J. L. MOHUN.

EXPANSION BOLT.

APPLICATION FILED APR. 26, 1909.

945,403.

Patented Jan. 4, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

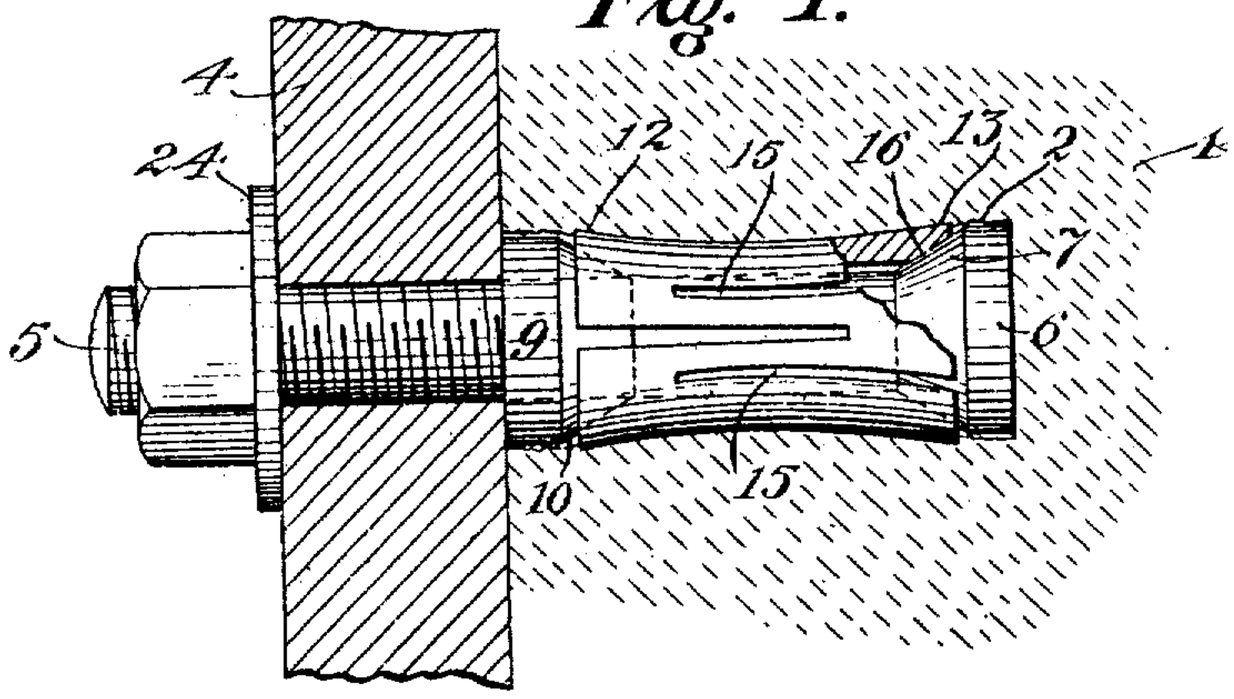


Fig. 2.

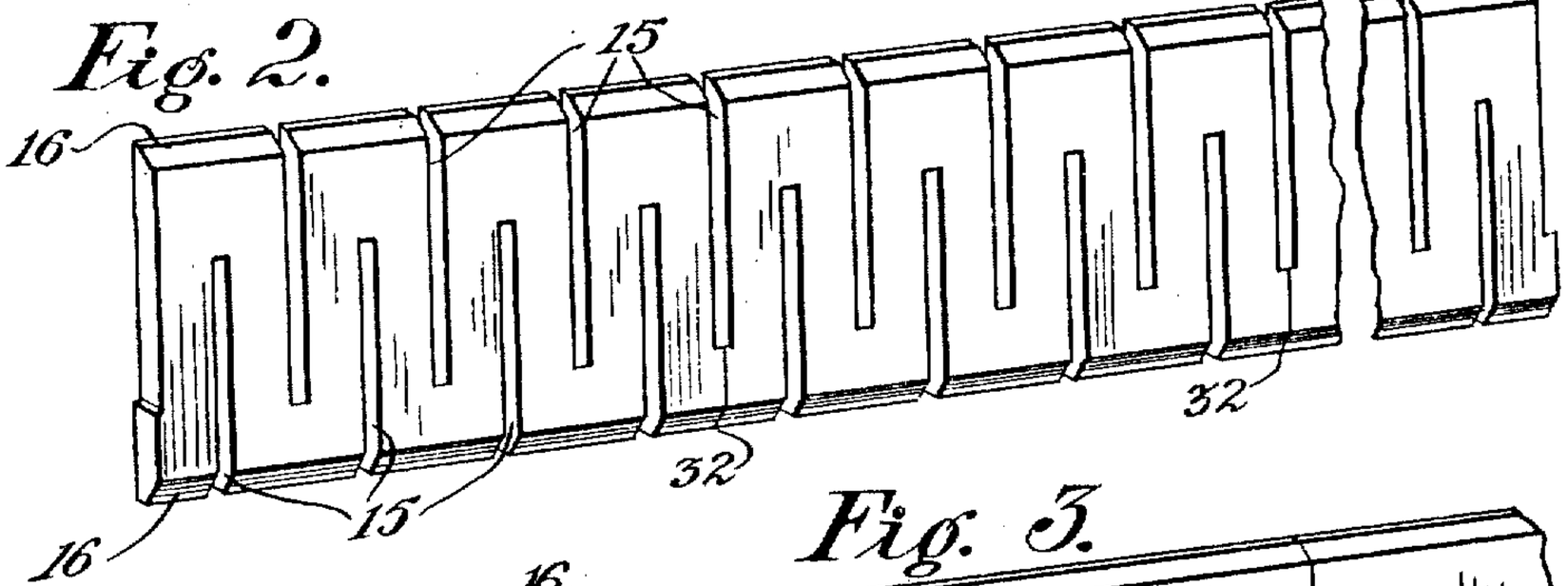


Fig. 3.

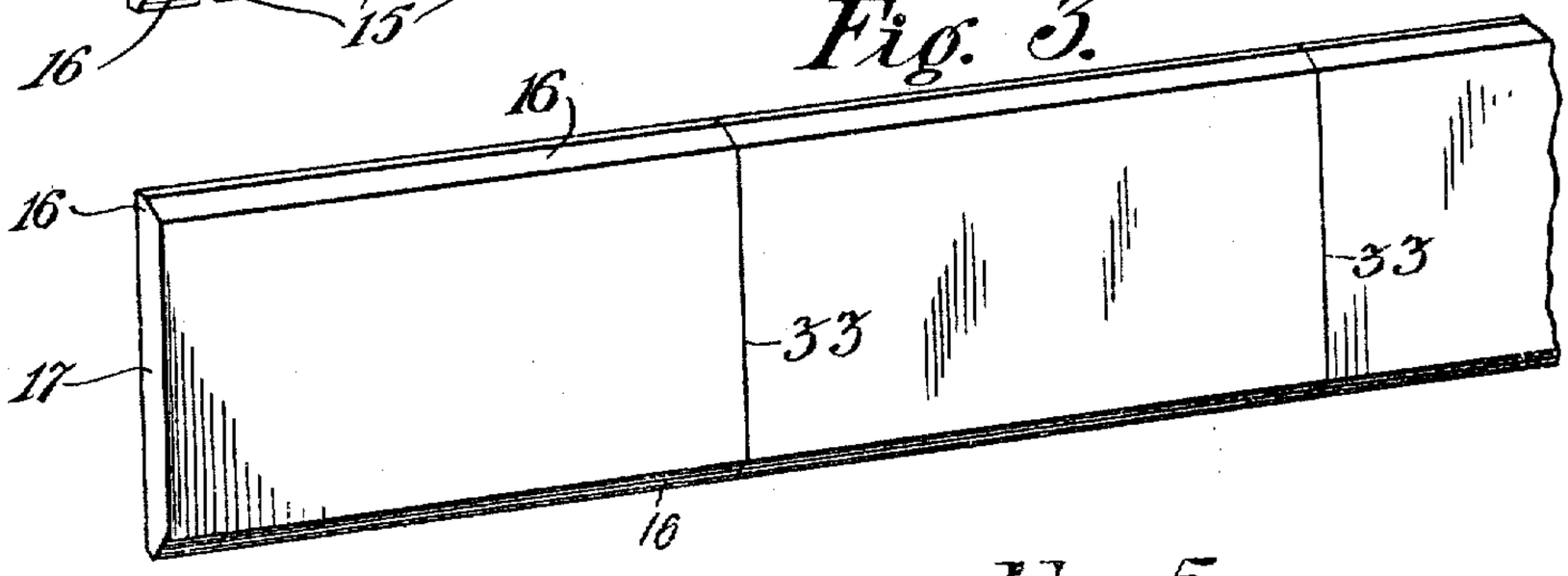


Fig. 4.

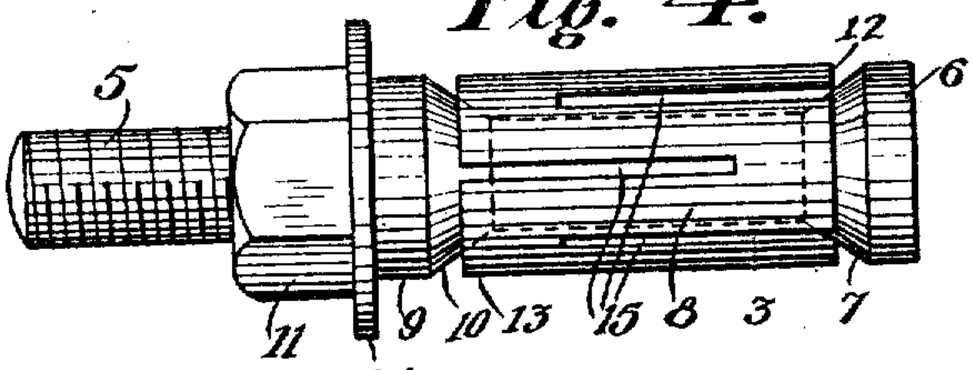
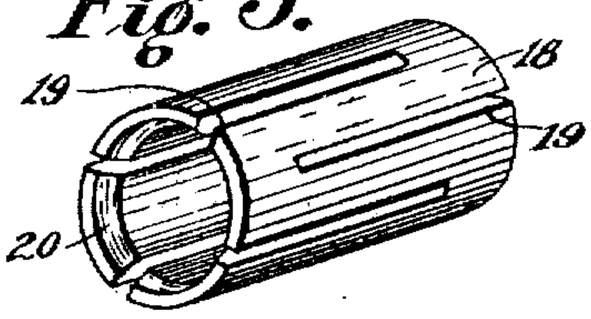


Fig. 5.



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945,403.

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2 SHEETS—SHEET 2.

Fig. 6.

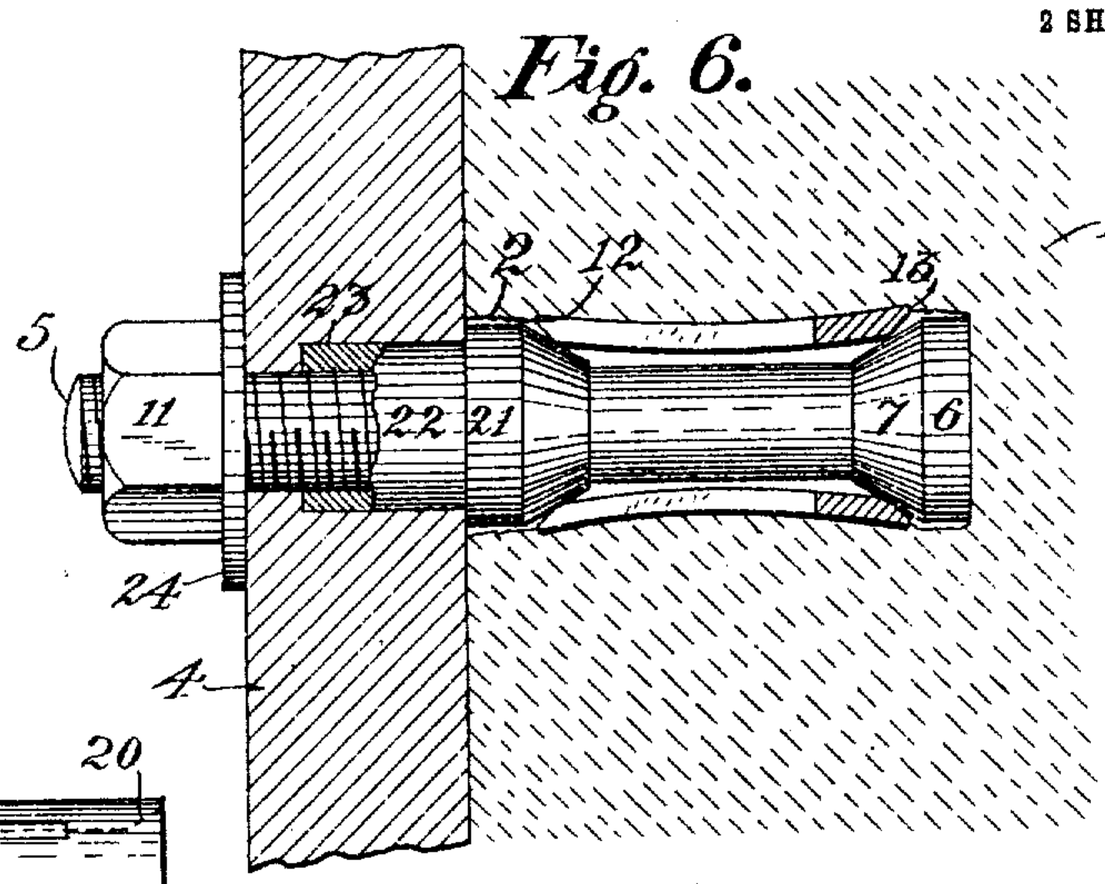


Fig. 8.

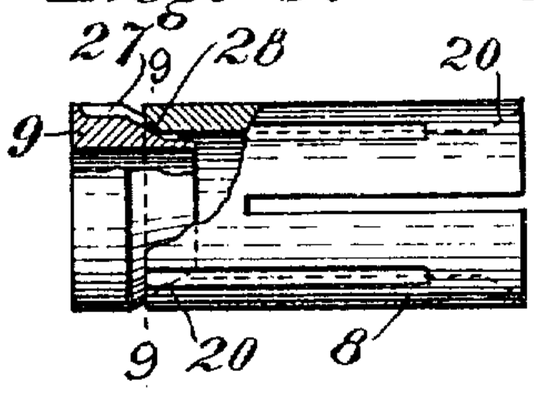


Fig. 7.

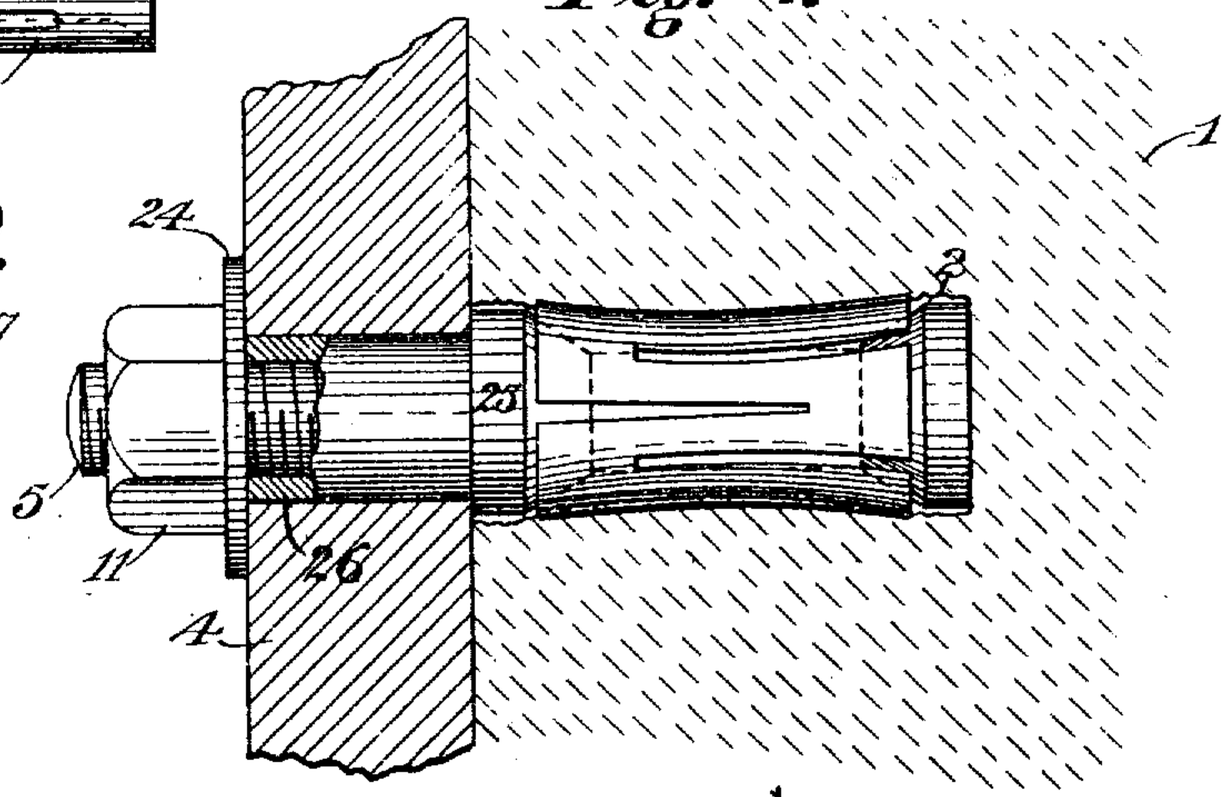


Fig. 9.

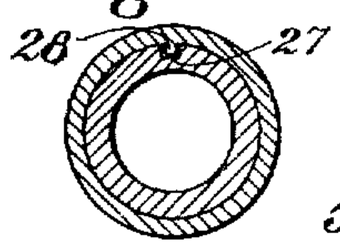
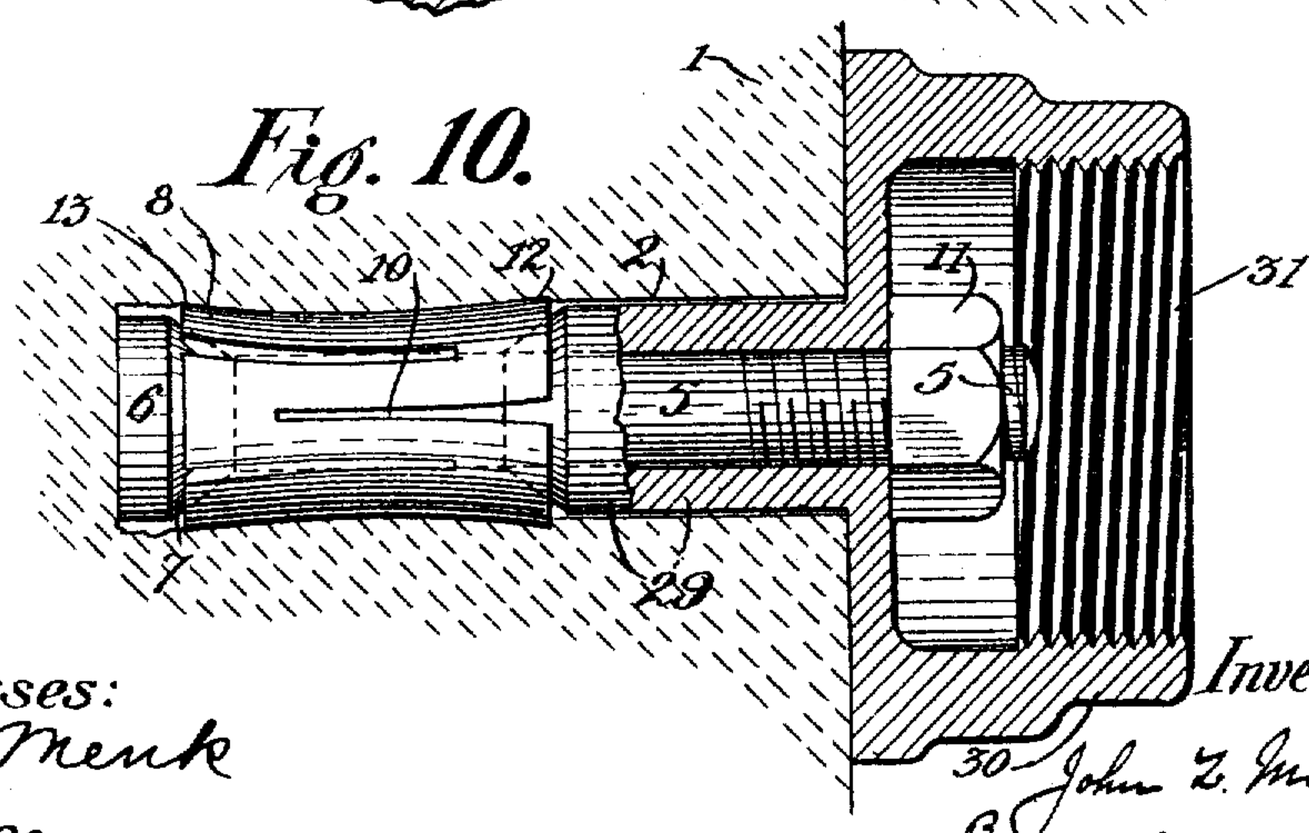


Fig. 10.



Witnesses:
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By Wilson Jr. Johnson
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UNITED STATES PATENT OFFICE.

JOHN L. MOHUN, OF NEW YORK, N. Y., ASSIGNOR TO DIAMOND EXPANSION BOLT COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

EXPANSION-BOLT.

945,403. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed April 26, 1909. Serial No. 492,277.

To all whom it may concern:

Be it known that I, JOHN L. MOHUN, a citizen of the United States, and a resident of the borough of Brooklyn, in the city and State of New York, have invented new and useful Improvements in Expansion-Bolts, of which the following is a specification, taken in connection with the accompanying drawings, which form a part of the same.

This invention relates to expansion bolts and more particularly to details of construction of the bolt and the expanding sleeve or shield, and other details of construction which will be described in the specification and pointed out in the claims.

In the accompanying drawings showing illustrative embodiments of the invention and in which the same reference numeral refers to similar parts in the several figures,—Figure 1 is a vertical section through a wall or other support and through the article or work supported, showing my expansion bolt in operative position and partly in side elevation and partly in section; Fig. 2 is a perspective view of the first step in the preferred manner of forming or manufacturing the shields or sleeves; Fig. 3 is a perspective view of a strip from which the shields or sleeves may be formed with the cross and staggered slots omitted; Fig. 4 is a plan view of the preferred form of my expansion bolt assembled and ready for the market, showing a washer, which, however, may be omitted. Fig. 5 is a perspective view of a modified form of expanding shield or sleeve; Fig. 6 is a vertical sectional view through a support and the article supported by the expansion bolt, the latter being a modified form, shown partly in side elevation and partly in section. Fig. 7 is a vertical sectional view through a support and the article supported, showing a modified form of my expansion bolt partly in side elevation and partly in section; Fig. 8 is a view of a detail showing a modification the same being partly in side elevation and partly in section; Fig. 9 is a vertical section on the line 9—9 of Fig. 8; Fig. 10 is a vertical section through a support showing another modified form of my expansion bolt.

In the illustrative embodiments of the invention shown in the drawing, 1 is a wall or other support of any description within which is bored, molded, drilled or otherwise formed in any suitable manner, a hole or opening 2 for the reception of my improved expansion bolt 3 which supports the article or work 4 on the support 1, as shown in Figs. 1, 6 and 7. This article 4 may be of any contour, shape or material.

My expansion bolt consists essentially of a threaded shank or bolt 5 having at its inner end a head 6 which I preferably form with wedge surfaces 7 adapted to force outward the expansible coöperating end of the shield or sleeve 8. These surfaces 7 are preferably, though not necessarily, formed conical and are preferably formed integral with the shank 5, though they may be otherwise permanently secured to it if desired. The other end of the sleeve or shield 8 is preferably supported by means of a loose cone 9 having a conical surface 10 which is adapted to take into one end of the hollow shield 8. When longitudinal pressure is applied to the loose cone 9 by means of a nut 11 coöperating with the threads upon the shank 5, these surfaces 7 and 10, upon the head 6 and loose cone 9 respectively, are forced into the opposite ends 12 and 13 of the shield 8 and cause it to expand and in this manner grip the interior surface of the hole or aperture 2 formed in the support. In my invention these ends 12 and 13 of the shield 8 are expanded to a greater extent than the remaining portion of the shield 8 and in this manner positively and firmly grip the interior surface of the hole 2 and prevent either inward or outward movement of the bolt anchor 3, after the parts are forced into their operative position.

In the preferred form of my invention I form the sleeve or shield 8 out of a continuous strip of material 14, Fig. 2 and cut off portions of it which when bent into cylindrical form make the shield 8. It is of course to be understood that different lengths may be cut from the strip 14 for different size shields or sleeves to form a part of expansion bolts of different sizes, and that this strip may be formed of any suitable material but preferably of metal. I also preferably, though not necessarily, roll or otherwise form this strip 14 with transverse, staggered and preferably overlapping slots 15, 15 Fig. 2. These slots tend to permit the edges 12 and 13 of the shield 8 to expand a little more readily than the center of the shield 8, besides saving material.

To form surfaces upon the shield 8 which

will more readily coöperate with the conical expanding surfaces carried by the head 6 and the cone 9, I also preferably roll, or otherwise form bevel surfaces 16, 16 upon opposite edges of the strip 14, which are so formed with relation to each other that when a section of the strip 14 is cut off and bent to form a shield 8 the bevel surfaces 16, 16 will be upon the interior of the shield 8 and form what may be termed cupped surfaces to coöperate with the conical surfaces 7 and 10 respectively. In some cases, however, I may omit both the bevel surfaces 16, 16 and the transverse staggered overlapping slots 15, 15. In Fig. 3 I have shown a strip 17 in which the slots 15, 15 are omitted, it being readily understood that the surfaces 16, 16 could also be omitted, though for purposes of illustration they are shown in this Fig. 3. Both strips 14 and 17 are preferably formed by rolling them through suitable rollers which preferably at the same time form the slots 15, 15 and bevels 16, 16. Other suitable rolls cut the strips into the required lengths at for instance the points indicated by 32 and 33.

Instead of forming the sleeve 8 from a strip such as 14 or 17, I may in some cases form it from a cylinder of any material or from wrought iron pipe, making such a shield as 18, Fig. 5, which is also provided with staggered overlapping slots 19, 19 extending inward from its ends. In this form I may also ream out the ends of the sleeve or shield or otherwise provide it with bevel or cupped surfaces 20, 20 to coöperate with the conical surfaces 7 and 10 respectively. With this form of shield one diameter of cylinder or, for instance pipe, such as wrought iron pipe can be used for two or more sizes of bolts. This is a marked advantage in manufacturing.

Various modifications of my invention can be made. For instance the loose cone 21 Fig. 6 may be provided with a sleeve 22 to fit into a recess or aperture 23 formed for its reception in one face of the supported article or work 4. In this form the article 4 is partly supported by the sleeve 22 and partly by the stem 5. It of course is to be understood that in addition to the nut 11 a washer 24 may be, if desired, used with this and the other forms of my invention.

In some cases it is desirable to extend the sleeve of the loose cone so that it will extend entirely through the article supported. In Fig. 7 the loose cone 25 is provided with a sleeve 26 upon which the article 4 is mounted, the sleeve extending entirely through the article. To avoid any relative rotation between the shield or sleeve and the loose cone, I may in some cases provide them with coöperating surfaces to prevent such movement. In Fig. 8 and 9 I have shown a groove 27 in the cone 9 and a coöperating teat 28 formed on the inner surface of the sleeve or shield. It is obvious that this arrangement of parts may be reversed if desired.

In some cases it is desirable to extend the loose cone so that the article supported may be screwed or otherwise secured to it. In Fig. 10, I have shown the loose cone 29 extended to form a cup 30 which, when the parts are secured in position, lies on the outside of the wall or other support 1. To this cup 30 in any suitable manner is secured the article or work to be supported. For purposes of illustration I have shown it provided with interior screw threads 31 to coöperate with similar threads on the article supported. It is to be understood, however, that my invention is not to be confined to this or any other particular manner of securing the supported article upon or from the cup 30. In the form shown, however, the sleeve or shield 8 is expanded and its ends 12 and 13 are forced into the support 1 by the nut 11 operating the conical expanding surfaces 7 and 10, when the nut 11 and shank 5 are concealed and hidden by the article supported (not shown) which screws into the cup 30. This produces a very handsome and pleasing effect. It is of course to be understood that the cup 30 may be given any artistic shape or configuration.

In all forms of my invention the expansion bolt can be first put into the wall 1, or other support, and the work or article supported 4, can then be brought to the expansion bolt when upon the tightening of the nut 11, the work is securely held in its desired position.

Having thus described this invention in connection with several illustrative embodiments thereof, to the details of which I do not desire to be limited, what is claimed as new and what it is desired to secure by Letters Patent is set forth in the appended claims.

1. The combination in an expansion bolt, of a threaded shank having a rigid head provided with a wedge surface, a loose cone provided with a wedge surface, a shield or sleeve between said head and cone provided with staggered slots, and a nut on the threaded part of the shank.

2. The combination in an expansion bolt of a threaded shank, a head on the end of the threaded shank, provided with an expanding surface, a loose member mounted on the shank and provided with an expanding surface, a shield mounted between the expanding surfaces on the head and loose member, and a sleeve carried by the loose member between said head and loose member.

3. The combination in an expansion bolt of a threaded shank, a head on the end of

the threaded shank, provided with an expanding surface, a loose member mounted on the shank and provided with an expanding surface, a shield mounted between the expanding surfaces on the head and loose member, and a sleeve carried by the loose member, the sleeve being provided with means to coöperate with and assist in supporting the article supported.

4. The combination in an expansion bolt of a threaded shank, a head on the end of the threaded shank, provided with an expanding surface, a loose member mounted on the shank and provided with an expanding surface, a shield mounted between the expanding surfaces on the head and loose member, the sleeve being provided with an enlarged cupped portion and surfaces in the cupped portion to coöperate with similar surfaces carried by the article supported.

JOHN L. MOHUN.

Witnesses:
ALAN M. JOHNSON,
LOUELLA F. LITTLE.

Certificate of Correction in Letters Patent No. 945,403.

It is hereby certified that the assignee in Letters Patent No. 945,403, granted January 4, 1910, upon the application of John L. Mohun, of New York, N. Y., for an improvement in "Expansion-Bolts" should have been described and specified as *Diamond Expansion Bolt Company, a corporation of New York*, instead of "Diamond Expansion Bolt Company, of Brooklyn, New York, a corporation of New York," as shown by the record of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of January, A. D., 1910.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.

the threaded shank, provided with an expanding surface, a loose member mounted on the shank and provided with an expanding surface, a shield mounted between the expanding surfaces on the head and loose member, and a sleeve carried by the loose member, the sleeve being provided with means to coöperate with and assist in supporting the article supported.

4. The combination in an expansion bolt of a threaded shank, a head on the end of the threaded shank, provided with an expanding surface, a loose member mounted on the shank and provided with an expanding surface, a shield mounted between the expanding surfaces on the head and loose member, the sleeve being provided with an enlarged cupped portion and surfaces in the cupped portion to coöperate with similar surfaces carried by the article supported.

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