No. 811,097. PATENTED JAN. 30, 1906.

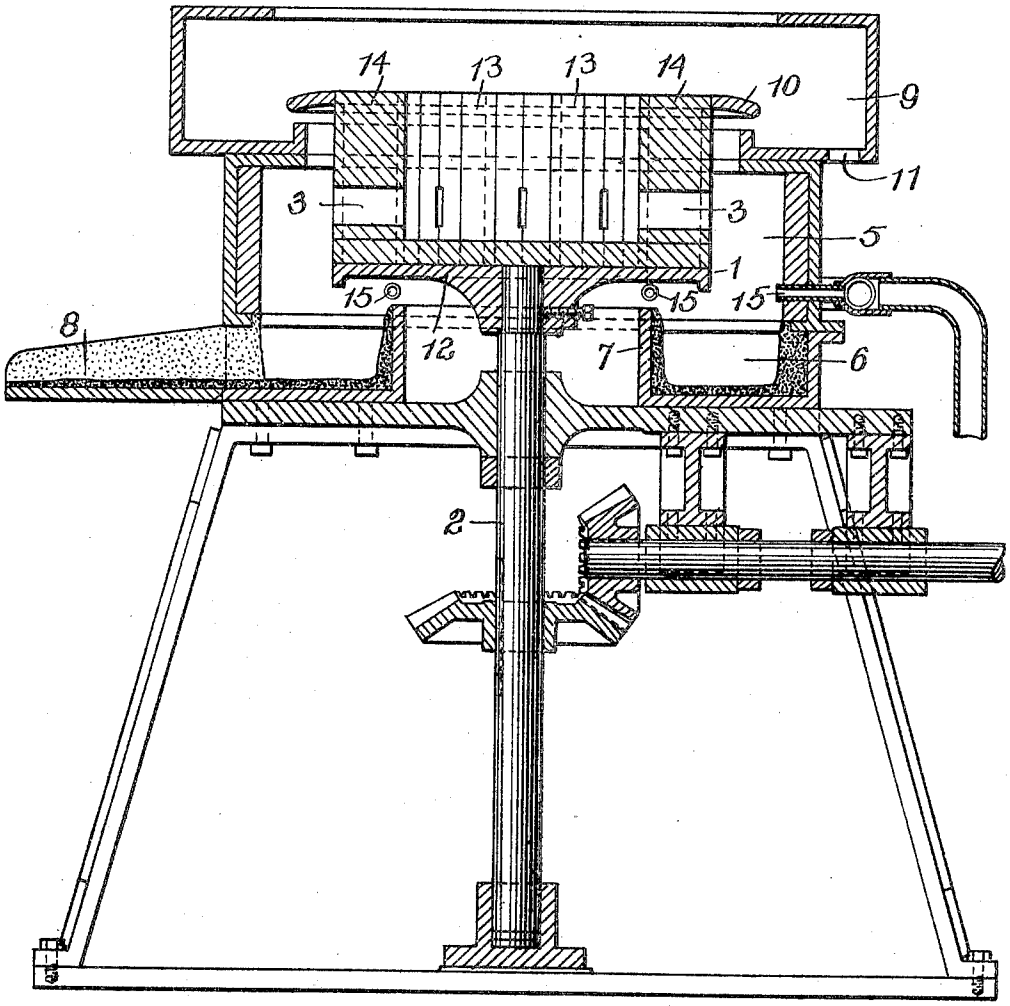
J. S. SEAMAN.

APPARATUS FOR TREATING MOLTEN METAL.

APPLICATION FILED MAY 23, 1904.

2 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:
Herbert Bradley.
Fred Kirchner.

INVENTOR
Joseph S. Seaman,
by Christy & Christy, Atty's

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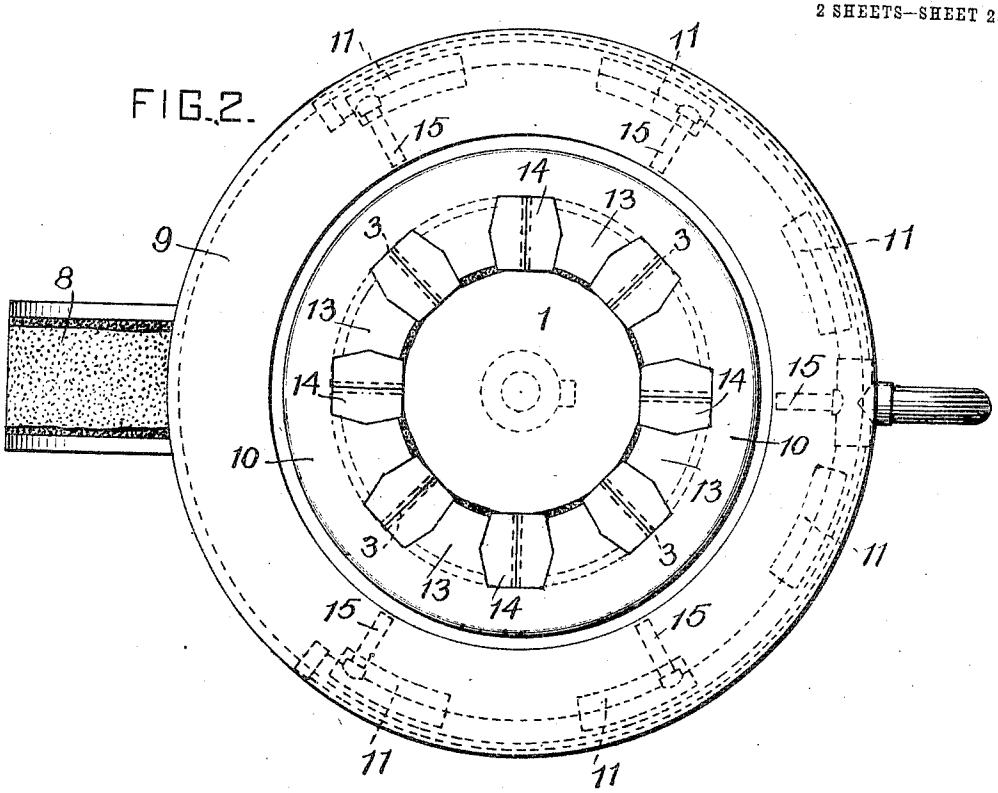
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APPARATUS FOR TREATING MOLTEN METAL.

APPLICATION FILED MAY 23, 1904.

2 SHEETS—SHEET 2.

FIG. 2.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JOSEPH S. SEAMAN, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR TREATING MOLTEN METAL.

No. 811,097. Specification of Letters Patent. Patented Jan. 30, 1906.

Application filed May 23, 1904. Serial No. 209,311.

To all whom it may concern:

Be it known that I, JOSEPH S. SEAMAN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Apparatus for Treating Molten Metal, of which improvements the following is a specification.

The invention described herein relates to certain improvements in apparatus for treating and casting metal, and has for its object the separation of slag and other impurities from the good metal as it passes from the ladle or other source of supply to the mold and also during such passage to afford opportunity for the escape of gases and for a purifying treatment of the molten metal.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of my improved apparatus for purifying metal, and Fig. 2 is a top plan view of the same.

In the practice of my invention I provide suitable means whereby the molten metal as it comes from the cupola or other source of supply is subjected prior to its entry into the mold to a centrifugal action, whereby the impurities, such as slag, &c., may be separated from the good metal and the latter broken up for a short time into small masses or bodies, so as to provide for the escape of gases.

While many forms or constructions of apparatus may be employed in the practice of my invention, I have found that the construction shown in the accompanying drawings is a convenient one for the apparatus. This apparatus consists, primarily, of a basin 1, mounted upon a vertical shaft 2, which can be rotated at the desired speed by any suitable form or construction of motor through the medium of a gearing. This basin is provided with peripheral ports or passages 3, preferably arranged adjacent to the bottom of the vessel for the escape of good molten metal, which is forced out through the openings by the centrifugal action imparted to the metal by the rotation of the basin. The basin, or at least that portion having the perforated periphery, is inclosed within a retaining vessel consisting of a shell 5, surrounding the basin at a suitable distance from its periphery and lined with fire-clay or other refractory material. This ring 5 is supported upon the outer rim of an annular trough 6, the inner rim 7 of such trough being within the plane of the periphery of the basin. This trough is provided with a spout 8, and the trough is so supported that the metal falling thereinto will flow toward and through the spout. In using this apparatus sufficient metal will be poured thereinto so as to maintain a depth of metal therein at least sufficient to cover the radial openings 3. As the good metal is maintained at a height above the level of the ports, slag and other impurities will accumulate sufficiently to flow over the top of the basin. I therefore provide a catch-basin 9, having an open top and surrounding the centrifugal basin. The bottom of the catch-basin extends under the rim 10, which is preferably formed around the upper edge of the centrifugal basin. This catch-basin will prevent the dangerous scattering or spreading of any metal which may overflow from the centrifugal basin and is provided with openings 11, through which metal caught therein may flow out. While not necessary, it is preferred to line this catch-basin with clay or other refractory materials.

While the centrifugal basin may be constructed in any suitable manner, it is preferably formed of a base-plate 12, having a hub adapted to be detachably secured to the vertical driving-shaft 2. A series of vertical staves or sections 13 are formed on or secured to the base-plate and are connected together at their upper ends by the rim 10. These staves or sections are arranged a distance apart, forming pockets or recesses for the reception of staves or sections 14, formed of refractory material, such as clay. By reference to Fig. 2 it will be seen that adjacent walls of the metal staves are inclined so as to form double dovetailed recesses for the refractory staves, which have their outer walls similarly inclined, so that they may be securely held in position. Through these refractory staves, which for convenience of manufacture are formed in two sections, are formed the radial openings for the escape of metal.

In using this apparatus the molten metal is teemed into the centrifugal basin in such quantities as to maintain a depth of metal therein sufficient to cover the radial openings. By the rotation of this basin the metal is forced outwardly through the radial openings in small streams, which, striking against the inner wall of the ring 5, are further broken

up, thus permitting a perfectly free escape for any gases contained in the metal. After striking against the ring 5 the metal will drop down and collect in a mass in the trough and flow thence through the spout into a mold beneath the same or a ladle, whereby the purified metal may be carried into the mold. As the good metal is heavier than the slag or other impurities, it will be mostly subjected to centrifugal action, and will therefore be separated from such impurities by the flowing of the good metal through the radial openings.

As it may at times be desirable to purify the molten metal, as by subjecting it when broken up to the action of the air, nozzles 15, connected to a source of air or gas under pressure, are inserted through the walls of the retaining vessel in such position that the air-jets can be forced through the metal while broken up.

I claim herein as my invention—

1. An apparatus for treating metal having in combination an open-topped rotatable basin having radial ports or passages in its side wall, a receiving vessel inclosing the basin and provided with a spout and a catch-basin surrounding the upper portion of the separating-basin, substantially as set forth.

2. An apparatus for treating metal having in combination, a basin having removable wall-sections provided with ports or passages, means for rotating said basin, a receiving vessel surrounding the basin and provided with a spout, substantially as set forth.

3. An apparatus for treating molten metal having in combination a rotatable basin having radial ports or passages, a receiving-receptacle surrounding the basin and having an outlet and blast-pipes arranged to direct jets of air against the metal in the receptacle, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOSEPH S. SEAMAN.

Witnesses:

DARWIN S. WOLCOTT,

F. E. GAITHER.