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Patented Sept. 2, 1902.

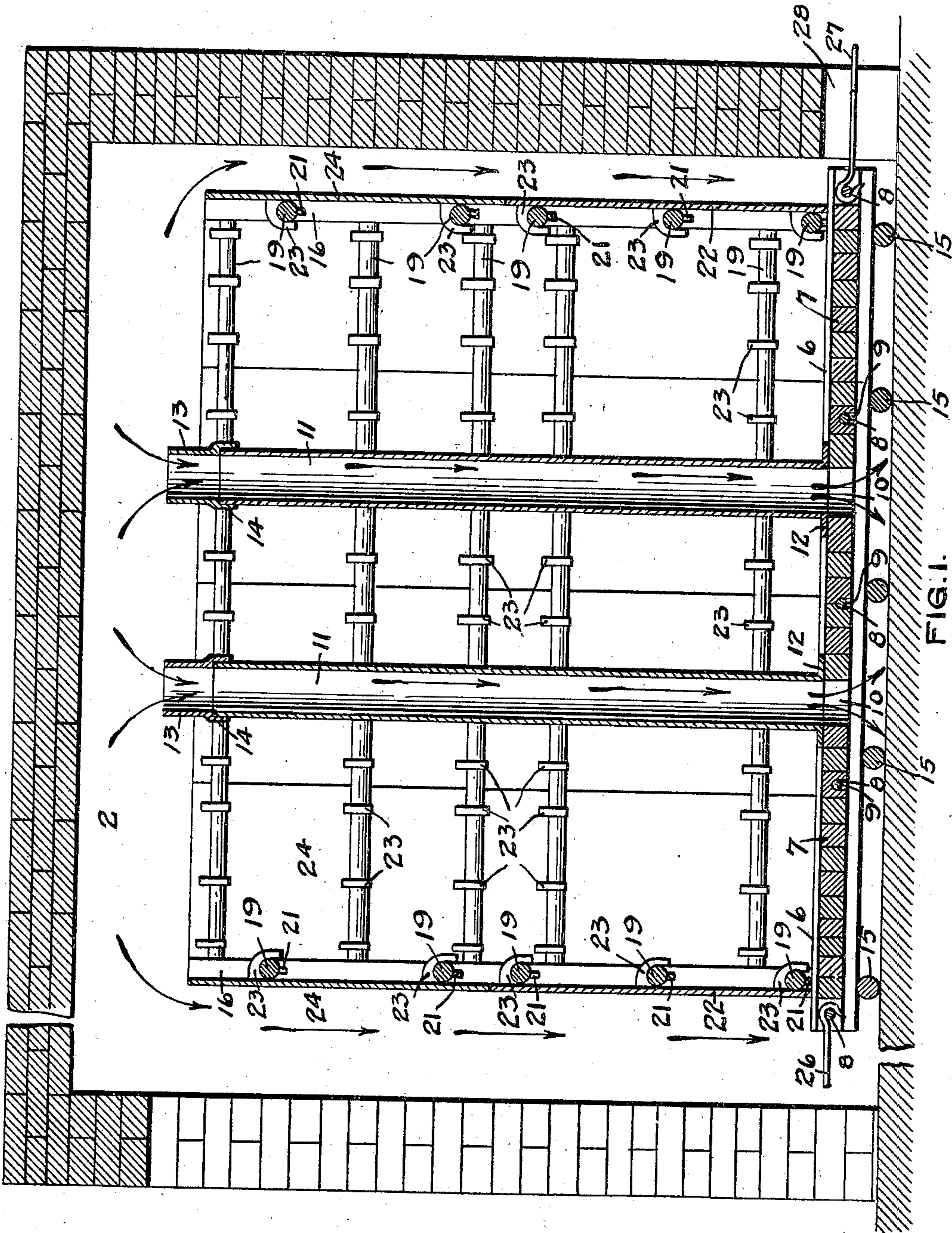
A. W. McCLARY.

ANNEALING RECEPTACLE FOR CASTINGS.

(Application filed Apr. 12, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES
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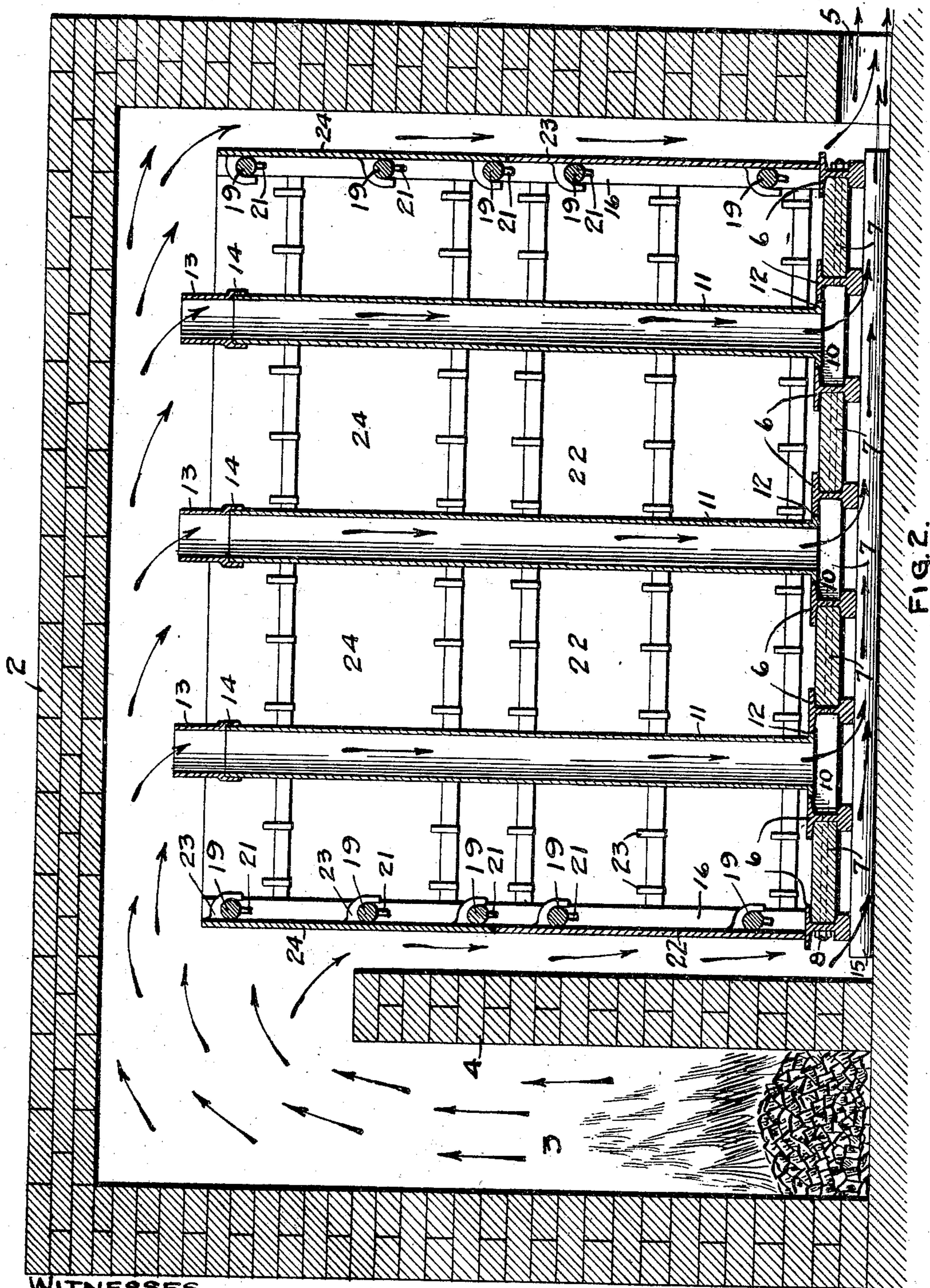
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3 Sheets—Sheet 2.



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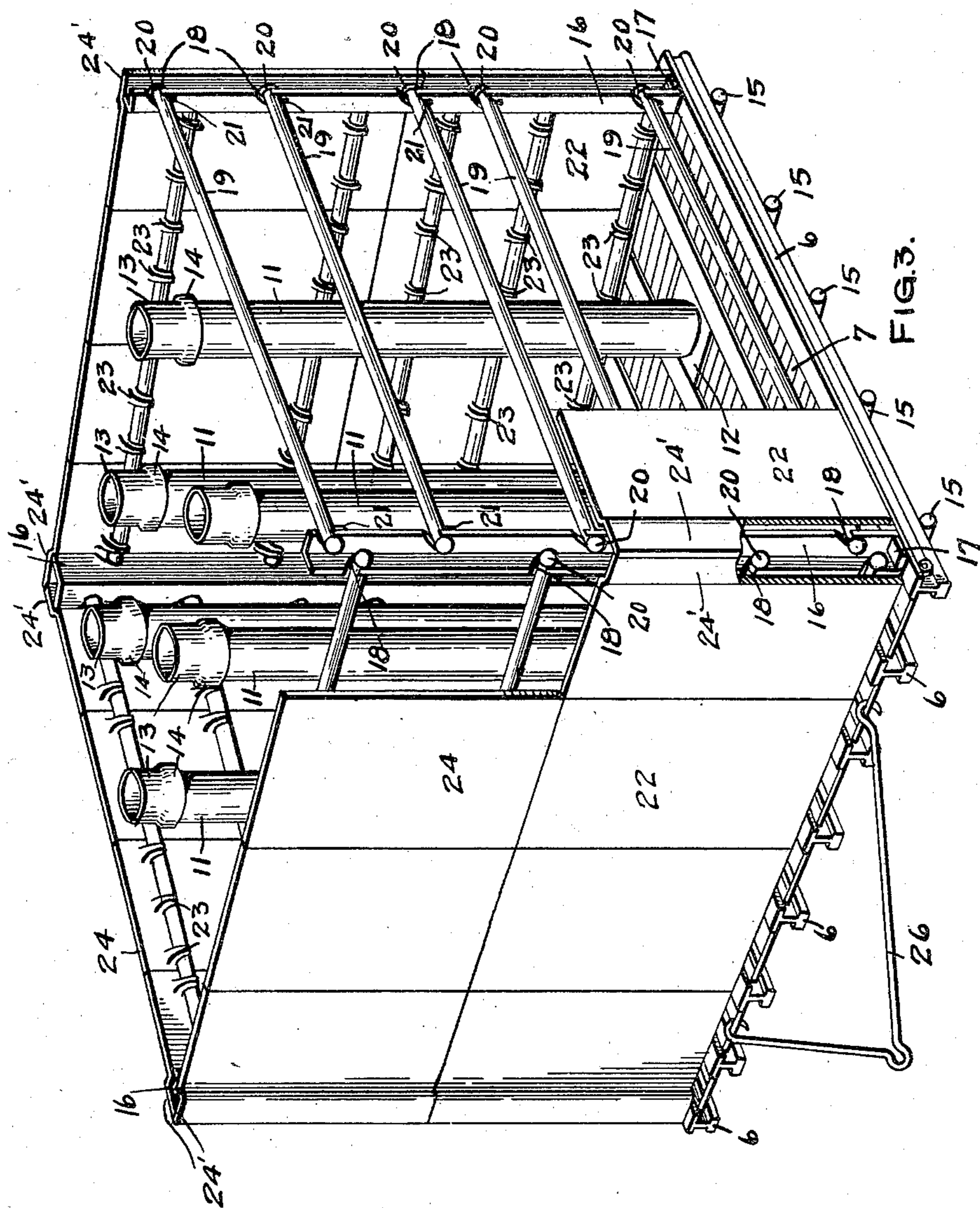
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

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ANNEALING-RECEPTACLE FOR CASTINGS.

SPECIFICATION forming part of Letters Patent No. 708,384, dated September 2, 1902.

Application filed April 12, 1901. Serial No. 55,461. (No model.)

To all whom it may concern:

Be it known that I, ALLAN W. MCCLARY, of St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Annealing-Receptacles for Castings, of which the following is a specification.

My invention relates to improvements in devices employed in the process of annealing castings which are packed in iron oxids and usually are placed within bottomless annealing-pots that are separably arranged one upon another on a suitable base and filled one at a time with castings until the desired height is reached. Usually three pots are stacked upon each base; but a larger number may be placed thereon when the height of the annealing-oven will permit. After being filled the pots are moved on their base into the oven, where the castings are subjected to the usual annealing process. A number of stacks of the pots may be placed in each oven at the same time; but each stack is moved in and out separately, requiring the employment of a truck apparatus and a crew of men each time an oven is filled or emptied. The life of an annealing-pot is only three or four heats, and consequently the renewal of burned-out and broken pots constitutes a very large item of expense in the cost of carrying on a malleable-casting foundry. Furthermore, the scales must be cleaned from the pots when they are removed from the oven, and the pots of each stack or pile must be broken apart and the castings dug out, all of which requires the expenditure of considerable time and labor. It has also been found that the heat is not evenly distributed through the oven among the rows of pots and that in consequence the castings are frequently not uniformly annealed, those in the pots near the fire being affected more quickly by the heat than those in the more distant pots. There is also more or less delay in removing the pots from the oven, owing to the fact that those near the rear of the same cannot be reached by the workmen on account of the heat until some time after the oven is opened.

The object, therefore, of my invention is to obviate all these objections and difficulties incident to the use of the ordinary annealing-pot by providing a receptacle for the castings whereby the use of the pots may be dis-

pensed with and the cost of renewing and maintaining them entirely avoided.

A further object is to provide a receptacle the use of which will render unnecessary the employment of large crews of men to place the castings in the oven and remove them therefrom.

A still further object is to provide a receptacle which may be quickly filled and moved into the oven and as readily drawn out again and emptied as soon as the oven has been opened.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in a receptacle having separable walls and wherein the castings are packed preparatory to being placed in the annealing-oven.

Further, the invention consists in a receptacle wherein the walls are separable from each other and the base or bottom.

Further, the invention consists in a receptacle having walls composed of separable sections.

Further, the invention consists in a receptacle having a series of flues, whereby the heat will be uniformly distributed among the castings.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a longitudinal section of an annealing-oven and of my improved casting-receptacle therein. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a perspective of the receptacle, the sections upon one side being removed.

In the drawings, 2 represents an annealing-oven of any ordinary or preferred construction, having a fire-chamber 3, separated from the main portion of the oven by a wall 4, between which and the top of the oven the flames and products of combustion are directed. A series of flues 5 are provided in the wall of the oven on the opposite side, preferably near the floor, through which the products of combustion pass to the stack after circulating through the oven.

The receptacle which I prefer to employ for the castings to be annealed consists, pref-

erably, of a base or bottom composed of a series of inverted railroad-rails 6, arranged parallel, the spaces between them being filled with blocks of brick 7 or other suitable material. The rails are connected and held from spreading by tie-rods 8, arranged at intervals, those intermediate to the ends of the rails preferably fitting within grooves 9 in the blocks. The blocks 7 may be loosely placed between the rails, and when the rods are drawn up they will be firmly clamped between the rail-webs and will be prevented from slipping up or down by the flanges and heads thereof. A compact rigid base or support for the castings will thus be formed, which will not be warped or twisted by the heat of the oven or be pulled apart in moving the receptacle into or out of the same. At suitable intervals in the base I prefer to provide a series of holes 10, over which I arrange a corresponding number of removable pipes or flues 11, having flanges 12 at their lower ends which support the flues in an upright position on the base. The flues are taken off the base when the receptacle is emptied and are placed in position over the holes preparatory to filling the receptacle. I have shown six of these flues that are preferably cast in cylindrical form; but there may be a greater or less number, and instead of being arranged vertically they may be placed horizontally or at an incline in the receptacle. Instead of constructing the flues of cylindrical castings I may make them of angle-iron, each flue in that case being rectangular and consisting of two bars of iron with the edges of their flanges placed together. On the top of each flue I prefer to provide a removable extension 13, having a flange 14, that laps down over the upper end of the flue and holds the extension in position thereon. These extensions are directly exposed to the heat of the oven and after being burned out or damaged may be replaced at a small expense, whereas without their employment it would be necessary to provide an entire new flue whenever its exposed end became damaged or worn by the action of the heat. The base of the receptacle is placed upon a series of rollers 15 preparatory to filling the same with the castings, and these rollers remain under the receptacle while in the oven, so that a space will be provided between the bottom of the receptacle and the floor of the oven, through which the heated air and products of combustion may circulate down through the flues and under and around the base and walls of the receptacle. These rollers consist, preferably, of round iron of suitable size, and the filled receptacle is moved in and out of the oven over them. At each corner of the base I provide angle-bars 16, forming the corner-posts of the receptacle and held in place against outward movement at their lower end by blocks 17. The flanges of these bars are provided with a series of notches 18, there being, preferably, two near the top and middle of the bar

and one at the bottom thereof. These notches are adapted to receive rods 19, connecting the bars on each side of the receptacle, and these rods are provided with heads 20 and pins 21, which prevent longitudinal movement of the rods when in use, but permit them when raised to be disengaged from the notches whenever it is desired to separate the walls. To prevent the ends of the rods from interfering at the corners, the notches 18 are alternately arranged. Each wall of the receptacle is preferably composed of a series of separable sections, arranged in rows one above the other. The sections 22 form the lower portion of the wall and are each provided with a series of hooks 23, in position to engage the rods 19, that are located near the middle and at the bottom of the corner posts or bars. In the drawings I have shown the sections 22 on two sides of the receptacle provided with two horizontal rows of hooks and with three rows on the other two sides, said rows of hooks being adapted to engage a corresponding number of the alternately-arranged rods. The upper row of sections 24 is correspondingly provided with two or three rows of hooks, according to the arrangement of their supporting-rods, and it will be understood that the number and position of these rods will govern the number of hooks and their position on the sections. The sections 22 and 24 at the corners of the receptacle are provided with offset flanges 24', which inclose and conceal the corner-posts and the ends of the rods supported thereby. The walls of the receptacle are during the handling process subjected to a continued intense heat and are liable to be burned or warped or twisted thereby, and if made in one piece the walls would need frequent renewing, and it would be often difficult, if not impossible, to secure the warped and twisted parts together or to separate them. I have avoided all this difficulty, however, by providing walls composed of a series of separable sections. If one or more sections become broken or burned or otherwise affected by the heat, new sections may be substituted therefor without the necessity of discarding the entire wall. The sections are easily separated from each other and from their supporting-rods when it is desired to remove the castings, and as each wall is divided into groups of sections there will be no danger of their becoming warped lengthwise and binding the supporting-rods in their sockets and rendering it difficult to separate the walls.

Any suitable means may be employed for moving the loaded receptacle into and out of the oven. In Fig. 3 I have shown a bail 26, adapted to be attached to one end of the base and to which a suitable mechanism may be connected for drawing the loaded receptacle out of the oven. A bail or similar device may be provided at the other end of the base, to which a cable 27 is connected through an opening 28 in the rear wall of the oven. The cable 27 may be connected in the rear of the

oven to a suitable windlass, by means of which the loaded receptacle may be drawn into the oven.

The receptacles may be made of any suitable size; but I prefer to construct them of such dimensions that the ordinary annealing-oven will accommodate two, arranged one in front of the other.

In filling a receptacle with castings the upright flues are placed in position over their holes in the base, the corner posts or standards set up and connected by their horizontal rods. The lower group of sections are then hung upon the rods on three sides of the receptacle and the castings laid on the base, packed in the usual quantity of iron oxids, and after the space inclosed by the lower group of sections on three sides has been well filled the remaining sections of said group on the fourth side are hung in position and the receptacle filled to the top of these sections. The workmen then place the sections of the upper group in position and carry on the filling of the receptacle until the desired height is reached. The loaded box or receptacle is then moved into the oven, where the castings are subjected to the usual degree of heat and for the customary length of time. A sufficient space is provided between the side walls of the oven and the receptacle for the flames and products of combustion to pass down and around the body of castings, and the open top flues will conduct heat down through the interior of the receptacle and under the bottom of the same. In this way the whole body of castings will be affected uniformly by the heat, the center of the mass as well as the outside, and a uniform annealing will result therefrom. As soon as the oven is opened or at any time thereafter the receptacle may be dragged out and when cooled sufficiently the workmen may remove the sections, separate the walls, and then by tilting the base overturn the entire mass upon the ground. This will cause the castings to be separated more or less from one another and break up the caked portions and facilitate the cleaning and separating of the castings. Should one of the sections or rods be burned or warped, it may be replaced by another, so that the yearly expense of renewing the damaged portions of the receptacle will be extremely small as compared with the cost of maintaining the annealing-pots in general use.

The flues, the sections, and supports of the walls are all preferably made of castings of any preferred size.

The manner of supporting the horizontal rods on the upright supports, as well as the method employed for securing the sections

on said rods, may be modified, and in various ways the construction of the apparatus is capable of change, the essential idea of the invention being to provide a box, crate, or receptacle having walls divided horizontally into a series of independent bottomless sections and provided with suitable flues.

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

1. The combination, with a base or floor, of corner posts or standards thereon, removable rods connecting said posts, a series of sections suspended on said rods, and removable flues provided on said base.

2. The combination, with a base or floor, of angle-bars having a series of notches provided at the corners thereof, a series of rods removably fitting said notches and tying said bars together, and a series of sections suspended on said rods.

3. An annealing-receptacle comprising a base or bottom having flue-holes, flues removably arranged over said holes, and walls removably arranged upon said base around said flues and divided horizontally into a series of independent sections, substantially as described.

4. An annealing-receptacle comprising a base or bottom made up of a series of blocks and parallel rails, alternately arranged, and provided with a series of flue-holes, a series of flues fitting over said holes, means for binding said blocks and rails together, and walls composed of separable sections resting upon said base and inclosing said flues, substantially as described.

5. An annealing-receptacle comprising a base composed of a series of parallel rails suitably spaced, a filling material provided with flue-holes for the space between said rails, means for binding said filling material and said rails together, flues fitting over said holes, and walls divided into separable sections removably supported upon said base and inclosing said flues, substantially as described.

6. An annealing-receptacle, comprising a base or bottom, flues removably arranged on said base, and walls removably arranged upon said base around said flues and divided horizontally into a series of independent bottomless sections.

In witness whereof I have hereunto set my hand this 8th day of April, 1901.

ALLAN W. MCCLARY.

In presence of—

RICHARD PAUL,
M. C. NOONAN.