(No Model.)

E. WHEELER.

METHOD OF FORMING METAL INGOTS.

No. 368,176. Patented Aug. 9, 1887.

Fig. 1.

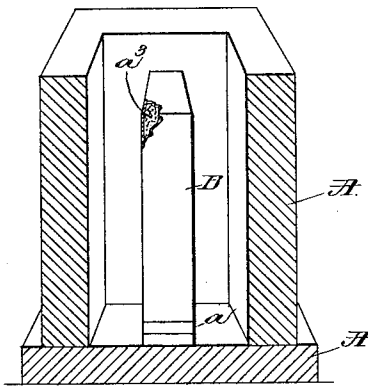


Fig. 7.

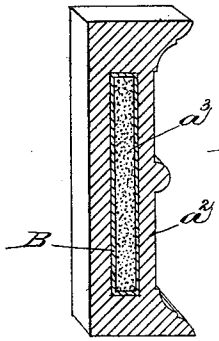


Fig. 2.

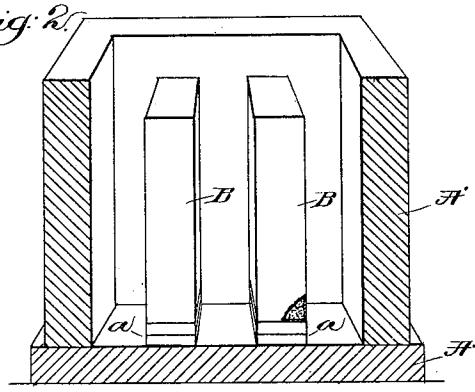


Fig. 6.

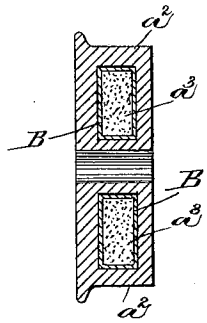


Fig. 8.

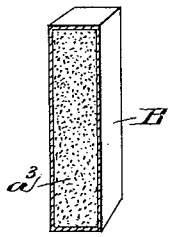


Fig. 3.

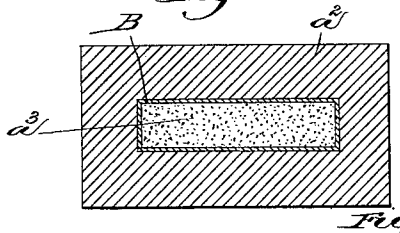


Fig. 4.

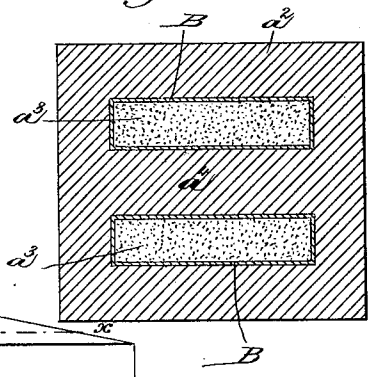
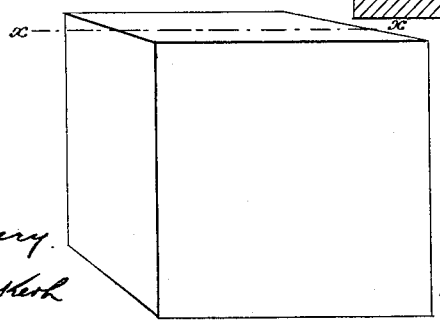


Fig. 5.



Witnesses
Fred L. Emery.
John F. C. Brinkerhoff.

Inventor
Elbridge Wheeler
by Crosby & Gregory
Attys.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ELBRIDGE WHEELER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO WARE B. GAY, GEORGE W. GOGIN, AND HIMSELF, TRUSTEES; ALL OF SAME PLACE.

METHOD OF FORMING METAL INGOTS.

SPECIFICATION forming part of Letters Patent No. 368,176, dated August 9, 1887.

Application filed October 21, 1886. Serial No. 216,843. (No model.)

To all whom it may concern:

Be it known that I, ELBRIDGE WHEELER, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in the Method of Forming a Metal Ingot or Body, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide a novel method by which to produce a metal casting, the external configuration or shape of which, for the use intended for the casting, is derived from the shape of the mold, rather than by rolling or hammering, as in the case of an ingot such as referred to in my application, Serial No. 190,871, filed February 4, 1886.

My improved method is especially applicable for the production, among other things, of columns for building or other purposes, fortification and building blocks, car-wheels, and other articles which may be cast into their ultimate shape, and which when cast do not require to be reduced to ultimate shape.

In accordance with my invention, I place within a mold of any suitable construction, but of the shape it is desired to give to the finished article, one or more non-metallic or silicious bodies, which, for the best results, will be sand contained within a case or jacket, preferably of sheet metal, and when the said non-metallic body is in proper position within the mold, a metal, either iron or steel, or it may be brass or copper, or any other desired metal, is cast or poured into the mold to surround and extend beyond the ends of the said case or jacket.

My improved method for the production of a metal casting therefore comprehends inclosing a non-metallic or silicious body within a case or jacket, placing one or more of said cases or jackets within a mold, and pouring or casting metal into said mold to surround and extend beyond the ends of the said case or jacket, as will be hereinafter specified.

Figure 1 is a vertical section of one form of mold with which to practice my invention, the said mold containing in elevation a case or jacket, the case or jacket being, however, broken out to show the silicious body within it; Fig. 2, a like vertical section of a mold containing two cases or jackets; Fig. 3, a transverse section of a casting such as may be produced in the mold shown in Fig. 1; Fig. 4, a transverse section, and Fig. 5 a perspective, of a casting or ignot produced in the mold shown in Fig. 2, the section being on line $x\,x$ of Fig. 5; Fig. 6, a diametrical section of a car-wheel embodying my invention; Fig. 7, a vertical section of one form of a building-column, and Fig. 8 a detail of the case or jacket.

The molds A A′, resting upon bases A^2 A^3, are herein shown in Figs. 1 and 2 as rectangular in shape; but they may be of any other desired configuration, according to the external shape of the article to be produced.

Referring to Fig. 1, the mold A has placed within it a non-metallic or silicious body, a^3, preferably sand, which is contained within a case or jacket, B, the said case or jacket and its contained body resting, as shown, upon end pieces, a, preferably of metal, and which in practice will be incorporated in and form part of the ingot produced.

The case or jacket B may be placed within the mold in any desired position, it being herein shown as centered to produce a casting or ingot—such as shown in Fig. 3—by casting or pouring a metal, a^2, into the mold A, so as to surround and extend beyond the ends of the case or jacket, the said metal a^2 being either a cast metal—such as iron, or copper, or brass, or any other desired metal or alloy of metals.

Referring to Fig. 2, I have shown two cases or jackets B, supported upon end pieces, a, placed within the mold A′ in such position as to produce the casting or ingot shown in Figs. 4 and 5, it consisting of two silicious bodies, a^3, surrounded by metal a^2, the said bodies being separated by a metal wall or division, a^4.

The casting or ingot shown in Figs. 4 and 5 is especially adapted to be used as a building or fortification block when the metal a^2 is either iron or steel.

Fig. 7, in section, shows a column, preferably of cast-iron, a^2, and a non-metallic or silicious body, a^3.

For the production of a column such as shown in Fig. 7, the mold to receive the cast

metal will be formed in a flask containing the usual loam, the shape of the mold being determined by a suitable pattern, as in ordinary casting; but it is evident any other desired or fanciful design may be thus given to the column.

When a mold of the desired shape has been formed, the non-metallic body a^2, contained within a suitable case or jacket, will be placed therein, it being supported in any suitable manner, and the cast metal to be used will be poured or run into the mold to surround and extend beyond the ends of the case or jacket.

Referring to Fig. 6, I have shown a car-wheel composed preferably of iron, a^2, enveloping a non-metallic or silicious body, a^3.

To produce the car-wheel referred to, a sand or other mold is made in the usual manner employed in the manufacture of car-wheels. Then the pattern is removed, and in the recess in the sand left by the removal of the pattern is placed a circular or segmental case or jacket, B, containing sand or other non-metallic or silicious material, a^3, and when so placed iron or other suitable metal is cast into the mold to envelop the said case or jacket and its contained body. The non-metallic or silicious body contained within and forming part of the metal casting greatly increases the power of the said casting to withstand compression.

I do not herein broadly claim the method of forming an ingot by casting a malleable metal about a non-metallic body contained within a case or jacket, and then reducing the ingot so formed by rolling, hammering, or compression, as such forms the subject-matter of another application, Serial No. 190,871, filed by me February 4, 1886.

I am also aware that a non-metallic or silicious body has been placed within a box-pile, which was then heated and rolled, such a pile being shown and described in other applications filed by me, Serial Nos. 189,429, 189,430, and 189,431.

As shown in Fig. 2, the cases or jackets containing the non-metallic or silicious body occupy positions side by side, with metal intervening between them.

If desired to produce long columns having solid portions, the said cases or jackets may be placed in the mold, one upon the other, with metal slabs or pieces between.

I claim—

The improvement in the art of forming a composite body comprising a metal exterior portion and a permanently-retained non-metallic interior portion, which consists in inclosing in a mold substantially of the shape of the body to be produced a non-metallic body, preferably silicious, contained within a case, and casting metal into said mold to surround and extend beyond the ends of the case, substantially as described.

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

ELBRIDGE WHEELER.

Witnesses:
G. W. GREGORY,
J. H. CHURCHILL.