

W. H. Perry,
Refining Iron.
No. 99588. Patented Feb. 8. 1870.

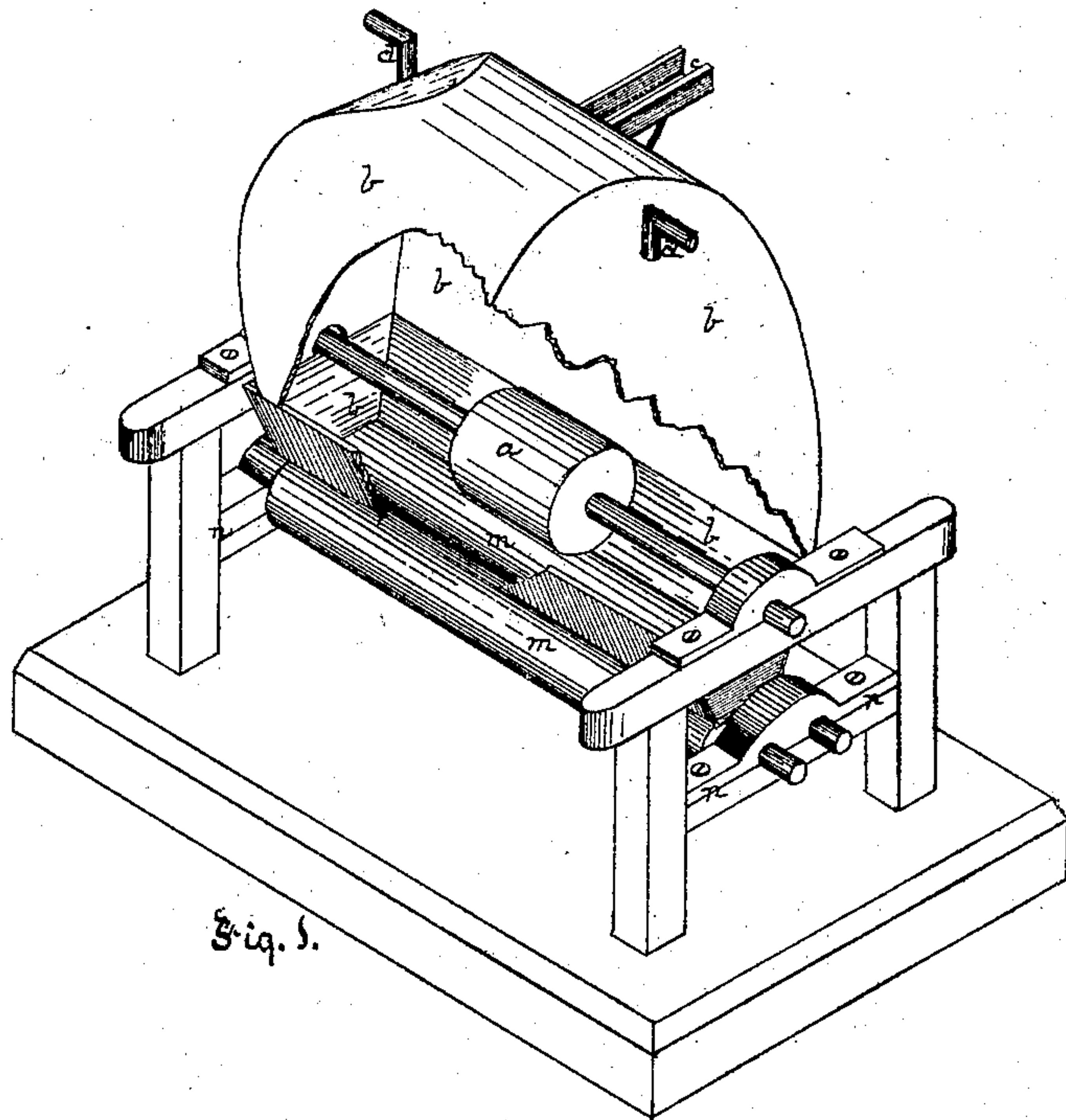


Fig. 1.

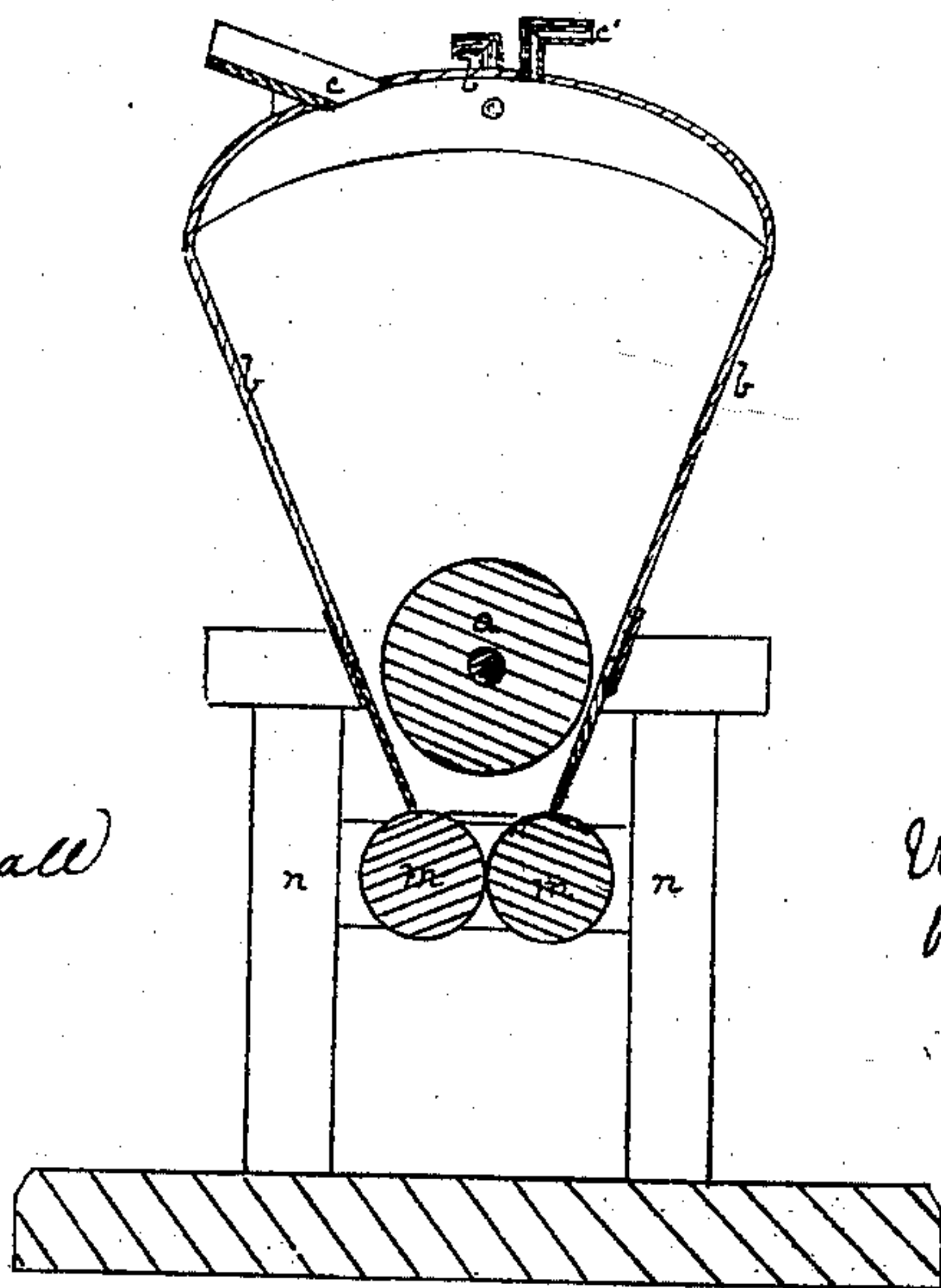


Fig. 2.

Witnesses:
R. C. Wrenshaw
E. G. Fittler

Inventor:
William H. Perry,
by Bakewell Johnston,
his Attys.

UNITED STATES PATENT OFFICE.

WILLIAM H. PERRY, OF SHARON, PENNSYLVANIA.

IMPROVEMENT IN THE MANUFACTURE OF IRON AND GRANULATING THE SAME.

Specification forming part of Letters Patent No. 99,588, dated February 8, 1870.

To all whom it may concern:

Be it known that I, WILLIAM H. PERRY, of Sharon, in the county of Mercer and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Iron; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view, partly in section, illustrative of my improvement; and Fig. 2 is a vertical cross-section of the devices shown in Fig. 1.

Like letters of reference indicate like parts in each. The nature of my invention consists in an improved mode of granulating cast-iron and in the construction of improved devices therefor.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and mode of operation.

In order to avoid the tedious and costly process of puddling, efforts have been made to granulate the pig metal or reduce it to minute subdivisions, so that when charged into the converting-furnace it may be more readily and uniformly decarbonized and come to nature in less time than by the puddling process, with a consequent saving of time, labor, fuel, and also of much or all of the material required in the preparation of the puddling-furnace.

In order to carry out the same idea in a more practicable way than any yet adopted, I granulate the iron by causing it to run in a stream or streams directly from the blast-furnace, or from a remelting-furnace onto a wheel, *a*, having any desired breadth of operative surface, and which wheel is caused to revolve with any required degree of velocity by power applied in any of the ordinary ways. At the same time I play a jet or stream or streams of water onto the wheel. The result then is as follows: The wheel, in consequence of its revolution, granulates or breaks up into small grains or subdivisions the molten iron as it falls thereon, chilling it at the same time. This result is still further facilitated by the action of the water, which, falling on the wheel along with the molten metal, comes in intimate contact with it and produces a more perfect granulation; also, it chills the granules more instan-

taneously, and, in connection with the air or steam through which the iron passes while hot, partially decarbonizes it, whereby the subsequent work of converting it into wrought-iron is greatly facilitated. The water or jet of steam which is played into the wheel *a* also keeps the surface of the wheel cool and in such condition that the iron falling onto it will not stick or adhere to it, but be thrown off in a finely-granulated state, as already described.

For decarbonizing the iron and keeping the wheel clear steam may be used instead of water; or, if so preferred, both may be used together.

To keep the granulated metal confined within due bounds, I cover the wheel *a* with a hood, *b*, of any desired size, but large enough so that the granulated iron flying about in it will not clog the wheel nor interfere with the fall of the molten metal or water onto the wheel. I then provide a gate, *c*, or gates, through which to pass a stream of molten metal onto the wheel *a*, and one or more steam or water pipes, *d*, either at the top or in the sides of the hood *b*, through which to play water or steam, or both, onto the wheel *a* at the same time the metal falls onto it. A blast of air may also be blown in if so desired, in order to facilitate the decarbonization of the iron, though I seldom deem it necessary. An escape-aperture, *e*, for the steam may also be made. The lower part of the hood *b*, being open, may rest in or stand over a reservoir of water, into which the granulated iron is collected; or, if a finer degree of granulation is desired, one or more pairs of crushing-rolls, *m m*, may be mounted in the housings *n*, directly under the hopper-shaped lower end of the hood *b*, and rotated in the usual way. These rolls may be plain or grooved or fluted; or, if more than a single pair of rolls be used, one pair may be plain and one grooved. Such rolls are so set with reference to each other that they will crush, grind, or pulverize the iron which falls onto them from the hood *a* and discharge it below still more finely subdivided. Thence it may be conveyed by elevators or in other suitable way to any suitable converting-furnace, into which it is charged, heated, converted, and balled in any way known to the art, and thereafter manipulated in the usual way.

Instead of a stream of water playing onto the wheel *a*, the same effect on the wheel may

be secured by hanging or adjusting it so that the lower part of its cylindrical face shall play through a vessel of water below; and such mode of applying water to the wheel I include in my invention.

As in this connection the success of the converting process depends largely on the perfectness of the granulation, and somewhat on the extent to which the iron is decarbonized before being charged into the converting-furnace, the utility of my improvement will readily be apparent.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Granulating molten cast-iron by bringing it in contact with a vertical revolving wheel, the face of the wheel being kept wet either by streaming water or steam onto it, or by a par-

tial submersion of the operative face of the wheel in water, substantially as described.

2. A revolving granulating-wheel, in combination with one or more pairs of crushing-rollers, substantially as described.

3. A hood, *b*, having a gate or gates for the supply of molten iron, in combination with a granulating-wheel, substantially as described.

4. A hood, *b*, hopper-shaped at its lower end, in combination with a granulating-wheel and one or more pairs of crushing-rolls, arranged substantially as described.

In testimony whereof I, the said WILLIAM H. PERRY, have hereunto set my hand.

WILLIAM H. PERRY.

Witnesses:

JOHN GLENN,

R. C. WRENSHALL.