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H. ROSENBERG

1,719,136

ANCHORAGE DEVICE

Filed Oct. 24, 1923

Fig. 1.

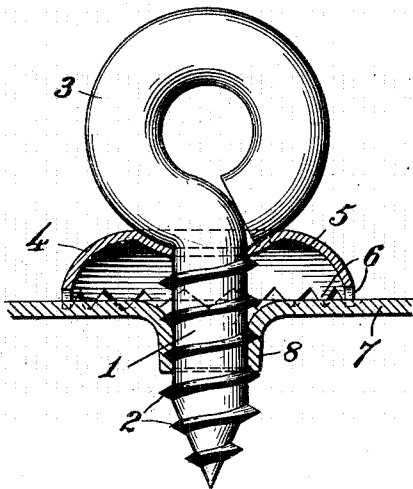


Fig. 4.

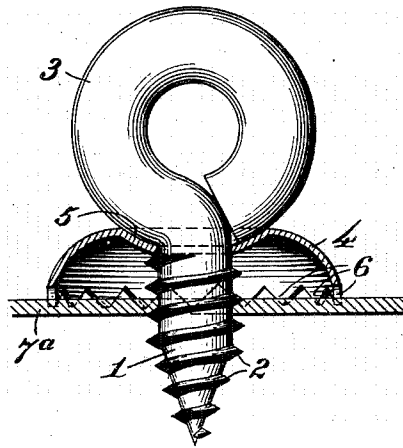


Fig. 2.

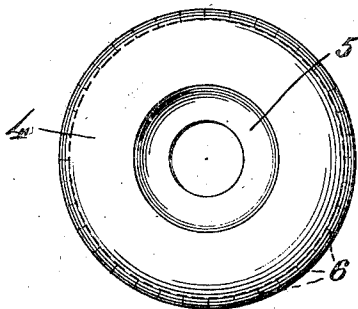
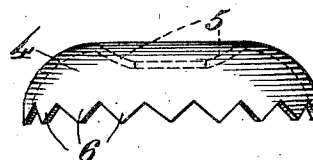


Fig. 3.



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ANCHORAGE DEVICE.

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This invention relates to improvements in supports or anchors, and has as its primary object the provision for effective anchorage under conditions of minimum opportunity for purchase.

A more detailed object is the provision of a construction affording an increased length of bearing for resisting lateral stresses where the normal bearing of the anchoring device is normally relatively short.

A further object in view is the effective anchorage of a structure adapted to receive its main stresses laterally of itself and outwardly of the engaged support.

With these and further objects in view as will in part hereinafter become apparent and in part be stated, the invention comprises certain novel constructions, combinations and arrangement of parts as subsequently specified and claimed.

In the accompanying drawings,—

Figure 1 is a sectional elevation of a structure embodying the features of the present invention.

Figure 2 is a plan view of the collar detached.

Figure 3 is an edge view thereof.

Figure 4 is a view similar to Figure 1 of the anchoring device as applied to a sheet of metal by a different process.

Referring to the drawings by numerals, 1 indicates the body of a screw having the thread 2 and the eye or anchorage extension 3. The thread 2 is of the size and pitch relative to the body approximately the same as that of an ordinary wood screw, and extends from the eye 3 throughout the entire length of the body 1 and terminates at the tip of its pointed or entering end. The thread 2 is hardened so as to cut or enter ordinary soft iron or soft steel substantially without injury to the thread. The hardening of the thread 2 may be accomplished in any well known way, but for purposes of facility and economy, it is preferable to produce the hardening of the thread by the usual cyanide case-hardening process. As will become obvious from the method of employing the screw, the hardening of the surface of the body 1 and eye 3 by the case-hardening process is but an incident of that process, the essential requisite being that the thread 2 shall be hardened to the extent previously indicated. Surrounding the body 1 at its outer portion in position for contacting with the anchorage extension or

eye 3 is a collar 4, which collar is preferably formed of sheet metal and stamped or otherwise brought to a concavo-convex shape. The central portion of the collar 4 is formed with a parti-globular depression 5 adapted to snugly receive and surround a part of the engaged portion of the eye 3, and to permit the eye to freely revolve while engaging the collar. The edge of collar 4 is formed with serrations or teeth 6, 6, and the said teeth are hardened to the same degree as the hardness of the thread 2.

The improved support of anchorage device made up of the screw and collar is adapted to be applied to relatively thin sheet metal structures, such as hollow metal window frames and trim, sheet metal ducts, ceilings and walls, and like sheet metal structures. When the anchorage extension assumes the form of an eye, as shown, it is adapted to receive the cord of a window shade or for attaching a picture frame or the like. It is to be observed that the anchorage extension may assume any other contour than that of an eye, according to the particular use to which it is to be put with the functions of the anchorage device in mind. The anchorage device may be applied either as seen in Figure 1 or as seen in Figure 4. In the former, the relatively thin sheet of metal is indicated at 7 and has been punched with a sharp-pointed, tapering punch having a cylindrical shank which produced the boss 8 formed of the metal of the sheet 7. This formation is somewhat similar to that produced in the manner described in my Patent No. 1,299,232, dated April 1, 1919, and covering certain improvements in the art of fastening sheets together. The opening through the boss 8 is substantially equal in diameter to the diameter of the body 1, and the improved anchorage device is applied by having the entering point of the screw 1 introduced into said bore and the screw revolved. The collar 4 is, of course, placed on the screw before the screw is caused to engage the boss 8. As the screw is revolved, after the introduction of the penetrating point thereof into the bore of boss 8, the thread 2 will cut the metal of said boss or enter the same and form a co-operating internal thread therein so that continued rotation of the screw brings the parts to the position seen in Figure 1. It will be observed that the thread 2 in this position has a very effective anchorage in

the sheet 7, so that direct longitudinal withdrawal of the body of the screw is practically impossible. During the bringing of the parts to this position, as the body of the screw approaches its final position, the teeth or serrations 6 are caused to engage and enter the metal of sheet 7, as clearly seen in Figure 1, until an effectively locked relation is obtained between the three parts, the screw and its anchorage extension, the collar 4, and the sheet 7. While usually too minute for illustration without great magnification, it is a fact that the sheet 7 frequently slightly flexes or buckles under the biting action of the teeth 6 on the one hand and the opposite pulling action of the thread 2 on the other, and such buckling materially increases the locked-together relation of the parts.

When the parts are thus brought to the position seen in Figure 1, the anchorage device is ready for functioning to support anything which may be caused to engage its anchorage extension, and by repeated tests it has been proved that the anchorage is so effective that in practically every instance a large area of the sheet 7 will be torn away, when sufficient stress is placed on the anchorage extension 3, without any indication of any give between the anchoring device and the sheet 7.

The anchorage device, as shown in Figure 4, is identical with that described and the same reference numerals will apply, except that the body of the screw is slightly shorter because of the condition of the sheet to which the anchorage device is to be applied. The sheet 7^a, as seen in Figure 4, has been drilled or perforated by the use of a shearing punch which has formed an aperture of a size to snugly accommodate the body of the screw. The application and functioning of the anchorage device, as seen in Figure 4, is otherwise identical with that described, it being apparent, of course, that the only difference is that the internal thread in the sheet 7^a formed by thread 2 crosses the relatively thin cross section of the sheet 7^a and actually extends a distance less than one-half of the circumference of the body of the screw. The thread 2, however, opposite the internal thread cut in sheet 7^a underlaps the sheet and co-operates to make an effective connection between the screw and sheet. The extent of engagement with sheet 7^a is, therefore, considerably less than the engagement in the structure seen in Figure

1, but nevertheless the anchorage incident to the fact that the thread 2 is hardened and the collar 4 co-operates is effective for all practical purposes and will stand a lateral strain approximating that of the structure seen in Figure 1. In both instances, as will be apparent, the actual length of the bearing for the screw for resisting lateral stresses, such as that resulting from the suspension of a weight, is largely increased.

What is claimed is:—

1. In anchorage devices, the combination of a collar having an edge adapted to engage the surface of a support, and a screw extending through and at both sides of the collar, the portion of the screw extending at one side of the collar being screw-threaded and adapted to engage the support, and the portion of the screw extending at the other side of the collar being adapted to receive and sustain lateral stresses, and having means engaging the collar for stressing the collar toward the support when the screw-threaded portion is screwed into the support, the edge of the collar being hardened sufficiently for entering metal, such as ordinary soft iron or soft steel, substantially without injury to such edge.

2. In anchorage devices, the combination of a collar having a serrated biting edge adapted to engage the surface of a support, and a screw extending through and at both sides of the collar, the portion of the screw extending at one side of the collar being screw-threaded and adapted to engage the support for anchorage thereto, and the portion of the screw extending at the other side of the collar being adapted to receive and sustain lateral stresses and having means engaging the collar for stressing the collar toward the support when the screw-threaded portion is screwed into the support, the serrated edge of the collar being hardened sufficiently for entering metal, such as soft iron or soft steel, substantially without injury to the serrations.

3. An article of manufacture for anchorage devices comprising a concaved collar having its periphery formed into a biting edge and having said edge sufficiently hardened for entering metal, such as soft iron or soft steel, substantially without injury to the edge.

In testimony whereof I affix my signature.

HEYMAN ROSENBERG.