Nov. 28, 1950 D. W. SAUNDERS 2,531,473

METHOD AND APPARATUS FOR "MAKING BOTTOM" IN INGOT SOAKING PITS

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Fig. 1.

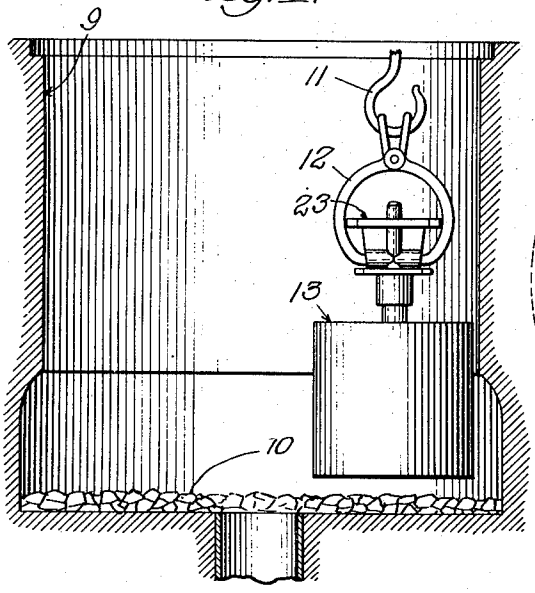



Fig. 2.

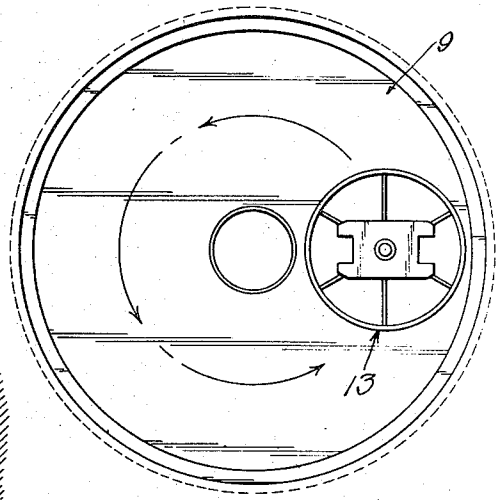
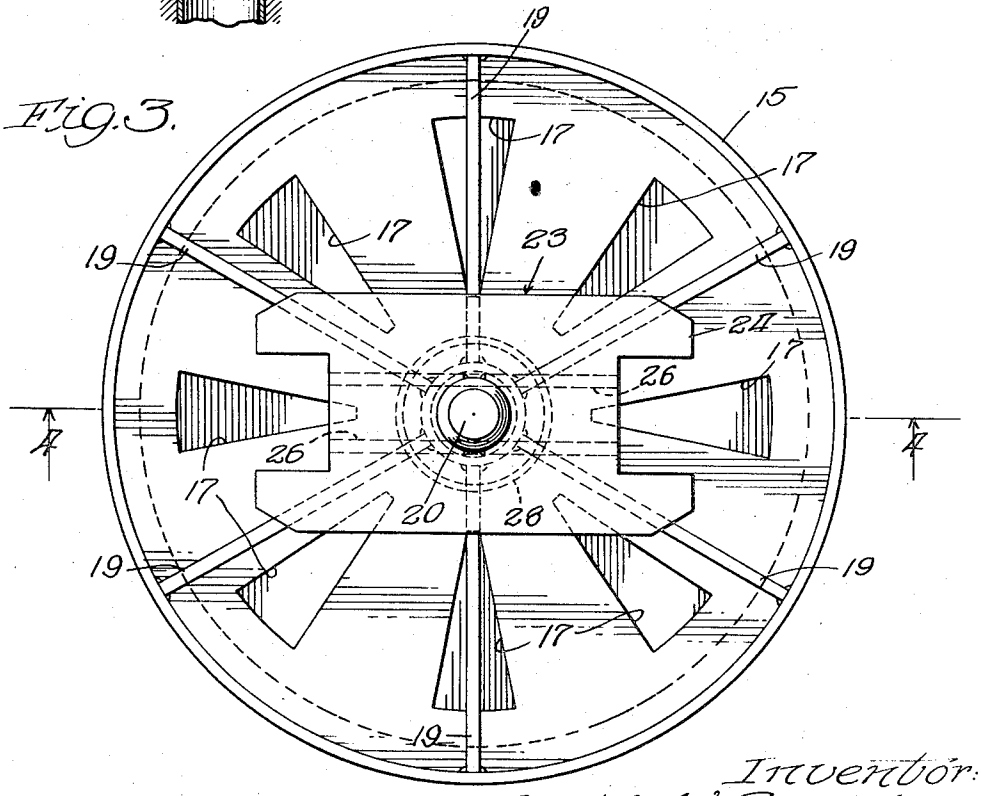



Fig. 3.



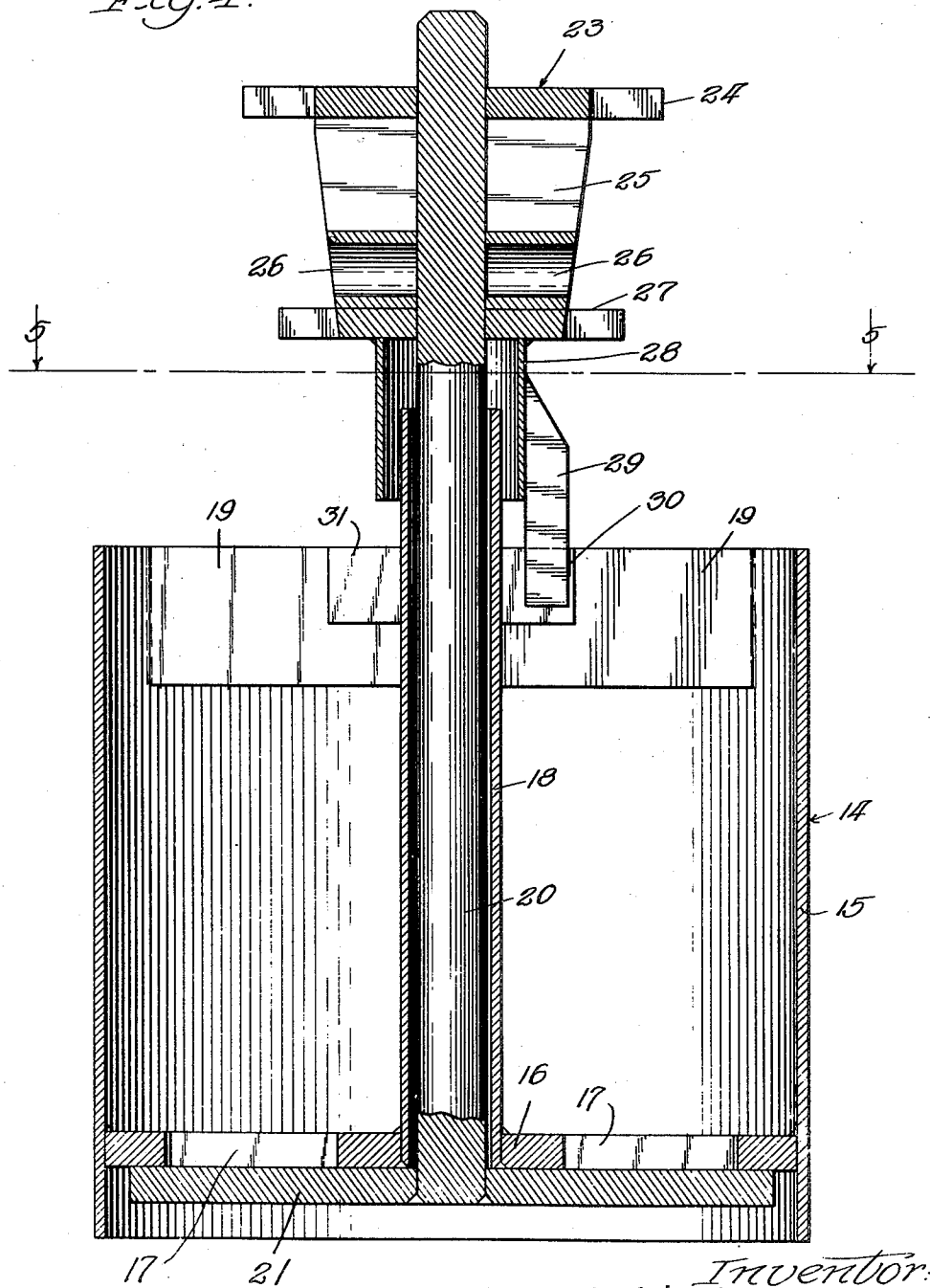

Inventor:
David W. Saunders,
By Chittick, Schroeder, Merriam & Agren,
Attys.

Nov. 28, 1950 D. W. SAUNDERS 2,531,473

METHOD AND APPARATUS FOR "MAKING BOTTOM" IN INGOT SOAKING PITS

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Fig. 4.




Inventor:
David W. Saunders,
By Church, Schroeder, Morriam & Hopgood,
Attys.

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METHOD AND APPARATUS FOR "MAKING BOTTOM" IN INGOT SOAKING PITS

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Fig. 5.

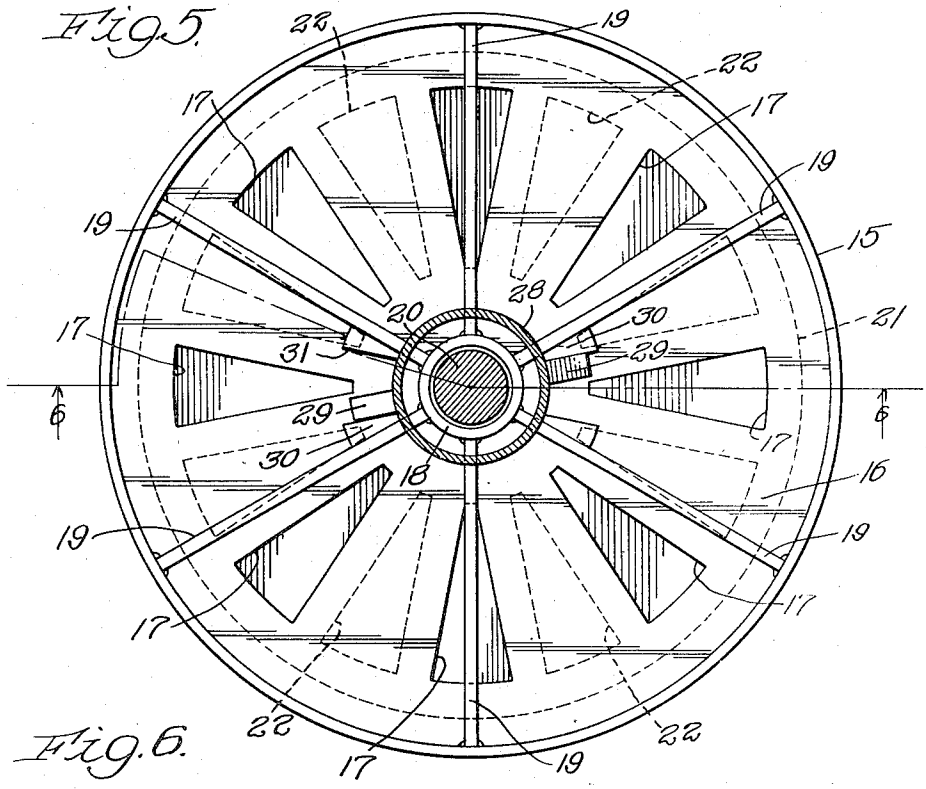
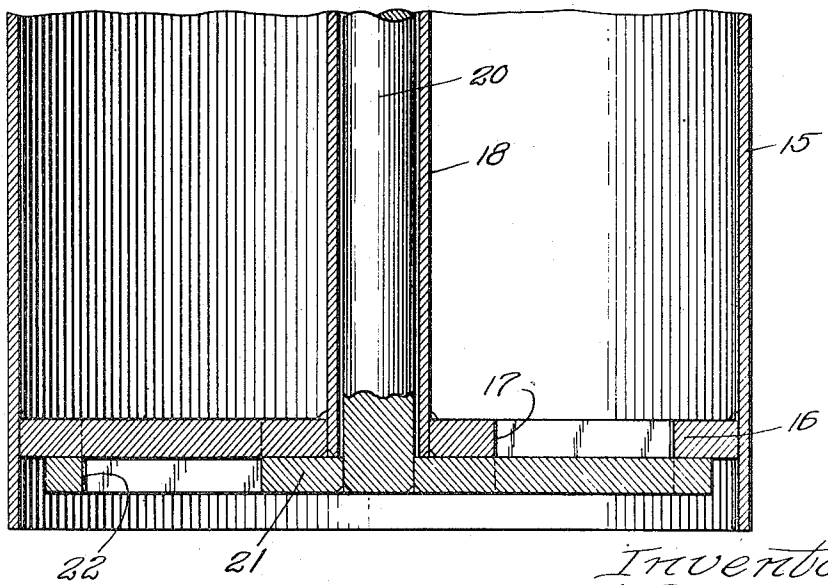



Fig. 6.




Inventor:
David W. Saunders,
By Christian, Schneider, Morrison & Hofgren,
Attys.

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METHOD AND APPARATUS FOR "MAKING BOTTOM" IN INGOT SOAKING PITS

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Fig. 7.

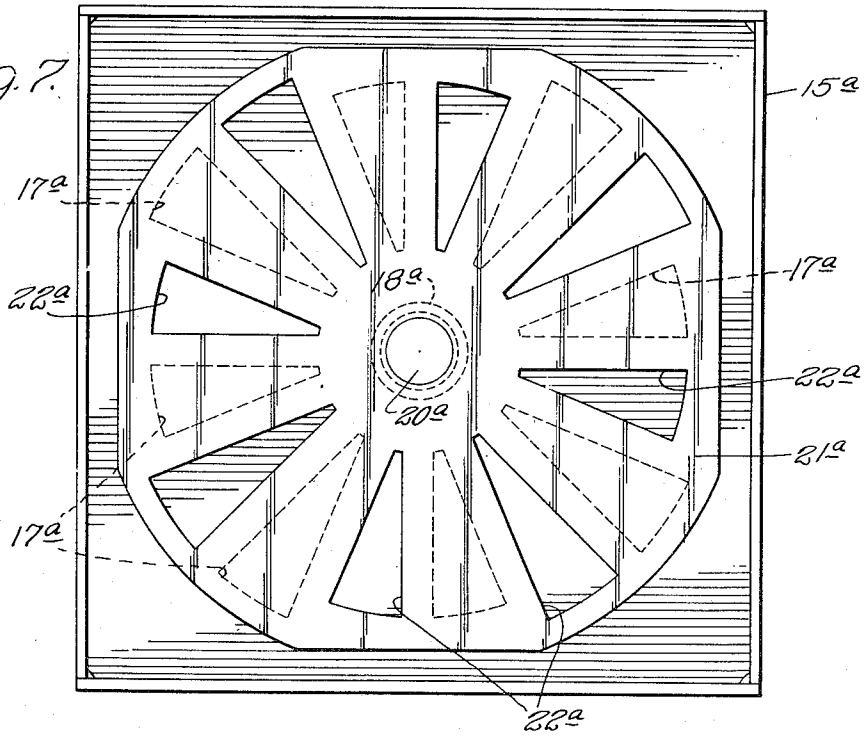
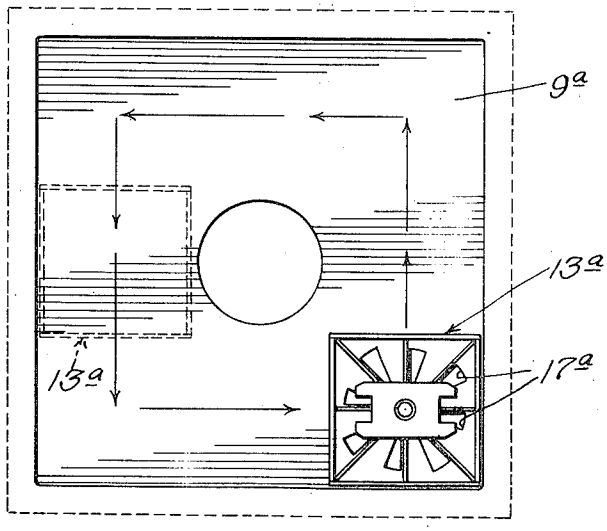



Fig. 8.




Inventor:
David W. Saunders,
By Christen, Schroeder, Merriam & Hofgren,
Attys.

Patented Nov. 28, 1950

2,531,473

# UNITED STATES PATENT OFFICE

2,531,473

## METHOD AND APPARATUS FOR "MAKING BOTTOM" IN INGOT SOAKING PITS

David W. Saunders, East Chicago, Ill., assignor to Inland Steel Company, a corporation of Delaware

Application January 15, 1947, Serial No. 722,267

10 Claims. (Cl. 25—155.5)

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This invention relates to a portable coke bin which may be used to spread an even layer of coke on the floor of an ingot soaking pit.

In the processing of ingots in a blooming mill they must be "soaked" at high temperature for a considerable period of time. This is done in a soaking pit which is usually circular, but may be square, and is merely a sand or firebrick lined pit about 10 or 12 feet deep, with hot gas inlets in its side wall near the floor and an ash pit in the center of the floor. It is set in the floor of a pit room, and is provided with a cast iron cover.

A layer of coke braize must be spread on the floor of the soaking pit to "make bottom," and the ingots are stood on end on the coke braize for soaking.

The method heretofore used in making bottom was to dump coke braize on the pit room floor adjacent the soaking pit and have the "bottom makers" shovel it into the soaking pit and smooth it with longhandled shovels. This was very hot, laborious work, and had several practical disadvantages. The bottom thus produced was often not very level, making it difficult to stand the ingots up properly; and the pockets in the coke bottom caused slag and cinders to form and adhere to the bottom and wall of the pit. Furthermore, it was virtually impossible to remove all the coke from the top brick or upper sand surface, and this coke in contact with the hot cover would burn out the cover casting.

The present invention is a coke bin which may be filled with coke braize and carried into the mill on a car. The craneman picks it up with the ingot tongs and lowers it onto the floor of the soaking pit. The bottom of the bin has covered openings which may be opened by twisting the tongs, after which the bin is raised about a foot off the floor and is slowly circled around the area of the pit floor by the crane so as to form an even layer of coke. The craneman can use the bin itself to smooth the coke bottom.

The invention eliminates the hot, laborious, hand work of bottom making, saves considerable time in making bottom, permits the making of a smoother, more satisfactory bottom, eliminates the hazard and dirt of dumping coke onto the pit room floor, and prevents burning out of pit covers.

The invention is illustrated in the drawings in which: Fig. 1 is a vertical section through a soaking pit with the coke bin in use; Fig. 2 is a top plan of a soaking pit showing the manner of using the coke bin; Fig. 3 is a top plan of the coke bin; Fig. 4 is a sectional view thereof taken as indicated at 4—4 of Fig. 3; Fig. 5 is a sectional view thereof taken as indicated at 5—5 of Fig. 4;

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Fig. 6 is a partial sectional view thereof taken as indicated at 6—6 of Fig. 5; Fig. 7 is a bottom view of a modified coke bin adapted for use with a rectangular soaking pit; and Fig. 8 is a plan view of a rectangular soaking pit showing the manner of using the modified coke bin.

Referring to the drawings in greater detail, a soaking pit 9 is provided with a coke braize bottom 10. A crane hook 11, of a crane (not shown), is provided with ingot tongs 12, from which is suspended a coke bin, indicated generally at 13.

The coke bin 13, which is the subject of the invention, consists of a body member 14 having a side wall 15 and a bottom 16, the body member 14 being provided at its bottom with a plurality of distributing openings, 17. A tube 18 is secured to the center of the bottom 16 in register with an aperture therein, and is connected adjacent its upper end to the side wall 15 by means of struts 19. A shaft 20 is both rotatably and slidably mounted in the pipe 18, and has secured to its lower end a closure member 21 which is provided with openings 22.

Preferably, the openings 17 in the body member 14 are all located in the bottom 16, and are in the form of radial segments of a circle, as are also the openings 22; and the angular space between adjacent openings 17, or between adjacent openings 22, is at least as great as the angular breadth of the openings. The openings 22 in the closure member may be moved into and out of register with the openings 17 in the body member by rotating the shaft 20. The preferred shape of the openings 17 and 22 provides for a very even distribution of coke braize below the bin.

The upper end of the shaft 20 is provided with a carrying member, indicated generally at 23, consisting of a cross member 24 which has its end portions recessed to accommodate the ingot tongs 13, a vertical cross fin 25 which extends downwardly from the cross member 24, and a pair of pipe sections 26 secured to the lower edge portion of the cross fin 25, into which the jaws of the ingot tongs 13 may fit. A second cross member 27 acts as a slide-travel stop for the shaft 20, and forms, together with the depending skirt 28 which surrounds the upper end of the tube 18, a dust cap to prevent coke from entering the tube when the bin is being loaded.

Secured to the depending skirt 28 are a pair of stop members 29 which coact with close stop members 30 and open stop members 31 on the tube 18 to limit the rotation of the shaft 20 so as to assure that the openings 17 in the bottom member will either be fully closed or fully open.

It will be noted that the side wall 15 extends

below the closure member 21, and thus serves as a base upon which the bin rests.

The operation and use of the coke bin is obvious from the above description. The bin 13 may be filled with coke by the use of any convenient mechanism, and conveyed into the pit room on a car. The craneman picks up the bin by hooking the jaws of the ingot tongs 12 into the pipe sections 26, and conveys the bin from the car to the soaking pit 9, where he sets it upon the existing bottom 10 close to the side wall of the pit. When the bin is set on the bottom, the shaft 20 and closure member 21 are free to drop until the closure member is resting on the bottom. By twisting the crane hook 11, the craneman rotates the shaft 18 until the stop members 29 abut against the stop members 31, at which point the openings 17 and the openings 22 are in exact register. The craneman then lifts the bin about a foot off the bottom and circles it slowly around the pit 9 close to the wall, thus distributing an even layer of coke braize, and renewing the bottom 10. If inspection shows that the newly laid coke is not sufficiently smooth, the craneman can readily smooth it by lowering the bin and using the lower edge portion of the side wall 15 as a drag.

The modified form of coke bin shown in Figs. 7 and 8 is adapted for use in a rectangular soaking pit. The arrangement of the bin is similar to that of the round bin, except for the fact that the space enclosed by the side wall 15*a* is rectangular rather than circular, and the openings 17*a* in the bottom member and the openings 22*a* in the closure member are not all of the same radial extent. Thus, as will be seen, the openings adjacent the corners of the bin have a greater radius than the openings adjacent the sides thereof. This provides for a better distribution of coke into the corners of the rectangular soaking pit 9*a* than would be possible if the openings were all of the same radial extent.

Aside from these differences in arrangement, the rectangular bin 14*a* is like the circular bin 14, and is used in the same manner.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, for some modifications will be obvious to those skilled in the art.

I claim:

1. A coke bin for an ingot soaking pit comprising a heavy metal body member having a side wall and a bottom, said body member being provided with a plurality of distributed openings at its bottom, a closure for each of said openings, and mechanism whereby said closures may be simultaneously opened by manipulation from above, said mechanism including a carrying member by which the bin may be carried in a level position by a crane which may also manipulate said mechanism.

2. A coke bin for an ingot soaking pit comprising a heavy metal body member having a side wall and a bottom, said body member being provided with a plurality of distributed openings at its bottom, a closure member provided with a plurality of openings, said closure member being movable so as to move the openings therein into or out of register with the openings in said body member, a shaft secured to said closure member whereby the closure member may be moved by manipulation from above, and a carrying member integral with the upper end of said shaft whereby the bin may be carried in a level position by a crane which may also manipulate said closure member.

3. A coke bin of the character described in claim 2 in which the area enclosed by the side wall is rectangular.

4. A coke bin of the character described in claim 2 in which the area enclosed by the side wall is rectangular, and the openings in the body member are only in the bottom, said openings, and the openings in the closure member being in the form of radial segments of a circle with an angular span between the edges of adjacent openings at least as great as the angular span of said openings, and the openings adjacent the corners of the rectangle being of greater radius than the openings adjacent the sides thereof.

5. A coke bin of the character described in claim 2 in which the carrying member is shaped to accommodate the jaws of crane ingot tongs.

6. A coke bin for an ingot soaking pit comprising a continuous side wall, a bottom provided with a plurality of distributed openings, a central upwardly extending tube secured to said bottom in register with an aperture therein, a rotatable and slidable shaft extending through said tube and having a dust cap thereabove which serves as a slide travel stop, a carrying member secured to the upper end of said shaft, and a closure member secured to the lower end of the shaft, said closure member being provided with openings which may be moved into and out of register with the openings in the bottom by rotation of the shaft.

7. A coke bin of the character described in claim 6 in which a fixed element and a rotatable element are provided with coacting stop members whereby a positive register is obtained between the openings in the bottom and the openings in the closure member.

8. The method of making bottom in an ingot soaking pit which comprises filling a portable bin with coke braize, lowering the bin into the soaking pit adjacent the sidewall thereof, slowly moving the bin about the circumference of the pit and simultaneously releasing the coke slowly from the bin in such a manner as to distribute it evenly across the radius of the pit.

9. The method set forth in claim 8 which includes the additional step of smoothing the coke bottom with the base of the bin.

10. A coke bin for an ingot soaking pit comprising a body member having a side wall and a bottom, said member being provided with a plurality of distributed openings at its bottom, a closure for each of said openings, a carrying member by which the bin may be carried in a level position by a crane, said carrying member having opposed apertures to accommodate the jaws of crane ingot tongs, and connecting mechanism between said carrying member and said closures so that the closures may be simultaneously opened by manipulation with the crane.

DAVID W. SAUNDERS.

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