F. J. NILSSON.

APPARATUS FOR CASTING RADIATORS, SECTIONAL BOILERS, AND THE LIKE.

APPLICATION FILED SEPT. 30, 1913.

1,256,588.

Patented Feb. 19, 1918.

4 SHEETS—SHEET 2.

Fig. 4

Fig. 5

INVENTOR

AttoRENN

WITNESSES:

G. Hogg

B.Cole

Fur Emanuel Nilsson

by Raphael Sagel
To all whom it may concern:

Be it known that I, FRANS JUSTINUS NILSSON, a subject of the King of Sweden, residing at Husqvarna, Sweden, have invented certain new and useful Improvements in Apparatus for Casting Radiators, Sectional Boilers, and the like, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof, this application being a division of my copending application, Ser. No. 628,687, filed May 22, 1911.

This invention relates to the molding and casting of radiators for steam or hot water, low-pressure sectional boilers and other similar apparatus. By using the new device, the sections may be cast separately as well as also, though in a modified form, cast together, in order to produce a cheaper and more solid product than the one obtained by mechanical joining of the sections.

The methods now in use for manufacturing such objects are causing less both of time and money because the quality of the objects produced, depends upon so many circumstances during the molding, that may unfavorably influence their density. In the molding of larger sections, especially, more time is needed to place the chaplets in the pattern than it is required to make up the mold. On account of the purpose of the chaplets it is of the greatest importance, that these be placed in their right position, as otherwise a variance in thickness arises which causes porosities. If the chaplets are not quite clean porosities may result around them because they do not become welded to the metal poured in.

In using hitherto known methods of molding radiators and the like, the great number of chaplets necessary to keep the core in the right position during the pouring is necessitated by the position of the mold during the same, the core as well as the mold offering the largest surface possible to the vertical pressure of the metal poured in. On account of the horizontal position of the mold during the pouring, the metal spreads over the largest surface possible, thus quickly losing its fluidity and life, in consequence of which it becomes more difficult for the metal to run together without forming porosities.

These difficulties are overcome to a great extent by the present method by placing the chaplets in a new way. During the pouring, the mold is put in such a position, that it offers the smallest surface possible to the vertical pressure of the poured metal. With this in view, the gate is arranged in a special way in the making of the mold. By applying these new arrangements, it is also made possible to pour several sections simultaneously with uniform pressure, if the flasks are piled in a tipping frame specially adapted for the method.

In the new method of applying the chaplets still another simplification and improvement may be obtained by using a pattern arrangement, whereby these parts of the pattern arrangement, that correspond to the connecting part between the sections during the pressing in a double press molding machine, are brought into clean contact with each other thus forming a continuous mold, which, when piled in the tipping frame already mentioned, may be put in a position suitable for pouring, whereby all the sections are cast together in one piece, the pressure during the pouring being uniform in all sections.

If two or more sections are cast together in this way, the work on several sections cast together does not amount to more than the work on a single one, if the larger mass to be handled is left out of consideration, which may be easily done considering the modern means of conveyance now at disposal. Another advantage is, that joint leakage, which it has been hitherto impossible to avoid in spite of all precautions taken during the manufacturing cannot take place, when the sections are cast in one piece. If the sections are cast together no reinforcements at the connections are needed, and the risk of the connections corroding by rust is prevented. The process of pouring becomes more simple and allows a considerable saving of space.

Figure 1 of the accompanying drawings represents a side elevation of one embodiment of this casting apparatus adapted for casting a single radiator section, in position for casting.

Fig. 2 represents a transverse section thereof on line 2—2 of Fig. 1.

Fig. 3 represents a longitudinal vertical section on line 3—3 of Fig. 2, of another emb-
bodiment of this invention for casting a series of radiator sections independently of one another, in position to be tipped into casting position.

5 Fig. 4 represents a vertical transverse section thereof on line 4—4 of Fig. 3.

10 Fig. 5 represents a vertical longitudinal section on line 5—5 of Fig. 6 of another embodiment adapted for casting a plurality of radiator sections preparatory to being tipped into pouring position.

Fig. 6 represents a vertical transverse section thereof on line 6—6 of Fig. 5.

15 Fig. 7 represents an elevation of the inner face of one member of a two part flask removed from its companion member and containing a half mold for a single radiator section.

Fig. 8 represents a side elevation of a complete casting apparatus indicated in Fig. 7 and supported in pouring position in a tipping frame.

The same reference numbers indicate corresponding parts in the different figures.

20 When producing one single section in each flask the molding is done in the usual way either by hand or by molding machines of known type. For instance, the molding may be done by pressing a pattern plate into a flask 2 (Fig. 1) which suitably may be provided with a perforated bottom (2). The chaplets 3, made of wire, are dried in the core 4 and placed in such a way that their projecting ends are embedded in the parting of the molds. These chaplets are of such a length, that their ends rest either directly against the inner sides of the flask or otherwise against shoulders 5 (Fig. 7) placed on these sides. The core is prevented from changing position in the right angle direction with respect to the core studs by the resistance the sand offers the studs. One or more of these core studs are used according to the length of the core.

The flask is provided with supporting shoulders 6 (Figs. 1 and 2) on which it rests when in pouring position, so that it stands edgewise in a somewhat slanting position. The opening 7 (Fig. 1) for the drop gate is conveniently made close to the end and in the corresponding edges of the flasks, half of it in one and half of it in the other.

Several flasks may be piled one over the other in a tipping frame and several radiator sections completely separated from one another may be cast therein. In this case the mold is made in a double press molding machine, the flasks are piled on top of each other with the cores in which the chaplets are dried in, placed in such a way, that the projecting ends of the chaplets are embedded in the parting of the flasks piled up.

The frame 8 consists conveniently of two angle irons, 30 and 35, each bent in an angle of 90°. The two angle irons are connected by diagonal crossformed stay 9 and the stay-rods 10. In the outer ends of the lower legs of the angle irons are provided notches 11 for the lower cross connections 12 of a screw clamp 13, that is threaded in its upper end and provided with a hand wheel 14, by means of which a head piece 15 can be pressed against the longitudinally arranged strengthening rib 16° on a plate 16 covering the pile of flasks. Thus this plate keeps the pile together during the tipping, which conveniently is brought about by means of a strap 17 hooked in the upper ends of the angle irons. On the back side of the frame there are two brackets 18 of such a shape, that the plate when resting on these after being tipped comes into a position suitable for pouring. The frame has a plate 19 at its bottom, which bottom plate is perforated in the same way as the covering plate 16. The lowest flask is placed upon this bottom plate and the core 4 is laid in after the core print 20 in the usual manner. The transversal chaplets 3 mentioned above serve as a locking device for the core in all directions.

Some of the flasks in the pile differ from the usual type inasmuch as they in their edges are provided with a notch or recess 7 (Fig. 7) for the down gate 21 in the same way as the flasks shown in Figs. 1 and 2. The metal enters by the opening into and down the down gate 21 into the main runner 22 and from thence into the mold through the ingates or sprays 23.

The chief thing is, that the tap fits well and that it does not touch the bottom of the corresponding recess. The core gases escape in usual manner through canals 25.

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

1. A tipping frame for a casting apparatus comprising right angled bars forming a side and bottom, adapted to support a series of flasks, the side being provided with a series of notches near its upper end and the bottom being provided with notches near its outer end, a detachable top member engaging said side notches, and a side member engaging said bottom notches and provided with a clamping device engaging said top member.

2. A tipping frame for a casting apparatus comprising right angled bars forming a side and bottom adapted to support a series of flasks, the side being provided with legs of different lengths adapted to support the frame at an incline and with a series of notches near its upper end and the bottom being provided with notches near its outer end, a detachable top member engaging said side notches, and a side member engaging said bottom notches and provided with a clamping device engaging said top member.

3. A casting apparatus comprising flasks
having a series of molds disposed in different planes one above another and connected with a common sprue, and a tipping frame including right angled bars forming a side and bottom, adapted to support a series of flasks, the side being provided with a series of notches near its upper end and the bottom being provided with notches near its outer end, a detachable top member engaging said side notches, and a side member engaging said bottom notches and provided with a clamping device engaging said top member. In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

FRANS JUSTINUS NILSSON.

Witnesses:

L. PEMON.

BROR LAGERQUIST.