C. S. GIRVAN.

BOLT ANCHOR, [illegible]NK THEREFOR, AND PROCESS FOR MAKING SAME.

APPLICATION FILED OCT. 28, 1914.

1,286,285.

Patented Dec. 3, 1918.

2 SHEETS—SHEET 1.

Fig. 1,

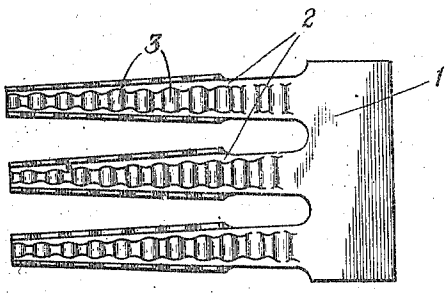


Fig. 2,

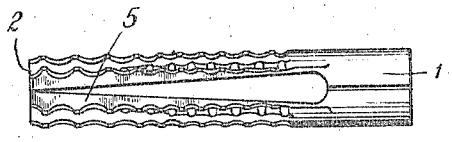


Fig. 3,

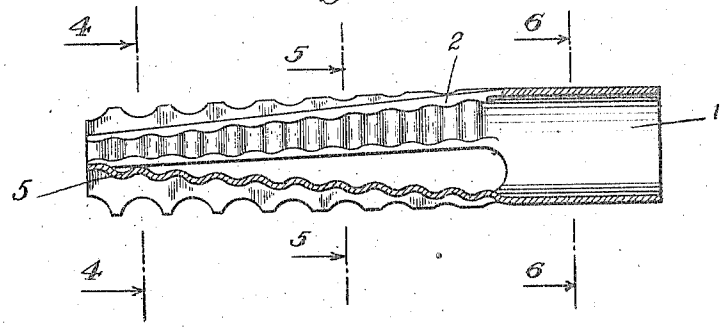


Fig. 4,

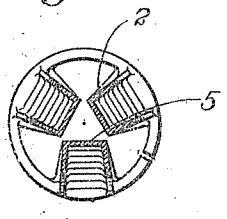


Fig. 5,

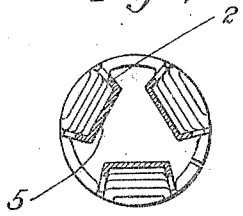
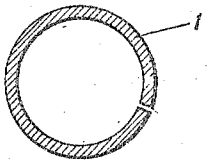


Fig. 6,



WITNESSES:

Newton A. Burgess

F. L. Mooney

INVENTOR

Charles S. Girvan

BY

Kenyon & Kenyon

ATTORNEYS

C. S. GIRVAN.

BOLT ANCHOR, BLANK THEREFOR, AND PROCESS FOR MAKING SAME.

APPLICATION FILED OCT. 28, 1914.

1,286,285.

Patented Dec. 3, 1918.

2 SHEETS—SHEET 2.

Fig. 7.

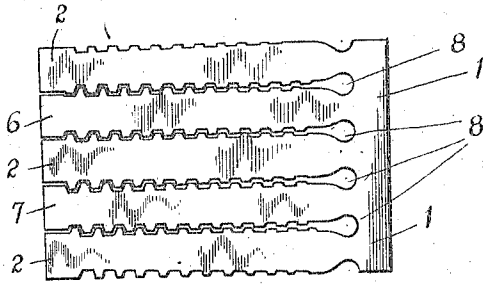


Fig. 8.

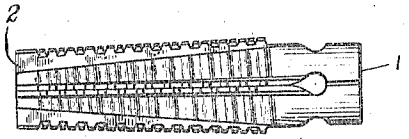


Fig. 12.

Fig. 11.

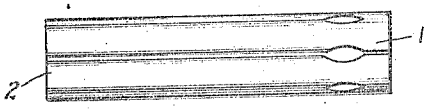


Fig. 9.

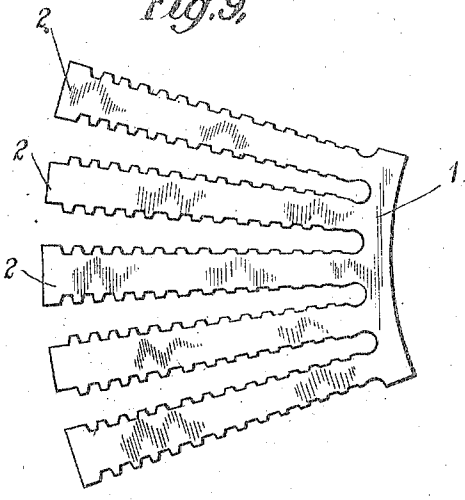
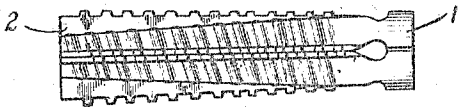


Fig. 10.



WITNESSES:

Newton A. Burgess

F. B. Mowry

INVENTOR

Charles S. Girvan

BY

Kenyon & Kenyon

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES S. GIRVAN, OF WHITE PLAINS, NEW YORK, ASSIGNOR TO LAWRENCE S. JACKSON, OF NEW YORK, N. Y.

BOLT-ANCHOR, BLANK THEREFOR, AND PROCESS FOR MAKING SAME.

1,286,285. Specification of Letters Patent. Patented Dec. 3, 1918.

Application filed October 25, 1914. Serial No. 868,963.

To all whom it may concern:

Be it known that I, CHARLES S. GIRVAN, a citizen of the United States, and a resident of White Plains, county of Westchester, State of New York, have invented certain new and useful Improvements in Bolt-Anchors, Blanks Therefor, and Processes for Making Same, of which the following is a specification.

My invention relates to bolt anchors, blanks therefor and process of manufacturing the same.

My invention is the result of extensive experiments, the object of which was the production of a bolt anchor of the general form shown in the drawings attached hereto with the least possible waste of material and with the least possible distortion and consequent weakening of the metal, as well as with the fewest number of operations in manufacture.

It has been proposed heretofore to manufacture devices of this kind by stamping or otherwise forming a blank in circular form from sheet metal, and then forming this blank into a device of the general form of that shown, for instance, in Figure 8.

It will be observed that in the former manufacture of such an article a considerable amount of metal (about 80%) was wasted. Notwithstanding the fact that from a manufacturing point of view this waste is an item of considerable importance, I am not aware that heretofore anyone has been able to produce an anchor of this character with as little loss of metal as is experienced in the use of my process.

Another point of importance is that when an anchor is made from a circular blank the metal which holds the different gripping members together is so strained in the manipulations transforming it from a disk to tubular shape, that it is considerably weakened, while an anchor, made in accordance with my process, retains all of its strength by reason of the fact that there is no strain put upon it by reason of any strenuous bending. The advantages resulting from my invention are obvious, and consist principally in a great saving of material; a process of few steps or manipulations; and an article of great strength.

My invention also includes many novel features in the blanks and the anchor. These points of novelty will be pointed out specifically hereinafter and claimed at the end of this specification.

My invention will be clearly understood by reference to the following description taken in connection with the attached drawings, which form a part of this specification, and in which—

Fig. 1 shows a blank having three gripping members;

Fig. 2 shows an anchor made from the blank of Fig. 1;

Fig. 3 is a central longitudinal section of Fig. 2;

Fig. 4 is a cross-section on line 4—4 of Fig. 3;

Fig. 5 is a cross-section on line 5—5 of Fig. 3;

Fig. 6 is a cross-section on line 6—6 of Fig. 3;

Fig. 7 shows a blank having five gripping members;

Fig. 8 shows an anchor made from the blank shown in Fig. 7;

Fig. 9 is a modified form of blank having fan shape;

Figs. 10 and 11 show an anchor made from the blank shown in Fig. 9; and

Fig. 12 is an end view of the anchor shown in Fig. 11.

By reference to the drawings it will be seen that the blank consists of a rectangular portion 1 provided with gripping members 2. Certain portions of the members 2 are bent at an angle to the main body portion thereof, as shown in Figs. 2 and 8, 10 and 12. In Figs. 2, 8 and 10 of the drawings the device is represented as having the central portion of each of the members 2 inset with the edges substantially in line with the body portion, while in Figs. 11 and 12 the edges are inset with the central portion substantially in line with the body portion 1. The inset portion is also represented as having threads 3, but these threads may be omitted without in any way altering my invention.

The edges of the gripping members may be serrated for the purpose of forming gripping surfaces to contact with the wall of the opening in which the anchor is placed. If, however, these edges are turned inwardly the teeth form a thread for the bolt. And when turned outward they may be so

arranged that each tooth is placed over the corrugation in which the top of the bolt-thread travels, thereby strengthening and stiffening the gripping member, and at the same time the teeth form a thread that will tend to draw the anchor into the hole should it be given a turning motion while being set in place.

The inset portion of the members 2, whether it is the central part, as in Figs. 2, 8 and 10, or the edges, as in Figs. 11 and 12, is greater at one end than at the other. In the specific embodiment shown in the drawings the inset portion 5 of the gripping members increases in depth from the end nearest the body portion 1 outward. This arrangement is clearly shown in Figs. 4, 5 and 6. The object of this arrangement is to give an opening of decreasing diameter so that when a bolt is screwed into the anchor it will cause the members 2 to expand and firmly grip into the wall of the opening into which the anchor is placed. If it is desired to make the inset deeper at the end nearest the body portion 1, the bolt will be screwed into a nut which will be drawn inward toward the body portion 1 to expand the anchor in the well known manner, or the expansion may be caused by the head of the bolt being drawn inward toward the body portion 1.

It will be noted that in Figs. 1 and 9 the blank shows a space between the gripping members 2, while the blank shown in Fig. 7 has five members with practically no space whatever between them.

In manufacturing the preferred form of blank and anchor, shown in Figs. 7 and 8, the holes or openings 8 are made by punching the same or otherwise forming them and the members 2, 6 and 7 are separated by either punching the members 6 and 7 down while holding the members 2 in horizontal position, or by punching the members 2 down while holding the members 6 and 7 in horizontal position. The central portions of the members 2, 6 and 7 are then inset and, if desired, threaded. After these operations the whole piece is bent upon itself along its longitudinal axis so as to form the piece in substantially tubular form. When so bent it assumes the shape shown in Fig. 8.

When it is desirable to make the teeth conform to the thread the blank is made in the shape shown in Fig. 9—that is, with some space between the different gripping members 2. In this case when it is desired to have five members with the portion 1 of given diameter, the blank is preferably made in fan shape. The members may be made wider at their outer ends than at their inner ends in the event that a great expansion is desirable. When the edges of the members 2 are turned outward, as in Figs. 2, 8 and 10, the teeth at the outer end of the members 2 are made longer than those at the inner end. When the edges are turned inward, as in Figs. 11 and 12, the members are made wider at their outer ends than at their inner ends. The teeth in this case may be the same length, but the depth of inset will be greater at one end than at the other for the reason hereinbefore mentioned. In this case the length of the teeth may be equal to the depth of thread on the screw and are so arranged as to form a thread inside the device of pitch equal to the pitch of the thread on the bolt or screw. The members 2 are then bent by insetting a portion thereof, as above described. The blank is then bent into substantially tubular shape the same as above described regarding that of Fig. 7. Figs. 11 and 12 show an anchor in which the edges 10 of the members 2 have been inturned. These edges have teeth thereon so arranged that they form a thread for the bolt. The inset portion of the members 2 increases from the inner end outward so that the teeth come closer and closer together nearer the outer end of the device. When a bolt is screwed into this opening, the members 2 are expanded and grip the anchoring wall to secure the bolt in position. The outer surface of the anchor may be left smooth, as shown, or it may have indentations or projections made thereon if desired.

My complete process therefore consists in the following steps:

Forming a blank, as by punching, of the shape shown in Figs. 1, 7 or 9; separating the gripping members 2 from each other while having them attached to the rectangular portion 1: bending a portion of each of the members at an angle to the main portion of the member, and if desired, forming threads on the gripping members: and then bending the blank into substantially the shape shown in Figs. 2, 3, 4, 5, 6, 8, 10, 11 and 12.

When desired, the ends of the member 1 may be fastened together by welding, soldering or held together in any suitable way. This will be unnecessary, however, in the usual uses of this device, but it might be considered advisable to join these ends in order to strengthen the device if made for very large bolts.

From the foregoing it is evident that by the use of my process a device is secured which is entirely reliable, which is simple in construction, and which is cheap to manufacture by reason of the fact that there is substantially no waste of material and very few manipulations necessary from the blank to the completed device.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The process of making sheet metal bolt

anchors, which consists in forming a blank of metal having a four sided body portion at one end thereof and a plurality of members attached thereto and extending in the same general direction, offsetting a portion of each of said members and bending said blank upon itself leaving an opening therethrough.

2. The process of making bolt anchors from a four sided piece of sheet metal which consists in forming a plurality of members integral with a body portion at one end of the blank, offsetting the edges of said members and bending said piece into substantially tubular shape along its major axis.

3. The process of making sheet metal bolt anchors, which consists in taking a four sided blank of metal, punching a plurality of members therefrom, said members being united to a body portion at one end and extending to the other end of the anchor, offsetting a portion of each of said members and bending said piece upon itself along its longitudinal axis leaving an opening therethrough.

4. The process of making sheet metal bolt anchors which consists in taking a four sided piece of metal with one side of length equal to the length of the anchor and an adjacent side of length equal to the circumference of the anchor when complete, forming a plurality of members attached only along said second side and offsetting a portion of said members and forming the piece into substantially tubular shape.

5. The process of making sheet metal bolt anchors which consists in taking a four sided piece of metal having one side of length equal to the length of the anchor and an adjacent side of length equal to the circumference of the anchor when complete, dividing said piece into a plurality of members across said second side and separating said members for a greater part of the distance along said first side, offsetting a portion of each member and forming said piece into substantially tubular shape.

6. The process of making sheet metal bolt anchors which consists in taking a four sided piece of metal with one side of length equal to the length of the anchor and adjacent side of length equal to the circumference of the anchor when complete, making a series of openings across the second side of said piece and a substantial distance from one end thereof, separating said metal from one edge of said opening to the farthest end of the piece therefrom, offsetting a portion of each member formed thereby and forming said piece into tubular shape.

7. The process of producing a bolt anchor which consists in forming a blank with an arcuated side body and fan-like projecting segments and curving the body and segments into tubular form.

8. The process of producing a bolt anchor which consists in forming a blank with an arcuated side body and fan-like projecting segments and curving the body and segments into tubular form, with the body at one end and the segments projecting therefrom and insetting the segments into line with the bore of the body to form a bolt anchor with the bore of the body of substantially the same diameter throughout and with a contracted throat in line with the bore.

9. The process of producing a bolt anchor which consists in forming a blank with a side body at one end and fan-like projecting segments extending to the other end thereof and curving the body and segments into tubular form, with the body at one end and the segments projecting therefrom and insetting the segments into line with the bore of the body.

10. A blank out of which to form a bolt anchor having at one end a four sided body portion with a plurality of adjacent members separated except at the end having the said body portion.

11. A sheet metal blank out of which to form a bolt anchor, comprising a body at one end of said blank and a series of segments extending from said body to the opposite end of the blank, each of said segments being in angular relation to an adjoining segment.

12. A blank out of which to form a bolt anchor comprising an arc-like body at one end and a series of segments disposed in fan-like relation thereto and extending to the other end thereof.

13. A blank out of which to form a bolt anchor comprising an arc-like body at one end, and a series of segments disposed in fan-like relation thereto and extending to the other end thereof, each segment having a reduced neck portion where it joins the body.

14. A blank out of which to form a bolt anchor comprising an arc-like body at one end and a series of segments disposed in fan-like relation thereto and extending to the other end thereof, each segment having a reduced neck portion where it joins the body, the edges of the segments being serrated and the middle portions thereof indented and such serrations and indentations terminating short of the neck portions.

15. A blank out of which to form a bolt anchor comprising an arcuated body and a series of laterally disposed segments each in angular relation to the adjoining segment.

16. A blank out of which to form a bolt anchor comprising an arcuated body and a series of segments each in substantially radial relation to the curve of the arcuated body.

17. A blank out of which to form a bolt anchor comprising a curved body and a

series of laterally disposed segments each in substantially radial relation to the curve of the body, each segment tapering toward its outer end.

18. A blank out of which to form a bolt anchor comprising a curved body and a series of laterally disposed segments each in substantially radial relation to the curve of the body, each segment being scored transversely to its center line by indentations increasing in length as the center is approached.

19. A blank out of which to form a bolt anchor comprising a curved body and a series of laterally disposed segments each in substantially radial relation to the curve of the body, each segment tapering from its outer end toward the center along radial lines.

20. A blank out of which to form a bolt anchor comprising an arcuated body, and a series of laterally disposed tapering segments attached thereto.

21. A bolt anchor comprising a body portion, a plurality of members integrally attached thereto, said members having one edge thereof inturned throughout their length to form a bearing surface for an expansion member.

22. A bolt anchor comprising a body portion, a plurality of members integrally attached thereto, said members having teeth on an edge thereof and being inturned throughout their length so that the teeth thereon form a thread.

23. A bolt anchor comprising a body portion of substantially tubular shape, a plurality of members integral therewith, said members having their central longitudinal portions in alinement with said body portion and their edges inturned throughout their length to form an opening of decreasing size through said anchor.

24. A bolt anchor comprising a tubular open-ended body portion and a plurality of members projecting therefrom, said members having longitudinally disposed anchoring portions in alinement with the body walls and having their longitudinal edges inset throughout their length to form a tapered opening through said anchor.

25. A bolt anchor comprising a sheet metal tubular open-ended body portion and a plurality of members projecting from one end thereof and integral therewith, said members tapering toward the body portion and having longitudinally disposed anchoring portions in substantial alinement with the body portion, said members having their longitudinal edges inturned throughout their length to form a tapered opening through said anchor and teeth on said edges arranged to form a thread.

26. A bolt anchor comprising a sheet metal tubular open-ended body portion and a plurality of integral members projecting therefrom, said members having their longitudinal edges inturned throughout their length, the inturned portion of said edges being greater at the free ends thereof than at the ends adjacent the body portion, said members having their central portion substantially in alinement with the body portion.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES S. GIRVAN.

Witnesses:
NEWTON A. BURGESS,
EDWIN SEGER.