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PATENTED MAY 15, 1906.

No. 820,858.

M. H. FLETCHER.
CORE.

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Fig. 1.

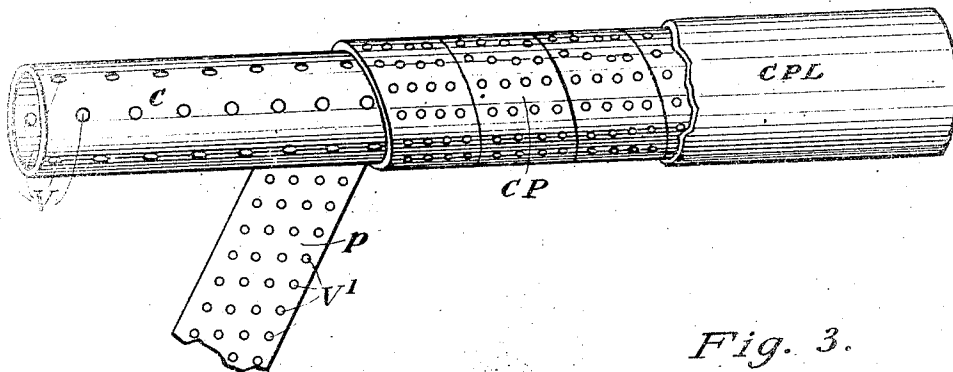


Fig. 2.

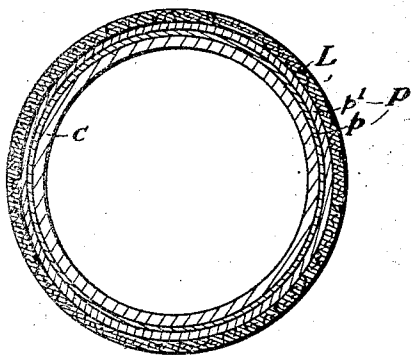
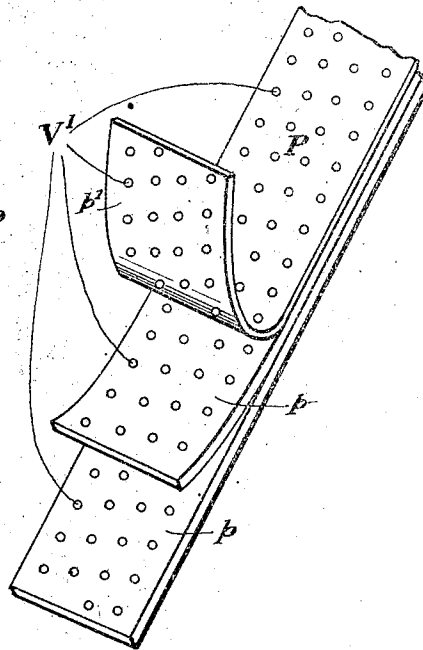


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

MORDECAI H. FLETCHER, OF CINCINNATI, OHIO.

CORE.

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No. 820,858.

Specification of Letters Patent.

Patented May 15, 1906.

Application filed April 10, 1905. Serial No. 254,740.

To all whom it may concern:

Be it known that I, MORDECAI H. FLETCHER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Cores, of which the following is a specification.

My invention relates to cores employed in casting hollow metal articles, and more particularly hollow cylindrical pipes wherein upon a metal core-barrel is superimposed a concentric layer of combustible material and then a core-surface of sand, loam, or the like.

At present in making cores for casting iron pipes such as are used for gas, water, &c., the ordinary practice is to wrap closely upon a metal core-bar which has been previously perforated for venting hay, straw, or like material in the form of rope, so wrapped around the barrel as to make as nearly as possible a solid combustible layer. Upon this layer of hay rope is placed a coating of clay in plastic state. This coating is then thoroughly dried. After drying there is superimposed a final concentric layer of loam which when dried and suitably blackened exteriorly forms the casting-surface of the core. The heat of the molten metal surrounding this core causes the layer of hay rope to be consumed, leaving a space between the core-barrel and the non-combustible layer sufficient to enable the core-bar to be withdrawn. Certain difficulties and disadvantages encountered with this method are briefly as follows: First, even with careful winding there are at times spaces and chinks left between the strands of hay rope into which the plastic clay is pressed as the clay layer is put upon the bar, tending to prevent withdrawal of the bar. This difficulty is increased because of lack of symmetry and uniformity of size of the rope. Then under the intense heat of the molten iron the clay burns tight to the core-bar, forming a hard brickly mass which adheres to and requires much labor and expense in cleaning it from the inner surface of the pipe; second, the layer of hay rope beside being unsymmetrical is unequally compressible, frequently causing an unevenness of the inner surface of the pipe; third, two drying operations are required, causing double cost of labor in handling and more than double the amount of fuel because of greater quantity of material to be dried as well as two dryings; fourth, the hay rope itself is expensive; fifth, the combustible layer is thick and because of the

lack of its uniformity the succeeding layers are necessarily thick to secure an even casting-surface, necessitating the use and handling of large quantities of material with consequent added expense. All these difficulties and disadvantages are overcome by my improved core, with which a pipe with a cylindrical opening of six inches in diameter may be cast on a five and one-half inch core-barrel, whereas formerly a core-barrel four and one-half inches to five inches in diameter would have been used. In this size therefore I would build up not over one-half the thickness of combined combustible and surfacing material. Still the bar may always be drawn with ease.

To this end my invention consists of a core built upon a metal core-barrel suitably vented, in which instead of the hay rope I substitute a foundation layer of paper or other combustible material in sheet form, which may be cut into strips and wound on the bar spirally, if preferred. Upon this is superimposed a layer of loam or other non-combustible material in a plastic state. This is dried by subjecting to moderate heat or a blast of air and is then ready for use.

In the drawings attached hereto, illustrating the structural features of the core designed for use in casting cylindrical pipes, Figure 1 exhibits an exterior view of a vented metal core-barrel partially wound spirally with a strip of combustible material in sheet form and a part of the so-wound portion partially coated with the finishing layer of loam. Fig. 2, a transverse cross-section of a completed core; Fig. 3, a perspective of one kind of combustible material, showing the component sections parted at one end.

Referring to the drawings, C designates a metal core-barrel abundantly vented by suitable drill or other holes *v* to permit the escape of gases formed by heating the earthy layer and the burning of the layer of combustible material, &c. CP designates the core-barrel when wound with the combustible layer P, in this case applied in a strip spirally. This strip is so placed on the bar as to have its contiguous edges close fitting, making a practically solid combustible layer P and then coated with the ultimate loam layer L, against which when coated with the blacking the molten metal is poured. The loam itself composing this layer is designated by the letter L. The combustible layer is in sheet form, may be composed of layers, and may

have an exterior layer impervious to moisture or whose sustaining power is not impaired by the action of water, which is to be next the loam layer. I prefer the use of such a sustaining layer when using the cheap papers, as carpet-papers, which lose their cohesion when long subjected to moisture and which would cease to form a close-fitting layer concentric with the core-bar unless held in place. These layers I have designated as p' , a sustaining layer, and p , an inner readily-combustible layer, of which there may be one or more, according to thickness desired. More than one such combustible sheet layer may be applied, if needed.

The combustible strip may be wound on by hand or any other convenient way and may be held in place by adhesive material or preferably by tying with thin cord or soft wire. All superfluous or overhanging portions may be trimmed away at either end of the bar, or, if applied in a strip, by having the strip previously cut at a suitable bevel at the starting end, and by cutting it at a like angle at the finishing end all waste may be avoided. The loam or finishing layer is turned upon the bar in the usual way after it is wrapped with the combustible layer. The loam layer is then dried and usually blackened on its surface when the core is ready to place in the mold.

The combustion of the layer P while complete because of the intense heat of the molten metal surrounding it is sufficiently slow to enable the loam or finishing layer to retain its proper form until the metal "sets." The combustible layer if not sufficiently porous may be perforated at v for venting and in connection with the vents v permit the free escape of gases engendered in casting, as well as permit sufficient admission of air to properly sustain combustion.

A proper application of the invention will secure more smooth and uniform castings at a smaller cost and greatly decrease the percentage of "failures" or castings so imperfect as to necessitate rejection.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. An improved core for casting hollow objects of metal, consisting of a metal core-barrel having applied thereto a concentric combustible compound layer, whose outer section is waterproof, in sheet form wound on in

a spiral strip and secured in position at each end of the core-barrel, and upon this a concentric layer of loam to form the casting-surface.

2. An improved core for casting hollow pipes and the like consisting of the metal core-barrel wrapped in a spiral direction with a strip of combustible material applied directly to said core-barrel, said strip having flat sides and a substantially uniform diameter from edge to edge, and a non-combustible outer layer.

3. An improved core for casting pipes consisting of the metal core-barrel wrapped in a spiral direction with a relatively wide and thin strip of combustible material whose inner surface is applied direct to the surface of the core and whose outer surface is rendered impervious to moisture, and a non-combustible outer layer.

4. An improved core for casting pipes, consisting of a metal core-barrel wrapped in a spiral direction with a relatively wide and thin strip of combustible material, perforated for venting, whose inner surface is applied directly to the surface of the core and whose outer surface is rendered impervious to moisture, and a non-combustible outer layer.

5. A core for casting hollow pipes and the like consisting of the metal core-barrel wrapped with a combustible layer in sheet form applied directly to said core-barrel, and one or more non-combustible outer layers.

6. A core for casting metal pipes and the like, consisting of a properly-vented metal core-barrel wrapped with a combustible layer in sheet form applied directly to said core-barrel spirally, said combustible layer secured to said core-barrel, and one or more non-combustible outer layers.

7. A core for casting hollow pipes and the like consisting of the metal core-barrel wrapped with a suitably-perforated combustible layer in sheet form, applied directly to said core-barrel, and one or more non-combustible outer layers.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MORDECAI H. FLETCHER.

Witnesses:

JOSEPH R. GARDNER,
CHAS. HERBERT JONES.