

No. 709,672.

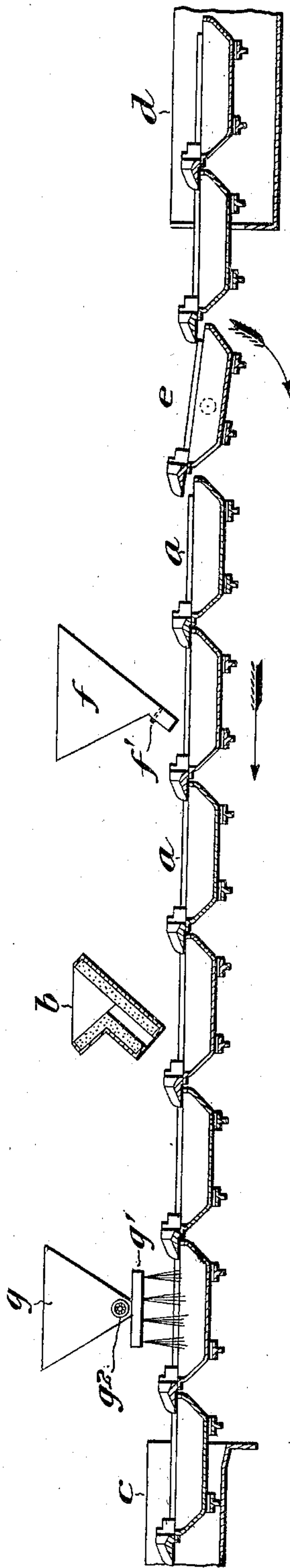
Patented Sept. 23, 1902.

J. M. HARTMAN.

MOLD COATING FOR APPARATUS FOR CASTING PIG METAL.

(Application filed July 25, 1901.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN M. HARTMAN, OF PHILADELPHIA, PENNSYLVANIA.

MOLD-COATING FOR APPARATUS FOR CASTING PIG METAL.

SPECIFICATION forming part of Letters Patent No. 709,672, dated September 23, 1902.

Application filed July 25, 1901. Serial No. 69,654. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. HARTMAN, a citizen of the United States, residing on Gowen avenue, Mount Airy, in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Mold-Coatings for Apparatus for Casting Pig Metal, whereof the following is a specification, reference being had to the accompanying drawing.

My invention concerns machinery—such, for example, as is shown in Letters Patent of the United States No. 629,903, granted to me under date of August 1, 1899—whereby a series of molds are led continuously beneath the point where molten metal is fed into them and thereafter are cooled by wetting with water and inverted, so as to dump the pig thus cast. My invention relates to a coating for such molds, having for its object to prevent the pig which has been cast from fusing and sticking to the mold and also to prevent explosions in case when the mold returns to the spout to be poured there is water adhering to it.

In operating any continuous casting-machine a difficult problem is presented in preventing the molten metal from fusing to the mold. Carbonaceous material in many forms, either as a dry powder or as a paste, has been tried, but only with partial success. I have discovered that finely-powdered bituminous coal dusted over the interior surface of the mold satisfactorily overcomes the difficulty.

In order to illustrate the application of my invention, I have shown in the accompanying drawing in diagrammatic section a series of pig-metal molds *a*. This is supposed to be an endless series; but only so much thereof is shown as relates to my invention.

b is a refractory nozzle, through which the molten metal is fed into the molds as they pass beneath it.

c is the end of a water-trough, into which the molds pass soon after being filled with water. *d* is the other end of this water-trough, from which the molds emerge after the metal has been sufficiently cooled by wetting therein. At *e* the molds are inverted and drop the pigs which they contain, immediately righting themselves as they pass on.

Thus far what I have described does not

differ from the arrangement shown in my previous Letters Patent, to which I have referred.

f is a convenient receptacle containing finely-divided bituminous coal and fitted at its lower end with an aperture or other means for feeding this coal into the molds. As will be observed, the feeding of the powdered bituminous coal into each mold takes place before the mold reaches the point *b*, where the metal is poured into it. This material has a tendency to adhere to the sides of the mold as it is poured into it, although some of it slides down to the bottom, where it is most needed, because of the fact that the metal is poured into the mold along its median line. As the metal rises in the mold it pushes part of the dust up against the sides. The molten metal excludes the air from the dust, which consequently is not consumed by the heat, but adheres to the surface of the mold as a sooty coating so firmly that after the mold and pig have completed their circuit through the water and the pig has been dumped the coating can be rubbed off by the naked hand. Thereafter this sooty coating adheres tenaciously to the mold, doubtless owing to the oil contained in the bituminous coal, and continues to form a sufficient barrier between the mold and the pig to prevent adhesion of the one to the other. The receptacle *f* is fitted with a slide *f'* or some other convenient means for regulating the flow of the coal-dust therefrom. As the process proceeds the feeding of the bituminous-coal dust is continued from time to time as needed.

It is further desirable in providing a mold-coating for casting-machines to provide against the contingency of adhesion of water to the mold when it comes beneath the pouring-point in order to prevent resulting explosion. After a machine has been in operation for some time the molds become so hot that they dry off as soon as they leave the water, preventing the contingency mentioned; but when the machine is first started the molds are cold, and consequently come beneath the pouring-point wet. In order to prevent explosions before starting the machine, I grease all of the molds with refuse oil—as, for example, spent oil from machinery-journals or the waste oil sold under the name of “refuse”

by refineries. This effectually prevents the explosion which I have spoken of. As a convenient means for accomplishing this I provide an oil-receptacle *g*, fitted with a sprinkling device *g'* and a regulating-valve *g''*. This is situated just in advance of the point where the molds enter the water-trough, and during the first rotation of the machine before the pouring of the metal commences the oil is sprinkled into the molds. Before the first molds into which metal has been poured come beneath the oil-receptacle *g* the supply of oil is stopped. In place of the device which I have shown it is sufficient to station at the same point a man with a mop and a bucket of oil. I am not able to state positively the reason for the efficacy of the oil, for notwithstanding the oil coating there may be water contained in the mold; but I believe it to be because the presence of the oil prevents adhesion of the water to the mold, so that when the iron is poured into it the water instead of being imprisoned below the iron is pushed ahead of and on top of it. Whatever the reason may be I have found that it effectually prevents the explosions which otherwise would occur. After greasing the molds I sprinkle on the coal-dust, as above explained.

Having thus described my invention, I claim—

1. In a pig-metal-casting apparatus, the

combination of a series of metal-molds; means for wetting the said molds; and a coating formed of powdered bituminous coal applied to the interior of the molds, substantially as described. 35

2. In a pig-metal-casting apparatus, the combination of a series of metal-molds; means for circulating the said molds successively beneath the point where metal is poured and through a wetting apparatus; and a coating for the interior of said molds consisting of powdered bituminous coal, applied prior to the passage of the mold beneath the point where metal is poured, substantially as described. 40 45

3. In a pig-metal-casting apparatus, the combination of a series of metal-molds; means for circulating the said molds successively beneath the point where metal is poured and through a water-cooling apparatus; and a coating for the interior of said molds consisting of refuse oil applied prior to the entry of the molds into the water and a further coating consisting of powdered bituminous coal applied prior to the passage of the mold beneath the point where metal is poured, substantially as described. 50 55

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