

H. Davies, 2, Streets, Street 1.

Refining Iron.

No. 104,939.

Patented July 5, 1870.

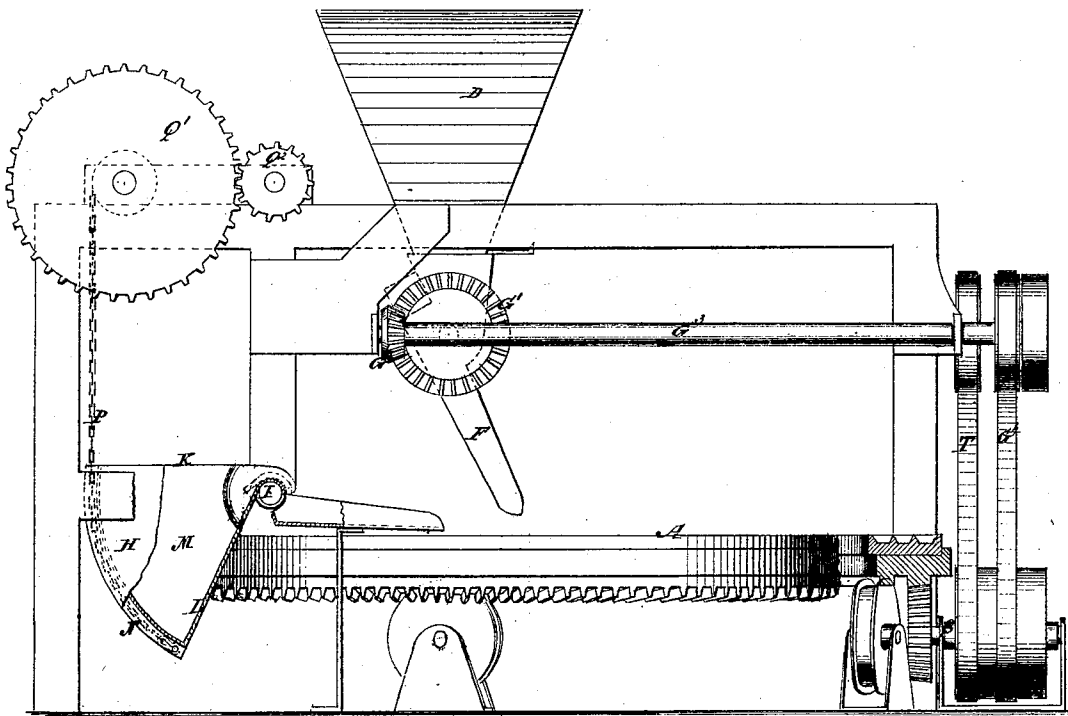
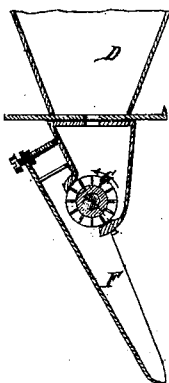


Fig. 2.



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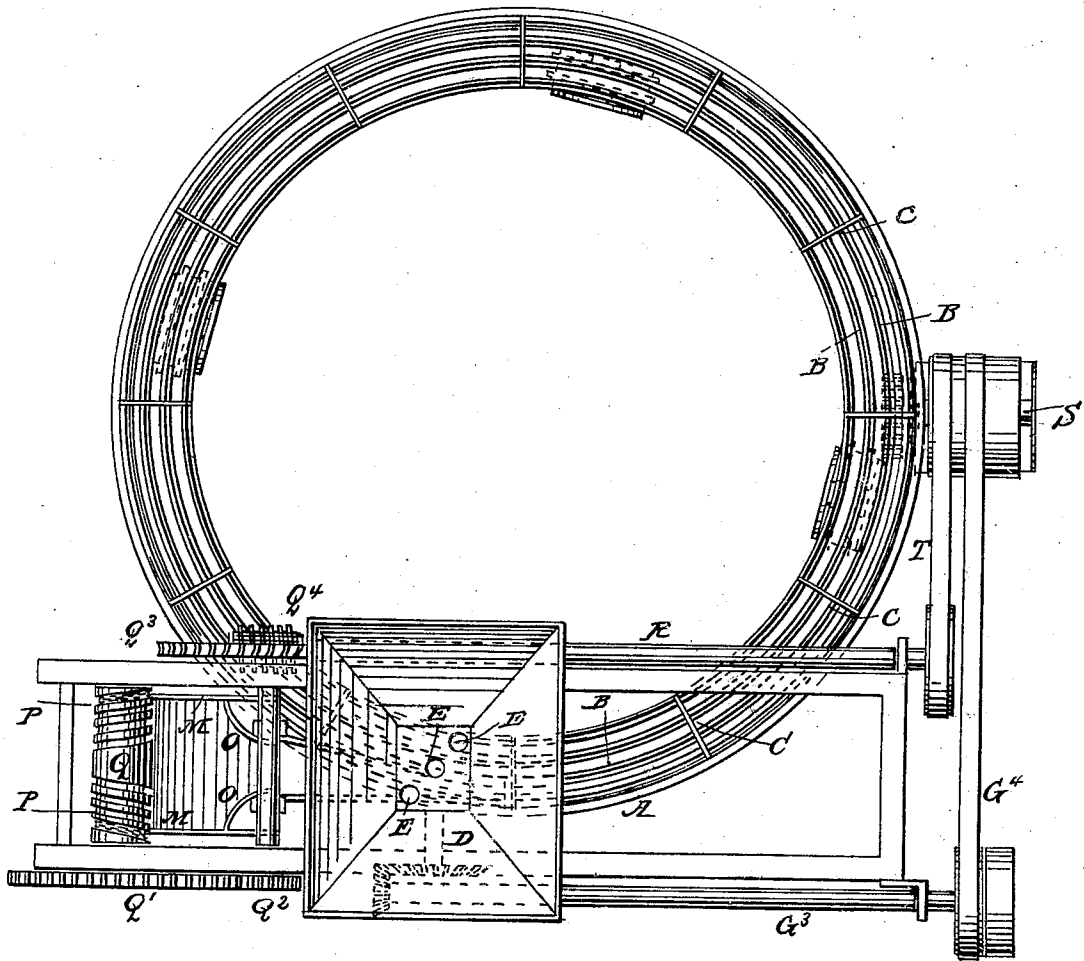
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Fig. 3



witnesses  
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# UNITED STATES PATENT OFFICE.

HENRY DAVIES, OF NEWPORT, KENTUCKY.

IMPROVEMENT IN THE MANUFACTURE OF IRON BY THE ELLERSHAUSEN PROCESS.

Specification forming part of Letters Patent No. **104,939**, dated July 5, 1870.

*To all whom it may concern:*

Be it known that I, HENRY DAVIES, of Newport, in the county of Campbell and State of Kentucky, have invented a new and useful Improvement in the Manufacture of Iron; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming a part of this specification:

This invention relates to improvements in the manufacture of iron according to what is known as the "Ellershausen process;" and consists in an arrangement of mixing-table, molten-iron ladle, and ore-feeding apparatus, whereby the mixture of ore or earthy matter with the molten metal can be made in exact and predetermined proportions, as hereinafter specified.

Figure 1 is a side elevation of my improved machine, partly taken out. Fig. 2 is a sectional elevation of the ore-feeding apparatus, and Fig. 3 is a plan view.

Similar letters of reference indicate corresponding parts.

A is a large circular table for the reception of the molten metal and the ore to be mixed. This table is arranged to revolve in a horizontal plane under the declining spouts for the substance to be mixed, and is divided into two or more channels on the top by vertical ribs B, and these are divided again into sections by the transverse rib C.

D is a hopper above the table A, into which the pulverized ore or earthy matter is placed for feeding down upon the table. This hopper has as many feeding-orifices E in the bottom as there are channels in the top of the table, and the feeding-spout F, leading therefrom, also has a similar number of channels, and each orifice E has a cutting-off slide or gate. Below the cutting-off gate is a feed-roller, G, with corresponding spaces or channels divided transversely for the reception of the ore and delivering to the spout below.

H is a hopper or ladle for feeding the molten metal to the table for mixing with the ore. It is made in the form of a hollow sector of a circle, and journaled at the axis I of the said circle. The top K and the bottom L represent

radial lines, and the sides M are parallel, while the back N represents the section of a circle. At the mouth it is narrowed down on the curved lines O, Fig. 3, and these narrowing walls are also curved in the plane of the circle of the ladle, and on the same axis as shown in Fig. 1.

The object of this construction is to cause the ladle to pour the same quantity of metal to every inch it is raised on its axis, whether at the beginning or at any other part of the pourings. It is necessary to narrow down the mouth of the ladle, to prevent the flow therefrom being so thin as to chill and not run free.

The rear part of the ladle has chains P connected to the lower part, and attached, by their other ends, to the spirally-grooved rollers Q in the top of the frame.

The connection of the ladle to the axial bar I is such that it may be adjusted from side to side thereon for pouring into either of the channels of the table A.

The winding-drum Q is connected, by the reducing-gears Q<sup>1</sup>, Q<sup>2</sup>, Q<sup>3</sup>, and Q<sup>4</sup>, with the driving-shaft R, connected with the main driving-shaft S, which also drives the table by suitable driving-wheels, by the belt T, and suitable pulleys, and the feed-roller G is connected, by wheels G<sup>1</sup> G<sup>2</sup>, shaft G<sup>3</sup>, belt G<sup>4</sup>, and suitable pulleys, with the same driving-shaft.

Fast and loose pulleys are provided for the belt G<sup>4</sup>, so that the feed-roller may be set in motion at the right time after the table and the ladle have been started. The ladle is raised, by the drum and chains, on its axis, to pour the metal upon the table.

It will be seen that the hopper and the ladle being charged with their respective substance, and the machine being set in operation, the delivery of each will be in exact proportion to the other, no matter whether it moves fast or slow, and, by the proper calculations, arrangement, and adjustment of the speed, any required predetermined mixtures may be effected. The driving-gears of either the table, feed-roller, or ladle may have differential charge apparatus for effecting any modifications required of the proportions.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A tilting ladle constructed and arranged for delivering a uniform quantity of metal, when tilted at a uniform rate of speed, substantially in the manner herein shown and described.
2. The combination, with a rotating or other receiving-table, of the ore-hopper and feeding-wheel, and the tilting ladle, arranged for operating relatively to each other, substantially as specified.
3. The arrangement of the ladle for adjustment along its axis, substantially as specified.

HENRY DAVIES.

Witnesses:

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