J. C. LOVINGTON.

EXPANSION BOLT.

APPLICATION FILED JUNE 16, 1919.

1,372,708. Patented Mar. 29, 1921.

Fig. 1.

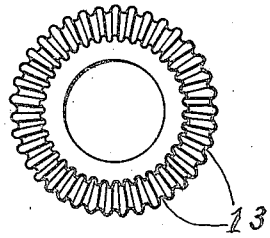


Fig. 2.

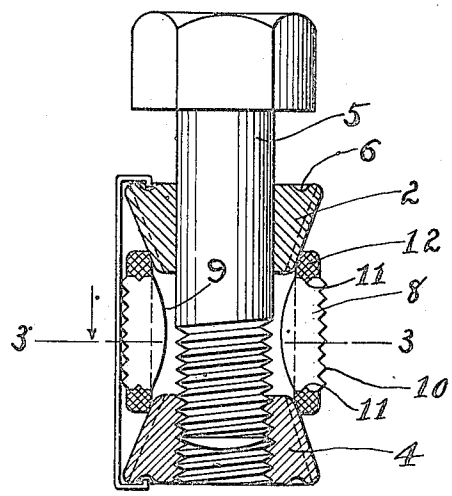


Fig. 3.

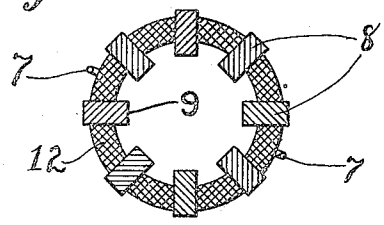
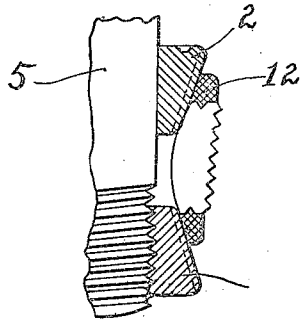


Fig. 4



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UNITED STATES PATENT OFFICE.

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EXPANSION-BOLT.

1,372,708. Specification of Letters Patent. Patented Mar. 29, 1921.

Application filed June 16, 1919. Serial No. 304,627.

To all whom it may concern:

Be it known that I, JOSEPH C. LOVINGTON, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Expansion-Bolts, of which the following is a specification.

This invention relates to expansion bolts and its object is to provide a device of the character specified of simple construction and reliable in operation. To these ends my improvements comprise features illustrated in their preferred embodiment in the accompanying drawing, wherein:—

Figure 1 is a plan view of one of the expanding members. Fig. 2 is a front elevation of the whole device, a portion of the members being shown in section. Fig. 3 is a transverse cross-section on line 3—3 of Fig. 2, with the bolt and lower member omitted. Fig. 4 is a fragmentary sectional elevation similar to a portion of what is shown in Fig. 2 and illustrating one feature of operation. All the figures of the drawing are to one scale.

Opposite, coaxial, expansion members 2 and 4 each have an axial hole therethrough for the passage of bolt member 5. The hole through upper member 2 is sufficiently large to permit the free passage of said bolt, and the hole through lower member 4 is threaded to engage the threaded portion of said bolt. While said members 2 and 4 may be of other peripheral configuration, they are preferably conical, and arranged with their smaller ends facing each other. Also the peripheral surfaces of said expansion members are preferably corrugated, as at 13 in Fig. 1, which may be a top plan view of member 4 or a bottom plan view of member 2. Said members 2 and 4 are further provided in their outer ends with pockets or grooves 6, comprising seats for the reception of means for temporarily holding said expansion members against other members lying therebetween. Said means may comprise a wire tie member 7, having its ends bent into hook formation for engagement with said seats 6 respectively. Said wire tie may be provided in plurality if desired.

Arranged radially about bolt member 5 are a plurality of jaws 8, 8, positioned between expansion members 2 and 4 and each having their inner faces 9 of convex formation. The upper and lower ends of said inner faces are located from bolt 5 a distance slightly beyond the smaller end of either member 2 or 4 from said bolt, so that as said members are forced toward each other those smaller ends will be effective for entering between said bolt and the ends of said jaws respectively. Said jaws preferably have serrated outer edges 10 for engaging the wall of any cavity within which the device is placed for use. Said jaws are further provided with seats at their opposite ends for the engagement of suitable means for temporarily retaining said jaws in predetermined radial positions. Said seats may comprise protrusions similar to one or more of teeth 10, but I preferably cut notches 11 in said ends into which is seated adjacent portions of carrier 12. Said carrier 12 is preferably of annular form and has mortises through its cylindrical wall in which jaws 8 are carried. Said carrier 12 may be made of any of a variety of suitable plastic or frangible deformable materials such as wood, molded composition, or some metal such as lead. Its function is to support temporarily in position jaws 8 so that members 2, 4, when drawn toward each other by bolt 5, will engage the inner faces 9 respectively of said jaws and force those jaws radially outwardly. In addition to the function of bringing jaws 8 into gradual engagement with the opposing walls of any cavity in which my improved device may be employed, convex inner walls 9 are also efficient to enable the outer toothed faces 10 of said jaws to accommodate themselves to tapered or irregular shaped holes, as those convex walls may ride up farther on the conical face of one of members 2 and 4 than on the other thereof, thereby rocking said jaws into canted position, as shown in Fig. 4. The corrugations in the conical walls of members 2 and 4 are efficient to maintain carrier 12 and jaws 8 against twisting when said expanding members are drawn toward each other.

I claim:

1. In an expansion bolt, the combination of opposite coaxial members each having an axial hole therethrough, a bolt adapted for drawing said opposite members toward each other, a plurality of jaws radially arranged about said bolt between said opposite members and plastic means for temporarily maintaining said jaws in position.

2. In an expansion bolt, the combination

of opposite coaxial members each having an axial hole therethrough, a bolt adapted for drawing said opposite members toward each other, a plurality of jaws radially arranged about said bolt between said opposite members, each of said jaws having its inner face of convex formation lengthwise, and plastic means for temporarily maintaining said jaws in position.

3. In an expansion bolt, the combination of opposite coaxial conical members each having an axial hole therethrough, a bolt adapted for drawing said opposite members toward each other, a plurality of jaws radially disposed about said bolt between said conical members and adapted to be forced radially outwardly by and as said conical members approach each other, and plastic means for maintaining said jaws in position.

4. In an expansion bolt, the combination of opposite coaxial expanding members, a plurality of radially arranged jaws adapted to be forced outwardly by said expending members as those members approach each other, means for drawing said expanding members toward each other, means for temporarily maintaining said jaws in position to be engaged by said expanding members, a seat in the outer end of each expanding member, and means engaging said seats for temporarily holding said expanding members and jaws in coacting relation.

5. In an expansion bolt, the combination of a bolt, opposite expanding members, one slidable on said bolt and the other in threaded engagement with said bolt, said expanding members having conical outer surfaces tapering toward each other respectively, a plurality of jaws radially arranged about said bolt and having the extremes of their inner edges in a circle of greater diameter than the diameter of the small ends respectively of said expanding members, and plastic means for temporarily maintaining said jaws in position to be actuated radially of said bolt by said expanding members.

6. In an expansion bolt, an annular shaped carrier of deformable material, having a mortise through its cylindrical wall, a jaw in said mortise, and coacting means on the ends of said jaw and on said carrier, respectively, for temporarily maintaining the relation of said jaw and carrier.

7. In an expansion bolt, the combination of a plurality of jaws radially arranged, each of said jaws being provided with seats in its opposite ends, and an annular carrier for said jaws having portions engaging the seats in said jaws.

8. In an expansion bolt, a plastic carrier, a jaw having wall-engaging means on its outer face and having its inner face of convex formation lengthwise and having means at its ends for engaging said carrier.

9. In an expansion bolt, a plastic carrier, a jaw having an inner face of convex formation lengthwise and having means at its opposite ends for engaging said carrier.

10. In an expansion bolt, an annular shaped carrier having a mortise through its cylindrical wall, a jaw in said mortise, a seat in each end of said jaw, and means at each end of said mortise for engaging said seats, respectively, for maintaining the relation of said carrier and jaw.

11. In an expansion bolt, an annular shaped plastic carrier having mortises through its cylindrical wall, a plurality of jaws carried in said mortises, respectively, and coacting means on said jaws and carrier for temporarily retaining said jaws in position in said carrier.

12. In an expansion bolt, an annular shaped carrier having mortises through its cylindrical wall, a plurality of jaws in said mortises, respectively, notches in the opposite ends of each of said jaws, and adjacent portions of said carrier seated in said notches, respectively.

In witness whereof, I hereby affix my signature this 13th day of June, 1919.

JOSEPH C. LOVINGTON.