E. A. M. BANDOLY.

ANCHORING DEVICE.

APPLICATION FILED OCT. 4, 1920.

1,373,645.

Patented Apr. 5, 1921.

Fig. 1.

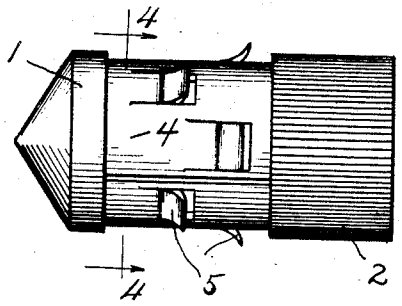


Fig. 2.

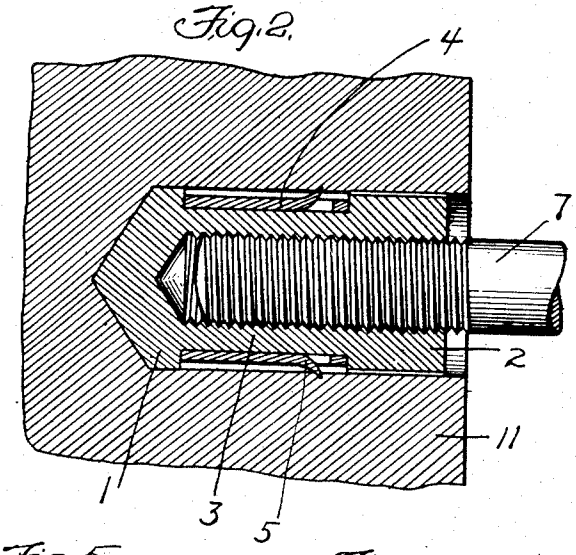


Fig. 4.

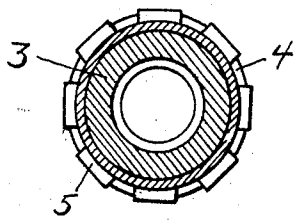


Fig. 5.

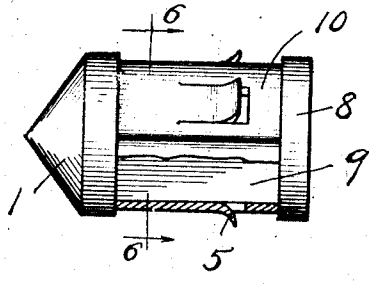


Fig. 6.

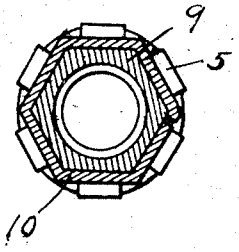
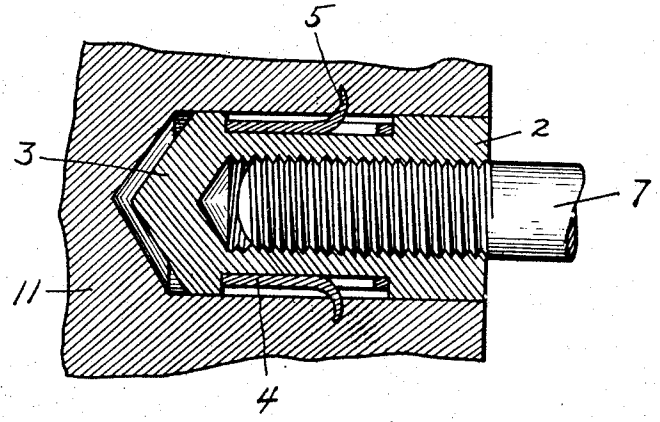


Fig. 3



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UNITED STATES PATENT OFFICE.

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ANCHORING DEVICE.

1,373,645. Specification of Letters Patent. Patented Apr. 5, 1921.

Application filed October 4, 1920. Serial No. 414,442.

To all whom it may concern:

Be it known that I, ERICH A. M. BANDOLY, citizen of Germany, residing at Chicago, Illinois, have invented certain new and useful Improvements in Anchoring Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to fastening devices suitable for use in some of the compressible materials, such as wood, its general objects being to provide simple and inexpensive means for automatically anchoring an object inserted in a bore, so that the inserted object will be able to resist the strains tending to withdraw it. More particularly, my invention relates to nuts suitable for use in connection with machine screws or bolts as substitutes for wood screws in affording permanently secure fastenings. In this aspect my invention aims to provide a nut adapted to be driven into a bore in the wood and so equipped that the inserted nut will be securely locked against rotation, that it will offer a decided resistance to the screw or bolt tending to withdraw it from the bore, and that it will automatically lock itself against withdrawal after a relatively short outward movement due to such a strain.

In constructing phonograph cabinets, piano cases, office furniture and the like, much trouble has heretofore been experienced owing to the loosening of the wood screws used for fastening the various parts to one another. This difficulty has been all the more serious where the demands of haste have not allowed ample time for the proper drying of the wood, as has been true owing to business conditions brought about by the recent war. Consequently, much dissatisfaction has resulted from the loosening of wood screws due to the gradual shrinking of the wood on objects in which these screws were originally quite firmly tightened, and heavy losses have been encountered owing to the rejection and return of the goods which proved defective on this account. Likewise, if either the manufacturer or the purchaser attempted an adequate tightening of the screws, this has sometimes resulted in a stripping of the thread in the wood and a consequent damaging of the object. Moreover, the relatively high pitch of wood screws always makes it easy for them to work loose as compared with the similar pitch of machine screws of corresponding diameter, so that for really permanent fastenings, the machine screws afford decided advantages.

My invention aims to provide means whereby these advantages of the machine screw thread may be employed when making fastenings in wood, and more particularly aims to provide a drive nut which can easily be embodied in the wood and which will effectively anchor itself so as to afford a firm operative connection between the wood and a screw or bolt having a regular machine screw thread. Still further and more detailed objects will appear from the following specification and from the accompanying drawings, in which drawings—

Figure 1 is an elevation of a self-anchoring nut embodying my invention and designed for insertion in a bore corresponding in diameter to the diameter of the tapering cap of the nut.

Fig. 2 is a fragmentary central and longitudinal section through the same nut and through the tail end of a machine screw or bolt associated therewith, showing this nut as it appears after it has been driven into a bore in a board and before it has been subjected through the screw or bolt to a strain tending to withdraw the nut from the bore.

Fig. 3 is a similar section, showing the manner in which the same nut anchors itself in the wood when the screw or bolt associated therewith has moved the nut for a relatively short distance in attempting to withdraw the nut from the bore.

Fig. 4 is a transverse section through the self-anchoring nut of Figs. 1 to 3 inclusive, taken along the correspondingly numbered line in Fig. 1.

Fig. 5 is an elevation of another embodiment, namely a self-anchoring nut having a plain cylindrical tail piece and having both its shank and its anchoring collar hexagonal in cross-section.

Fig. 6 is a transverse section through the embodiment of Fig. 5, taken along the correspondingly numbered line in that figure.

In the embodiment of the first three figures of the drawings, the fastening device of my invention comprises a metal cap nut having a tapering tip 1 connected to a rear end portion 2 by a shank 3 of a diameter somewhat smaller than that of the parts 1 and 2. The cap 1 is desirably of a diameter

slidably fitting the hole which is bored in the wood 11, while the tail end 2 is slightly larger in diameter but suitably fluted (as by nurling) to afford longitudinal ribs on its surface, which ribs are adapted to indent themselves into the wood when the nut is driven into the previously formed bore, so that these ribs will then prevent the nut from being rotated in the bore.

Surrounding the medial shank 3 of the nut is a collar 4 which is desirably formed of spring metal and which has a series of prongs 5 formed from it intermediate of its ends. These tongues all extend toward the tail portion 2 of the nut and initially are sprung slightly outward from the axis of the collar so that the tip or free end of each tongue initially projects for a distance somewhat greater from the axis of the collar than the radius of the bore in which the resulting fastening device is to be inserted. Consequently, when the device (consisting of the said nut and collar) is driven into the bore, the resiliency of the tongues will force their tips to engage the wall of the bore, and a retractile movement of the collar will therefore cause these tips to indent themselves into the wood. To augment this action, I provide the cap 1 with a square shoulder at its juncture with the shank 3, so that the forward end of the collar will engage this shoulder, and I also desirably form the said tongues so that their tips will be acute-angled and therefore more ready to dig into the wood. I also desirably arrange the tongues 5 in a pair of rows extending circumferentially of the collar and with the tongues in successive rows in staggered relation to each other, whereby I increase the number of points at which the collar is engaged with the wood without unduly weakening the collar.

In practice, I have found such a fastening device to be particularly suitable for use in connection with machine screws as substitutes for the wood screws heretofore used in assembling parts of automobiles, phonograph cabinets and various items of furniture. For such purposes, the bore in the wood is desirably made a little in excess of the depth required for the nut, and my fastening device is driven into this bore until its rear end has entered the bore for some distance behind the mouth of the latter. The resulting space between the extreme rear end of the nut and the surface of the wood then allows for a partial retracting of the nut by the initial pull of the screw or bolt 7 which is threaded into this nut. That is to say, when the strain is placed on this screw, the nurling on the rear portion 2 prevents the latter from turning with the screw or bolt, so that the nut slides lightly backward toward the mouth of the hole without rotating. During this sliding movement of the nut, the engagement of the forward end of the collar 4 with the adjacent shoulder on the head 1 moves the collar backward also, thereby causing the tongues 5 to dig into the wood and gradually to turn outward at an increased angle with the axis of the nut, after the manner shown in Fig. 3. Owing to this increased angle, I can secure a holding power or firmness of anchoring far in excess of the holding power of an ordinary wood screw having the same size of shank as the screw 7. Furthermore, since this anchoring can be increased in extent with a slight additional retraction of the nut and collar in case the wood dries out and shrinks, and since I can use a screw of a much finer threading than the ordinary wood screws, I can obtain a security of fastening far in excess of that afforded by the latter.

However, while I have heretofore described my invention in a highly desirable embodiment, I do not wish to be limited to the details of construction and arrangement thus disclosed, it being obvious that various additions, omissions or other changes might be made without departing from the spirit of my invention. For example, the nurling of the tail portion may not be ample to prevent a rotating of the nut when the same is made for large sizes of screws or bolts. For these larger forms, I may employ a smooth cylindrical tail 8 as shown in Fig. 5 and may employ a shank 9 of hexagonal cross-section and I may use a collar 10 of correspondingly angular cross-section. Thus arranged, the forcible engagement of the tips of the tongues with the wood will prevent the collar from rotating, and the interlocking of the angularly sectioned collar with the shank of the nut will prevent the latter from rotating within the collar, hence the tongues will simultaneously anchor the nut both against retraction and against rotation.

I claim as my invention:

1. A self-anchoring nut or the like comprising a main member equipped intermediate its ends with a peripheral groove, and a collar seated in the said groove and having outwardly projecting tongues formed therefrom and all extending in the same direction longitudinally of the collar.

2. A self-anchoring nut or the like comprising a main member having a pair of ends of substantially equal diameter connected by a shank of relatively smaller diameter, one of the said ends having formations directed radially outward therefrom; and a collar of resilient material surrounding the said shank and equipped with tongues all extending toward one of the said ends and all having their tips normally forced outward by the resiliency of the tongues beyond the periphery of the collar.

3. A self-anchoring nut or the like comprising a main member equipped intermediate its ends with a peripheral groove, and a collar seated in the said groove and having outwardly projecting tongues formed therefrom and all extending toward the tail end thereof; the main member having a longitudinally fluted tail end of larger effective diameter than the main portion of the collar, whereby the flutes thereof are adapted to indent themselves in the walls of the bore slidably entered by the main portion of the collar so as to lock the main member against rotation.

4. A self-anchoring nut comprising a peripherally grooved main member slidably fitting the bore into which the nut is to be inserted, and a collar disposed in the said peripheral groove and having resilient tongues yieldingly engaging the said bore, the collar being formed of a single piece of sheet material wrapped around the grooved part of the said main member and the tongues being integral with the collar.

5. For anchoring a peripherally grooved nut in a bore completely housing the said nut, a collar disposed in the said groove and having resilient tongues yieldingly engaging the said bore and all directed toward the mouth of the bore, the tongues being disposed in a plurality of rows extending circumferentially of the collar and with the tongues in adjacent rows in relatively staggered relation.

Signed at Chicago, Illinois, September 30th, 1920.

ERICH A. M. BANDOLY.