(No Model.)

J. C. HILL.

CASTING.

No. 507,365. Patented Oct. 24, 1893.

Fig. 1.

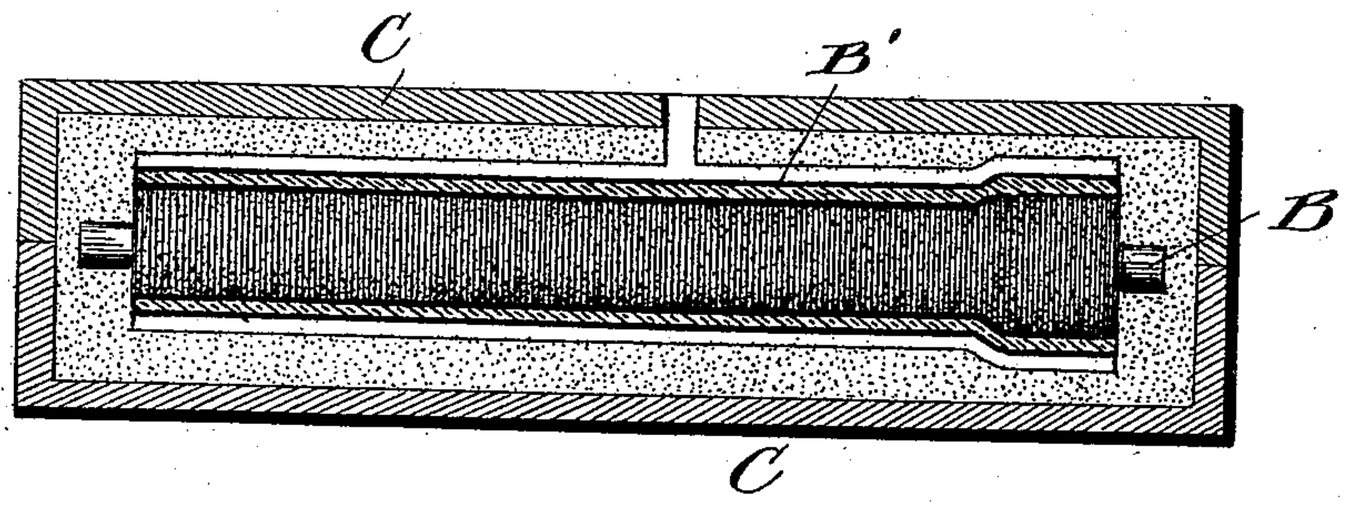
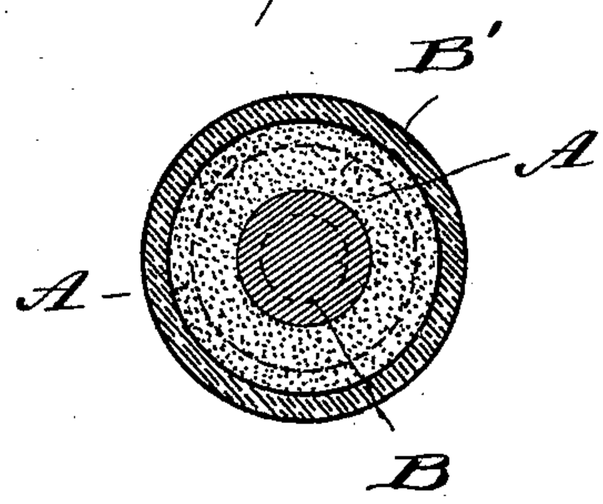


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN C. HILL, OF POTTERSVILLE, NEW JERSEY, ASSIGNOR OF ONE-HALF TO GEORGE W. BROWNE, OF EASTON, PENNSYLVANIA.

CASTING.

SPECIFICATION forming part of Letters Patent No. 507,365, dated October 24, 1893.

Application filed June 9, 1892. Serial No. 436,118. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. HILL, a citizen of the United States, residing at Pottersville, in the county of Hunterdon and State of New Jersey, have invented certain new and useful Improvements in Castings, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in casting, and it has for its objects among others to provide a covering for the core whereby the body of the core is unaffected by the heat of the metal in casting so that it may be thereafter used, thus making a material saving of the sand used. It is customary to wash the outer surface of sand cores for the purpose of securing a smooth surface on the casting but the sand constituting the whole or the outer portion of the core is destroyed, burned out, by the heat of the molten metal and cannot be used again. The principal object of my invention is to save this sand. It is also customary in forming a core for pipe casting with a body of wood, metal or sand or other suitable substance to wind the same with straw rope and to cover the rope with loam and it is the general practice and an almost universal requirement to provide cores with vent holes and passages for the gases eliminated in the process of casting. The use of straw rope tends to increase the quantity of gas and the burning up of the sand; by my invention I am enabled to make solid ventless cores which demonstrates that by its use the gases are excluded from the body of the core.

The composition of matter which I employ consists of ground coal or coke, cinders or other similar substance which is capable of being formed into a pasty moldable state more or less impregnated with salt or salt water. Ground coal or coke is inflammable in that it will burn but only after the application of a considerable degree of heat. By forming a pasty substance of these materials by mixing them with salt and water or salt water or with salt alone they are rendered materially less inflammable in that they are rendered practically incapable of giving off gases when subjected to the heat of molten metal in quantity and in the direction which will cause them to penetrate and burn the interior and protected or coated portions of the core. Herein lies the prime advantage of the invention in that the sand constituting the body of the core is fit for subsequent repeated use in forming new cores. Heretofore when these materials had been used other ingredients have been employed which act to destroy the fire and gas proof characteristic of the salt so that the gases eliminated in the process of casting not only penetrate the molten metal causing blow-holes, but enter the core and burn the life out of the sand of the body portion thereof. In my composition the salt, especially where water is used, forms to a great degree the exterior surface of the core or coating. Where water is not used the heat of the molten metal melts the salt of the composition so that the exterior surface of the coating or composition serves as a practically fire and gas-proof protection to the sand constituting the body of the core. The employment of sawdust, sulphuric acid and petroleum as ingredients of a core coating aids the generation of gases and the destruction of the coating and the incased core sand. My coating acts to prevent the penetration of gases given off when a core coated therewith is subjected to the heat of molten metal. The main portion of these gases is at the exterior surface of the core and the direction in which they trend is outward; this direction being induced by the consumption of the exterior gases as soon as they are formed, while it is assumed that the thickness of the coating is such that no appreciable amount of gas is evolved with a pressure sufficient to cause it to impregnate the body of the core from the interior portions of the coating. Vegetable or combustible matter in the composition is objectionable and if used at all should be to a very limited extent on account of its combustibility and gas-producing faculty. The proportions of the ingredients may be as desired, even to almost entirely coal dust or its equivalent with a slight percentage, say from five to ten per cent. of salt with sufficient water to form a pasty mass, or entirely of salt and sufficient water to cause the salt to adhere to the surface of the core

or finally a large proportion of salt and a small proportion of ground coal or its equivalent.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claim.

The accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, will aid in the understanding of my invention.

In said drawings Figure 1 is a longitudinal section substantially in a central vertical plane through a flask with my improved coated core in position. Fig. 2 is an enlarged cross section through the core.

Like letters of reference indicate like parts in both of the views where they appear.

In carrying out my invention I take a core A of any suitable material; it may be entirely of sand, or of sand provided with a core B of wood or metal or other material either solid as shown by full lines or hollow as seen by dotted lines in Fig. 2; or it may be a hollow wood or metal cylinder as seen by the larger dotted circle in said Fig. 2. This core, however formed or of whatever material it is formed, I coat with a coating formed essentially of coal dust, cinders, coke or other analogous material and salt and water or salt water. In making this composition I take a quantity of the coal dust or cinders or other material and mix therewith a sufficient quantity of salt and water to form a plastic mass and then apply the same to the outer surface of the core as seen at B′ in both views. In Fig. 1, I have shown the core with its coating in a flask C of known construction and when the molten metal is poured through the pour-hole it comes in contact with the coating and not with the material of the core.

What I claim as new is—

A core comprising a body of sand and a coating of coal dust and salt forming a material portion of the cross area of the core and homogeneously united with the body and giving rigidity to the core as a whole, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN C. HILL.

Witnesses:

PETER N. HONEYMAN,

JOHN MILSON.