C. BODMER & A. W. RITTER.

SPIRIT LEVEL.

APPLICATION FILED MAY 31, 1916.

1,212,735. Patented Jan. 16, 1917.

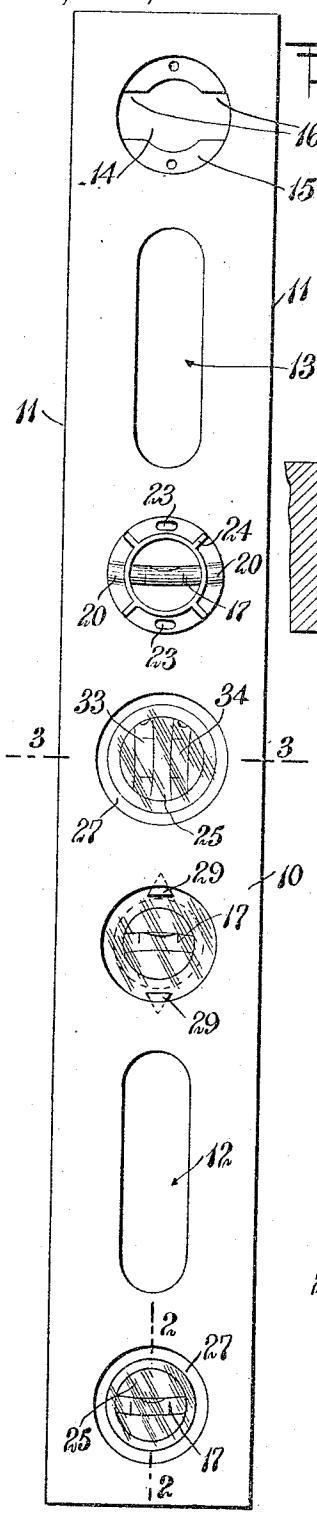


Fig. 1

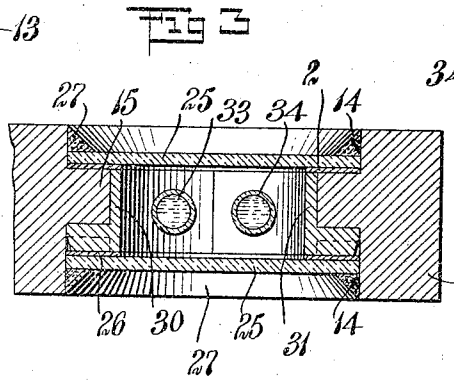


Fig. 3

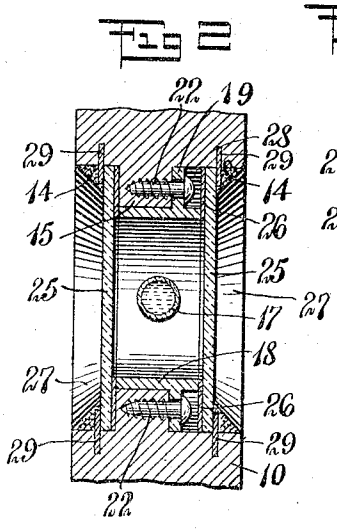


Fig. 2

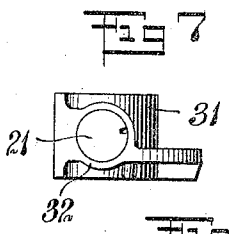


Fig. 7

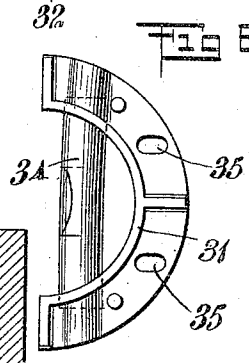


Fig. 6

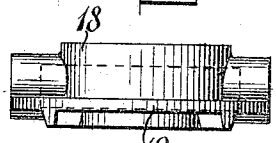


Fig. 5

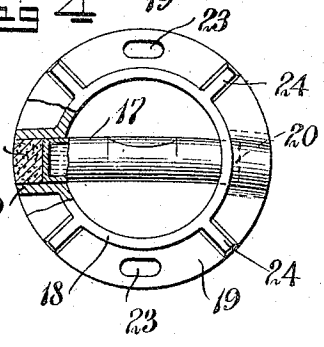


Fig. 4

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UNITED STATES PATENT OFFICE.

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SPIRIT-LEVEL.

1,212,735. Specification of Letters Patent. **Patented Jan. 16, 1917.**

Application filed May 31, 1916. Serial No. 100,749.

To all whom it may concern:

Be it known that we, CHRISTIAN BODMER and ALBERT W. RITTER, citizens of the United States of America, residing at New Britain, Connecticut, have invented a new and useful Spirit-Level, of which the following is a specification.

Our present invention has for its objects to improve the construction of spirit levels generally, special objects being to simplify and reduce the cost of construction and to make such devices more accurate and serviceable.

In the carrying out of our invention we employ a level stock which is counterbored from opposite sides so as to leave an intermediate supporting web and mount the spirit tube in a holder of annular shape which has a bearing on said supporting web. The spirit tube is usually mounted in hollow bosses provided on said annular member and the supporting web is usually reduced at opposite points to separate the webs into oppositely disposed supporting shelves receiving between them the bosses aforesaid. The tube holder is preferably sealed in the level stock by the provision of transparent cover plates at opposite sides of the stock which engage the opposite ends of the annular holder, packing gaskets being usually interposed between said cover plates and the ends of the holder.

A special feature of our invention is the mounting of two spirit tubes in a single holder, said holder in such case being preferably made in two parts with one tube supported in each part.

Another feature of the invention is the provision of the annular holder with elongated openings to receive the fastenings and with projecting shoulders which can be engaged for the purpose of readily shifting the holder with respect to the fastening means.

Various other features of the invention will appear as the specification proceeds, attention being directed to the accompanying drawing forming part hereof and wherein we have illustrated our invention in a practical and preferred form.

In said drawing: Figure 1 is a face view of a level having the features of our invention incorporated therein. In this view the upper spirit tube has been omitted and the cover plate for one other spirit tube has been left off. Fig. 2 is a fragmentary sectional view of the same taken substantially on the plane of the line 2—2 of Fig. 1. Fig. 3 is a similar view taken substantially on the plane of the line 3—3 of Fig. 1. Fig. 4 is a broken detail face view of one of the annular spirit tube supports. Fig. 5 is an edge view of the same. Fig. 6 is a side view of one member of the two-part spirit tube support. Fig. 7 is an edge or end view of the same.

Referring now to the drawing more in detail: 10 designates the level stock provided with the usual straight edges 11 and in this case with hand hold openings 12 and 13.

In the particular embodiment herein illustrated the level stock mounts five leveling and plumbing devices and it is therefore formed with five bores or sockets to receive such devices. These sockets are provided by counterboring the level stock from opposite sides substantially as indicated at 14 in Figs. 2 and 3 leaving intermediate web portions 15 which are usually separated at opposite points by recesses or cut-outs 16 for a purpose which will later appear, such cut-outs constituting the webs in effect, oppositively disposed supporting shelves which project inwardly into the bore.

The spirit tubes 17 are mounted in supports or holders 18 of annular construction which fit into the bores in the level stock and which are provided with outstanding flanges 19 arranged to bear upon the supporting webs 15. The tubes are usually supported in these holders by providing them with hollow bosses 20 which receive the end portions of the tubes and in which the tubes may be secured as by sealing with a suitable plastic material 21.

The annular tube supports are secured in their sockets by suitable fastenings, the same consisting in the present disclosure, of screws 22 passed through the outstanding flanges 19 into the supporting webs 15.

Provision is made for initial adjustment of the spirit tubes in their sockets by forming elongated openings 23 in the flanges through which the screws project so that the holders may be adjusted with respect to the screws and this adjustment is facilitated by providing raised shoulders or abutments 24 on the holder for engagement by a screw driver or other suitable positioning tool.

The leveling and plumbing devices are usually sealed in place in the level stock, in the present disclosure by means of transparent cover plates 25 at the opposite ends of the annular supports 18, gasket rings 26 being usually interposed between the cover plates and the ends of the annular portion of the holder and said cover plates being usually sealed in place by suitable sealing medium 27.

In order to provide clearance for the heads of the securing screws the outstanding flange 19 of the holder is preferably located intermediate the ends of the annular member 18, thereby providing a space 28 beneath the cover plates for said screw heads as clearly appears in Fig. 2. One method of securing the cover plates in position is by the use of triangle "points" such as indicated at 29 in Fig. 1, said points being concealed in the completed structure by the sealing material 27.

In some instances two spirit tubes are mounted in the same holder as is the case of the leveling device at the center of the level stock. In such cases we preferably make the tube holder in two complementary parts or segments 30 and 31 each having sockets or hollow bosses 32 for the spirit tubes 33 and 34 respectively. These segments are preferably adjustably supported independently of each other by making them with elongated openings 35 to receive the screws or other securing devices. The advantage of this double tube construction is that one spirit tube can be used for each straight edge of the level stock and that if one tube becomes broken the other will still serve the purpose.

From the foregoing it will be apparent that our invention is quite simple and inexpensive and further that the various plumbing and leveling tubes may be readily set to proper position and when so set will be securely held.

What we claim is:

1. A spirit level comprising a level stock having a bore therethrough and supporting webs in said bore, a tube support seated in said bore and having a flange bearing on the webs aforesaid, fastenings extending through said flange into the webs, cover plates engaging the ends of the tube support and fastenings engaged in the level stock and confining said cover plates to the ends of the tube support.

2. A spirit level comprising a level stock having a bore therethrough and supporting webs in said bore, a tube holder having a supporting flange disposed intermediate the ends of the same and bearing on the supporting webs aforesaid and securing means extending through the supporting flange into the supporting webs having head portions disposed below the plane of the adjacent end of the tube holder and cover plates engaging the ends of said tube holder.

3. A spirit level comprising a level stock counterbored from opposite sides to thereby leave a supporting web in the bore thus provided, said web being recessed at opposite points to separate said web into oppositely disposed supporting shelves, an annular tube holder having a flange resting on said oppositely disposed supporting shelves and bosses received in the recesses between said shelves and a spirit tube mounted in said bosses in the annular support.

4. A spirit level comprising a level stock counterbored from opposite sides to thereby leave a supporting web in the bore thus provided, said web being recessed at opposite points to separate said web into oppositely disposed supporting shelves, an annular tube holder having a flange resting on said oppositely disposed supporting shelves and bosses received in the recesses between said shelves, a spirit tube mounted in said bosses in the annular support, the supporting flange of said tube holder being disposed intermediate the ends of the annular portion of said holder, securing means extended through the supporting flange into the shelves having head portions disposed below the plane of the adjacent end of the annular member and cover plates engaging the ends of said annular portion of the tube holder.

5. In combination with a level stock having a bore therethrough and supporting webs at opposite sides of said bore, a tube holder seated in said bore having a flange bearing on said supporting webs and provided with elongated openings therethrough, fastenings passed through said elongated openings into the supporting webs and raised shoulders on said tube holder arranged to be engaged by a tool for shifting said holder relatively to said fastening means.

6. A spirit level comprising a stock counterbored from opposite sides to provide an intermediate supporting web within the bore, an annular tube holder fitting in said bore and having an outstanding flange intermediate the ends thereof bearing on said web, fastenings securing said flange to said web and cover plates applied to the ends of the annular member at opposite sides of the level stock.

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