G. BREDESON.

LEVEL.

APPLICATION FILED JAN. 24, 1921.

1,426,454. Patented Aug. 22, 1922.

Fig. 1.

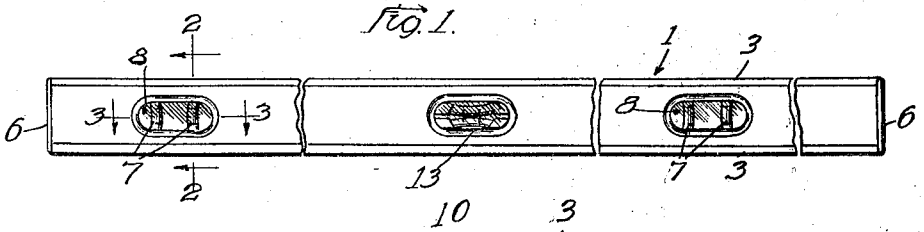



Fig. 2.

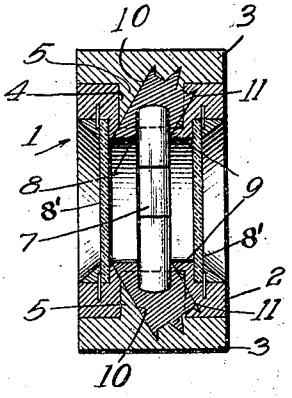



Fig. 3.

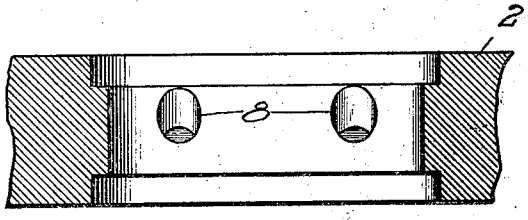



Fig. 4.

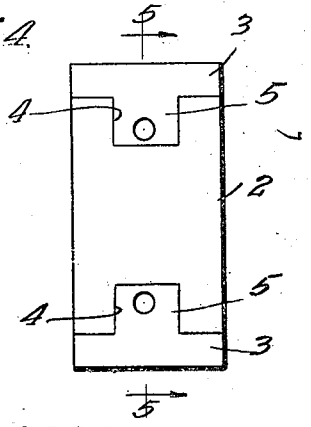
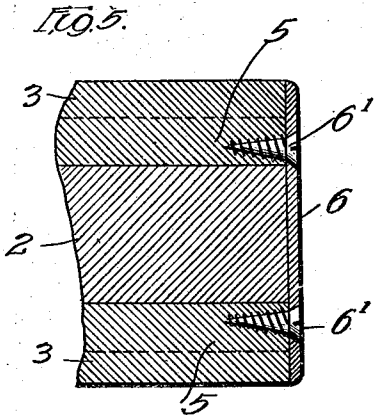



Fig. 5.




Witnesses.

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# UNITED STATES PATENT OFFICE.

GUSTAVE BREDESON, OF CHICAGO, ILLINOIS, ASSIGNOR TO EDWARDS AND POWELL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## LEVEL.

1,426,454. Specification of Letters Patent. Patented Aug. 22, 1922.

Application filed January 24, 1921. Serial No. 439,506.

*To all whom it may concern:*

Be it known that I, GUSTAVE BREDESON, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Level, of which the following is a specification.

My invention relates to improvements in artisans' levels and has special reference to levels made principally of wood.

The object of my invention is to provide a level construction which shall result in a level of light weight and low cost; which level shall be substantially permanent as to form, in other words, which shall not tend to warp or become distorted under the rough usage and weather conditions to which masons' and such like levels are subjected in use.

Another important object of my invention is to reduce the cost of such levels by making it possible to use up strips of wood which are too small in cross section to make a complete body by combining several strips and permanently joining them together so that the body when completed is an integral unitary structure.

Another feature relates to the production of a level body having hard wood edges and a softer wood center portion, the edges providing excellent wearing parts and the body not being subject to weather checks or cracks and hence more permanent than a single piece hard wood body.

In another aspect my invention resides in a three piece level, the outer pieces being hard wood for wear, and the three pieces being bound permanently together by the doweling action of cement inserts in which the level tubes are held. Furthermore the edge pieces are so formed that the metal end plates and their screws serve to bind the strips upon the middle or body portion.

My invention will be clearly understood by reference to the following description, taken in conjunction with the accompanying drawings forming part of this specification, and in which I have illustrated a level made in accordance with my invention.

In said drawings:—

Figure 1 is a side view of the level;

Figure 2 is a cross-section on the line 2—2 of Figure 1;

Figure 3 is a fragmentary central longitudinal section on the line 3—3 of Figure 1;

Figure 4 is an end view of the level with the end plate removed;

Figure 5 is a transverse sectional view on the line 5—5 of Figure 4, with the end plate in position.

In said drawings, 1 is a level comprising a central body portion 2 extending from end to end and edge strips or portions 3, 3 also extending from end to end. Preferably the body portion is provided in each edge with a central longitudinal groove 4 and the edge strips are each provided with central longitudinal tongues 5 which are adapted to completely fill the grooves 4. Preferably the two sides of each groove are parallel with each other so that the edge strips can be placed directly into the grooves and avoid the necessity of placing them in the grooves endwise, thus facilitating the retaining of the glue in the joint between the edge strips and the body portion which might be removed if the edge strips were required to be entered into the grooves endwise. The edge strips 3 can evidently be produced out of strips or edgings which would otherwise be waste material and being made of hard wood they provide wearing edges on the level which are adapted to satisfactorily withstand the hard rough usage to which such levels are subjected.

It is obvious that I may make the main body portion 2 of what is termed soft wood or of light weight wood such as pine or white wood, which is not so subject to weather checks or cracks as hard wood, or that for other purposes I may make the body portion 2 of hard wood similar to the edges; in both cases I preserve the advantages of making use of edgings or strips which would otherwise be waste.

The three part body has another distinct advantage over a one piece body, which is that a body made up of several different pieces of wood united by suitable glue and other fastenings or dowels and having the grain severed in several planes, eliminates the warping tendency which is usually present when such articles are made of single pieces of wood.

The edge strips 2 being provided with inwardly extending tongues, I am enabled to secure the end plates 6 by means of screws 6′ which enter into the tongue portions of the strips and thus clamp and firmly hold the ends of the edge strips to the body por-

tion, even though the glue with which they are joined should in time fail to hold the parts together.

Near each end of the level I provide transversely arranged level tubes 7 which are mounted within the body of the level in openings 8. For mounting these tubes I provide pockets in the outer walls of the openings 8 in which the ends of the tubes are received. In building the level I preferably mount the two edge portions on the body portion making the two tongue and groove joints as permanent as possible by the use of suitable glue. I then produce the openings 8 extending through the body portion from side to side of the level. The transverse dimensions of the openings 8 are somewhat less than the distance between the bottom of the two grooves 4 so that walls 9 remain at each side of the openings 8 which are a part of the middle section 3.

I then bore holes 10 at an angle and outwardly from the side surfaces of the openings 8, two at each side through the wall 9 and the adjacent tongue 5 and which holes cut into the inner corners of the middle portion 3 at the outer edges of the grooves as shown at 11. Having provided the necessary inclined holes, two in each side of each of the openings 8 for two transverse tubes in each opening, I then proceed to mount the level tubes 7 in place by means of a hardening cement, such as plaster Paris. I fill the holes 10 with the cement and then force the tubes into the inner ends of the holes, setting them in the cement which hardens and holds them permanently in place. The cement which fills the holes 10 and hardens therein forms rigid dowels or interlocks permanently and securely connecting the edges 2 to and upon the body portion 3 at several points spaced between the ends of the level and these interlocks hold the several parts of the level together even though the glue joints may not last permanently.

I protect the level tubes 7 by means of glass plates 8′ secured in said openings 8, one at each side and secured in place by any suitable means such as fasteners and putty.

As is usual in such levels, I provide longitudinally extending level tubes in the middle part of the body in an opening 13.

A level constructed in accordance with my invention remains in proper usable shape and condition much longer than those in the making of which holes are cut through the edges, being later filled either with metal such as screws, or with wooden plugs or otherwise. The edges of my improved level are continuous from end to end with no openings or holes and no part which may become loose and thus protrude and destroy the accuracy of the level. The body can be made quite light in weight, strong and rigid and will remain permanently in its proper shape, and is provided with non-metallic wearing edges.

As many modifications of my invention will readily suggest themselves to one skilled in the art, I do not limit or confine my invention to the specific details of construction herein shown and described.

I claim:

1. In a level of the kind described, a central body member having central longitudinal grooves in its edges, edge strips having longitudinal central tongues entering said grooves, the central member having an opening for receiving level glasses, the level body provided with level receiving pockets extending outwardly on each side from said opening in the central body portion and into the edge strips and hard cement in said pockets adapted to interlock the parts together and serve as mountings for the level glasses.

2. In a level, a longitudinal body portion having edge strips thereon, and inclined dowels projecting outwardly through the body portion and into the edge strips.

3. In a level, a longitudinal body portion having central longitudinal grooves in its edges, edge strips having central longitudinal tongues filling said grooves, the body portion having openings for level glasses, and inclined dowels projecting outwardly from said openings through the body portion and into the edge strips.

4. In a level, a longitudinal body portion having central longitudinal grooves in its edges, edge strips having central longitudinal tongues filling said grooves, the body portions and edge strips having registering openings fitted with hardened cement interlocking the strips with the body portion.

5. In a level of the kind described, a longitudinal central portion having central longitudinal grooves in its edges, edge strips having central longitudinal tongues filling said grooves, the central portion provided with a plurality of level glass receiving openings between its ends, and inclined openings extending from the side walls of the level openings outwardly through the central portion and the tongues of the side strips and entering the inner corner of the middle portion at the outer edges of the grooves, and adapted to receive a hardening cement, as and for the purpose specified.

Signed at Chicago, in the county of Cook and State of Illinois, this 20th day of January 1921.

GUSTAVE BREDESON.