No. 828,590. PATENTED AUG. 14, 1906.

F. G. WRIGHT.

APPARATUS FOR INTRODUCING POWDERED ELEMENTS INTO CASTINGS.

APPLICATION FILED FEB. 23, 1906.

Fig. 1.

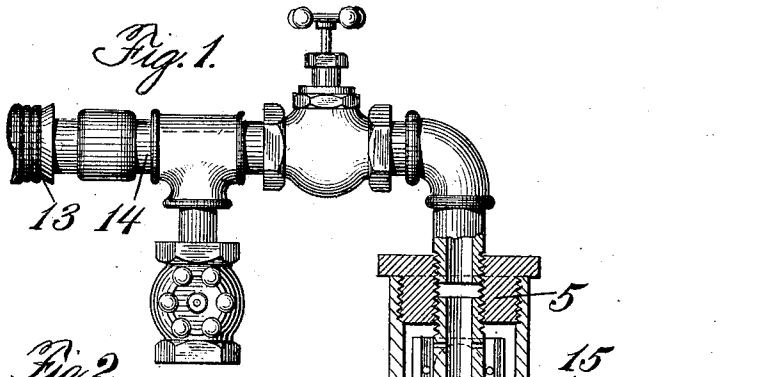


Fig. 2

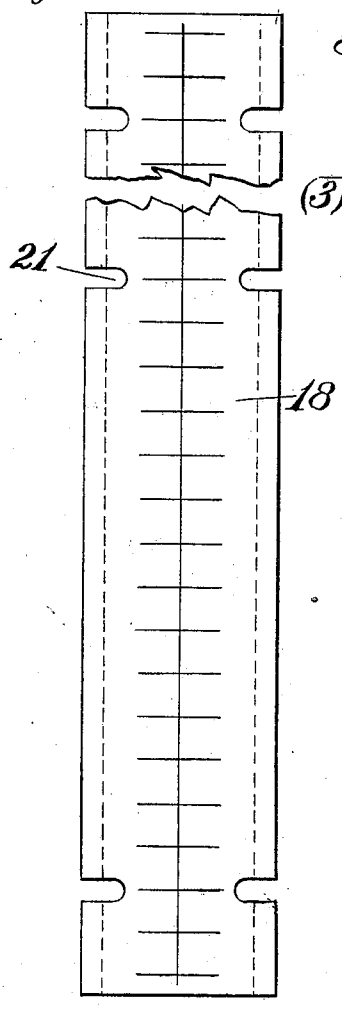
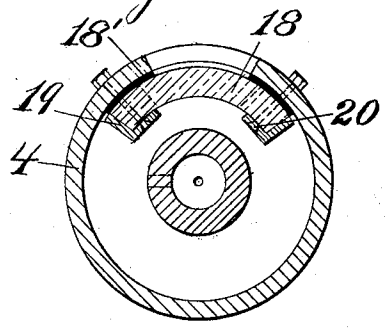
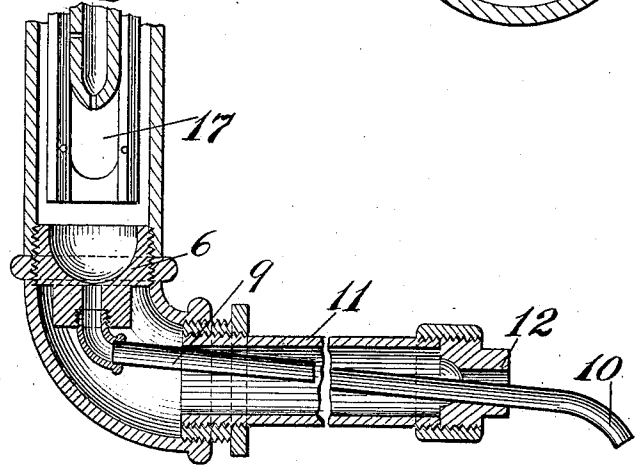


Fig. 3.





WITNESSES

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APPARATUS FOR INTRODUCING POWDERED ELEMENTS INTO CASTINGS.

No. 828,590. Specification of Letters Patent. Patented Aug. 14, 1906.

Application filed February 23, 1906. Serial No. 302,420.

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 Apparatus for Introducing Powdered Elements into Castings, of which the following is a specification.

The invention relates to apparatus for the introduction of powdered elements into fluid metal and has for its objects the provision of a fluid operated device for supplying the powdered modifying element at any desired rate; to provide a device of the kind specified in which the powdered element is conveniently disposed in the blowing apparatus, and in which the quantity of powder can be observed at any time, and to provide a blower which will supply the powdered element without clogging, and in which all the powder in the holder or receiver may be used before refilling. One form of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation partially in cross section in order to show the interior of the apparatus;

Figure 2 is a detail in front elevation of the glass used on the holder, and

Figure 3 is a transverse section on line (3) (3) of Figure 1.

The apparatus is designed for use in any case in which it is intended to introduce a powdered modifying element of any character into the fluid metal of a casting, but as illustrative of a particular use to which the apparatus may be put, it may be stated that it may be used advantageously for introducing manganese into cast steel with a view to the hardening thereof. In such use and in fact in any use it is desirable that the mixture of the powder with the fluid metal be thorough and intimate, and that the rate of flow be under control. The blower is intended to accomplish this result and to afford a convenient means for supplying the powder.

As shown in the drawing, 4 is the casing or receptacle for holding the powdered element, which casing for cheapness of manufacture may consist of an ordinary piece of pipe, screw threaded at its upper and lower ends for receiving the plugs 5 and 6, respectively. Extending through the casing, longitudinally, is the pipe or blower tube 7 connected at its upper end with a supply of compressed air and having along its side and at its end the perforations 8, whereby the pipe communicates with the interior of the casing 4. The plug 6 has connected to its bottom a smaller pipe 9 for conducting the powdered material to the nozzle 10, which is a continuation of the pipe 9. The pipe 9 is supported in the laterally extending section of casing 11 and is held at its outer end by the plug 12. All the sections and connections used are the ordinary ones employed in pipe fitting and the manner of connecting up will be apparent from inspection of the drawing. The supply of compressed air is furnished from the flexible pipe 13 connected to the pipe 14, which is provided with a suitable controlling valve. Provision is made for the introduction of the powder into the interior of the casing in the short pipe section 15 provided with a plug 16. In order that the amount of material in the casing 4 may be observed without difficulty and at any time the casing is provided with long slots 17 covered by the glass 18, shown in detail in Figure 2, in the manner of an ordinary gage glass. This glass may be marked with the indicating numbers as desired. The manner in which the glass is applied and held will be apparent from inspection of Figures 2 and 3. A gasket 18′ is applied in the usual way between the casing and the glass in order to make a tight joint, and the glass is held against the casing by means of the angle-shaped clamps 19, indicated in section in Figure 3. These angles fit over the edge of the glass and are secured in position by means of the small bolts 20 which pass through the slots 21 in the glass and are secured on the outside of the casing by means of the nuts shown.

The operation of the device is as follows: Compressed air being admitted through the pipes 13 and 14 into the tube 7 escapes through the perforations 8, and moves down through the body of the casing carrying with it a certain amount of powder which escapes through the small pipe 9 at the bottom. The concavity of the plug 6 assists in directing air properly into the pipe 9. The apparatus is supported by the operator who

grasps the casing 4 with one hand and the pipe 11 with the other and directs the powdered material issuing from the nozzle 10 into the stream of heated metal flowing from the ladle to the mold. The force of the air may be controlled by means of the valve at the top of the casing, and the amount of powder supplied may be therefore regulated as well as the velocity with which the powder is forced through the stream of fluid metal. By means of the gage glass 18, the amount of powder in the casing 4 may be observed at any time and such quantity renewed whenever necessary. The glass also serves the purpose of indicating how rapidly the device is feeding. The provision of perforations throughout the length of the tube 7 provide for the proper settling of the entire mass of powder and prevents any portion of the powder from sticking while the powder beneath is fed out. It will also be apparent that the placing of the perforations on the side away from the glass admits of an easier reading of the glass during operation. By virtue of the flexible pipe 13 the apparatus may be easily carried about and constitutes a very convenient and effective means for getting the powdered material into the fluid metal. The mixture is also very complete because a force of the air drives the particles of powder through the body of the fluid stream.

The nozzle is placed at an angle to the body of the device to prevent the powder from running out of the tube when carried in a vertical position, and further to provide a more convenient grasping means than that where the body and nozzle are in line.

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

1. An apparatus of the character described, comprising a supply pipe, a receptacle provided with outlet means, and a blower tube provided with a perforation in its side and connected to the supply pipe and extending into the receptacle.

2. An apparatus of the character described, comprising a supply pipe, a receptacle provided with outlet means, and a blower tube having longitudinally arranged perforations, connected to the supply pipe and extending into the receptacle.

3. An apparatus of the character described, comprising a supply pipe provided with a regulating means, a receptacle provided with outlet means and a blower tube provided with a plurality of side perforations and connected to the supply pipe and extending into the receptacle.

4. An apparatus of the character described comprising a supply pipe, a receptacle provided with a nozzle at an angle thereto, and a perforated blower tube connected to the supply pipe and extending into the casing.

5. An apparatus of the character described, comprising a supply pipe, a receptacle having outlet means and a slot along the side thereof provided with a window, and a blower tube provided with longitudinally arranged perforations and connected to the supply pipe and extending into the receptacle.

6. An apparatus of the character described, comprising a supply pipe, a receptacle provided with a curved nozzle at an angle thereto, and a perforated blower tube connected to the supply pipe and extending into the receptacle.

7. An apparatus of the character described, comprising a supply pipe, a receptacle provided with outlet means and having a slot along the side thereof provided with a window, and a blower tube connected to the supply pipe and extending into the receptacle and having longitudinally arranged perforations opposite that portion of the casing not provided with the window.

8. An apparatus of the character described, comprising a supply pipe, a receptacle provided with outlet means, and a blower tube closed at the bottom and provided with end and side perforations, connected to the supply pipe and extending into the receptacle.

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

FRANK G. WRIGHT.

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