasses 24 and 25. Each carrier is made of a single strip of sheet metal with an elongated middle portion 26 longitudinally dished, as shown at 27, and there coated on the side toward the glass with a coating 28 of some reflecting material, such as enamel paint or the like. At each end of the middle portion 26 it is provided with bent-up sides 27^a forming receptacles for the corresponding ends of the glass 23 which may be held in place by plaster of Paris 23^a or in any other way customarily employed in the construction of levels. Beyond each receptacle 27 are angle continuations or lips 28, 29, respectively. The lip 28 has a screw 30 threaded therethrough, and this screw is provided with an axial pin extension 31 at the end remote from the head of the screw, the said pin extension being lodged in the passage 18 or 22, as the case may be.

The angle extension 29 of the carrier for the level glass has a tongue extension 32 adapted for the respective perforation 19 or 20, as the case may be. The tongue 32 is of about the width of the diameter of the respective perforation so as to fit quite snugly therein. The parts are so proportioned that the tongues 32 engage the parts to which they extend with the screws 30 at the other ends having the pin extensions 31 engaging in the respective perforations therefor under some stress exerted lengthwise of the glass carrier, the elasticity of the parts being such as to cause the desirable strain.

The carrying frame made up of the strip 15 with the terminal upright legs 16 and their extensions 17 fits quite snugly within the casing 4 when the latter is lodged in the body member 1, and hence has its sides 6 compressed at their lower edges against the strip 15.

The glass 23 is so situated with respect to the side openings 9 and 10 as to be visible therethrough when the parts are assembled with the casing 4 inclosing the frame 15 and parts mounted thereon. The glasses 24 and 25 are visible through the sight openings 11 and 12 at each end of the casing 4.

The screw 30 on the carrier having the glass 23 mounted therein is accessible through the opening 14 so that after the parts are assembled the glass 23 may be properly adjusted. The screws 30 on the carriers for the glasses 24 and 25 are accessible through the openings 13 after the parts are all assembled, so that these glasses may be properly adjusted.

The casing or housing 4 and the parts inclosed therein are connected to the body member 1 by pins 33 extending through the sides 3 and the walls 6 in such relation to the supporting frame 15, 16 as to in no wise interfere therewith.

While the expansive spring of the side walls of the casing or housing 4 is not needed to hold the casing in place it serves a valuable function in preventing any liability of rattling because of loose contact of metallic parts.

What is claimed is:—

1. A level comprising an elongated body of channel form, a frame with bubble glasses therein and carried by the channel body at the mid point of its length, and a casing for the glass carrying frame housing the latter and secured to the body member between the side walls of the channel.

2. A level comprising an elongated channel member with the face remote from the channel concave, and level indicating means

mounted on the channel member between the ends thereof and extending into the channel.

3. A level comprising an elongated metallic channel member, a metallic carrier with plumb and level glasses thereon and adapted to seat in the channel member, and a housing for the carrier inclosing the carrier and glasses and secured to the channel member, said housing constituting a means for securing the carrier to the channel member.

4. A level comprising an elongated channel member, a housing secured to the channel member, and a frame with indicating means thereon inclosed by the housing, said housing having side apertures for observation of the indicating means, and said indicating means having adjusting means at all times accessible through the housing.

5. A level comprising a metallic channel member, a metallic housing entering the channel member and secured thereto, and a metallic carrier with plumb and level indicating means thereon inclosed by the housing, the latter being provided with sight openings for observation of the indicating means.

6. A level comprising an elongated body member, a housing carried by the body member, and separate plumb and level indicating means wholly inclosed by the housing and secured to the body member thereby, the housing being provided with sight openings for observation of the plumb and level indicating means.

7. A level comprising an elongated sheet metal body bent into channel form, a sheet metal housing lodged between the side walls of the channel member, and a metallic carrier of sheet metal with bubble glasses thereon and lodged in and held to the body member by the housing, the latter being provided with sight openings for observation of the bubble glasses.

8. A level comprising a body member of channel form, a sheet metal housing with sides having a normal tendency to separate and with ends formed by inturned portions of the sides, said housing being adapted to be lodged in the channel member between the sides thereof with the inturned extensions in substantial abutment, and a frame of a size to be contained within the housing, said frame having bubble glasses thereon and means for adjusting the bubble glasses, and said housing having openings for viewing the bubble glasses and for providing access to the adjusting means for said bubble glasses.

9. A level comprising a body member, a housing mounted thereon, a frame lodged within the housing and held thereby to the body member, and carriers each provided with a bubble glass, each carrier having an adjusting screw at one end engaging a corresponding portion of the frame and a tongue at the other end with the frame provided with a perforation receiving the tongue, said housing having sight openings for observation of the bubble glasses and other openings for accessibility to the leveling screws.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM J. NEIDL.

Witnesses:
BENJAMIN N. ALLING,
HELEN B. BLANK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."