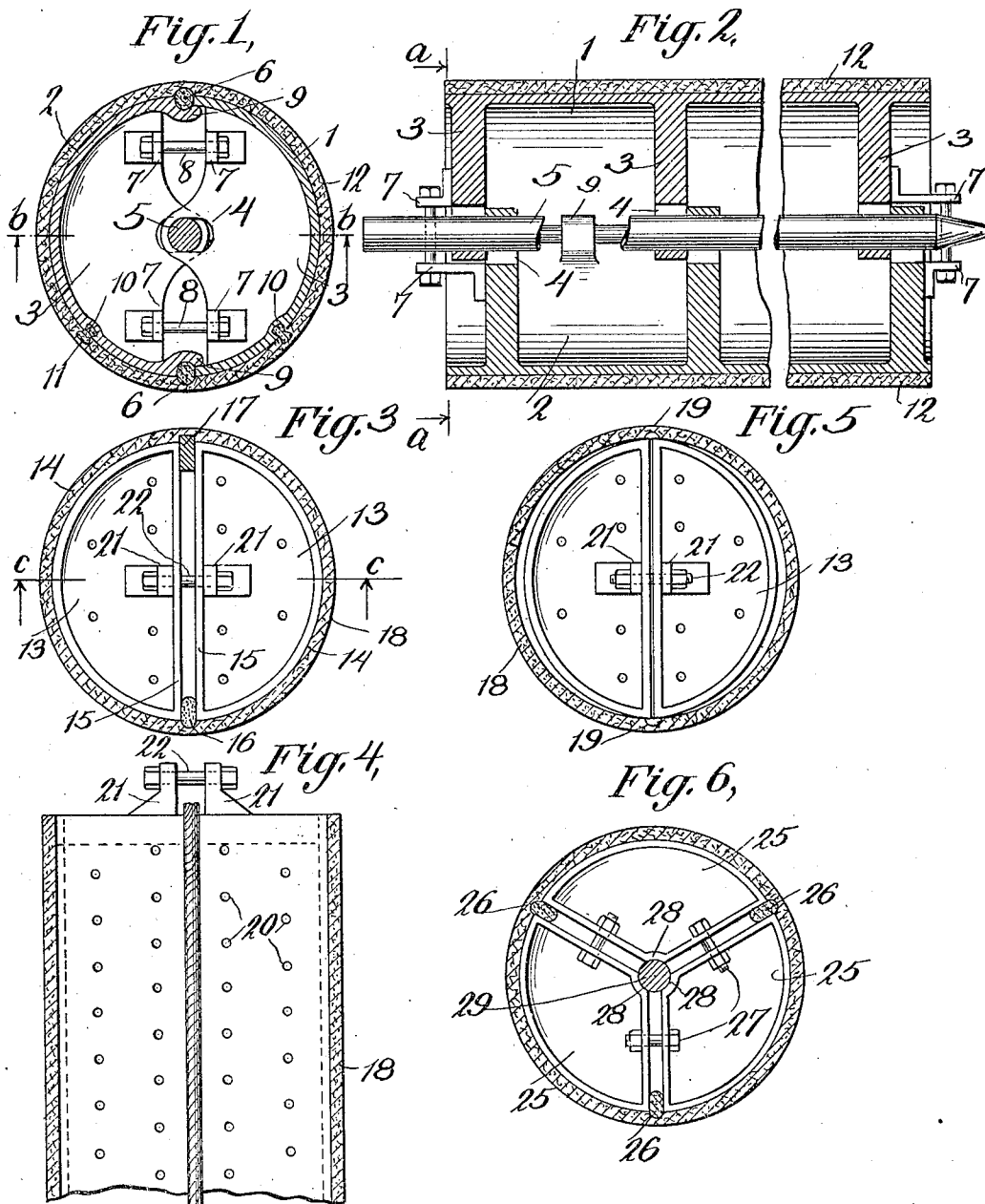


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CORE.

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CORE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK WILLIAM YOUNG, a citizen of the United States of America, and a resident of East Orange, State of New Jersey, have invented certain new and useful Improvements in Cores, of which the following is a specification.

My invention relates to cores for casting hollow cylinders, and it is especially adapted for use in the manufacture of cast-iron pipes and columns and similar articles.

The object of my invention is to provide a core which shall be simple and effective in construction and operation, which shall result in saving of time and material over the methods heretofore in use, and which shall be capable of producing more uniform and reliable results.

My invention consists in providing a plurality of segmental core-bars preferably made of hollow cast iron or steel plate and adapted when secured in position to present an exterior cylindrical surface of appropriate form, the segmental surfaces of said core-bars being separated or held apart an appropriate distance by means of combustible material; in providing means to hold said segmental core-bars in position against the separating-strips of combustible material, and in covering the core-body thus formed with a refractory material, such as clay, loam, or other material suitable for this purpose.

In most of the cores heretofore in use for the purpose of casting hollow cylinders a single core-bar has been employed variously constructed and covered with a layer or envelop of combustible material formed of ropes of hay or other similar material wound around the core or of pulverized or granulated combustible material mixed with clay or loam, the outside of such layer or envelop being itself covered with a layer of refractory core material.

Such a construction is objectionable on account of the time and material consumed in its preparation, on account of the tendency to distort before it has dried and hardened, and, in addition, on account of the difficulty of removing the core from the finished casting. It is also objectionable on account of the core breaking down irregularly during the cooling and contraction of the casting, causing irregularities in the finished casting, which, especially in water-pipes, greatly impairs their usefulness.

In the drawings accompanying and form-

ing part of this specification, Figure 1 is an end view, partially in section on line *a a* of Fig. 2, of the preferred form of my invention. Fig. 2 is a section on line *b b* of Fig. 1. Fig. 3 is an end view, and Fig. 4 a section on line *c c* of Fig. 3, of a modified form of my invention. Fig. 5 is an end view corresponding to Fig. 3, showing the two segmental core-bars drawn together; and Fig. 6 is another modified form of my invention, in which three segmental core-bars are used.

The reference characters are used in the same sense throughout the drawings and specification.

Referring to the preferred form illustrated in Figs. 1 and 2, numerals 1 and 2 represent core-bars of approximately semicircular cylindrical cross-sections, preferably made of cast-iron and having transverse webs 3 on their inner sides. These webs extend beyond the center of the core and are provided with elongated slots or openings 4, in which is received the rod 5. The openings 4 are so proportioned as to permit the adjacent edges of the core-bars to be separated a distance sufficient for the reception of separating-strips 6 made of ropes of hemp, hay, or other fibrous combustible and absorbent material and permit the core-bars 1 and 2 to come together when the separating-strips 6 have been removed or burned. Lugs 7 are secured to the end webs 3, and through these lugs are passed bolts 8, which clamp the core-bars together against the separating-strips 6. On one end of the segmental core-bars I provide lugs 9, which extend across the space between the adjacent edges of the core-bars for the purpose of holding the separating strips or ropes in position while the core is being formed. In some of the cases, especially when making cores for large cylinders, I provide longitudinal grooves 10 along the lower side of the core-bars for the reception of additional strips 11 of fibrous absorbent material for the purpose of providing a greater absorbing capacity on the lower side of the core. Upon the exterior cylindrical surfaces of the segmental core-bars I form a mantle or covering 12, of clay, loam, or other refractory material, and to increase the adhesion between said mantle and the surface of the core-bars the latter are preferably somewhat roughened. The mantle 12 is applied to the surfaces of the core-bars in a plastic condition, and it is then baked or dried in an oven in the usual manner.

In the modified forms shown in Figs. 3, 4, and 5 numeral 13 represents segmental core-bars preferably formed of steel-plate and being made hollow. These core-bars have cylindrical external surfaces 14 of a shape corresponding with the interior of the castings to be made from them and plane division-surfaces 15, between which are located separating-strips of combustible material, the lower strip 16 being preferably made of hay or hemp or other combustible material capable of absorbing moisture, while the upper separating-strip 17 may be of wood, which is less expensive and more convenient to handle. The separating-strips 16 and 17 are preferably located so as to project somewhat outside of the cylindrical surfaces 14. Upon the exterior or cylindrical surfaces of the core-bars 13 a mantle 18, of clay or loam or other refractory material, is applied. The projection of the separating-strips 16 and 17 outside of the surface of the core-bars will leave small recesses 19 on the interior of the mantle 18, and thus facilitate the drawing together of the core-bars. The core-bars are provided with perforations 20 to permit the escape of gases in the usual manner, and they are provided at their ends with extensions or lugs 21, through which pass the bolts 22, which serve to clamp the segmental core-bars together against the separating-strips 16 and 17.

The method I employ in making cores by means of my improved apparatus is as follows: The separating-strips are placed between the segmental core-bars, and said core-bars are clamped against them so as to hold them in accurate alinement and preferably so as to allow the separating-strips to project slightly beyond or outside of the cylindrical surfaces of the core-bars. Plastic refractory material, such as clay or mixture of clay and sand or other suitable core material, is then placed upon the exterior surfaces of the core-bars. The core thus formed is then dried or baked in the usual manner, care being taken that the core is kept in a position in which there is a separating-strip of absorbent material at its lower side until the moisture has evaporated, as otherwise the lower side of the mantle on which the moisture tends to accumulate is apt to separate from the core-bar. The metal is poured around the core thus constructed and prepared. The separating-strips between the segmental core-bars burn away,

and this not only allows the casting to contract as it cools, but also permits the segmental core-bars to be moved inward toward each other and become separated from the refractory mantle, so that they may be easily withdrawn.

It will be observed that by means of my improved construction much less fibrous material is employed than with cores heretofore in use and that the cores may be prepared far more expeditiously. It will also be observed that on account of applying a refractory mantle directly to the metallic surface of the core-bars it is far less likely to become distorted or injured before it is baked or during the cooling and contraction of the casting.

In Fig. 6 I have illustrated a modified form in which three segmental core-bars are employed, (represented by numeral 25.) These segments are separated by separating-strips 26, and they are held together by bolts 27. Curved recesses 28 are formed at the intersection of the division-surfaces of the segmental core-bars for the purpose of receiving the bar 29 against which the segmental core-bars are clamped and held while the core is being constructed. The said bar, however, should be withdrawn before casting.

Having thus described my invention, what I claim is—

1. In a core for casting hollow cylinders the combination with a plurality of segmental core-bars of webs secured to the interior of said core-bars and having elongated openings adapted to receive a rod parallel with the axis of the core-bars.

2. In a core for casting hollow cylinders, the combination with a plurality of segmental core-bars, of separators made of combustible material adapted to be placed between said segmental core-bars, a mantle of refractory material applied to the exterior surfaces thereof and means for holding said segmental core-bars in position while the mantle is being formed, said means being adapted to be removed prior to the casting operation.

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

FREDERICK WILLIAM YOUNG.

Witnesses:

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