To all whom it may concern:

Be it known that I, DANIEL H. MELOCHE, a citizen of the United States, residing at 2241 Gladstone Ave., Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Coatings for Metal Molds, of which the following is a specification.

This invention relates to an improved coating for the protection of the surface of metal molds exposed to the molten metal. This invention relates specifically to the protection of cast iron molds when used for the production of iron casting in which a refractory coating is used next to the metal of the mold and in which a superimposed coating of lamp black is also used.

The difficulty heretofore found with the coatings used has been that the coatings that were easiest to apply were the least stable and those which were extremely refractory and therefore most desirable would not adhere to the face of the mold. Coatings easiest to apply were volatile or semi-volatile but because they were volatile they were not permanent.

The ideal coating available is fire clay, as this most refractory coating prevents the overheating of the molds and acting as an insulator as well as a refractory coating. Overheating is objectionable because it limits the thickness of the lamp black coating that can be applied and so still further increases the overheating. Various methods have been proposed for making fire clay adhere as a smooth non-blistering coating. I have discovered that if finely ground fire clay be mixed with "water glass," which is the trade name of a solution of sodium silicate in water, and if this mixture of fire clay and sodium silicate solution be applied to a heated metal surface the water evaporates and the sodium silicate acts as a binder for the particles of fire clay. This coating is both tenacious and refractory, the silicate giving it its tendency and the fire clay its refractory and insulating properties. I have found that with this coating I can pour iron at a temperature of 2500° F. continuously at a temperature of 2500° F. continuously and repeatedly without overheating the molds providing a thick coating of lamp black is maintained on the coating. The coating is particularly adapted for use in the production of unchilled iron castings commonly known in the trade as gray iron castings.

Satisfactory results have been obtained by using a 10% saturated solution of sodium silicate in water and mixing an equal weight of finely ground fire clay with the solution. That is to say, I may take 10 pounds of the water solution and add to the same 10 pounds of the finely ground fire clay, which has been found to be an ideal mixture for making certain castings. The quantity of fire clay, however, may be reduced somewhat where the mold having the coating applied thereto is designed for the casting of complicated or intricate castings.

The method of applying this coating is as follows:

The surface of the cast iron or other metal molds being cleaned is first heated to approximately 350° F. and then the solution prepared as described above is applied with a brush, four or five coatings being applied quickly so that a substantial thickness of sodium silicate and fire clay is formed on the surface of the molds.

In actual use the refractory coating is in its turn protected by a thick coating of lamp black renewed between each casting, as described in my co-pending application Serial Number 579,927, filed August 5, 1922.

What I claim is:

1. A coating for protecting iron molds, consisting of an inert refractory insulating material, and a small percentage of soluble silicate acting as a binder only for the refractory insulating material.
2. An insulating refractory wash for coating iron molds, consisting of fire clay powder suspended in water, in which there is dissolved a small percentage of soluble silicate.
3. A coating for a permanent mold to be used in the production of ferrous castings, consisting of fire clay and a heat resisting adhesive.
4. A coating for protecting iron mold surfaces, consisting of an insulating refractory material mixed with water and a heat resisting binder, said coating being adapted to resist a temperature of at least 2000° F.
5. A mold for metal castings, comprising a cast iron body, having a mold cavity and a refractory lining for the surface of...
the mold cavity consisting of a mixture of refractory material and a binder of soluble silicate.

6. A metal mold having its mold surface coated when heated with a wash containing a refractory insulating material mixed with a heat resisting adhesive, and being adapted to resist a temperature of at least 2000°F.

7. A metal mold having its mold surface coated when heated with a wash containing a fire clay mixed with a heat resisting adhesive, and being adapted to resist a temperature of at least 2000°F.

8. A mold for castings, comprising a mold body having a cavity, an insulating refractory coating for the mold cavity adapted to resist a minimum temperature of 2000°F, said coating consisting of an insulating refractory material incorporated with a relatively small quantity of a heat resisting binding substance.

9. A metal mold for the production of unchilled gray iron castings, said mold being lined with a smooth adherent coating of fire clay, and an inorganic heat resisting binder.

10. A metal mold for the production of ferrous castings, said mold being lined with a smooth adherent coating of fire clay, and an inorganic heat resisting binder.

11. A metal mold for the production of ferrous castings, said mold being lined with a smooth adherent coating of fire clay, and a binder of soluble silicate.

In testimony whereof I affix my signature.

DANIEL H. MELOCHE.