

C. BURGESS.

Manufacture of Refined Cast-Iron.

No. 141,319. Patented July 29, 1873.

Fig. 1.

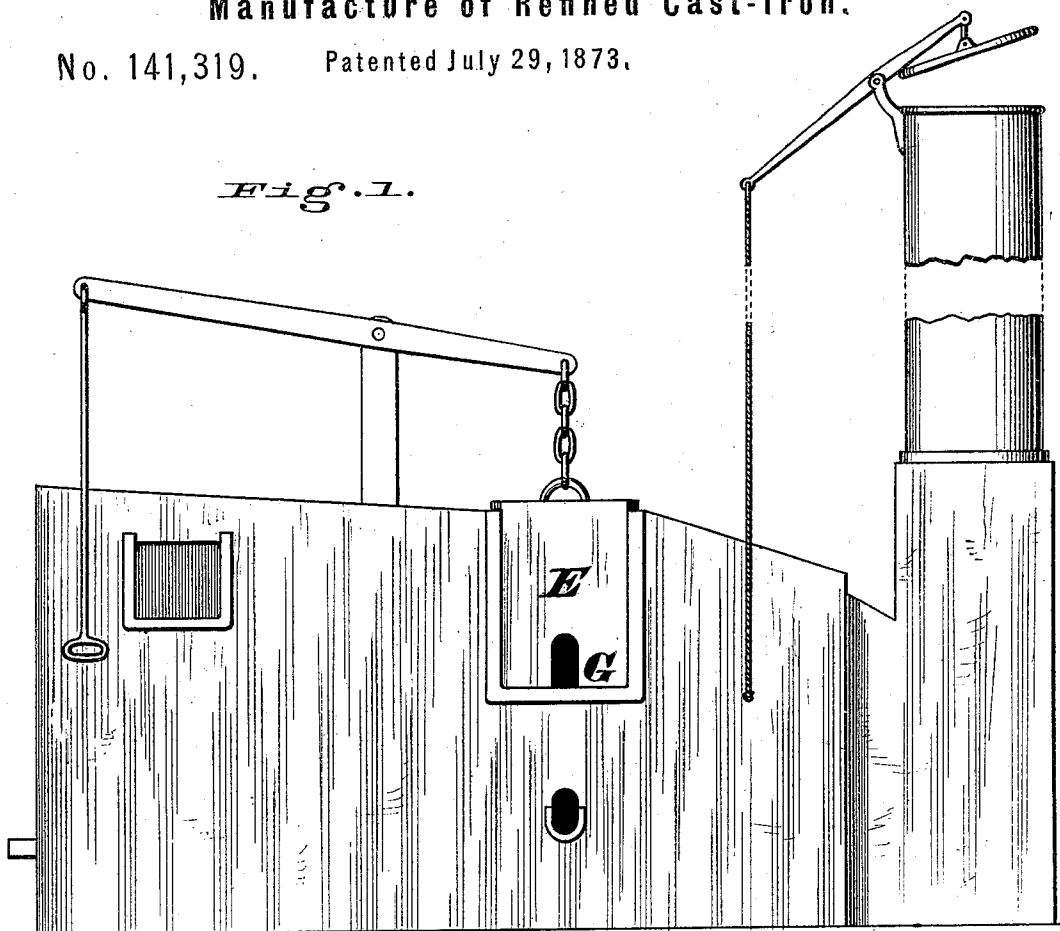
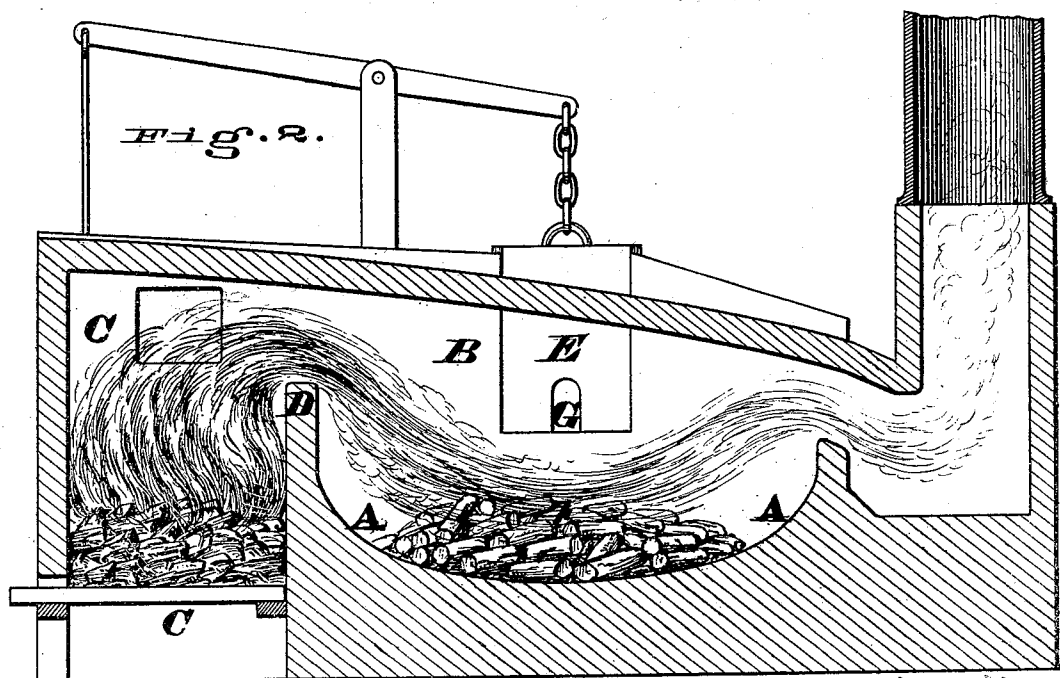


Fig. 2.



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CHARLES BURGESS, OF PORTSMOUTH, OHIO.

IMPROVEMENT IN THE MANUFACTURE OF REFINED CAST-IRON.

Specification forming part of Letters Patent No. **141,319**, dated July 29, 1873; application filed March 21, 1873.

To all whom it may concern:

Be it known that I, CHARLES BURGESS, of Portsmouth, Scioto county, Ohio, have invented an Improved Process for Producing Refined Cast-Iron, of which the following is a specification:

The partial decarbonization of cast-iron in larger quantities than can, by the ordinary process or by any known mode of operation, be worked in a puddling-furnace, has heretofore been effected in the refinery-fire, with the use of coke or wood charcoal and a blast. By this means a large mass of "refined" or partially-decarbonized iron is produced, which being broken up into smaller portions or charges, the latter are worked separately, and brought to nature in the puddling-furnace or in an open knobbling-fire—it being understood that the operation of puddling into balls for blooming is practicable only with much smaller quantities of metal, and can be produced in the refinery. This refining operation is, however, a costly one, involving as it does the use of coke or charcoal and a very strong blast.

I propose in my process to produce refined (partially-decarbonized) iron, suitable for casting or for breaking up into convenient fragments for complete puddling and balling, by the use of stone-coal in an ordinary puddling or other suitable closed or reverberatory furnace, so as to greatly cheapen the production of refined cast-iron.

In the accompanying drawing, Figure 1 is a side elevation of a reverberatory furnace, such as may be used in carrying out my invention. Fig. 2 is a longitudinal section of the same.

A fire, which may be of ordinary stone-coal, having been raised in the fire-place C of a puddling-furnace, or other suitably-closed or reverberatory furnace, a charge of broken pig or other cast iron is placed on the hearth A, and, the ash-pit and damper being left open so as to secure a thorough draft, the workman examines the charge from time to time through the stopper-hole G, and as soon as the exposed upper surface shows signs of partial fusion, the workman gently turns over the pieces, so as to expose fresh surfaces to the action of the flame, after which he keeps

shifting the pieces until they are all melted down into the condition of a "puddle." The workman then (the ash-pit and damper remaining open) closes the stopper-hole and stimulates the fire. This process of intense heating and active combustion, without manipulation of any sort, is permitted to continue for a period of five to fifteen minutes, until the workman, closely watching the behavior of the charge from time to time through the stopper-hole, observes, at that portion of the puddle near the fire-bridge, numerous jets of blue flame about the size of the flame of an ordinary tallow candle. The tap-hole is then opened, so as to allow the charge to flow out into a suitable shallow cast-iron mold, such as customarily employed in the molding of refinery-slabs, and the crust of cinder separated by the application of cold water, in the usual way.

Iron thus refined may be used with great advantage, and a large saving of expense in the manufacture of car-wheels, and numerous manufactures of malleable iron. It may be remelted in a cupola for casting, or it may be reworked in the puddling-furnace or knobbling-fire in any customary manner for producing wrought-iron. The knobbling-fire resembles a sunken-hearth refinery, but is usually of smaller size. It is furnished with tuyeres, and is used with coke or charcoal for working cast-iron into a ball for blooming.

It will be manifest that, in carrying out my process, the reverberatory may be arranged to take the molten metal direct from the smelting furnace.

The following is claimed as new:

The process herein described for the manufacture of refined iron—to wit, reducing the pig to the condition of puddle upon the hearth of a reverberatory furnace separately from the fuel, then raising the heat and allowing the iron to remain in a state of rest until jets of blue flame appear, after which the charge is drawn.

In testimony of which invention I hereunto set my hand.

CHARLES BURGESS.

Attest:

GEO. H. KNIGHT,
JAMES H. LAYMAN.