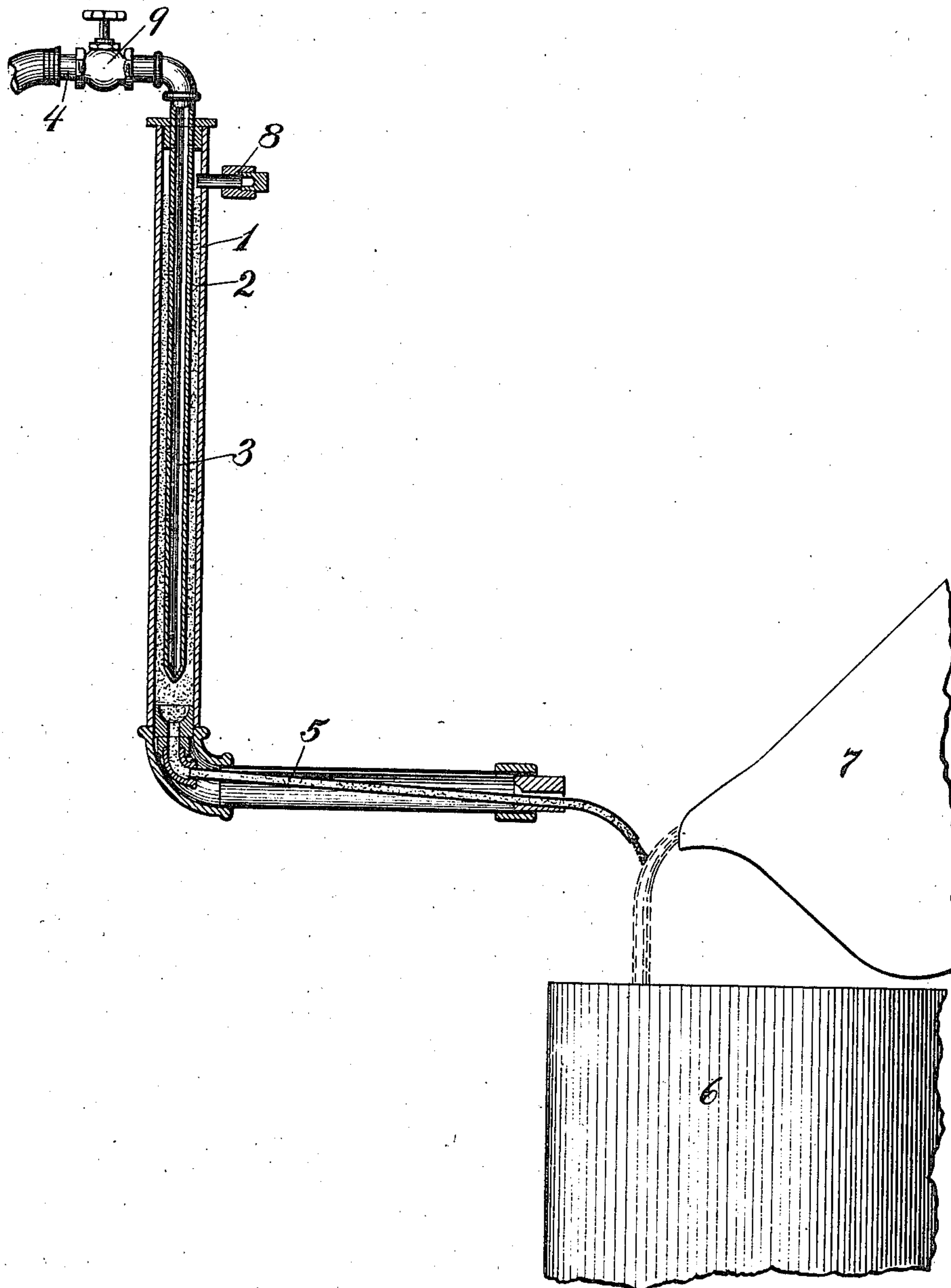


F. G. WRIGHT.  
PROCESS FOR INTRODUCING MODIFYING ELEMENTS INTO CASTINGS.  
APPLICATION FILED FEB. 23, 1906.

963,973.

Patented July 12, 1910.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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PROCESS FOR INTRODUCING MODIFYING ELEMENTS INTO CASTINGS.

963,973.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed February 23, 1906. Serial No. 302,419.

*To all whom it may concern:*

Be it known that I, FRANK G. WRIGHT, a citizen of the United States, residing at Indiana Harbor, in the county of Lake and State of Indiana, have invented certain new and useful Improvements in Processes for Introducing Modifying Elements into Castings, of which the following is a specification.

The invention relates to a process for the introduction of quantities of modifying elements into castings, and has for its objects, to provide a process whereby the element introduced is thoroughly disseminated throughout the mass of the casting to the end that uniformity of product is secured; to provide a process whereby the quantity of modifying element introduced into the body of the casting may be accurately gaged and regulated, and to provide a process whereby the mixing is accomplished conveniently and expeditiously during the pouring of the casting. One form of apparatus whereby the process may be carried out is illustrated in the accompanying drawing, in which—

The figure is a diagrammatic showing of the way in which the process is applied and in which for the purposes of a clearer showing the blower employed is shown in section.

It has heretofore been common to introduce modifying elements into molds and also to supply such elements in the form of powder to the metal as it is poured, but in so far as I am aware, no means has ever been provided for forcing the powder into and through the heated metal. My process, which is an embodiment of the latter idea, constitutes an improvement on the old methods above indicated and consists substantially in forcing the powder through the metal as it is being poured, by means of air pressure. This secures an intimate mixture and prevents any uneven collection of the modifying material. It also incorporates the material instantly into the body of the heated metal so that it is free from the continued action of the air as is the case in the old methods in which no means are provided for getting the powder away from the surface of the heated metal.

The process is intended for use in any case in which it is desired to introduce any kind of powdered material into the body of castings of any kind of metal for the purpose of modifying the characteristics

thereof, but as illustrative of a particular application of the process it may be stated that it may be very advantageously used in the manufacture of cast steel bodies requiring great toughness and strength, as for instance, car wheels in which the powdered substance introduced for the purpose of hardening and improving the texture of the metal may be manganese.

The drawing shows one form of apparatus which may be conveniently employed for mixing the powder with the compressed air and forcing it through the heated metal as it is being poured. This apparatus is shown more specifically in my co-pending application No. 302,420 in which such apparatus is claimed, and consists primarily of a casing adapted to receive the powdered material, and having extending therethrough the perforated pipe which is connected with the supply of compressed air by means of the pipe 4. The lower end of the casing 3 is provided with an outlet pipe 5 through which the powdered material is forced. The mold is designated by the numeral 6 and the ladle by the numeral 7, and as shown, such parts are in the position of pouring and the blower is so placed as to supply the powdered material to the stream of molten metal as it flows from the ladle into the mold. The casing 1 may be provided with a gage glass whereby the amount of powdered material may be observed, and also has an introducing opening 8 by means of which the powder may be placed in the receptacle.

The operation of the device will be apparent from inspection. The air from the pipe 4 flows through the perforations in the pipe 3 carrying the powdered material down through the pipe 5 and into the stream of fluid metal. The air pressure may be regulated by the valve 9 whereby the force with which the powder is sent into the stream of metal may be varied and whereby the amount of powdered material introduced may be governed. By the use of this apparatus the amount of powdered material introduced may be very accurately gaged, as may also the rate at which the powder is supplied. It will also be apparent that the process affords a very convenient method for handling the powdered material and getting it to its desired location, and also that there is no possibility of an uneven distribution

of the powder throughout the body of the casting as is the case where the mixing powder is simply dropped into the stream of heated metal. Furthermore, the force of the  
5 air carries the mixing material away from the surface of the heated material so that it is not exposed to any continued action of the air at its surface.

Having thus described my invention and  
10 illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

The process of introducing a modifying

element into a cast body during pouring into the molds which consists of directing a blast 15 of air containing the element in the form of a powder in a downward direction into the stream of heated metal as it enters the mold.

In testimony whereof I have hereunto signed my name in the presence of the two 20 subscribed witnesses.

FRANK G. WRIGHT.

Witnesses:

J. H. HUMMEL,  
M. E. KOLB.