Oct. 22, 1935. G. F. CROESSANT 2,018,251

ANCHORING SOCKET FOR BOLTS

Filed May 23, 1934

Fig. 1

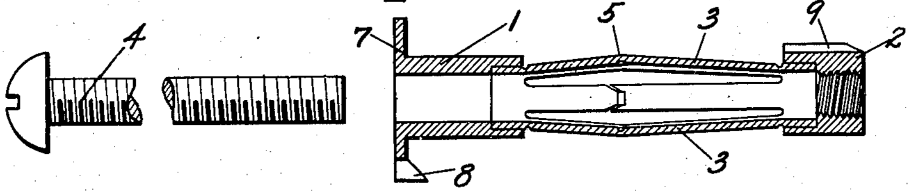


Fig. 2

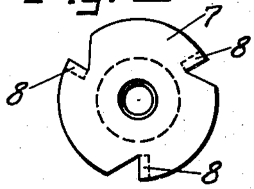


Fig. 4

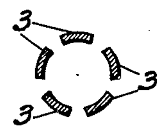


Fig. 3

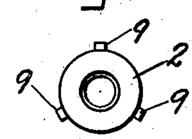


Fig. 5

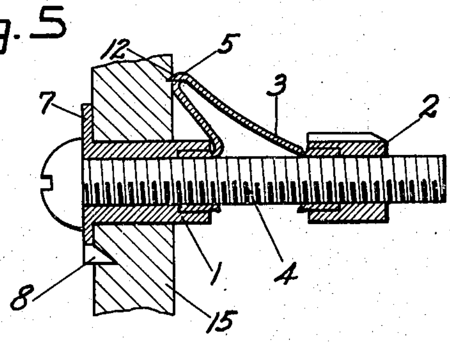


Fig. 6

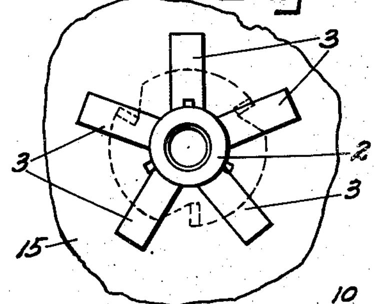


Fig. 7

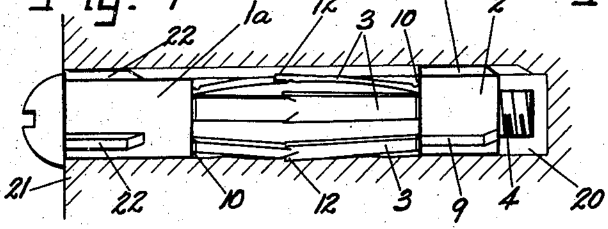


Fig. 8

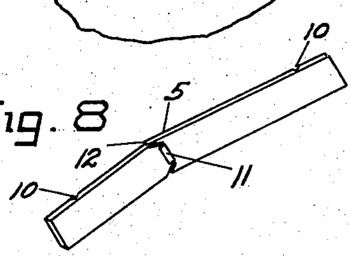
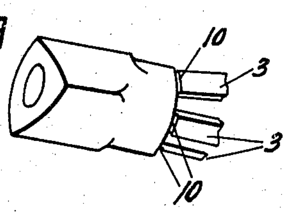


Fig. 9



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INVENTOR

BY [signature]

ATTORNEYS

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ANCHORING SOCKET FOR BOLTS

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7 Claims. (Cl. 85—2.4)

My invention relates to sockets for anchoring bolts to walls, floors, and the like, and more particularly to the kind which is longitudinally collapsible so as to transversely spread an intermediate portion with gripping frictional engagement in a wall aperture, or into spread anchoring engagement against the inner surface of a wall pierced by the aperture provided for the socket.

I am aware that sockets of this nature have been shown and described in prior patents, and my main objects are to produce a socket that will overcome the deficiencies of such disclosures, will meet the varied requirements of practical use, and will have an improved and adequate anchoring grip that may be retightened if necessary and that will permit repeated withdrawals and reengagements of the associated bolt.

With these main objects in view, and with others that will appear later herein, my invention comprises the improvements in socket construction which I will now more fully describe in connection with the accompanying drawing, and the novel features will be set forth in the appended claims.

Fig. 1 of the drawing is a sectional elevation of a preferred embodiment of my improved anchoring socket for bolts, the socket being shown as unexpanded and the bolt therefor in fully withdrawn position.

Figs. 2 and 3 are respectively opposite end views of the socket shown in Fig. 1, and Fig. 4 an intermediate cross-sectional view.

Figs. 5 and 6 respectively show in vertical section and inner end view, the application of my socket to a thin wall with the anchoring strips engaging the inner surface of the latter.

Fig. 7 shows in vertical section the application of my socket in a suitable aperture of a thick wall.

Fig. 8 shows on an enlarged scale one of the bendable anchoring strips employed in my socket.

Fig. 9 indicates a modification of the sleeve employed in my socket.

Referring to the drawing, my improved socket is shown as a unit, essentially comprising a bolt-supporting sleeve 1, a spaced alined nut 2, and a plurality of intermediate connecting strips 3, 3, forming a transversely spreadable anchoring portion when intermediately outwardly bent by the longitudinal collapsing force exerted by the bolt 4 entered through the closely fitting sleeve 1 and engaging nut 2 to axially draw the latter toward said sleeve.

The strips 3, 3, are shown as circularly spaced and fixedly engaged in the recessed opposing ends of sleeve 1 and nut 2 from which they are preferably outwardly angled to their intermediate set bends 5, the external diameter at which bend points is substantially equal to the outer diameters of the sleeve and nut, so the socket may readily be entered in an aperture adapted to the latter. And to prevent rotation of the socket in such aperture the sleeve is shown in Fig. 1 as having an outer-end flange 7 with wall engaging teeth 8, and the nut provided with radial fins 9 slidably engageable with its wall aperture during axial movement of said nut.

It is to be particularly noted that the bends 5 unequally divide the lengths of the strips 3, 3, with their longer portions connected to the nut 2, for an important objective hereinafter more fully set forth. And the bending points of the strips 3 are preferably located by weakened spots, shown clearly in Fig. 8, in the form of die grooves; grooves 10, 10 being adjacent their respective sleeve and nut engaged ends, and groove 11 at said intermediate bend 5, and indicated as having angular ends cut through the strips to form projecting tits 12 when further bent. It will be further noted that in Figs. 1 and 4, the strips 3 are indicated as curved transversely, but this is not essential, and the die grooves 10 and 11 will flatten the strips more or less at such die grooves so as to facilitate bending; and I prefer generally to make the strip transversely flat throughout their length as shown clearly in Figs. 5, 6, 7, 8 and 9.

My improved socket as above set forth embodies new and important features making it practical and effective as a sturdy and assured anchor for its associated bolt. In Figs. 5 and 6 I have indicated a socket anchored to a thin wall 15, which may be of usual lath and plaster, or any of the known compositions or plaster board used for such purpose.

The socket indicated is adapted for a wall of maximum thickness equal to the length of the sleeve 1, and is shown applied to a wall of less than maximum thickness, with the flange 7 engaging the outer wall surface, teeth 8 embedded in the wall to prevent turning of said sleeve, and the inner end of the latter projecting beyond the inner wall surface. Bolt 4 is shown as having collapsed the strips 3 by engaging nut 2 and having axially moved the latter toward sleeve 1 sufficiently to outwardly bend the strips 3 to engagingly contact their intermediate bends 5 against the inner surface of the wall in circularly spaced relation around the projecting sleeve end, as

clearly seen in Fig. 6. This circularly spaced wall engagement by the bends 5 of strips 3 provides an enlarged base support to fixedly anchor the nut 2; engages wall surface removed from any weakness caused by the aperture made for the sleeve 1; permits retightening if required by further axial movement of nut 2; and reduces the variety of required sizes by successfully operating on walls of differing thickness within a given range; and it will be further seen that the bolt 4, may be freely removed, after its anchoring action, and replaced as often as required with no loosening effect on the anchored socket. This effective anchoring of the socket is secured by the special construction of the anchoring strips 3 as above described, which causes them to spread outwardly at their intermediate bends 5, as the nut 2 is drawn toward the sleeve 1 by the bolt 4, and the longer lengths of the nut-engaged portions of said strip 3 will cause their shorter lengths to radially spread from their sleeve engaged ends through arcs sufficiently more than ninety degrees to contact their intermediate bends 5 with the inner wall surface at spaced distances from said sleeve. The bends 5, thus greatly increased will cause the tits 12 to project and be embedded in the inner wall surface to more positively anchoringly engage the latter. Where any single strip 3 meets an obstruction, as a wall studding, it may individually assume any distorted variation of its bending without effecting the anchoring grip of the remaining strips.

Fig. 7 shows my socket as anchored in a suitable aperture 20 formed in a solid wall 21, of masonry, concrete or the like, the socket structure being the same as that shown in Fig. 1, except that the sleeve 1a differs from that shown in Fig. 1 by having radial fins 22, 22 to prevent sleeve rotation instead of flange 7 and teeth 8, but is a full equivalent of the latter, and either may be used as desired. The collapsing axial movement of nut 2 in this case is considerably limited due to the prompt engagement of the bending strips 3 with the wall aperture against which they frictionally engage in proportion to the collapsing force exerted by bolt 4 to axially move nut 2. Such prompt frictional contact of spreading strips 3 with the wall of the aperture starts a torsional strain on nut 2 tending to rotate the latter while axially moving it, causing a twisting or wrapping of the strips 3 around the bolt 4 to reduce their spread and loosen the socket in its aperture. This wrapping tendency of the anchoring strips 3 would thus limit their frictional anchoring engagements to a positive contact with the aperture wall, and to increase their frictional engagement beyond such limit for a desirable and essential greatly increased anchoring grip, I have provided the radial fins 9 on nut 2, which slidably engage in grooves formed by them in the aperture wall during their introduction to the latter, such slidable engagement preventing rotary movement of nut 2 as it is firmly axially moved by bolt 4 to crushingly spread the strips 3 into secure and powerful frictional engagement with the wall of aperture 20, the radial fins 22 on sleeve 12 preventing rotary movement of the latter during such tightening spread of the strips 3, and the tits 12 of the strips at their bends 5 embedding themselves more or less in the wall aperture 20.

This twisting tendency of the strips 3, present in the wall engagement shown in Fig. 7, is present in a very minor degree in the wall engagement shown in Figs. 5 and 6, in which sleeve 1 is held against rotation by flange teeth 8, and in this case nut 2 and strips 3 are free of contact until the latter are bent to engage against the inner wall surface, and any rotation tendency of nut 2 is sufficiently resisted by strips 3.

Fig. 9 indicates a further modified sleeve structure, in this case having a substantially triangular shape and being adapted, as well as the sleeve of Fig. 7, to lie flush in the wall, as distinguished from the flange of Fig. 1, these modifications indicating a common essential requirement of means to prevent sleeve rotation in its wall aperture. Other anti-rotating means, differing from the fins 9 shown in Fig. 1, may also be used. The sleeve and nut may conveniently be formed of cut lengths of suitable tubing, that for the nut being threaded, and the strips 3 of separate cut lengths of a properly bendable metal, or a die stamping therefrom bent to shape, the separate parts, after assembly, being conveniently united as by a dipping process in a coating material acting to solder their engaging connections. And due to the novel anchoring engagement of the strips 3 as spread by the longer nut engaged portions bending the shorter lengths about their sleeve-engaged ends in arcs greater than ninety degrees, the wall-contacting intermediate bends are located in a transverse plane within the length of the sleeve 2, such contacting plane depending on the thickness of the particular wall engaged. One or two sizes of sleeve length will thus give sufficient variation for a large number of standard wall thicknesses. It will be noted that the grooves 10, 10, and 11 insure outward bends of strips 3 adjacent their ends, and intermediate bends 5, which latter will be spread by action of the longer strip portions as radially controlled by the shorter strip portions, and the longer strip portions, when the bends are seated against a wall face, will form a circle of braces extending from their spread ends at bends 5 to their connections to nut 2 to firmly anchor the latter in fixed position. When secured in a wall aperture, the less widely spread bends 5 accomplish the same positive anchoring of the nut. The bolt 4 may be used solely for spreading the strips 3 so as to tightly secure the bolt-enclosing outer end of the socket in the wall aperture as set forth, with the nut end in anchored alinement therewith; subsequent removal of the bolt obviously permitting use of another nut-engaging screw when desired.

Having thus fully described my improved socket and its manner of engaging a wall in a secure and strong anchored relation, it is to be understood that the specific forms shown may be modified in other ways than above suggested, all within the scope of my invention, the novel essential features thereof being pointed out in the following claims.

What I claim is:—

1. A wall-clamping socket for bolts, comprising a non-rotatable sleeve adapted to project through a wall aperture, an alined nut spaced from the inner end of said sleeve, and a plurality of connecting anchoring strips having their respective ends secured within said sleeve and nut and radially spreading therefrom to the diameter of said sleeve at weakened-section intermediate bends located in a transverse plane dividing said strip lengths into shorter sleeve connections and longer nut connections, said strips being spread outwardly at said intermediate bends by longitudinal collapsing movement of said nut toward said sleeve, and said longer nut connections radially

bending said shorter connections from their sleeve connected ends to position said intermediate bends in anchored wall engagement in a transverse plane within the length of said sleeve and spacedly surrounding the latter.

2. In a wall-clamping socket for bolts having a sleeve and an alined spaced nut having opposed recessed ends, a plurality of connecting anchoring strips having their respective ends secured in said sleeve and nut recesses, bend-locating die grooves adjacent said secured ends, and an intermediate die groove in each strip locating bend thereof in a transverse plane between said sleeve and nut to radially spread said strip intermediately to the diameter of said sleeve, said strip bending at said die grooves to anchoringly spread said intermediate bends by longitudinal collapsing movement of said nut.

3. In a wall-clamping socket for bolts having a sleeve and an alined spaced nut having opposed recessed ends, a plurality of connecting anchoring strips having their respective ends secured in said sleeve and nut recesses, bend-locating die grooves adjacent said secured end, and an intermediate die groove in each strip locating bends thereof in a transverse plane between said sleeve and nut to radially spread said strips intermediately to the diameter of said sleeve, said intermediate die grooves having angular portions cutting through their respective strips adapted to form wall engaging tits at said bends when anchoringly spaced outward by longitudinal collapsing movement of said nut.

4. A wall clamping socket for bolts comprising, a sleeve, an alined nut, and a plurality of connecting strips having die grooves locating initial outward bends of said strips adjacent their respective sleeve and nut ends and reverse bends intermediate their length, movement of said nut toward said sleeve further bending said strips at said initial bends to spread said intermediate bends into wall engagement whereby said nut is clampingly anchored in adjusted relation to said sleeve.

5. A wall clamping socket for bolts comprising, a sleeve, an alined nut, and a plurality of flat connecting strips each having die grooves locating initial outward bends adjacent its respective sleeve and nut ends and a reverse bend intermediate its length unequally dividing said strip length into a sleeve-connecting portion and a longer nut-connecting portion, movement of said nut toward said sleeve further bending each strip to spread said intermediate bends into wall engagement whereby said nut is clampingly anchored in adjusted relation to said sleeve.

6. A wall clamping socket for bolts comprising, a sleeve, a spaced alined nut, and a plurality of bendable flat connecting strips having die grooves locating initial outward bends of said strips adjacent their respective sleeve and nut ends and intermediate reverse bends unequally dividing their lengths into sleeve-connecting portions and longer nut-connecting portions, movement of said nut toward said sleeve bending said strips at said initial bends to spread said intermediate bends, said shorter strip portions acting to radially spread said intermediate bends into wall-engagement in a plane within the length of said sleeve, and said longer strip portions forming anchoring strips to fixedly position said nut in adjusted relation to said sleeve.

7. A wall clamping socket for bolts adapted to engage a round wall aperture and comprising, a non-rotatable aperture-fitting sleeve, an alined nut, and a plurality of bendable flat connecting strips having die grooves locating initial bends increasingly bent into wall clamping engagement by movement of said nut toward said sleeve; said nut having a rotation-preventing radial fin adapted to slidably engage said wall aperture during said nut movement.

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