

May 3, 1966

C. O. LARSON

3,248,996

ANCHORAGE DEVICE

Filed June 19, 1964

FIG. 1

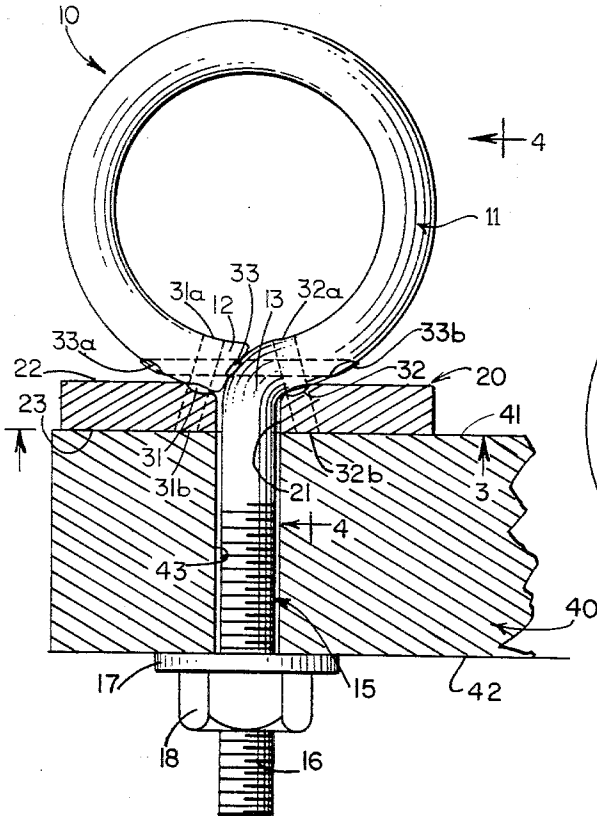


FIG. 3

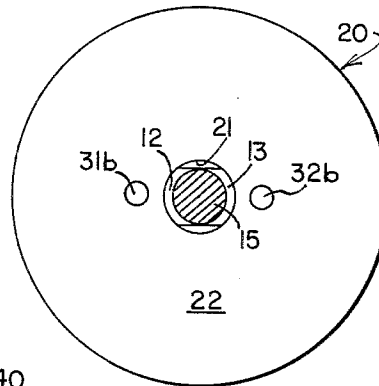


FIG. 2

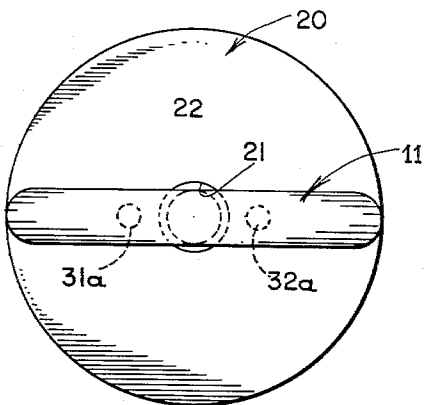
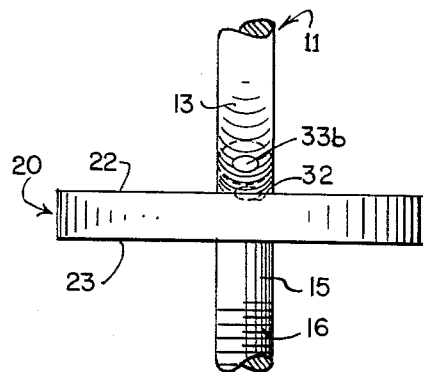


FIG. 4



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ANCHORAGE DEVICE

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Filed June 19, 1964, Ser. No. 376,469
3 Claims. (Cl. 85-9)

This invention relates to anchorage devices and particularly to anchorage devices which combine a shank and an eye and a washer disposed about the shank and adjacent to the eye and joined thereto.

It is an important object of the present invention to provide an improved anchorage device of the type including a shank and an integral eye and a washer about the shank and adjacent to the eye wherein the eye is formed particularly strong by the provision of weldments between the eye and the washer.

Another object of the invention is to provide an improved anchorage device of the type set forth wherein the eye is formed of a rod shaped to provide a generally circular eye with the free end of the eye turned back and abutting an intermediate portion of the rod, the remaining portion of the rod being shaped straight to provide an elongated shank, and wherein a washer having an opening disposed generally centrally therein is provided receiving the shank therethrough with the eye abutting one side of the washer, the washer having a thickness of the same order of magnitude as the diameter of the shank to provide substantial rigidity therefor, and weldments interconnecting the washer and the free end of the rod and interconnecting the washer and the eye adjacent to the juncture thereof with the shank so that the washer through the weldment serves to anchor the free end of the rod to the intermediate portion of the rod during the use of the anchorage device.

Yet another object of the invention is to provide an improved anchorage device of the type set forth wherein the washer further has a diameter which is of the same order of magnitude as the diameter of the eye to provide a substantial bearing surface thereon on the side thereof opposite the eye.

Still another object of the invention is to provide an improved anchorage device of the type set forth wherein another weldment is provided directly between the free end of the rod and the intermediate portion of the rod further to serve to prevent opening of the eye during the use of the anchorage device.

A further object of the invention is to provide an improved anchorage device of the type set forth which has an improved appearance and durability and in which the eye will not open even upon the application of severe loads.

Further features of the invention pertain to the particular arrangement of the parts whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of use, together with further objects and advantages thereof will best be understood by reference to the following specification taken in connection with the accompanying drawing, in which:

FIGURE 1 is a side view of an anchorage device made in accordance with and embodying the principles of the present invention, the anchorage device being shown mounted upon an associated support member having an opening therethrough;

FIG. 2 is a plan view of the anchorage device illustrated in FIG. 1;

FIG. 3 is a view in horizontal section through the anchorage device of FIG. 1 substantially as seen in the direction of the arrows along the line 3-3 thereof; and

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FIG. 4 is a fragmentary side elevational view of the anchorage device of FIG. 1 substantially as seen in the direction of the arrows along the line 4-4 thereof.

Referring now to the drawings, and particularly to FIG. 1 thereof, there is shown an anchorage device generally designated by the numeral 10 and made in accordance with and embodying the principles of the present invention. The anchorage device 10 includes an eyebolt having an eye 11 and a shank 15 which are preferably formed from a single rod of circular cross section which is shaped to provide the various parts thereof. More specifically, one end of the rod is shaped substantially circular to provide the eye 11, the free end 12 of the rod being turned back and abutting an intermediate portion 13 thereof to complete the circular eye 11. The other end of the rod is shaped straight to provide the elongated shank 15, the free end of the shank 15 being externally threaded as at 16.

A circular washer 20 is provided having a circular opening 21 therethrough which receives the shank 15 therein, the lower portions of the eye 11 as viewed in FIG. 1 resting upon the upper surface 22 on the washer 20. The thickness of the washer 20 is substantial, and more specifically is substantially equal to the diameter of the rod from which the eye 11 and the shank 15 are formed so as to provide a washer having substantial rigidity. The diameter of the washer 20 is of the same order of magnitude as the diameter of the eye 11 and as illustrated in the drawings, the diameter of the washer 20 is equal to the external diameter of the eye 11.

Three weldments are provided to secure the eye 11 in its desired shape and to interconnect the eye 11 and the washer 20. The first weldment generally designated by the numeral 31 is between the free end 12 and the washer 20, and more specifically between the under surface of the free end 12 as viewed in FIG. 1 and the upper surface of the washer 20 adjacent to the opening 21 therethrough. Preferably the weldment 31 is a spot weld and a column of metal illustrated by dashed lines is actually fused in the formation thereof, the electrodes having been placed at points marked 31a and 31b. A second weldment 32 is provided between the eye 11 and the washer 20, and more specifically between the undersurface of the eye 11 at the juncture with the shank 15 and the upper surface 22 of the washer 20 adjacent to the opening 21 therethrough. The weldment 32 is preferably formed by spot welding and a column of metal illustrated by dashed lines is rendered molten and fused by the application of electrodes at the points marked 32a and 32b. A third weldment 33 is formed between the free end 12 and the intermediate point 13, and a column of metal illustrated by dashed lines as rendered molten by the application of electrodes to the points marked 33a and 33b. The weldments 31, 32 and 33 serve fixedly to interconnect the free end 12 to the intermediate portion 13 to preserve the integrity of the eye 11, and to firmly interconnect the eye 11 and the washer 20. It will be seen that the weldment 33 directly resists attempts to open the eye 11 upon the application of a load thereto, and the weldments 31 and 32 also resist opening of the eye 11 since any forces tending to open the eye 11 are transmitted from the free end 12 and the intermediate portion 13 to the washer 20 which resists separation therebetween.

The anchorage device 10 is particularly designed for use with a support member such as the support member 40 illustrated in FIG. 1 and provided with a substantially flat upper surface 41, a substantially flat lower surface 42 and a circular opening 43 therethrough of a diameter such that it readily receives the shank 15 therein, the thickness of the support member 40, i.e., the distance between the surfaces 41 and 42, being less than the length

of the shank 15 so that the threaded end 16 of the shank 15 can extend beyond the lower surface 42 thereof. The lower surface 23 of the washer 20 bears upon the upper surface 41 of the support member 40, the relatively large area of the surface 23 providing a good contact between the washer 20 and the support member 40 and stabilizing the position of the anchorage device 10. The lower end of the shank 15 is provided with a washer 17 and a cooperating internally threaded nut 18 so as fixedly to mount the anchorage device 10 upon the support member 14.

In a typical illustration of the use of the anchorage device 10, the device 10 is utilized to anchor one end of a cable to the support member 40, the cable passing through the eye 10 and being fastened to itself to provide a loop extending through and connected to the eye 11.

The anchorage device 10 can withstand substantial loads without opening of the eye 11 because of the use of the weldments 31, 32 and 33. There also is an improved resistance to bending of the anchorage device 10 at the junction between the eye 11 and the shank 15 due to the presence of the washer 20 thereabout, the washer 20 receiving a substantial portion of the bending forces directly from the eye 11 and distributing them throughout a substantial area for transmission to the underlying support member 40. The washer 20 further distributes the forces tending to push the shank 15 against the edges of the opening 43 in the support member 40 throughout a substantial area so as not to enlarge the opening 43 or to cause shifting or giving of the position of the anchorage device 10 with respect to the support member 40, whereby the position of the anchorage device 10 with respect to the support member 40 is rendered more secure and less subject to shifting during use.

Summarizing, the anchorage device 10 is strong and more rugged than the anchorage devices of the same character provided theretofore and having the same weight and gauge materials therein. Furthermore, the anchorage device 10 does a better job of firmly securing and maintaining its position with respect to the support member 10. The washer 20 serves a plurality of functions including resistance to bending the eye 11, minimizing the bending of the anchorage device of the juncture between the eye 11 and the shank 15 and substantially eliminating movement of the shank 15 with respect to the support member 40.

It will be seen that there has been provided an anchorage device which fulfills all of the objects and advantages set forth above. While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications can be made therein and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. An anchorage device for use with a support having an opening therethrough, said anchorage device comprising an elongated rod, one end of said rod being shaped to provide an eye with the free end of the rod turned back and abutting an intermediate portion of the rod, the other end of said rod being shaped straight to provide an elongated shank, a washer having an opening disposed generally centrally therein and receiving said shank therethrough with said eye abutting one side of said washer, said washer having a thickness of the same order of magnitude as the diameter of said shank to provide substantial rigidity therefor, a first weldment interconnecting said washer adjacent to the opening therethrough and said eye at said free end of said rod, a second weldment interconnecting said washer adjacent to the opening therethrough and said eye adjacent to the juncture thereof with said shank, said first and second weldments rigidly interconnecting said washer and said eye and securely anchor-

ing said free end of said rod to said intermediate portions of said rod to prevent opening of said eye during the use of said anchorage device, and the free end of said shank being threaded and adapted to extend through the opening in an associated support with said washer and said eye disposed on one side of the associated support and said threaded shank and extending beyond the other side of the associated support.

2. An anchorage device for use with a support having an opening therethrough, said anchorage device comprising an elongated rod, one end of said rod being shaped to provide an eye with the free end of the rod turned back and abutting an intermediate portion of the rod, the other end of said rod being shaped straight to provide an elongated shank, a washer having an opening disposed generally centrally therein and receiving said shank therethrough with said eye abutting one side of said washer, said washer having a thickness on the same order of magnitude as the diameter of said shank to provide substantially rigidity therefor and having a major dimension thereof of the same order of magnitude as the major dimensions of said eye to provide a substantial bearing surface thereof, a first weldment interconnecting said washer adjacent to the opening therethrough and said eye at said free end of said rod, a second weldment interconnecting said washer adjacent to the opening therethrough and said eye adjacent to the juncture thereof with said shank, said first and second weldments rigidly interconnecting said washer and said eye and securely anchoring said free end of said rod to said intermediate portions of said rod to prevent opening of said eye during the use of said anchorage device, and the free end of said shank being threaded and adapted to extend through the opening in an associated support with said washer and said eye disposed on one side of the associated support and said threaded shank end extending beyond the other side of the associated support.

3. An anchorage device for use with a support having an opening therethrough, said anchorage device comprising an elongated rod, one end of said rod being shaped to provide a substantially circular eye with the free end of the rod turned back and abutting an intermediate portion of the rod, the other end of said rod being shaped straight to provide an elongated shank, a washer having a substantially circular shape and having an opening disposed generally centrally therein and receiving said shank therethrough with said eye abutting one side of said washer, said washer having a thickness of the same order of magnitude as the diameter of said shank to provide substantial rigidity therefor and having a diameter of the same order of magnitude as the diameter of said eye to provide a substantial bearing surface on the other side thereof, a first weldment interconnecting said washer adjacent to the opening therethrough and said eye at said free end of said rod, a second weldment interconnecting said washer adjacent to the opening therethrough and said eye adjacent to the juncture thereof with said shank, a third weldment interconnecting said free end of the rod and said intermediate portion of the rod, said weldments securely anchoring said free end of said rod to said intermediate portion of said rod and rigidly interconnecting said washer and said eye to prevent opening of said eye during the use of said anchorage device, and the free end of said shank being threaded and adapted to extend through the opening in an associated support with said washer and said eye disposed on one side of the associated support and said threaded shank end extending beyond the other side of the associated support.

No references cited.

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