

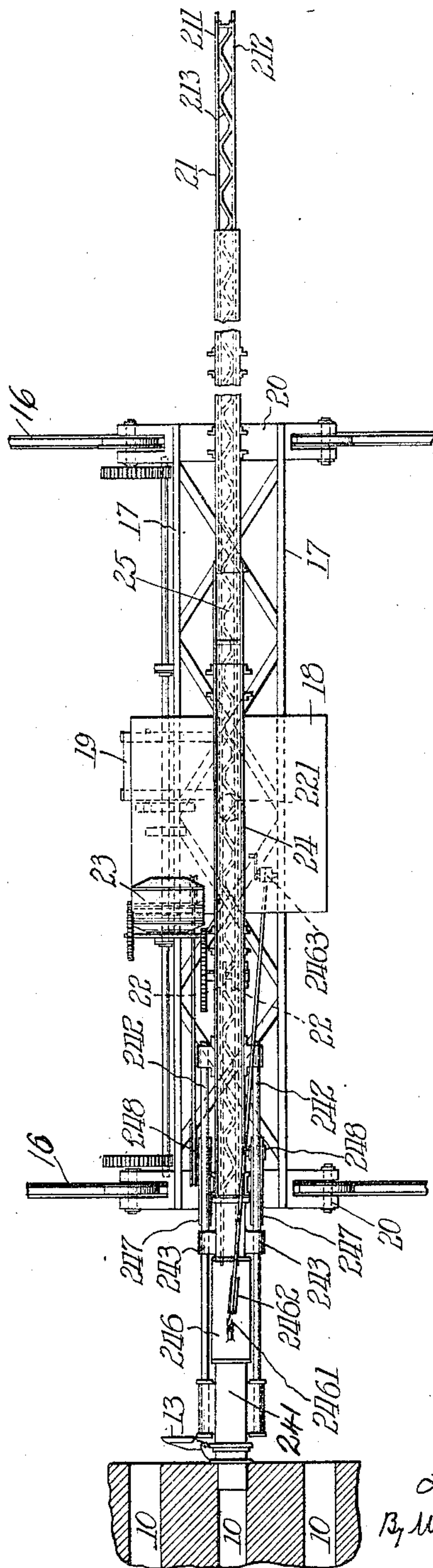
981,732.

L. WILPUTTE.
LEVELING RAM FOR COKE OVENS.
APPLICATION FILED OCT. 15, 1910.

Patented Jan. 17, 1911.

3 SHEETS-SHEET 1.

Fig. 1.

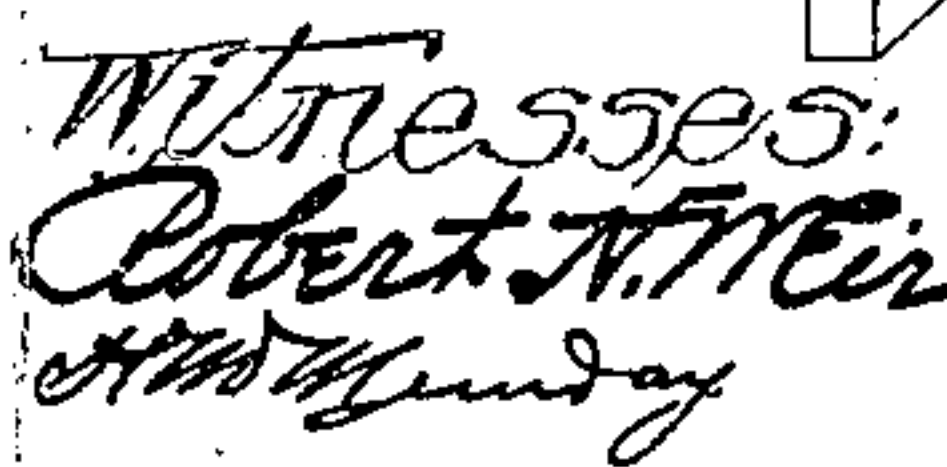


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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3.

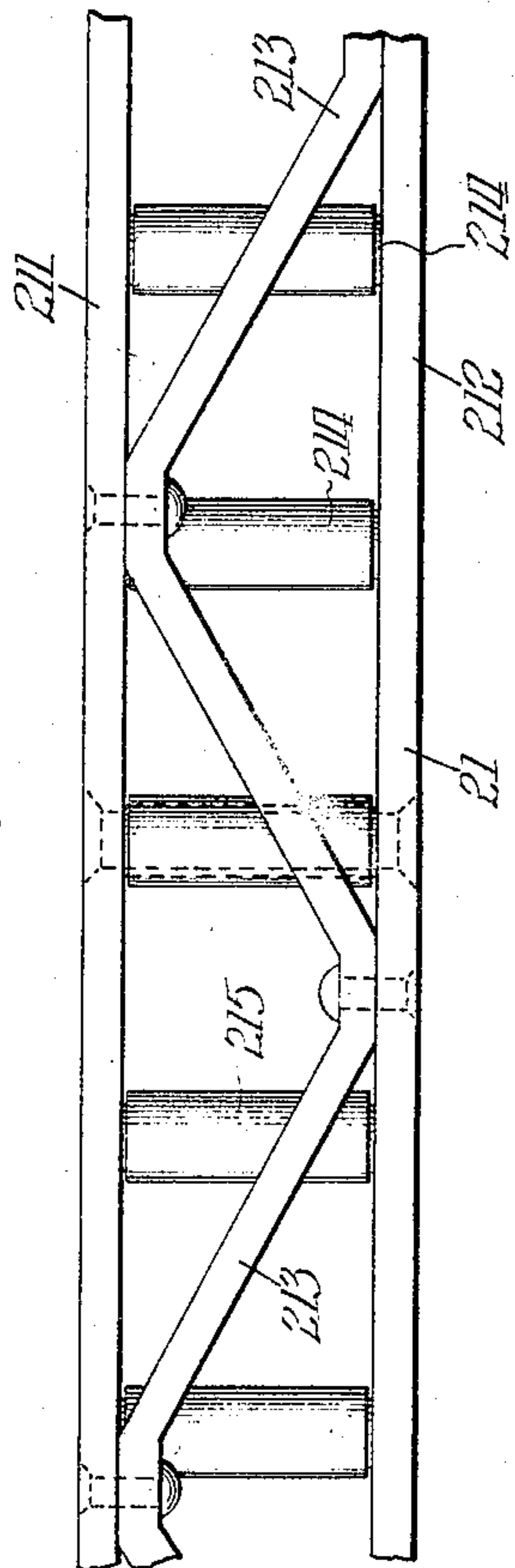


Fig. 4.

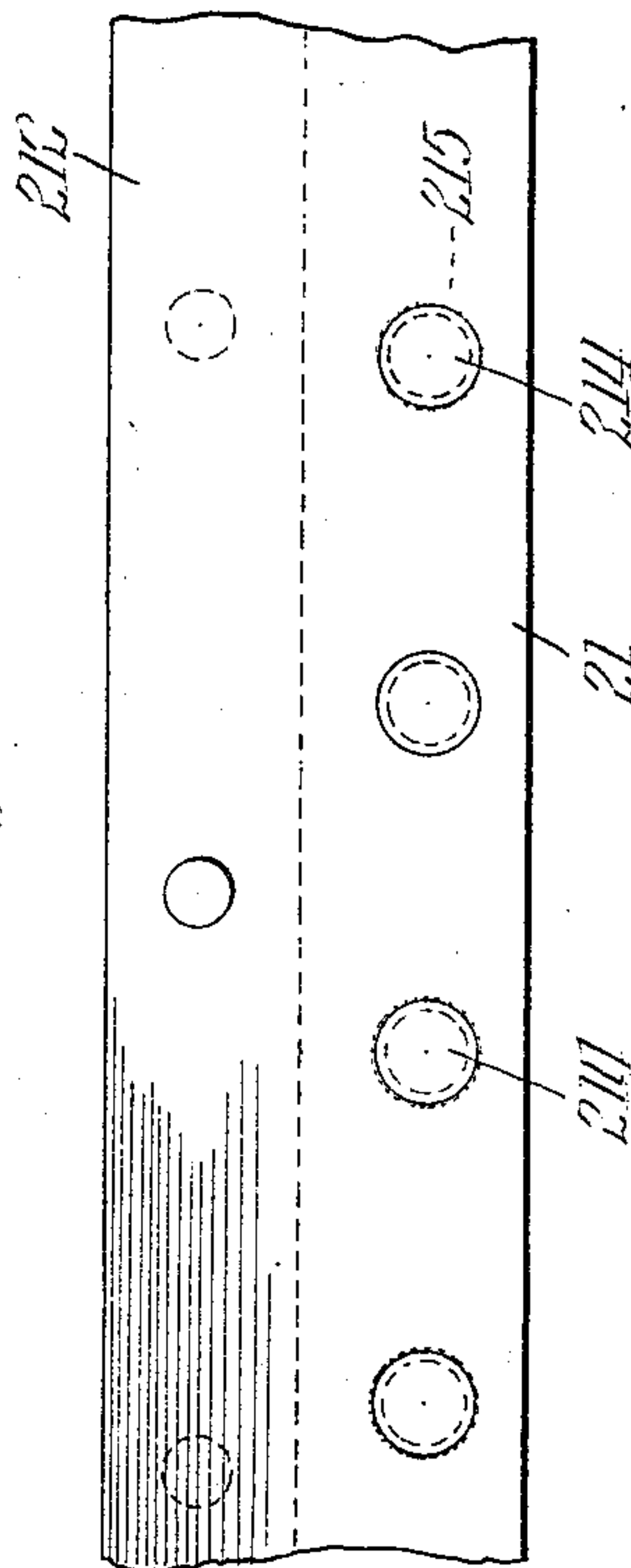
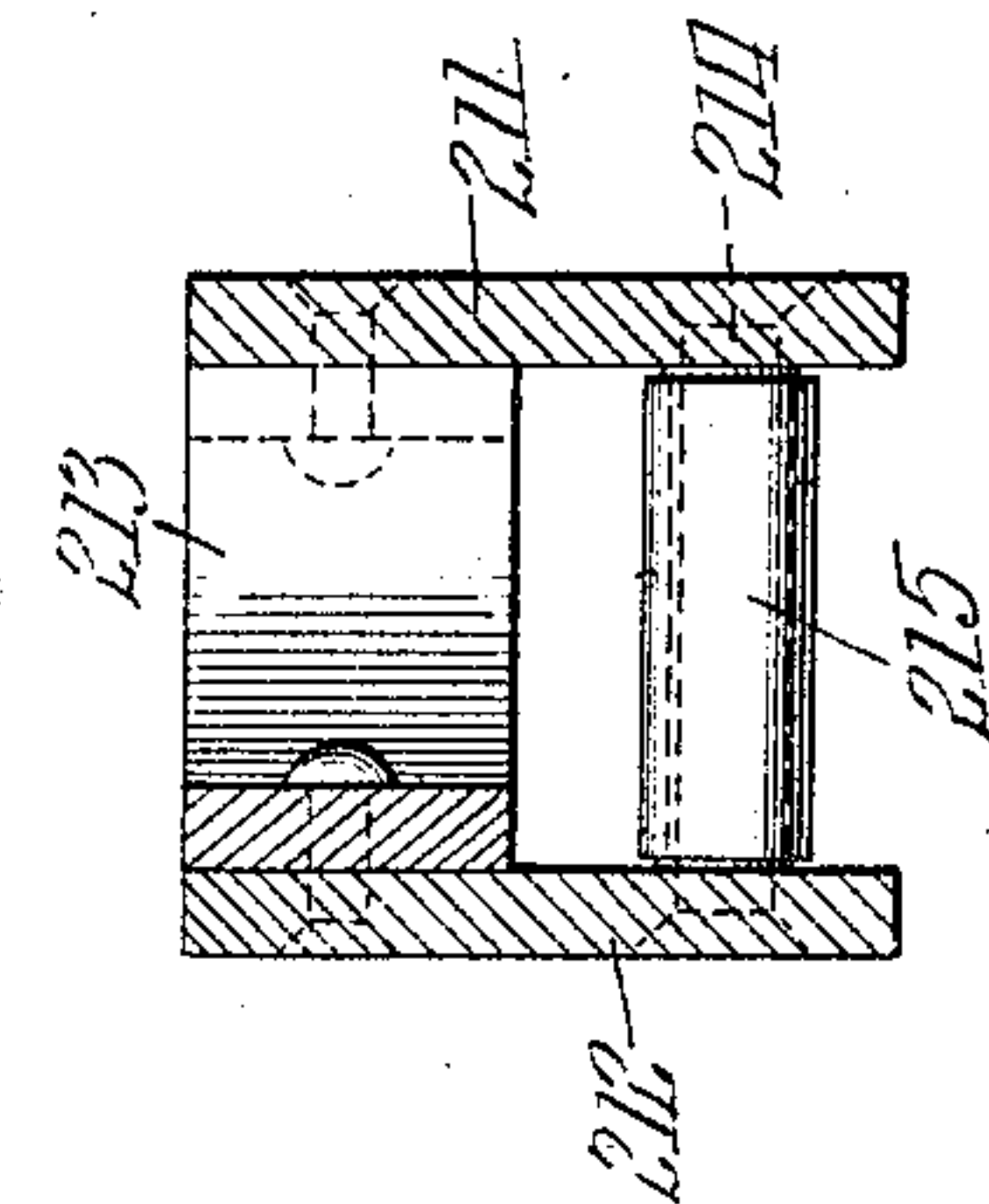


Fig. 5.



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UNITED STATES PATENT OFFICE.

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LEVELING-RAM FOR COKE-OVENS.

981,732.

Specification of Letters Patent.

Patented Jan. 17, 1911.

Application filed October 15, 1910. Serial No. 587,174.

To all whom it may concern:

Be it known that I, LOUIS WILPUTTE, a subject of the Kingdom of Great Britain, residing in Joliet, in the county of Will and State of Illinois, have invented a new and useful Improvement in Leveling-Rams for Coke-Ovens, of which the following is a specification.

The object of this invention is to provide for lessening the loss of gas during the operation of leveling the charge in coke ovens, and relates to the means for accomplishing this result, consisting in general terms of a housing, or containing the leveling ram, to be joined in a gas-tight manner to the opening in the oven while such leveling operation is going on, so that the leveling ram operates in an inclosure of which the oven is a part, thus greatly diminishing the escape of the gas to the outer air and its consequent loss during this time; and it further consists in the novel devices and parts, and combinations of parts and devices, substantially as hereinafter described, and shown in the accompanying drawing, which drawing forms a part of this specification.

In said drawing Figure 1 is a plan view of an apparatus embodying my invention; Fig. 2 is a side elevation of the same; Fig. 3,—upon a somewhat larger scale,—is a plan view of a portion of the leveler ram indicating its construction more in detail; Fig. 4 is an elevation of the same; and Fig. 5 is a cross section thereof.

Like letters of reference indicate like parts wherever employed in the several figures.

The modern coke ovens, as is well known to those skilled in the art, are built in proximity to each other, a number side by side, for convenience of operation and other economies. Along both faces of this multiple structure are built tracks upon which to run cars or locomotives; at one face the cars into which the finished coke is discharged and quenched, and at the other face a track for the locomotive staging upon which is mounted the pushing ram for discharging the coke from the oven, and, sometimes also, the leveling ram which is run into and reciprocated along the upper part of the oven to level the freshly delivered coal which, as it is fed in at several openings in the roof, lies in heaps, thus to bring the upper surface of said coal to a common horizontal plane to facilitate and equalize the coking. This leveling ram may however, be mounted on a separate loco-

motive staging of its own, which is perhaps the better way, especially where the ovens are numerous. These locomotive stagings are usually provided with a cab to protect the driver from the weather, and are moved from point to point on the track by means of an electric motor controlled by the driver from within said cab. They are also fitted with such motors for reciprocating the pushing ram and the leveling ram, one or both as the case may be. In the face of the oven at this side is the large opening through which the head of the pushing ram is admitted to pass into and through the oven chamber to push out the finished coke, and which opening during the coking is closed with a gas-tight or luted door. Above this large opening and near the upper part of the oven chamber is a smaller opening or leveling hole to permit the entry into the oven of the leveling ram, closed during the coking by a gas-tight or luted door. This smaller door to admit the ram is necessarily opened after the coal has been fed to the oven chamber and the coking begun, and consequently at a time when the gases are being freely and abundantly evolved and standing in the upper part of said oven so that when the door is opened to admit the leveling ram and all during the operation of leveling the gas rushes continuously out into the atmosphere and a large amount of it is thus lost. And as will be remembered the utilization of these gases as a valuable by-product of the coking is, and has been, of course, one of the chief things sought in modern coking. To remedy this condition I have devised my gas-tight, or practically gas-tight, housing or casing for the leveling ram. The features of such a housing, as developed, are the following:—It incloses or houses the entire ram, in a practically gas-tight chamber, at least while the operation of leveling is being performed. It is capable of ready application to the leveling hole to make a reasonably tight joint there. It embodies a pocket to receive the dislodged coal pulled out of the oven by the action of the ram or by its withdrawal. The structure does not interfere with the operation of the oven or the closing and opening of the doors thereof. These are the principal advantages or requirements; others of lesser note will appear as the description is hereinafter further given. It will be understood, by those skilled in the art, that the making of an ab-

solutely gas-tight removable chamber to contain the leveling ram and to be applied to and removed from the leveling hole of the oven is not a necessity and would be extremely difficult, and that it is sufficient if the housing be practically or approximately gas-tight to produce the saving sought, such saving being somewhat in proportion to the gas-tight character of the appliance. And herein, it may properly be said, I do not wish to be limited to an absolutely gas-tight structure.

In the drawing 10 is the coking chamber of the oven; 11 the opening to admit the passage of the discharge or pushing ram; 12 the leveling hole to permit the passage into the upper part of the oven of the leveling ram; 13 the door for closing the said leveling hole; 14 is the platform or walkway for the workmen who attend to the opening and closing of the openings; 15 is the overhead track for carrying the clay for luting, etc.; 16 the track on which runs the locomotive staging carrying the leveling ram and its mechanism at the will of the driver from oven to oven; 17 is the locomotive staging; 18 the cab carried thereon for sheltering the driver; 19 the electric motor for driving the locomotive staging and controlled from within the cab. Upon the locomotive staging is erected the frame-work 20, for supporting the leveling ram and its housing.

The leveling ram is shown at 21. It is made of two long side pieces 211, 212, connected together by the zig-zag bracing strip 213 riveted at alternate angles to one and to the other of the side pieces, as will be better understood by reference to the detail Figs. 3, 4 and 5 of the drawing. The side pieces 211, 212, at their forward ends are shown tapering from below upward so that the portion that first enters the oven shall be the smaller. And, below the zig-zag brace 213 the said ram is provided with a series of cross-bars 214, each having a friction sleeve or roller 215, the series forming a rack to be engaged by the driving pinion 22, constituting a means by which said ram may be moved in and out of the oven and reciprocated while within the oven chamber. The pinion 22 is driven in either direction by the electric motor 23, through gears, and controlled from within the cab. That the driver may know when to reverse the mechanism so that the leveling ram shall not be run in or drawn out too far, an indicator device to be observed, may be employed, such for example as the bell 221 to be struck and sounded in both directions by the projections 222, 223, which may also preferably be so placed as to be seen by the eye of the driver to indicate to him the position of the ram in case the bell does not sound or is removed for any cause. That the ram may move freely, and without binding, friction rollers 224 are pro-

vided for supporting the same above and below.

The housing or extensible chamber for inclosing the leveling ram is shown at 24. It is supported preferably above the cab on the framework of the locomotive staging, and is made extensible so that it may be put forward against the oven to prevent the escape of gas when the leveling ram is in operation, and drawn back away from the oven to permit the closing and luting of the oven doors, etc. The main part of this housing is a simple four sided chamber made with an inclined door 25 at its rear end. When the leveling ram is drawn back out of the oven its rear end strikes against this door and opens it upwardly, the opened door riding upon the surface of the ram, and when the ram is moved forward toward the oven far enough to enter the same it gets out from under the door which thus closes of its own weight and makes the housing or chamber at this end practically gas tight. To prevent wear and facilitate this action, the door 25 is provided with friction roller 251 that rides on the surface of the ram during the movement of the latter. In front of the cab and nearer the front end of the housing it will be seen that the housing or chamber is provided with pocket 26, having an inclined floor 261 near the lower end of which is a door 262. A portion 263 of the floor at the front is inclined in the other direction. The purpose of this pocket is to catch whatever coal may be incidentally and unintentionally pulled out of the oven, and into the housing by the action of the leveling ram, either in its leveling reciprocation within the oven or in its withdrawal therefrom, and to retain said incidental coal until after the ovens have been leveled, when it may conveniently be discharged from said pocket by the opening of the door 262 above referred to. The front end of this housing is so contrived that it may be moved or extended to a certain amount, sufficient to accommodate its application and removal from the oven and to permit the locomotive staging to travel from oven to oven. This extensibility may be accomplished in many ways, the best of which, so far as I know, is the one shown in the drawing, and which consists in mounting the movable extension 241 on supporting rods 242 secured thereto and sliding in guides 243 on the stationary part of the housing. It will be noted that the front end of the stationary part and the rear end of the movable part of the housing, both open, are made inclined with opposite inclines 244, 245, and that a wedge-shaped intermediate section 246 is movably interposed between these two inclined ends. The result is that when the wedge-shaped intermediate section is lifted out of place the extensible part of the housing may be moved freely

back and forth, and that when the housing is fully extended the wedge-shaped intermediate section may be lowered into place and, wedging home, a practically gas tight continuation of the housing passage is produced. This construction is such as will be understood by those skilled in the art that the operation is not materially interfered with by the deposit of gas tar which takes place in appliances used in this relation. To extend and withdraw the movable part of the housing racks 247 and pinions 248 are provided, the latter operated by a crank 249 within the cab connected by pulley and chain with the pinions 248. And, to raise and lower the wedge-shaped intermediate section a chain 2461 is carried from the pulleys 2462, 2463, to a crank 2464 in the cab, a counter weight 2465 on said chain tending to counterbalance the weight of the said intermediate section and thus render the operation of raising and lowering the same easy.

The operation is as follows:—The oven having been filled with the fresh charge of coal the driver in the cab brings the locomotive staging into position opposite the leveling hole and the door of said leveling hole being opened the driver by aid of his crank in the cab rotates the pinions which engage the extension rods and thus pushes the movable end of the housing outward until its outer end comes into contact with the framing around said leveling hole and makes a practically close joint; then by the aid of the other crank he lowers into place the wedge shaped intermediate section thus making a continuous close housing from the oven back to the rear end where the inclined door still remains open; but immediately and as soon as the joining is thus complete the driver starts the leveling ram motor to going which rapidly moves the forward end of said ram into the oven and runs the rear end within the housing permitting the inclined valve door to close said rear end of the housing. When the front end of the ram has gone in far enough the bell rings and the driver then reverses the motor and runs it back and forth in the oven with a reciprocating stroke of about five feet, more or less, until the coal is perfectly leveled, the zig-zag braces serving to rake the coal and distribute it evenly in the oven top into proper shape for even and regular coking. The leveling having been thus accomplished, the ram is quickly withdrawn and run back to its limit, the intermediate section lifted, and the extensible section withdrawn, leaving the leveling hole clear so that the assistant on the oven platform may close the same. Such coal as may be withdrawn accidentally by the action of the ram falls into the retaining pocket and by its inclined bottom is discharged at a convenient time and

place through the discharge door in the bottom thereof. When the housing is withdrawn the driver may immediately start the locomotive motor and move the staging into position for the next oven, and so throughout the series.

Although some gas is of course lost in the operation, it will be seen that by the use of this apparatus much escape of gas is prevented.

What I claim is:—

1. The combination with the coke-oven leveling-ram of a housing for inclosing said ram during the operation of leveling the coal for the purpose of lessening the escape of gas, substantially as specified.

2. The combination of a coke-oven-leveling-ram and a housing therefor adapted to set against the leveling hole in the oven, for lessening the escape of gas during the operation of leveling the coal, substantially as specified.

3. The combination of a coke-oven-leveling-ram, a housing therefor adapted to set against the opening in the oven for inclosing the ram during the operation of leveling the coal, and means for reciprocating the said ram, substantially as specified.

4. The combination of a coke-oven-leveling-ram, a housing therefor adapted to set against the oven for inclosing the ram during the operation of leveling the coal, means for reciprocating said ram, and means for extending and withdrawing the housing into and from contact with the oven, substantially as specified.

5. The combination with the leveling-ram of a housing therefor adapted to set against the leveling-hole in the oven for lessening the escape of gas during the operation of leveling the coal, said housing being provided with a pocket for containing the coal incidentally withdrawn from the oven by the action of the ram, substantially as specified.

6. The combination of a coke-oven leveling-ram mounted to reciprocate, means for reciprocating the same and the housing for containing said ram adapted to set against the leveling-hole in the oven for lessening the escape of gas during the operation of leveling the coal, substantially as specified.

7. The housing for a coke-oven leveling-ram, made with an extensible front end for fitting it against the leveling-hole of the oven, substantially as specified.

8. The housing for the leveling-ram of a coke oven, adapted to be set at its front end against the leveling-hole of the oven, and having at its rear end a door which closes automatically when the leveling-ram is in the oven, substantially as specified.

9. The combination of the locomotive staging, the leveling-ram and its housing mounted thereon and means for reciprocating

ing the leveling-ram and extending the housing all controlled within the cab of the locomotive staging, substantially as specified.

- 5 10. The extensible housing made in two parts one movable upon the other, the adjacent ends of the two parts being made with oppositely inclined edges, and an interme-

diate wedge-shaped section for supplying the gap between the two parts when extended, substantially as specified.

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