

Sept. 13, 1932.

C. G. RAIBLE

1,877,049

CHAPLET

Filed Feb. 25, 1930

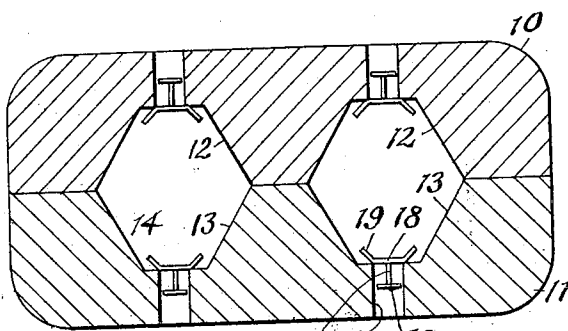


Fig. 1.

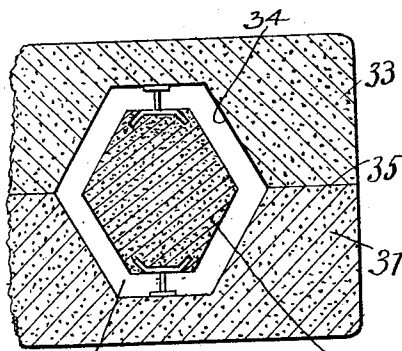


Fig. 2.

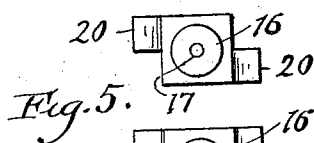


Fig. 3.

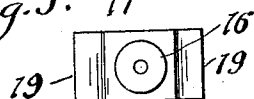


Fig. 4.

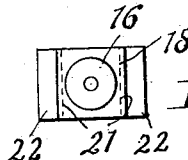


Fig. 5.

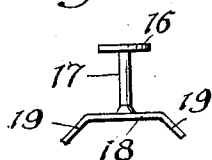


Fig. 6.

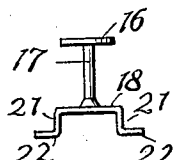


Fig. 7.

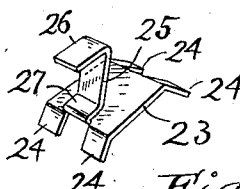


Fig. 8.

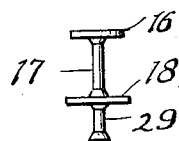


Fig. 9.

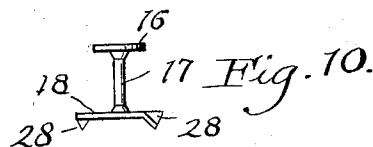


Fig. 10.

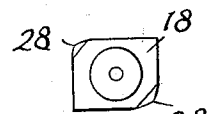


Fig. 11.

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UNITED STATES PATENT OFFICE

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CHAPLET

Application filed February 25, 1930. Serial No. 431,145.

This invention relates to chaplets, and methods and apparatus for utilizing the same in metal founding, for the purpose of holding a core spaced from the walls of a mold, and while the invention is of general application, it is of particular importance with respect to founding of castings having comparatively thin walls, such as radiator sections, automobile manifolds and the like.

10 It is an object of the present invention to provide a chaplet having spaced heads, in which one of the heads is so constructed that it may be received in a depression in the wall of a core box, and the other head is so constructed as to prevent the entrance of core sand into this depression.

15 A further object is to provide a chaplet having a head provided with an anchorage adapted to project into the cavity of the core box so as to be embedded and baked in the core.

20 Another object of the invention is to provide a novel method of employing chaplets in metal founding, whereby the chaplets may be located and otherwise manipulated in the core room, thus avoiding more difficult handling in the molding room.

25 A still further object is to mount the chaplets on the core in such a manner that they will be automatically located by positioning the core in the mold.

30 Still another object of the invention is to provide a chaplet having anchorages, and methods for utilizing the same, whereby the necessity of chipping or other removal of the anchorages from the external surface of the casting are avoided.

35 Other objects and features of novelty will be apparent as the following description proceeds, reference being had to the accompanying drawing, in which:

40 Fig. 1 is a cross section through a core box showing the novel method of employing the chaplets.

45 Fig. 2 is a section through a portion of a mold having a core, with chaplets according to the present invention having anchorages embedded in the core.

50 The remaining figures are details of various modified forms of chaplets embodying the principles of the present invention and

suitable for carrying out the novel method.

Fig. 3 is an elevation of a chaplet of the rivet type having a second head on the stem thereof, with anchorages thereon;

Fig. 4 is a plan view of the chaplet shown in Fig. 3;

Fig. 5 is a modified view similar to Fig. 4;

Fig. 6 is an elevation of a chaplet of the rivet type, with a modified anchorage;

Fig. 7 is a plan view of the chaplet shown in Fig. 6;

Fig. 8 is a perspective view of a chaplet which may be cut or stamped from sheet metal;

Fig. 9 is an elevation of a further modified chaplet of the rivet type;

Fig. 10 is an elevation of a still further modification; and

Fig. 11 is a plan view of the chaplet shown in Fig. 10.

The customary use of chaplets in metal founding has been in the molding or pouring room, to merely rest the bottom of the chaplet on the wall of the sand mold and to then place the core on the chaplets so as to afford a support therefor. With thin-walled castings the positioning of the chaplets is a very tedious process inasmuch as the chaplets are necessarily very small, and also of relatively unstable equilibrium. Furthermore, conditions in the founding or molding room are unfavorable for fine work, and the molders and foundrymen, being trained and equipped for the relatively heavy work of molding, are unable to position small chaplets skillfully and rapidly.

According to the present invention, the positioning of the chaplets is associated with the preparation of the core, rather than the mold. Thus the arrangement of the chaplets may be taken care of away from the mold room, preferably in the core room, where conditions are much more favorable for rapid work with small chaplets, inasmuch as the core room is cleaner, and the workmen there are trained and equipped for lighter and more skillful work. It is, therefore, obvious that the present invention will speed up production where very small chaplets are em-

played, and also result in more satisfactory manipulation of the chaplets.

Referring more particularly to the drawing in connection with the following detailed description of preferred embodiments of method and apparatus according to the present invention, there is shown in Fig. 1 a core box constructed of metal or other rigid material, and comprising a top portion or core pan 10 and a bottom portion or core drier 11. The core box portion 10 is provided with a plurality of recesses 12, and the portion 11 is provided with corresponding and co-operating recesses 13, which, together with the recesses 12 define the core cavity 14. The shape of the core cavity is of course predetermined by the shape of the core desired, which is in turn predetermined by the shape of the internal cavity desired in the hollow casting to be poured.

The portions 10 and 11 are further provided with holes 15 which may be drilled or otherwise formed therein, and extend into the material of the core box from the base of the cavities 12 and 13. These holes are adapted to receive chaplets for retaining the core spaced from the walls of the mold with which it is to be used.

The chaplet comprises a head 16 of such area and shape as to be received in the hole 15, and a stem 17 of such length as to hold the head 16 spaced from the core, at such distance that the overall length of the chaplet at the stem is equal to the desired thickness of the metal to be cast. A base or second head 18, parallel to the head 16 and spaced therefrom by the stem 17, is preferably constructed of sheet metal and of larger area than the head 16, so as to overlies and close the hole 15, as well as to prevent the head 16 from extending into the hole a distance greater than the desired thickness of the metal to be cast. The plate 18 is further provided with an anchorage 19 which extends away from the head 16 so as to project into the core cavity 14 and thereby to be embedded in the core formed in this cavity.

While the hole 15 may be any desired shape, it is preferably cylindrical so that it may be easily bored or drilled in the core box, and the head 16 is preferably, but not necessarily, circular so as to fit nicely therein, and at the same time permit the head 16 and the stem 17 to both be formed by a rivet, so that the entire chaplet may be constructed by merely securing plate 18 to a rivet having a head of the desired shape and stem of the desired length. The forms shown in Figs. 3 to 11 inclusive, with the exception of Fig. 8, may all be constructed in this manner if desired. However, for the present method, it is only necessary that the hole 15 and the head 16 be of such relative shapes as to permit the head 16 to be received in the hole 15, and that the plate 18

be of such dimensions as to prevent its entrance into the hole 15.

In the preferred embodiment of the invention shown in detail in Figs. 3 and 4, the base plate 18 and the anchorages 19 are all formed from a single rectangular piece of sheet metal, the anchorages being formed by flanges 19 bent away from the head 16 at an angle of about 45 degrees. These flanges may be cut away as shown in Fig. 5 leaving staggered anchorages 20 on the opposite sides of the plate 18.

In the form shown in Figs. 6 and 7 the anchorages are formed by flanges 21 bent outwardly on each side of the plate 18 at right angles thereto, and again bent laterally forming flanges 22 perpendicular to the flanges 21. This form may be further modified as shown in Figs. 4 and 5 by cutting away outer portions of the plate 18, thus leaving staggered flanges 22 on the opposite sides of the base plate.

In the form shown in Fig. 8, the entire chaplet may be struck or stamped from a single strip of sheet metal. This chaplet is Z shaped in elevation, and the base 23 thereof is rectangular, with anchorages 24 projecting therefrom to give it an H shape in plan. A strip of metal is struck up from between the two anchorages at one edge of the base and folded as shown to form an inclined flat stem 25 and a flat rectangular head 26. To insure that the inclined stem 25 will clear the edge of the holes 15, the same may be offset as at 27. It should be noted that the head 26 may be formed from the metal from between the anchorages 24 of the next blank, so that a minimum amount of scrap is produced.

In the rivet type of chaplet shown in Figs. 10 and 11, the rectangular base plate 18 has the corners thereof bent down at the desired angle, forming triangular anchorages 28 at diagonally opposite portions of the base plate 18.

The anchorages may also be formed by an extension of the stem 17 passing through the base plate, in which case the base may be secured on the stem of a rivet. The projecting stem may afford sufficient anchorage for some purposes, but it is preferred to deform the stem so as to afford a better grip or bond for the core material.

In Fig. 9 the stem 29 is upset at the end, as shown, to provide the desired anchorage.

With any of the forms of chaplets described above, the same may be inserted in the holes 15 in the core box, hereinbefore referred to. In forming the core, the upper half 10 of the core box is removed and with the chaplets inserted as described, the core material, preferably sand, is filled into the recess 13 flush with the upper surface of the portion 11. The portion 10 is likewise provided with chaplets and the recesses 12 are filled in, the portion 10 being reversed from

the illustrated position for convenience in this step. The two halves of the core box are then fitted together and the core material in the recesses 12 will join with the core material in the recesses 13 to form the desired cores 30. It will be obvious that the step of filling the recesses with core material will cause the core material to fit in, under and around the anchorages 19, with the result that these anchorages will be embedded in the core. Also the plate 18 being of larger area than the hole 15 will effectually prevent the core material from entering the holes 15.

When the cores have been formed as described above they are preferably baked so as to harden them and increase the bond between the core material and the anchorages 19. After the cores are formed, the top portion 10 may be lifted off, the heads 16 of the chaplets clearing the same by virtue of the holes 15, and the core 30 may then be lifted out of the recesses 13 in the bottom portion 11 of the core box, the heads 16 of the lower chaplets readily passing out of the holes 15. Thus a hard core is provided with chaplets having anchorages embedded in the core, and the chaplet stems and heads projecting outwardly from the surface of the core.

This core may now be positioned in a green sand mold such as shown in Fig. 2, in which the cope and drag portions of the flask are omitted. The lower or drag portion 31 of the mold has a recess 32 formed therein by the lower portion of pattern, and the upper or cope portion 33 of the mold has a recess 34 formed by the upper half of the pattern, the line of parting between the two portions of the mold being indicated at 35. The two halves of the mold will be formed in the manner customary in the art, and before the upper half of the mold has been applied, the core 30 with the chaplets mounted thereon may be inserted bodily into the recess 32, the head 16 of the lower chaplet resting on the bottom of the recess in the lower half of the mold. When the upper half 33 of the mold is applied, the head 16 of the upper chaplet will engage the top wall of the mold recess 34.

The sprues for conducting the molten metal to the mold cavity in pouring have not been indicated, inasmuch as this expedient will be obvious to those skilled in the art, as well as the functioning of the chaplets when positioned according to the present invention.

However, it may be briefly stated that the chaplets are constructed of such material, preferably Swedish iron, as will become fused into the metal of the casting as the same is poured, and form an integral part of the finished casting. With hollow castings where tightness is essential, as in radiators and manifolds, prior chaplets have been a source of leakage, which is largely avoided by the

present invention. The theory of this is considered to be that with thin castings, the metal will freeze quickly enough to afford the main support for the core, so that smaller chaplets may be used, of size sufficient for substantially only lateral support to resist being moved by the flowing metal.

While several embodiments of the present invention have been illustrated and described in such a detail as to enable any one skilled in the art to practice the invention, the scope of the invention is not to be limited to any of the details disclosed other than as necessitated by the prior art, but instead includes such embodiments of the broad idea as fall within the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A chaplet having spaced heads of different sizes, means connecting said heads and holding the same in spaced relation, and an anchorage on the larger head extending in a plane other than parallel with the plane of said connecting means.

2. A chaplet having a stem, a head at one end of said stem, a larger head on said stem and spaced from the first head, and a projection on said larger head extending angularly with respect to said stem.

3. A chaplet having spaced heads, one of said heads having extensions projecting angularly therefrom with respect to the stem and away from the other head.

4. A chaplet comprising a stem, spaced heads carried by said stem, one of said heads being larger than the other and constructed of sheet metal, and having flanges bent outwardly therefrom at an angle with respect to said stem and forming anchorages.

5. A chaplet comprising a stem, spaced heads on said stem, one of said heads being larger than the other and constructed of sheet metal, and having a flange bent outwardly therefrom forming an anchorage, said flange being disposed out of parallel with said stem.

6. A chaplet comprising a stem, spaced heads on said stem, one of said heads being larger than the other and forming a base, angularly disposed extensions integral with said base and extending in a plane out of parallel with said stem and said stem and the smaller head being formed by folds in sheet metal integral with said base.

In testimony whereof, I hereunto affix my signature.

CHARLES G. RAIBLE.