

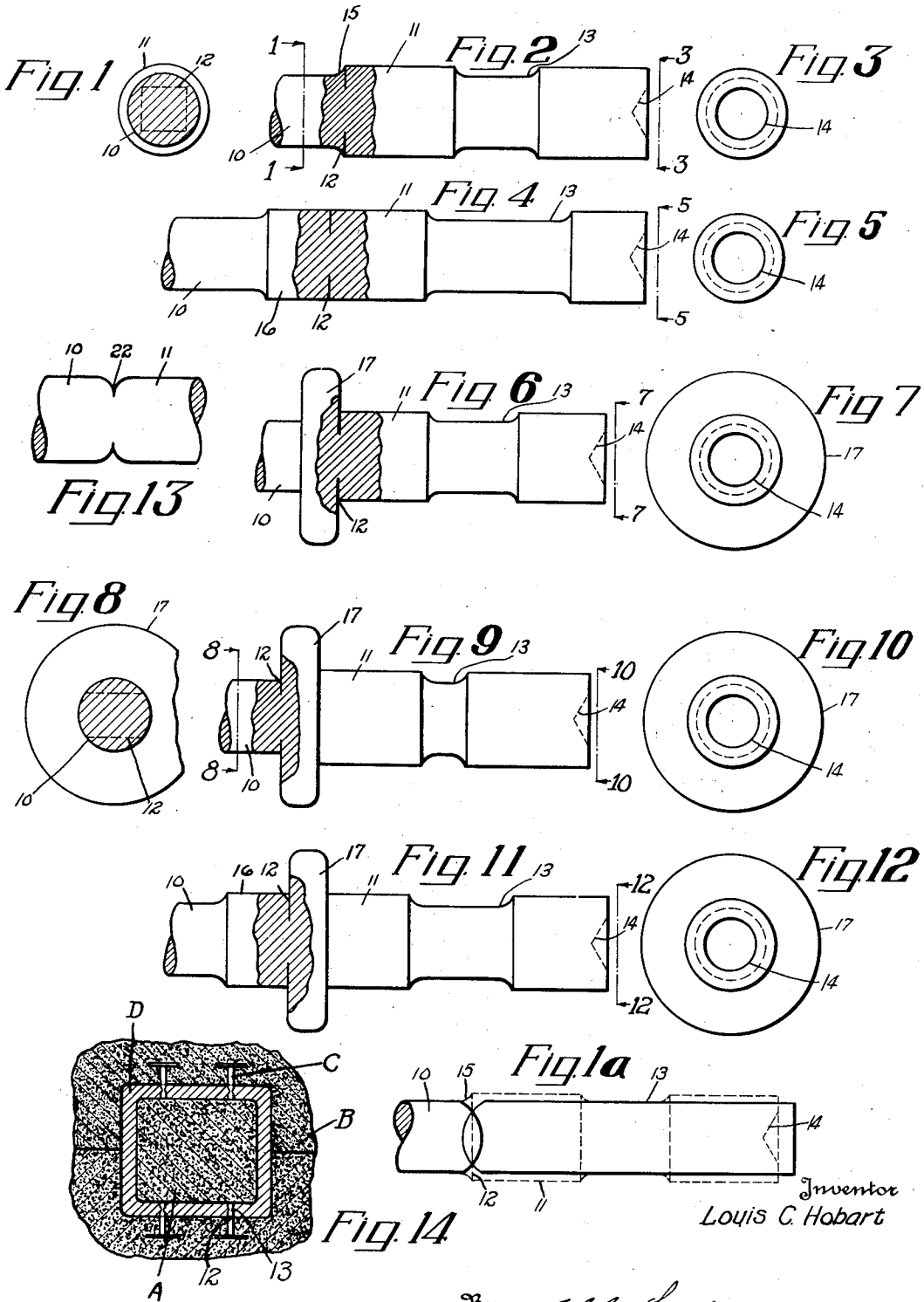
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CHAPLET

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CHAPLET

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This invention relates to the art of chaplets, such as are used in conjunction with molding apparatus for core supporting purposes.

A chaplet of a type now commonly used comprises a head, which is embedded in the sand of a mold to provide a good supporting base or foundation, and a wire part extending perpendicularly therefrom. The portion of the wire which is cast and fused in the product being molded, and which remains permanently embedded therein, may be known as the stem, while the portion of the wire extending between the head and the stem may be called the shank. It is the shank, together with the head, that is broken off and discarded subsequent to the casting operations. It is conventional practice in this art to provide a frangible connection between the stem and shank in the form of open break-off nicks in the wire between these parts. The stem is also usually provided with knitting nicks, which function to positively anchor the stem in the metal of the article being molded. In some forms of this type of chaplet, a shoulder is provided in the stem adjacent to the break-off nicks which serves to facilitate accurate positioning of the chaplet in the mold.

A chaplet made in accordance with the prior art as above characterized has certain disadvantages when put into use. The heat of the molten metal affects the stem to render it plastic and susceptible to deformation by the pressure of the core as the liquid metal tends to float it. The open break-off nick leaves only a small part of the original wire diameter as a support for the stem, the openings, or nicks proper offering no support. As a result, the cores are very often displaced from their proper position, and a very large loss, due to improper casting sections, has been evidenced in the prior art due to this condition. The prior art practice is also characterized by the use of a wire part, which is of a uniform maximum diameter throughout the stem and shank. The diameter of the wire must necessarily be sufficient to have the break-off and knitting nicks formed therein and still leave a minimum sectional area that is adequate for core supporting purposes. This condition results in the use of more material than is necessary, as will be pointed out more fully hereinafter.

With the foregoing in mind, this invention has in view the provision of a chaplet of novel form which obviates the above noted unfavorable conditions. The invention contemplates a chaplet, including a frangible connection between the stem and shank, which also is effective to resist

distortion of the metal of the stem while heated so as to insure of the core remaining in proper condition during the metal pouring operation, and thereby reduce core displacement to a minimum.

Another important object is to provide for a novel type of fusing or knitting anchorage between the stem and the cast metal. With these ends in view, as well as the economical considerations of using as small an amount of material as feasible, I propose to avail of a practical manufacturing process of comparatively simple nature by which my improved chaplets may be made. My novel process is characterized by the positioning of the smaller diameter shank portion of the wire part in confining dies, and then upsetting the metal to provide the larger diameter stem portion, and at the same time close the break-off nicks which were formed in the wire. Upsetting of the metal at the end of the stem may be effected by an indenting operation to provide an enlarged portion which cooperates with the enlarged portion first made, to provide the knitting groove or interlock which anchors the stem in the cast article.

Other objects will be in part obvious, and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawing, wherein:

Figure 1 is a transverse section through the wire part of a chaplet made in accordance with the present invention. This view is taken about on the plane represented by the line 1—1 of Figure 2.

Figure 1a is a view, somewhat diagrammatic, showing a part of the wire part with the nicks formed therein prior to the upsetting operations. The dotted lines bring out the outline of the metal after the upsetting has been effected.

Figure 2 is a fragmentary showing, partly in section and partly in elevation, of the chaplet shown in Figure 1.

Figure 3 is a view in end elevation of a chaplet shown in Figure 2.

Figure 4 is a view similar to Figure 2, showing a modified form of a part of a chaplet embodying the improvements of this invention.

Figure 5 is an end view of the chaplet shown in Figure 4.

Figure 6 is a showing of another modified form, while

5 Figure 7 is a view in end elevation of the chaplet shown in Figure 6.

Figure 8 is a transverse section through a part of still another form of chaplet, and is taken about on the plane represented by the line 8—8 of Figure 9.

Figure 9 is a side view, partly in section and partly in elevation, of the stem and a portion of the shank of the chaplet shown in Figure 8.

Figure 10 is an end view of the chaplet shown in Figure 9.

Figure 11 is a view developing still another modified form, while

Figure 12 is an end view of the chaplet shown in Figure 11.

Figure 13 is a detailed showing of the prior art break-off nicks after having been compressed by the core while in a semi-plastic condition as when the mold is poured.

Figure 14 is a showing, somewhat diagrammatic, of the manner in which the chaplets are used.

Referring now to the drawing, and more particularly to Figure 14, the sand core of a mold is indicated at A, while the mold itself is shown at B. Chaplets for positioning the core A are referred to generally by the reference character C, and it is notable that the chaplets C have stem portions, extending through the metal of the article being cast, which is designated D.

Referring now more particularly to Figures 1, 2, and 3, one of the chaplets C is shown as having a shank 10 and a stem 11, the stem being of a greater diameter than the shank 10. Intermediate the shank 10 and the stem 11 is a frangible connection at 12, which takes the form of break-off nicks which have been closed, as by pressing the edges of the nicks together. The formation of the particular type of frangible connection 12 is a result of the upsetting operation, which also results in the increased diameter in the stem 11 as compared to the shank 10, and in the fusing or knitting groove shown at 13. The finished chaplet will also have a recess in its end, as shown at 14, which is a result of the indenting operation which takes place incident to the upsetting of the metal at the end of the stem.

In manufacturing a chaplet such as is shown in Figure 2, a wire part of the diameter of the shank 10, cut off to the proper length and provided with open break-off nicks of the usual form as brought out in Figure 1a, is clamped in supporting dies and acted on by a punch provided with a recess of the proper shape to produce the enlarged portion in the stem. The metal of the end of the stem is then upset, as by indenting, to provide the enlarged portion of the end of the stem, as shown in the several figures of the drawing. With this arrangement, any desired width of knitting groove may be provided without waste of metal, as in a turned or cut groove; the frangible connection has been properly reinforced so that the shank 10 will resist distortion of the stem incident to the heating thereof when the metal is poured. Hence the core part A will be properly positioned during casting operations and the liability of faulty castings due to core displacement will be reduced to a minimum.

It is notable that in the form of chaplets

shown in Figures 1, 2, and 3 the metal of the shank 10 merges into the increased diameter of the stem 11, as shown at 15, substantially at the point (or in the plane) of the frangible connection 12.

In the type of chaplet shown in Figures 4 and 5, the increased diameter in the stem 11 has been carried back past the frangible connection 12 a considerable distance, as shown at 16, this to provide a better support for the stem back of the break-off line. The same upsetting operations are availed of to make the chaplet shown in Figure 2, and the several other modified forms herein illustrated and described, the only change being in the shape and adjustment of the tools (namely, supporting dies and upsetting punch) embedded in the cast article or projecting above its surface. Obviously, dies of any desired shape may be employed to provide the desired shape in the finished product.

Figures 6 and 7 develop still another modified form for the chaplet which includes an annular shoulder 17 that is formed as a part of the shank 10 and is positioned adjacent to the frangible connection 12 between the shank 10 and the stem 11.

Figures 8, 9, and 10 develop a still further modified form in which the shoulder 17 is formed as a part of the stem, rather than as a part of the shank. When this type of chaplet is used, the shoulder 17 remains embedded in the cast article after breaking off of the shank 10.

Figures 11 and 12 bring out a chaplet in which the shank 10 is formed with an enlarged portion 16 back of the break-off line between the stem and shank, and in which the shoulder 17 is formed as a part of the stem.

Figure 13 shows the condition of the frangible joint between the stem and shank of a prior art chaplet after the stem has been subjected to heat and compression. It is notable that when the nicks 22 are made sufficiently large to provide the desired frangibility, the stem is supported only across a small portion at the center. This is to be contrasted to the fully supported condition of the stem which exists after the break-off nicks have been closed, as by the precepts of this invention.

It is evident that, while the novel chaplet provided hereby is of a distinctly novel shape and design, it is readily manufactured by a comparatively simple process; namely, that of upsetting the metal to form a stem portion. The same operations are effective to provide chaplets of different design merely upon changing of the upsetting tools. The use of this type of chaplets results in a large saving of material, as the minimum diameter in the wire is employed throughout the shank and in a portion of the stem, and yet the necessary knitting or fusing groove is provided, as well as the frangible connection between the stem and shank which functions to properly support the stem.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the

scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. A chaplet of the character described comprising a shank and a stem integrally joined together by a frangible connection that consists of break-off nicks, the sides of which are in engagement.
2. A chaplet of the character described comprising a head, and a wire part extending therefrom constituting the stem and shank portions of the chaplets, the wire part being partially severed between the stem and shank portions, the line of severage being closed up to cause abutting engagement of the sides thereof.
3. A chaplet of the character described comprising

integral stem and shank portions, there being a frangible connection between these portions, the stem having spaced enlarged portions of greater diameter than the major part of the shank, one of the enlarged portions on the stem being continued to the shank so that it extends on both sides of the frangible connection between the stem and shank.

4. A chaplet of the character described comprising integral stem and shank portions, the stem having spaced enlarged portions of greater diameter than the major part of the shank, there being formed in one of said enlarged portions a frangible connection consisting of break-off nicks the sides of which are in engagement.

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