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Patented Mar. 22, 1910.

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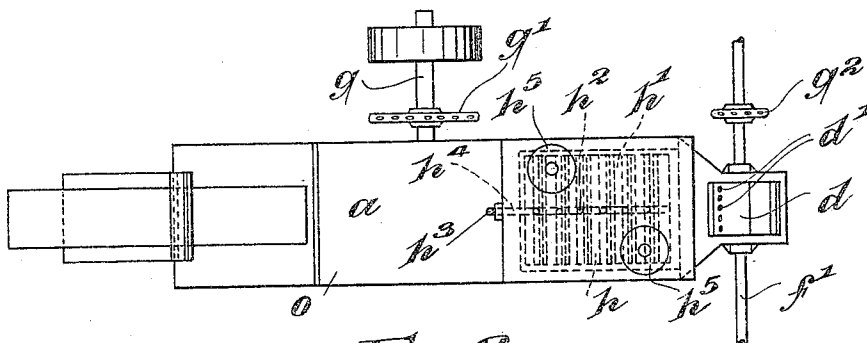


Fig. 2.

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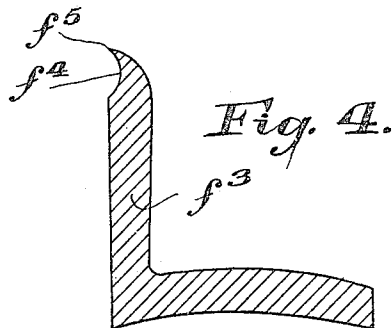
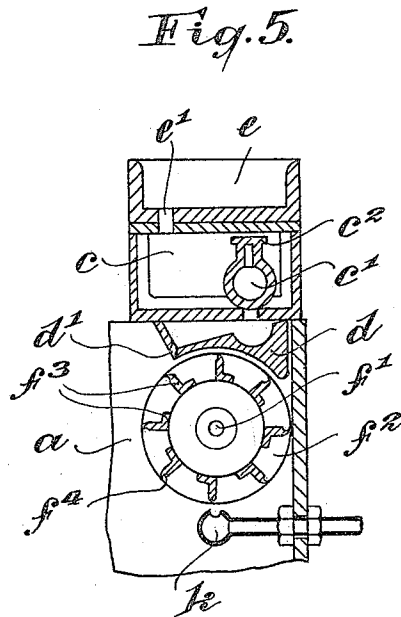
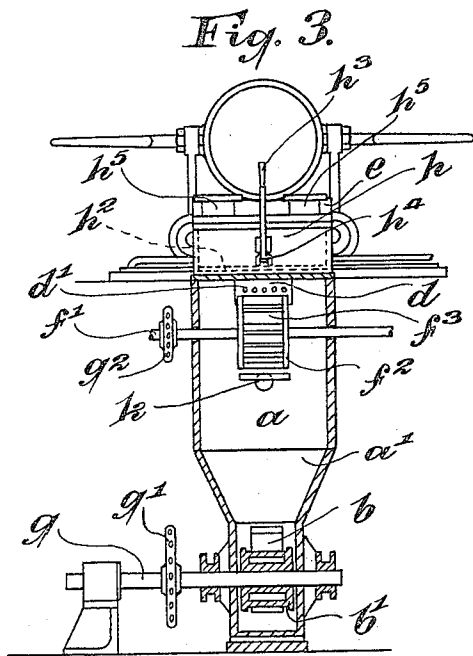
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952,828.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

PETER BENNETT MARTYN AND WILLIAM MARTYN, OF AIRDRIE, SCOTLAND.

APPARATUS FOR THE MANUFACTURE OF METAL GRIT.

952,828.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed June 28, 1909. Serial No. 504,674.

To all whom it may concern:

Be it known that we, PETER BENNETT MARTYN and WILLIAM MARTYN, both subjects of the King of Great Britain, and both residing at Airdrie, Lanarkshire, Scotland, have invented certain new and useful Improvements in Apparatus for the Manufacture of Metal Grit, of which the following is a specification.

10 This invention relates to the manufacture of what is known as "metal grit" and which is at present used for various purposes.

By this invention tempered metal grit of superior quality can be produced more cheaply than heretofore and, by using a standard grade of pig iron, uniformity of quality can be insured. Further, we can readily make the "grit" (within a certain range) to, practically speaking, a predetermined size or sizes.

Under this invention the molten metal is conveyed to a trough or receptacle from which it is delivered, through one or more openings in a column or series of columns said column or columns descending with a uniform flow and coming in contact with a rotary divider having on it a series of radial blades or teeth which cut the column or columns of molten metal into small pieces of a uniform size and throw or project them from the divider through one or more parallel descending sheets of water thereby chilling and tempering the pieces which are allowed to collect at the bottom of a water tank or hopper from which they can be removed in any well known manner. Preferably we make the apparatus so that several columns of molten metal are acted upon by the divider and the particles cut from the columns are projected through several parallel sheets of water. In order to keep the projections or teeth of the divider cool they are sprayed upon by a jet or jets of water which is or are preferably projected upward from below. By varying the speed of the divider (or, alternatively varying the number of teeth or blades thereon) and altering the size of the columns of molten metal, "grit" of various sizes can be made: and, by altering the position of the water sheets relatively with the divider and increasing or diminishing the number thereof the temper given to the grit can be changed as desired.

55 In order that our invention may be clearly understood we have hereunto appended ex-

planatory sheets of drawings whereon we have shown, by way of example, one form of apparatus made under our invention.

Figure 1 is a longitudinal section through the grit making apparatus. Fig. 2 is a plan view of the grit making apparatus. Fig. 3 is a cross section on the line y, y , Fig. 1. Fig. 4 is an enlarged sectional view of one of the divider blades. Fig. 5 is an enlarged sectional detail.

On the drawings the same reference letters wherever repeated indicate the same parts.

The grit making apparatus shown in the drawings consists of a closed tank or hopper a , which is preferably made of cast iron and made with a sloping bottom a^1 which is preferably shaped to receive the foot b^1 of the conveyer b . At one end of the tank a and on the top thereof we provide a box or receptacle c which is preferably made of cast iron suitably molded and internally covered with some suitable material such as molders' sand so as to prevent the molten metal destroying the metal of the box and which is made with a gateway through which the molten metal passes to a box or receptacle d the bottom and side of which are molded so as to direct the flow of the molten metal to a number of openings d^1 through which the metal passes in columns. We may provide a trough e above the box c the said trough e having a gateway e^1 leading to the box c .

e^1 is an outlet valve which extends to near the top of the box c and when the molten metal rises in the box to near the top thereof it acts on the head c^2 and lifts the valve e^1 off its seat thereby allowing metal to flow into the box d and outlet d^1 . The molten metal in the box c will be kept at a constant height therein thereby insuring a uniform flow through the outlets d^1 for after the box c has been filled and the valve e^1 opened the outflow of metal from the box will be automatically replaced by fresh metal from the trough e .

Immediately underneath the box d a rotary divider f is provided and suitably supported within the tank a , its shaft f^1 passing through the sides of the tank and any suitable means is provided for driving the same. In the apparatus shown on the drawings the shaft f^1 is driven from the shaft g through sprocket wheels g^1 and g^2 . The divider f preferably consists of a metal drum f^2 se-

cured on the shaft f^1 and having secured to and projecting radially from it a number of blades or teeth f^3 which are preferably made of angle section and each made with a groove f^4 and sharp edge f^5 as shown in detail at Fig. 4. Each of these projecting blades or teeth f^3 is removably secured to the drum f^2 and the latter is preferably provided with a number of holes or slots whereby a varying number of such projecting blades or teeth may be fitted thereon as, by so varying the number of blades or teeth the proportion of "cuts" for each rotation of the drum f^2 may be varied as desired without varying the speed of the latter, and, when it is desired to vary the number of cuts, it will be generally found to be simpler and easier to change the number of the blades or teeth on the drum than to change the speed of the shaft carrying it. The position of the divider f relative to the openings d^1 at the bottom of the box d is such that, as the former rotates, the blades or teeth f^3 thereon are one after the other, caused to cut through the columns of molten metal passing through the openings d^1 each piece cut off being of a size sufficient to make the size of grit required and the pieces, after they are cut off, are, by the force of the rotating drum f^2 , projected tangentially from the blades or teeth f^3 thereon. Above or on the top of the tank a we provide a water distributing box h having a number of slotted apertures h^1 in the bottom thereof. The breadth of each of the apertures h^1 in the bottom of the box h is capable of adjustment and, when desired, they may be closed by means of valves h^2 actuated by a lever h^3 and rod h^4 . Water is supplied to the box h from any convenient source of supply, or from a storage tank through pipes h^5 and enters the box through inlets h^5 , and when the valves h^2 are open the water will pass from the distributing box in a series of vertical and parallel sheets, passing to the water filled lower part of the tank a from which, if desired, the water may be returned to the storage tank and waste thereby prevented. The pieces of molten metal projected from the blades f^3 of the drum f^2 pass through the vertical and parallel sheets of water and they are chilled and tempered when passing therethrough and, as finished grit of uniform size or sizes, they finally drop down into the water filled lower portion of the tank a from which the finished grit may be taken out in any convenient manner, as, for instance, by means of the conveyor b .

In order to keep the blades or teeth f^3 of the divider f cool and to prevent the molten metal injuring them, they are sprayed upon by a water jet (or jets) from a pipe situated underneath the divider, the jet, or jets of water being projected upward on to each blade or tooth f^3 as it rotates, causing

it to carry a film of water until it cuts through the molten metal and this water-cooling of the blades or teeth of the divider is carried on so long as the apparatus is in use.

By altering the size of the openings d^1 in the bottom of the box d and by altering the speed of the divider f and adjusting the position of the vertical sheets of water relatively to the divider, the size or sizes and temper of the grit obtained may be altered to suit the purpose for which it is required.

To enable the sheets of water to be adjusted relatively to the divider, the box h is made adjustable in position and the water is supplied thereto by means of flexible pipe connections.

o are removable plates.

p is a water outlet valve.

Having now fully described our invention what we claim and desire to secure by Letters Patent is:—

1. An apparatus for the manufacture of metal grit comprising, in combination, means for delivering the molten metal in one or more columns, a rotary divider for cutting the metal into small pieces and a device for supplying vertical and parallel sheets of water through which the metal pieces are projected by the divider for the purpose of chilling and tempering the same.

2. An apparatus for the manufacture of metal grit comprising, in combination, means for delivering the molten metal in a regular flow, means for dividing the same into a number of columns, means for dividing the columns into small particles of a uniform size and means for supplying vertical and parallel sheets of water through which the metal pieces are projected by the dividing means.

3. An apparatus for the manufacture of metal grit comprising, in combination, means for delivering the molten metal in columns, a rotary divider provided with radial blades for cutting the metal columns into pieces of uniform size, a device for supplying vertical and parallel sheets of water through which the metal pieces are projected by the divider, said device being adjustable relatively with the divider.

4. An apparatus for the manufacture of metal grit comprising, in combination, means for delivering the molten metal in columns, a rotary divider provided with radial blades for cutting the metal columns into pieces of uniform size, a device for supplying vertical and parallel sheets of water through which the metal pieces are projected by the divider, and means arranged within the said device for regulating the flow of the water.

5. An apparatus for the manufacture of metal grit comprising, in combination, means for delivering the molten metal uniformly

in one or more columns, rotary means for cutting the column or columns into particles of uniform size and projecting them forward, a water spray acting on the said rotary means to cool the same, and a device for supplying one or more sheets of water.

6. An apparatus for the manufacture of metal grit comprising, in combination, a trough for the molten metal, means for delivering the molten metal uniformly from the said trough in one or more columns, a rotary device provided with radial blades for cutting the columns into pieces of uniform size, means for spraying water on to the blades of said rotary device, a device to which water is supplied having openings in its bottom through which the water can pass in descending sheets and means for regulating the size of or closing the said openings.

7. An apparatus for the manufacture of metal grit comprising, in combination, a trough to which molten metal is supplied, a chamber below the trough into which the molten metal runs and which has an outlet and a self acting valve controlling said outlet, a receptacle below the outlet which is provided with a series of openings from which the molten metal can flow in columns, a rotary divider provided with a series of radial blades for cutting the columns into pieces of uniform size, means for spraying water on to the blades of said rotary device and a device for supplying water in one or more vertical sheets.

8. An apparatus for the manufacture of metal grit comprising, in combination, a trough to which molten metal is supplied, a chamber below the trough into which the molten metal runs and having an outlet and a self acting valve controlling said outlet, a receptacle below the outlet which is provided with a series of openings from which

the molten metal can flow in columns, a rotary divider having blades the points of which are curved for cutting the columns into pieces of uniform size, means for spraying water on to the blades of said rotary device and a device for supplying water in one or more vertical sheets.

9. An apparatus for the manufacture of metal grit comprising, in combination, a water tank, a receiver for molten metal arranged thereon, means for causing the molten metal to flow from the said receiver uniformly in columns, a rotary divider having radial blades for cutting the columns of molten metal in particles of uniform size and projecting them tangentially, means for supplying a series of vertical and parallel sheets of water, means for allowing the water to overflow from the tank and conveyer means for raising the particles from the tank and discharging the same.

10. An apparatus for the manufacture of metal grit comprising, in combination, a water tank, a receiver for molten metal arranged thereon, means for causing the molten metal to flow from the said receiver uniformly in columns, a rotary divider having a series of radial blades each of which is curved at its outer extremity and terminates in a sharp edge, means for spraying water on to the blades, means for supplying a series of vertical and parallel sheets of water, means for allowing the water to overflow from the tank and conveyer means for raising the particles from the tank and discharging the same.

In testimony whereof we affix our signatures in presence of two witnesses.

PETER BENNETT MARTYN.
WILLIAM MARTYN.

Witnesses:

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