June 19, 1928. 1,673,873

W. T. HULSIZER

METHOD OF HARDENING CASTINGS AND APPURTENANCE THEREFOR

Filed April 29, 1925

Fig. 1

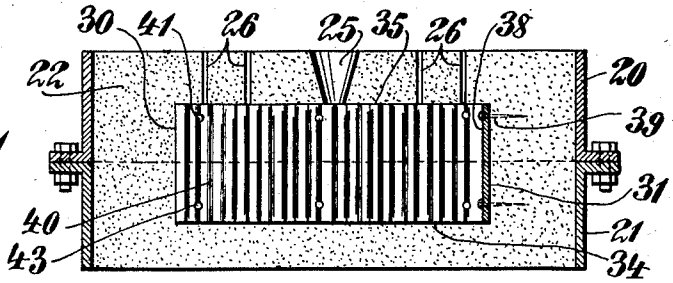


Fig. 2

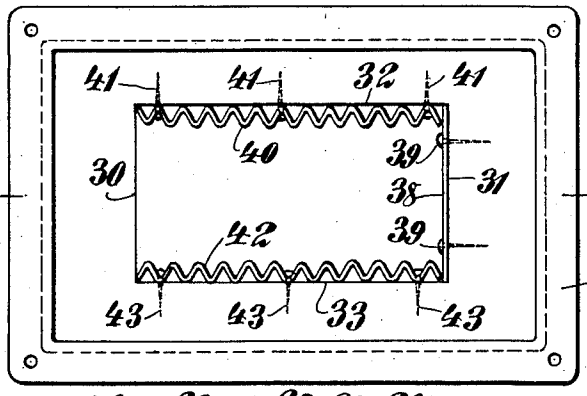


Fig. 3

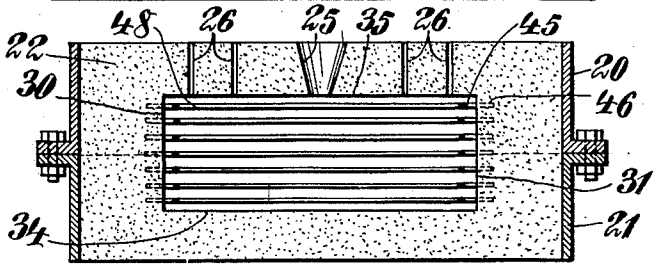
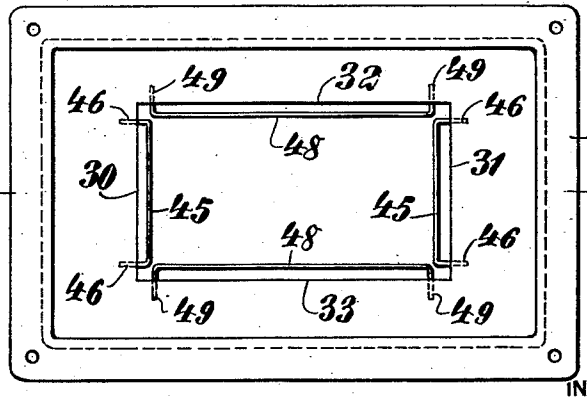


Fig. 4



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UNITED STATES PATENT OFFICE.

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METHOD OF HARDENING CASTINGS AND APPURTENANCE THEREFOR.

Application filed April 29, 1925. Serial No. 26,644.

This invention relates to the method of hardening castings and the appurtenances therefor.

The object of the invention is the production of means whereby the surfaces of castings can be easily hardened. The second object of the invention is the production of means whereby castings can be easily hardened to various depths below the surface thereof.

The organization of the invention comprises a mold which has connected to one or more faces of the cavities thereof, corrugated or plain sheets of metallic aluminum or wires of aluminum of different diameters. When the molten metal is poured into the mold, the aluminum fuses on the casting, and produces hard faces on castings of iron, steel or alloys that are as a whole less hard than aluminum.

In the accompanying drawings Fig. 1 represents a section of a mold as on the line 1, 1 of Fig. 2 exemplifying the invention; Fig. 2 shows a top plan view of the lower member of Fig. 1; Fig. 3 indicates a section as on the line 3, 3 of Fig. 4 exemplifying a modification of the invention and Fig. 4 shows a top plan view of Fig. 3.

Referring to Figs. 1 and 2 a mold is indicated with the cope 20 and the drag 21. The molding sand 22 has formed therein the usual gate 25 and the vent opening 26. The faces of the cavity of the mold are indicated at 30, 31, 32, 33 and 34. In this instance the face 31 of the cavity of the mold has connected thereto the sheet of aluminum 38, by means of the nails 39. The face 32 of the said cavity has connected thereto the corrugated sheet of aluminum 40, by means of the nails 41, and the face 33 of the said cavity has connected thereto the corrugated sheet of aluminum 42, by means of the nails 43.

When the molten metal for the casting is poured through the gate 25 into the mold, the aluminum sheet of metal 38 and the corrugated sheets 40 and 42 are fused and unite therewith and form hardened faces in the casting at the places where the union has taken place. In this instance the hardened faces of the casting corresponding to the walls 32 and 33 of the mold will be deeper than that corresponding to the wall 31 of the mold, the former resulting from corrugated sheets of aluminum and the latter from a flat sheet of aluminum.

Referring to Figs. 3 and 4, the mold is again shown with its cope 20, and the drag 21. The molding sand 22 is again shown with the gate 25 and the vent opening 26. The faces of the cavity of the mold are again indicated at 30, 31, 32, 33, 34 and 35. In this instance the faces 30, 31 of the mold have connected thereto the similar aluminum wires 45 with the legs 46, and the faces 32 and 33 of the mold have connected thereto the similar aluminum wires 48 with the legs 49. The legs 46 and 49 of said wires are respectively forced into the molding sand to hold them in place. The said wires may be of various diameters and various distances apart. When the molten metal for the casting is poured through the gate 25 into the mold, the aluminum wires are fused and unite therewith and form hardened faces in the castings at the places where the union has taken place.

Various modifications may be made in the invention and the present exemplification is to be taken as illustrative and not limitative thereof.

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

1. In combination a mold for making castings, and a corrugated sheet of metallic aluminum located against a face of the cavity of the mold to unite with the molten mass when poured into said cavity and form a hardened face of a depth related to the depth of the said corrugated sheet for the casting produced.

2. In a mold for making castings the combination of a corrugated sheet of metallic aluminum located against a face of the cavity of the mold, and a flat sheet of aluminum located against another face of the cavity, said corrugated sheet and said flat sheet fusing with the heat of the molten mass when poured into the mold and forming hard coatings on the faces of the casting, the corrugated sheet forming a coating of greater depth than the flat sheet.

3. The method of hardening faces of cast-

ings consisting in attaching to the face of the cavity of a mold a corrugated sheet of aluminum metal, attaching to another face of said cavity a flat sheet of aluminum and pouring molten metal into the cavity, said corrugated sheet and flat sheet of aluminum fusing onto the casting produced and respectively forming coatings thereon, the coating produced by the corrugated sheet being thicker than the coating produced by the flat sheet.

In testimony whereof I affix my signature.

WILLIAM T. HULSIZER.