

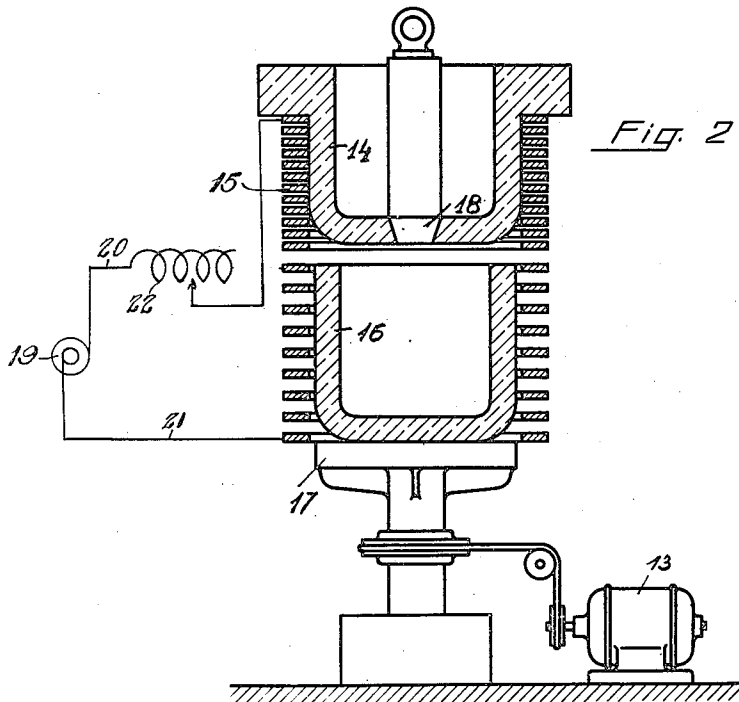
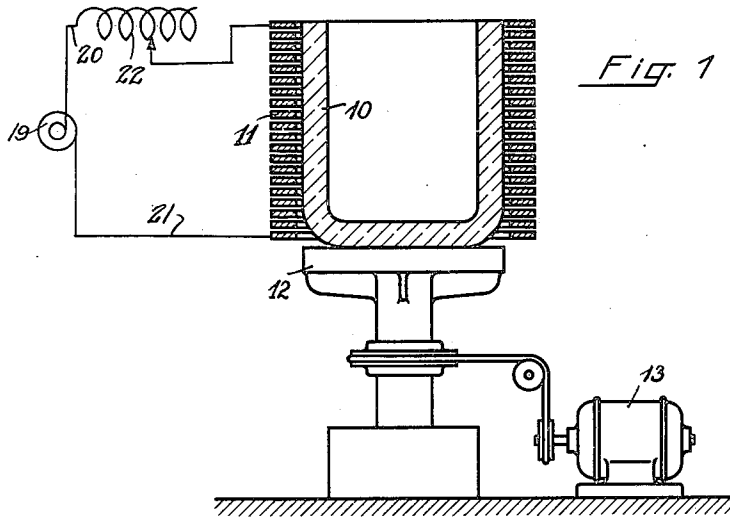
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METHOD AND APPARATUS FOR CENTRIFUGAL CASTING

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UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR CENTRIFUGAL CASTING

Application filed February 19, 1931, Serial No. 516,885, and in Germany December 19, 1929.

My invention relates to a method and apparatus for centrifugal casting.

It is known to cast metals by centrifugal casting. In performing this method the metal is cast into a rotating mould and frozen therein. Due to the uniform pressure caused by the centrifugal force, these castings have an extremely high density. However, this method has the disadvantage, that stratification occurs in the casting if the metal is cooled too early, and this stratification deteriorates the quality of the casting.

One object of my invention is to avoid the stratification of the castings by preventing the metals from premature cooling and freezing.

Another object is to heat the metal in the mould inductively.

A further object is to use the crucible itself as a mould.

A further object is to provide a mould rotating within an induction coil.

Further objects will appear from the specification and the drawings affixed thereto.

According to the invention the metal is heated inductively during freezing. The inductive heating presents no difficulties even with rotating moulds and prevents the metal from premature freezing so that the casting of uniform structure is obtained. As the inductive heating is very advantageous also for the melting operation, and is often used for this purpose, the crucible of induction furnaces can be used as a mould by rotating it within the induction coil after the metal has reached the molten state and the input has been reduced to such extent as to allow the slow solidification of the metal in the crucible. When the freezing process is finished the crucible has to be destroyed for removing the casting from it.

It is also possible to use the induction coil of an induction furnace for heating a separate mould being located beneath the crucible within the coil. Here the molten metal is allowed to flow into the mould through a tap hole and is then rotated together with the mould within the lower part of the induction coil, the windings of which are spaced further at this part than about the furnace so as to

supply only as much heat to the metal as necessary for obtaining its slow freezing.

In the accompanying drawings

Fig. 1 shows a diagrammatical section through a rotating mould with inductive heating and

Fig. 2 is a diagrammatical section of an induction furnace with extended induction coil and a mould located beneath the crucible within the lower part of the coil.

Referring first to Fig. 1, the mould 10 is surrounded by an induction coil 11 and is supported by a rotatable table 12 which is driven by a suitable motor 13.

In Fig. 2 the crucible 14 of an induction furnace is surrounded by a coil 15 extending below the bottom of the crucible. Within the lower part of the coil a mould 16 is provided which is supported by a rotatable table 17. In the bottom of the crucible a tap hole 18 is provided through which the molten metal can flow into the mould 16. The number of ampere-turns is smaller in the lower part of the coil than in its upper part so that the metal in the mould is heated just so as to allow its slow freezing.

Means for adjustment of the input to the coils in Figures 1 and 2 is shown in the conventional generator 19 supplying the coil through connections 20 and 21 within one of which is an adjustable inductance 22.

After having emptied the crucible it may be charged again and the new charge is melted while the casting in the mould is freezing.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. The method for centrifugal casting which consists in casting the molten metal into a rotating mould, heating it therein inductively so as to prevent premature freezing and progressively reducing the inductive electric heat input so as to allow slow freezing of the metal in the crucible.

2. The method for centrifugal casting which consists in melting the metal in an induction furnace, pouring the metal into the middle of the crucible, in rotating the crucible while subjecting it to electric induction to

additionally heat the molten metal and freezing the molten metal in the crucible while rotating and heating the same with reduced input.

3. An induction furnace for performing centrifugal casting comprising a crucible, an induction coil surrounding said crucible and extending below the bottom of said crucible, and a rotatable mould within the lower part of said coil.

4. An induction furnace for performing centrifugal casting, comprising a crucible, an induction coil surrounding said crucible and extending below the bottom of said crucible and a rotatable mould within the lower part of said coil, the number of ampere-turns per unit of length being smaller in the lower part than in the upper part of said coil.

In testimony whereof I affix my signature.

CYRANO TAMA.