

L. R. ZIFFERER.
EXPANSION BOLT.
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1,136,638.

Patented Apr. 20, 1915.

Fig. 1.

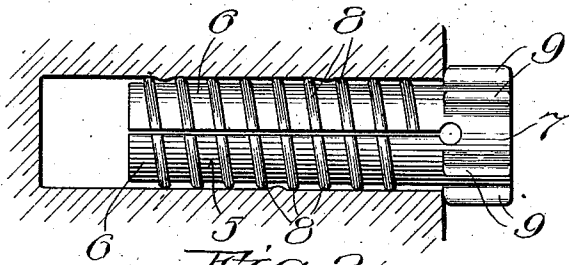


Fig. 2.

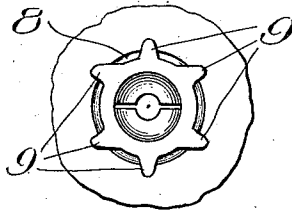


Fig. 3.

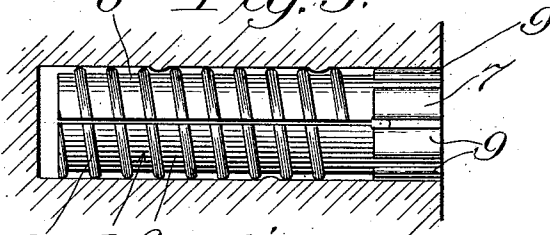
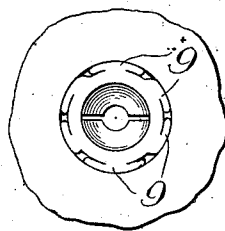


Fig. 4.



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UNITED STATES PATENT OFFICE.

LOTHAR R. ZIFFERER, OF NEW YORK, N. Y.

EXPANSION-BOLT.

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Specification of Letters Patent.

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Application filed November 25, 1914. Serial No. 873,967.

To all whom it may concern:

Be it known that I, LOTHAR R. ZIFFERER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Expansion-Bolts, of which the following is a specification.

This invention relates to an expansion bolt formed of a relatively soft or ductile material, such, for instance, as lead or one of its alloys, and is concerned primarily with the exterior construction of the shield.

My invention has for one of its principal objects the provision of elements upon the shield exterior so formed, arranged, and proportioned as to facilitate insertion of the device into its intended aperture, to resist withdrawal from the aperture, and prevent rotary movement within the aperture.

Other objects and uses will also appear from a detailed description of the invention as hereinafter set forth.

It is well recognized that there are many materials in which expansion bolts are commonly anchored. Also it is common knowledge that the walls of the holes drilled to receive such expansion bolts are not invariably smooth and free from irregularities. For these reasons it is frequently difficult to insert an expansion bolt into operative position, although the hole drilled for the purpose may appear to be of the proper dimension. This is due often to slight projections or other irregularities remaining upon the face of the wall which surrounds the hole. I have provided the construction shown herein to facilitate the insertion of an expansion bolt, as well as to prevent the same from turning within, or withdrawing from, the aperture.

In the drawing: Figure 1 is a side elevation of an expansion bolt embodying my invention, shown inserted within an aperture for the greater portion of its length; Fig. 2 is an end elevation of the device as shown in Fig. 1, looking toward the aperture; Fig. 3 is a side elevation of the expansion bolt shown completely inserted within an aperture; and Fig. 4 is an end elevation of the device as shown in Fig. 3, looking toward the aperture.

In the drawing I have represented a one-piece shield 5 slotted for the greater portion of its length to provide expansible segments 6, the outer or collar end 7 being integral.

Arranged upon the exterior of the shield for the greater portion of its length are spiral threads 8 of a size and pitch to provide between them spaces of substantial width. At the outer end of the shield body I arrange a number of projections or ribs 9, disposed preferably in directions parallel with the axis of the shield, and extending above the body of the shield slightly higher than the threads 8. Expansion of the shield is brought about in the usual manner as by advancing a bolt or screw into the shield interior, which is customarily tapered toward the inner end.

It will be noted that between the threads formed upon the shield exterior are spaces of substantial width. This is for the purpose of providing sufficient clearance within which may lie projections or other irregularities on the walls of the aperture, to permit of the shield being freely advanced into position through a rotary movement. It is desirable that the shield be inserted as far as possible by a frictionless method, rather than through a forcible advancement which would tend to break down and destroy the spiral threads that are of the same degree of ductility as the material of which the shield body is formed. To assist in this threading action, I prefer to employ a plurality of outer end projections 9, such as the number six which are shown on the drawing, by which a convenient hold is provided for the operator's fingers or for an instrument, if it be necessary, to impart rotary movement to the shield.

It is apparent when the shield has been inserted within the aperture up to the point where the longitudinal projections are located, a positive resistance is offered against further inward movement. To overcome this, I contemplate the application of force as by the striking of a blow against the outer end of the shield to advance the same the necessary distance to bury the device completely within the aperture. This advancement brought about under pressure results in a jamming or breaking down of the projections 9, such as to flatten out the material composing the same against the sides of the hole to effect a tight fit. As a result of such operations, it will be found that the shield when completely inserted in the aperture is so firmly wedged in place as to effectually resist any tendency toward rotation when a screw or bolt is inserted for

purposes of expansion. It is very desirable that no considerable friction between the shield and aperture should develop when the shield is first inserted. As previously explained, interference to an easy insertion, due to resistance offered by uneven and irregular places on the aperture walls, may be eliminated to a large extent if threads on the shield exterior enable rotation in the manner described. Without such a construction a hammer blow might often be required at the beginning of insertion. Until the shield has been inserted well within the hole, no such hammer blow should be struck, as, under such circumstances, a soft metal shield will frequently bend or buckle unless it is reinforced for a considerable portion of its length by the walls of a surrounding aperture. It frequently happens moreover that a number of shield threads at the inner end of the shield are worked past the irregular and uneven places on the aperture walls, so that when the shield is eventually struck to complete its insertion, such threads will not be broken down or otherwise mutilated so as to be rendered less effective for resisting forces which tend to withdraw the shield from the aperture. I prefer to use several of these longitudinal ribs to assist in the wedging action described. It is desirable that the cross sectional area of these projections should be so proportioned with respect to the intervening spaces as to allow of a spreading and flattening out of the material composing the same sufficient to effect the desired wedging pressure. For this purpose, as well as to multiply the number of

places at which such a wedging pressure is applied, I have shown six ribs 9, although the same wedging results, though in a less degree, are obtainable by varying this number. It will be noted also that for reasons of expediency in manufacture, I have caused the spaces between the ribs on the shield body adjacent the slots separating the segments 6 to be slightly greater than the other distances intervening between the ribs, and that the said ribs adjacent the slots are somewhat inclined toward these enlarged spaces. This is for the purpose of causing such ribs when pressed into the aperture to break down and flatten out in the direction of such widened spaces, thus distributing in a better manner the wedging action around the entire collar end of the shield.

I claim:

1. A shield for expansion bolts made of relatively soft material provided on its exterior at the inner end with threads, and at the outer end with projections slightly higher than the threads, substantially as described.

2. A shield for expansion bolts made of relatively soft material provided on its exterior at the inner end with threads, and at the outer end with projections slightly higher than the threads, said projections being irregularly spaced apart and inclined toward the wider adjacent spaces, substantially as described.

LOTHAR R. ZIFFERER.

Witnesses:

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