The following statement is a full description of this invention, including the best method of performing it known to us:

X526-88-1D-14P.C.
This invention relates to an improvement or modification of the bolt anchorage device set forth in claim 1 of Specification No. 402748. Such devices are for use in brick, concrete or other walls, structures or surfaces and serve to provide a secure anchorage for a bolt, stud or the like.

Claim 1 of Specification No. 402748 defines a bolt anchorage device comprising a cylindrical sleeve split or slit at its inner end so that it is expandible over its entire circumference at such inner end, a conical nut inserted in said inner end of the sleeve and internally screwthreaded to receive the end of a bolt and at least one finger extending from the inner end of the sleeve and engaging a slot in the side of the conical nut to prevent rotation of the nut with the end of the finger bent or closed over the nut after the nut has been inserted in the end of the sleeve to hold the nut in position, the whole so functioning that, when the bolt is screwed into the nut, the nut is drawn into the split or slit inner end of the sleeve with a wedge-like action to cause said end to be expanded around its entire circumference to grip the surface of the receiving hole in the wall or structure adjacent the inner end of the sleeve and obtain a secure anchorage therein.
Many types of anchorage devices for the above purpose have been devised in the past. Many are too complicated for economic production. Some do not secure a satisfactory grip around the entire circumference of the receiving hole in the wall or structure. Others again are often difficult to apply effectively as they tend to rotate within the receiving hole when the bolt is being tightened.

The present invention has for its object to provide a simple yet highly efficient bolt anchorage device which does not have the above mentioned disadvantages.

This object is achieved, according to the
invention, by providing an anchorage device as claimed in claim 1 of Specification No. 402748 further including anti-rotation means on the sleeve projecting or adapted to project from the outer surface of the sleeve for engaging the said surface of the receiving hole to
prevent rotation of the sleeve during the screwing of the bolt into the nut.

The anti-rotation means on the sleeve are preferably in the form of tongues spaced around the circumference of the sleeve.

The invention is more fully described aided by reference to the accompanying drawings which illustrate the preferred embodiment. In these views:

Fig. 1 is a plan view of the improved anchorage device.
Fig. 2 is a view of the nut end of the device.
Fig. 3 is a longitudinal section taken on line 3-3 of Fig. 2.
Fig. 4 is a cross-section on line 4-4 of Fig. 1.
Fig. 5 shows the flat blank from which the sleeve is formed.

As is shown in these views, the device comprises the cylindrical sleeve 1 and the conical nut 2, the latter being supported within the inner end 3 of the sleeve.

The sleeve has one slit 4 extending longitudinally the full length of the sleeve and a plurality, preferably three, of shorter slits 5 extending from the inner end of the sleeve to approximately the linear centre of the sleeve. The shorter slits 5 terminate at their closed ends in holes or apertures 6" and the full length slit 4 may have a corresponding aperture 7 at its mid portion.

The anti-rotation means on the sleeve are in the form of tongues 8 spaced around the circumference of the sleeve. Said tongues may be formed in conjunction with the slits 4 and 5 and the apertures 6 and 7. As is shown, slots 9 are cut in the sleeve parallel to the slits.
4 and 5 and extend from the apertures 6 and 7. The portions 10 of metal between said slots 9 and the slits form the anti-rotation tongues 8. Said tongues may be bent outwardly during manufacture to project from the surface of the sleeve or they may be bent outwardly by the user when the device is about to be used.

In the use of the device, the projecting tongues 8 engage the surface of the receiving hole in the wall or the like and prevent the sleeve from rotating during the screwing of the bolt into the nut 2. The tongues, of course, are bent outwardly sufficiently to be so effective depending on the size or diameter of the receiving hole. By forming the tongues by means of the slots 9 parallel to the slits, the tongues when in projecting position for use are sloped in a direction which facilitates insertion of the device into the receiving hole while the ends of the tongues form abutments which, by engaging against the wall of the receiving hole, resist movement of the sleeve in a direction outwardly of the receiving hole.

The conical nut 2 may be held in position in the inner slit end of the sleeve by means of fingers 11 extending from the inner end of the sleeve over the nut and having their outer ends bent or clenched as at 12 sufficiently over the end of the nut to render the nut captive. The nut may also have slots as 13 into which said fingers fit so that the nut is held captive against rotation by being secured to the sleeve. There are preferably two of such fingers and slots, diametrically arranged.
If desired, an apertured bush 14 may be inserted in the outer end of the sleeve to provide a bearing-like support for the bolt. Said bush may have a portion 15 of reduced diameter to fit into the end of the sleeve and a washer-like portion 16 which bears against the end of the sleeve. The bush may be held in position in the sleeve by means of internal pips or projections 17 punched inwardly from the outer end of the sleeve to engage in an annular groove 18 in the reduced diameter portion 15 of the bush. By this construction, the bush is free to rotate within the end of the sleeve while still being captive therein.

In use, the device is inserted in the receiving hole in the wall or structure and the bolt screwed into the conical nut 2 and tightened. This causes the nut to be drawn into the slit inner end of the sleeve so that the tapered external wall of the conical nut exerts a wedge-like action causing the slit inner end of the sleeve to be expanded to grip the internal surface of the receiving hole. The inner end of the sleeve is expanded over its entire circumference so that an efficient grip spread over the whole circumference of the receiving hole is obtained. The apertures 6 at the ends of the slits, by reducing the amount of metal at the base or root portions of the sections of metal between the slits, ensure efficient expansion of the inner end of the sleeve.

As the conical nut is drawn into the inner end of the sleeve by the bolt, such nut is prevented from
rotating with the bolt by the fingers 11 engaging in the slots 13 of the nut, such slots sliding along the fingers as the nut moves further into the end of the sleeve. The sleeve is also, as previously mentioned, prevented from rotating within the receiving hole by the tongues 8 or anti-rotation means as described.

To further improve the grip, the inner end of the sleeve may have surface projections as 19 or may have its surface serrated, milled or otherwise machine roughened.

The sleeve 1 is preferably formed as a flat blank as shown in Fig. 5 and rolled to cylindrical shape, the ends coming together to form the full length slit 4.
1. Bolt anchorage device as claimed in claim 1 of specification No. 402748 further including anti-rotation means on the sleeve projecting or adapted to project from the outer surface of the sleeve for engaging said surface of the receiving hole to prevent rotation of the sleeve during the screwing of the bolt into the nut.
2. Bolt anchorage device as claimed in claim 1 wherein the anti-rotation means on the sleeve are in the form of tongues spaced around the circumference of the sleeve.  
(13th September, 1967)

3. Bolt anchorage device as claimed in claim 2 wherein the sleeve has one slit extending longitudinally the full length of the sleeve and a plurality of shorter slits extending from the inner end of the sleeve to approximately the linear centre of the sleeve.  
(13th September, 1967)

4. Bolt anchorage device as claimed in claim 3 wherein each shorter slit terminates at its closed end in an aperture formed in the sleeve.  
(13th September, 1967)

5. Bolt anchorage device as claimed in claim 3 or 4 wherein the full length slit is enlarged at or near it midpoint, an aperture thereby being formed in the sleeve.  
(13th September, 1967)

6. Bolt anchorage device as claimed in claim 4 or 5 wherein the sleeve has slots parallel to the slits and extending from the apertures, towards the inner end of the sleeve the portions of metal between said slots and the slits forming the anti-rotation tongues.  
(13th September, 1967)

7. Bolt anchorage device as claimed in any one of the preceding claims wherein an apertured bush is inserted into the outer end of the sleeve to provide a bearing-like support for the bolt.  
(13th September, 1967)
8. Bolt anchorage device as claimed in claim 7 wherein the bush has a portion of reduced diameter to fit into the outer end of the sleeve and a washer-like portion which bears against the outer end of the sleeve.

(13th September, 1967)
Bolt anchorage device as claimed in claim 18 wherein the bush is held in position in the sleeve by means of internal pips or projections punched inwardly from the outer end of the sleeve to engage in an annular groove in the reduced portion of the bush.

(13th September, 1967)

Bolt anchorage device substantially as herein described with reference to the accompanying drawings.

(13th September, 1967)

Bolt anchorage device as claimed in any one of claims 14 and made from a flat blank as illustrated in Fig. 5 of the accompanying drawings. (13th September, 1967)

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