

A. H. PEHRSON.
 METHOD OF PRODUCING RODS, TUBES, WIRE, &c., DIRECT FROM MOLTEN METAL.
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Fig. 1.

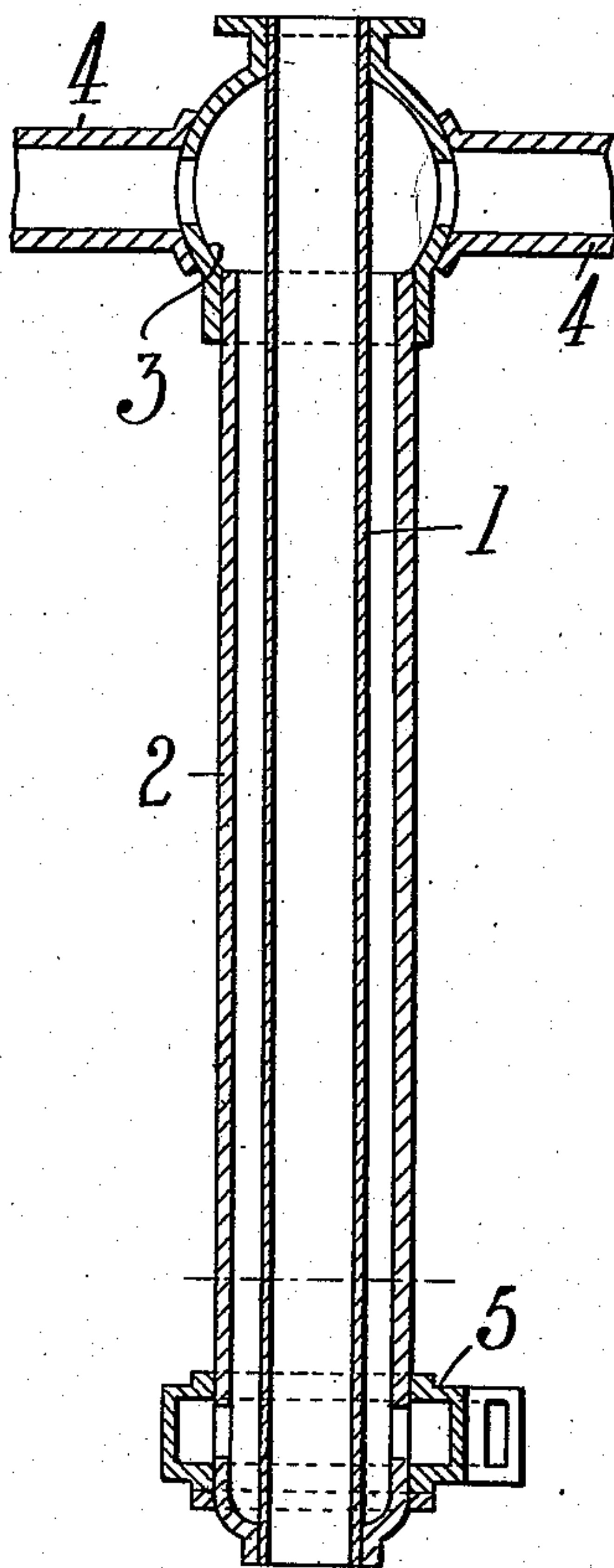
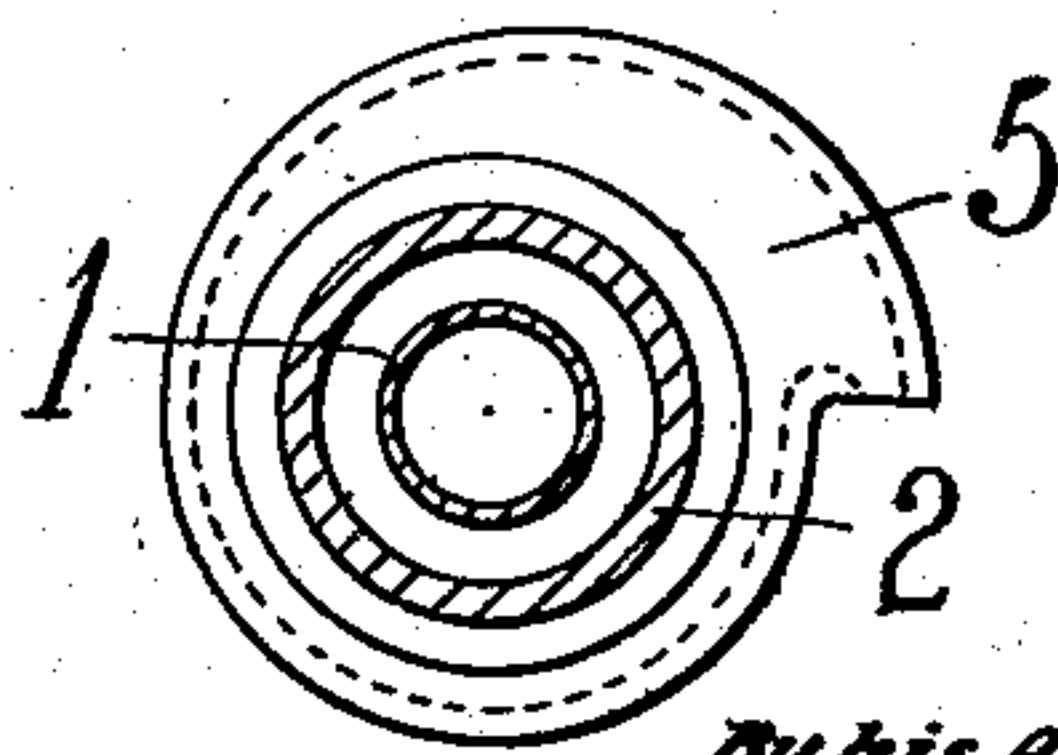


Fig. 2.



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ADAM HELMER PEHRSON, OF CENTRALPALATSET, STOCKHOLM, SWEDEN.

METHOD OF PRODUCING RODS, TUBES, WIRE, &c., DIRECT FROM MOLTEN METAL.

No. 930,490.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ADAM HELMER PEHRSON, engineer, a subject of Sweden, residing at Centralpalatset, Stockholm, Sweden, have invented new and useful Improvements in Methods of Producing Rods, Tubes, Wire, &c., Direct from Molten Metal, of which the following is a specification.

As is well known many endeavors have been made to produce rods, pipes, wire, etc. direct from molten metal by causing the metal to pass through cooled nozzles in which it may solidify successively. These endeavors have not been successful, and for the following reasons: the tendency of the metal to stick to the nozzle, the impossibility of cooling the metal direct by water, and mainly by reason of the shrinking of the metal during its cooling so that the surface of the metal rod will more and more depart from the inside of the cooling nozzle, and cause between the rod and the nozzle a space which will greatly prevent the cooling of the rod by the nozzle, and which may cause the incandescence and melting of the rod.

My invention relates to a method whereby the above mentioned drawbacks may be avoided, so that the metal which passes through the cooled nozzle may be cooled in a rapid and efficient manner. This method, is based on the observation of the fact that an efficient cooling can only be obtained by bringing the incandescent mass of metal into contact with cold metallic surfaces of sufficient size. The method consists in giving the rod or the nozzle or both of them such a relative motion that the parts of them which are in contact are changing all the time, or in other words that the above mentioned insulating space, caused by shrinking of the rod, changes position continually so that its hurtful action will be decreased and the cooling effect of the nozzle will be better, and a continuous formation of rod from the molten metal will therefore be possible. It is of course also necessary that these surface contacts are sufficiently large to cause efficient cooling. The manner of motion of the rod or the nozzle may vary; for instance a lengthwise vibratory motion may be used, or a lengthwise sliding motion, or one may turn around or roll upon the other, or have a gyratory or swinging motion in relation thereto, so that the contact surface between them is changed. A combination of one or several of such motions may of course also be used.

In the accompanying drawing is shown as an example an apparatus suitable for the method in question.

Figure 1 is a vertical section, and Fig. 2 a plan.

Referring to the drawing 1 is the vertically disposed nozzle, surrounded by and connected with a cooling pipe 2; the nozzle 1 and pipe 2 are fastened to a hollow ball-and-socket joint 3, which is journaled between two stationary pipes 4 for cooling water. The lower end of pipe 2 supports reaction turbine 5 having a tangential outlet at one side only, and which operates in such a manner that it gives to the said pipe 2 as well as to the nozzle 1 a swinging or gyratory motion around the centrally proceeding metal rod, the surface of which will therefore continually be brought into contact with fresh surfaces in the nozzle, so that the cooling will be efficient. The pipes 1 and 2 carrying a ball member 3 have a kind of universal joint movement on the socket portion formed by the two pipes 4, so that the pipes 1 and 2 can swing in the path of a cone. The cooling water entering through the pipes 4 and having exit tangentially through the turbine 5 by the reaction of the latter will cause the pipes 1 and 2 to have a rotary movement that will not be along the axis of the pipe, but will swing through the path of a cone, because the reaction is on one side only of the pipe 2. This will be somewhat in the nature of a gyratory motion in its nature, and the surface of the metal rod or tube formed in the pipe 1 will be brought into engagement with the fresh surfaces of the nozzle that will greatly facilitate and expedite the cooling of the member that is being cast.

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 of producing bars, rods, pipes, wire etc. directly from molten metal which consists in passing the molten metal through a cooled nozzle, and simultaneously giving to the nozzle, and to the passing metal rod or tube such a movement relative to each other that the insulating space caused by shrinking of the rod when solidifying will continually change position, in order to cause different parts of the inside surface of the nozzle to successively make contact with different parts of the metal passing through the nozzle, so that the cooling action of the

nozzle will be increased, and a continuous formation of rod will be possible.

2. The method of producing bars, rods, pipes, wire etc. directly from molten metal which consists in passing the molten metal through a cooled nozzle, and simultaneously giving to the nozzle and to the passing metal rod such a gyratory swinging movement relative to each other that the insulating space caused by shrinking of the rod when solidifying will continually change position, in order to cause different parts of the inside surface of the nozzle to successively make contact with different parts of the metal passing through the nozzle, so that the cooling action of the nozzle will be increased, and a continuous formation of rod will be possible.

3. The method of producing bars, rods, pipes, wire etc. directly from molten metal which consists in passing the molten metal

through a nozzle cooled by the passage of water between itself and an inclosing jacket whereby the passage of the water will impart movement relatively to the nozzle and the bar, so that the insulating space caused by shrinkage of the rod when solidifying will continually change position in order to cause different parts of the inside surface of the nozzle to successively make contact with different parts of the metal passing through the nozzle, so that the cooling action of the nozzle will be increased, and a continuous formation of rod will be possible.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADAM HELMER PEHRSON.

Witnesses:

JOHN EDBERG,

HJALMAR ZETTERSTROM.