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H. S. LEE

PERMANENT MOLD

Filed March 13, 1925

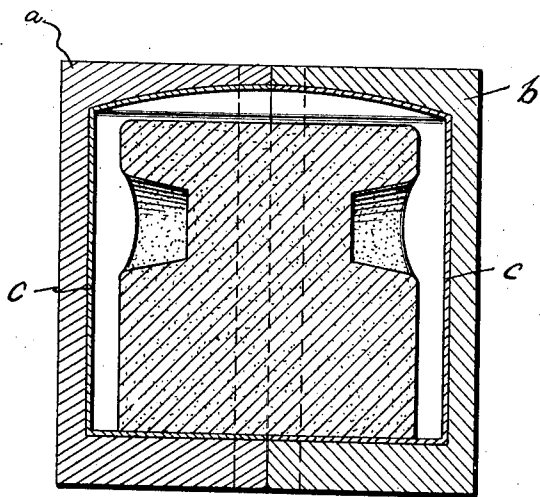


Fig. 1

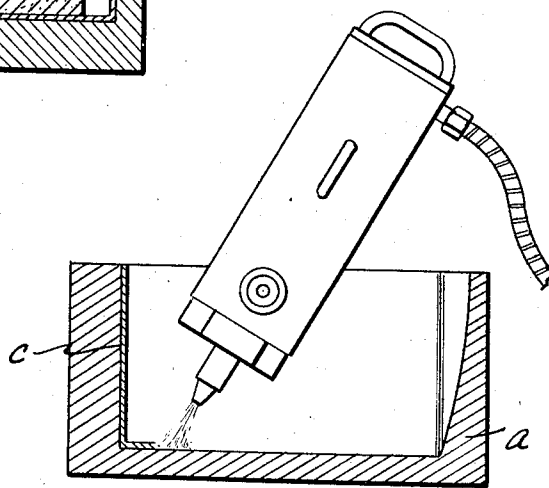


Fig. 2

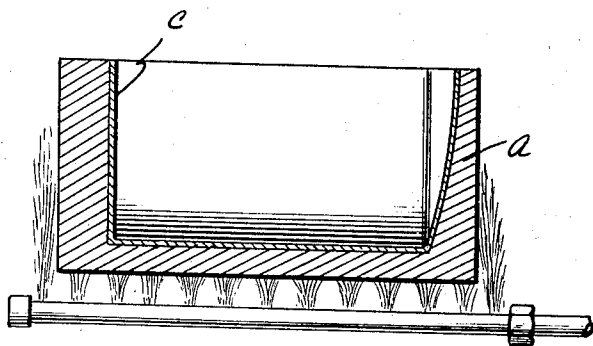


Fig. 3

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PERMANENT MOLD.

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This invention relates to permanent molds and has for its object the provision of a protecting lining for the mold which protects the mold from the excessive heat of the molten metal poured therein.

The object of such a protective lining is to insulate the mold from the casting so as to prevent the heat of the casting from melting the mold which is generally composed of a substance which melts at approximately the same temperature as the casting. Also such a lining serves to prevent the casting from becoming chilled. Such a lining as I have described forms a permanent part of the mold and the mold may be used over and over again for many pourings before the lining is destroyed.

In the drawings:

Fig. 1 is a sectional view through a mold showing my protective lining therein.

Fig. 2 is a detail of the mold, showing the same being sprayed with my mixture, which forms a protective lining for the mold.

Fig. 3 is a detail of a mold showing the same in the process of being heated.

The mold is composed of two parts *a* and *b*, which when used in a permanent mold machine may be automatically brought together and the molten metal poured in the molds to form the casting. Since the metal of the casting is sometimes the same as that of which the mold is formed, it is necessary to protect the mold in some way so that the molten metal which is poured in the mold will not affect the mold.

To do this, I have discovered that kieselguhr when mixed with sodium pyroborate (commonly known as borax) in solution, will form a mixture which may be sprayed on the mold. The kieselguhr, as is well known, possesses high heat-insulating properties and the borax serves as a binder for the kieselguhr.

The mixture which I have found to be suitable consists of one part of borax to four parts of powdered kieselguhr. The borax used is as near pure as possible and is used in powder form. It is first dissolved in water and the solution is as near the point of a saturated solution as is possible. It is then mixed with the kieselguhr and the same is then ready to be sprayed on the mold. In some cases it may be preferable to mix the kieselguhr and borax together and then mix with water instead of first dissolving

the borax in water and then mixing with kieselguhr.

This mixture may be sprayed upon the mold when cold and then the mold heated afterwards, but preferably the solution may be heated to approximately 200 or 300 degrees Fahrenheit and then sprayed on the mold. It is better to spray the material or mixture on the mold, which has been warmed to about 200 or 300 degrees, and permitted to dry to prevent the same from blistering. This mixture is sprayed on very slowly and covers the surface of the mold with a fine even chalk-like coating. The extreme heat resulting from the very first pouring of the molten metal into the mold which is at a temperature of around 2000 degrees F. melts the borax and fuses the mixture to the mold. Obviously the mold could be heated by other means instead of allowing the molten metal to heat the same, it being merely necessary that the temperature should be sufficient to melt the borax or sodium pyroborate. The borax and kieselguhr solution when fused or melted on the mold form a glassy insulating surface or lining *c* on the mold. A mold coated with such a lining may be used over and over again and efficiently prevents the heat of the casting from seriously affecting the mold, and also serves to protect the casting to prevent the casting from becoming chilled. The lining also serves as a parting material so that the casting may be easily withdrawn from the mold when cool.

What I claim is:

1. A heat-resisting lining for a permanent mold comprising initially of a mixture of kieselguhr and sodium pyroborate in solution and which is fused to the mold.

2. A heat-resisting lining for a permanent mold comprising initially of a mixture consisting of four parts of kieselguhr to one part of sodium pyroborate in solution and which is fused to the mold.

3. The method of coating the surface of a mold with a protective lining, which comprises the coating of a mold with a mixture of kieselguhr and sodium pyroborate in solution and fusing the said mixture to said mold.

4. The method of coating the surface of a mold with a protective lining, which comprises the warming of a mixture of kieselguhr and sodium pyroborate in solution, the

spraying of said warmed mixture onto said mold for coating the mold with a protective lining, and the heating of said mold to fuse the lining to the mold.

5 5. The method of coating the surface of a mold with a protective lining, which comprises the spraying of a warmed mixture of kieselguhr and sodium pyroborate in solution onto a mold which is warmed to approximately the same temperature as the mixture, and the heating of said mold to fuse the sprayed mixture to the mold.

10 6. The method of coating the surface of a mold with a protective lining, which comprises the spraying of a mold with a warmed mixture of kieselguhr and sodium pyro-

borate in solution, and the heating of said mold to a temperature sufficient to melt the sodium pyroborate and fuse the mixture to the mold.

7. A lining for a permanent mold consisting initially of a mix of a heat-resisting material and a binder in solution and which is fused to said mold forming a composite lining which serves to insulate the mold from the casting and serves as a parting to permit the casting to be withdrawn from the mold.

In testimony whereof I have affixed my signature.

HARRY S. LEE.