

No. 677,570.

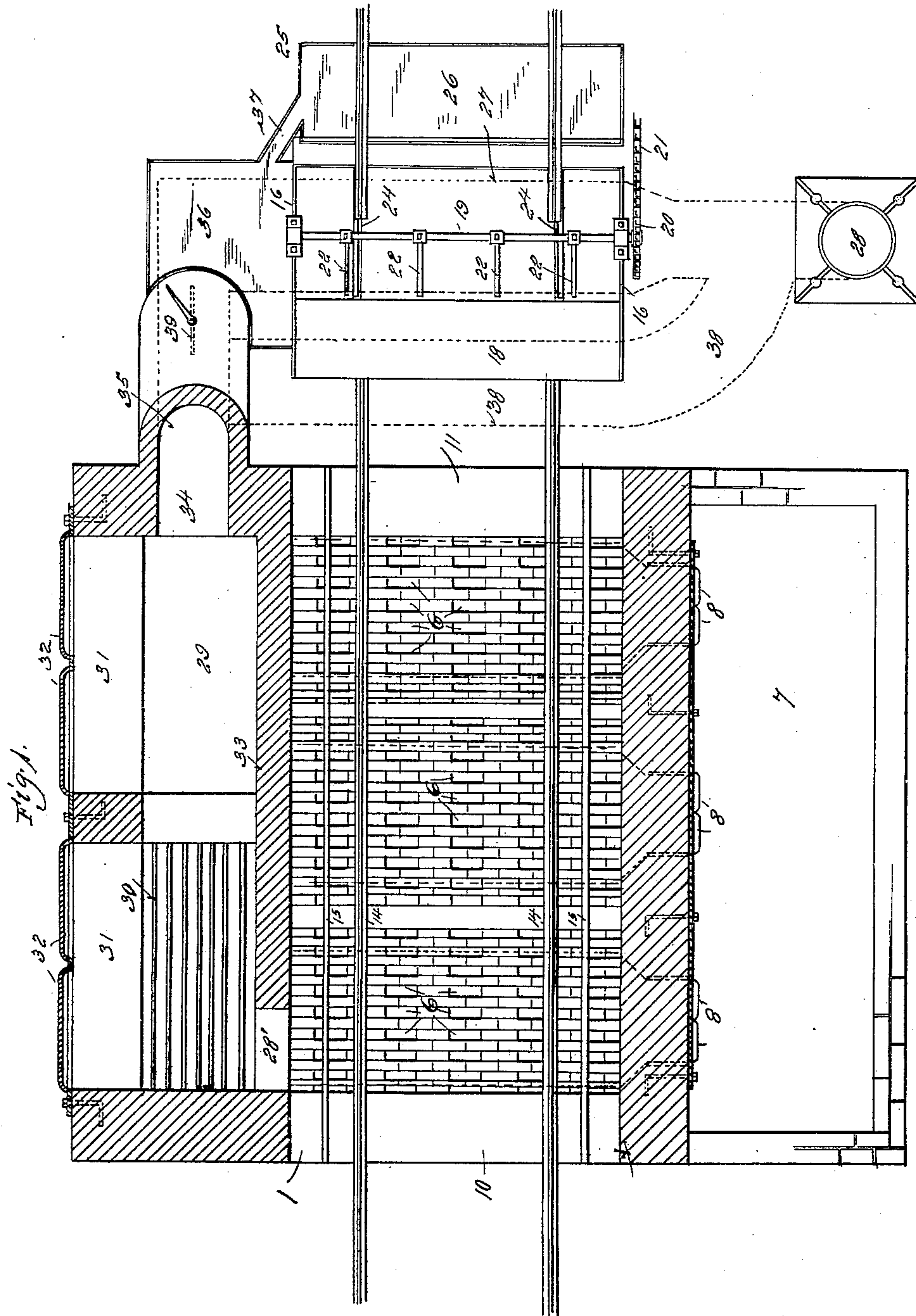
Patented July 2, 1901.

M. M. HEDGES.  
APPARATUS FOR COATING IRON PIPES.

(No Model.)

(Application filed Mar. 14, 1901.)

3 Sheets—Sheet 1.



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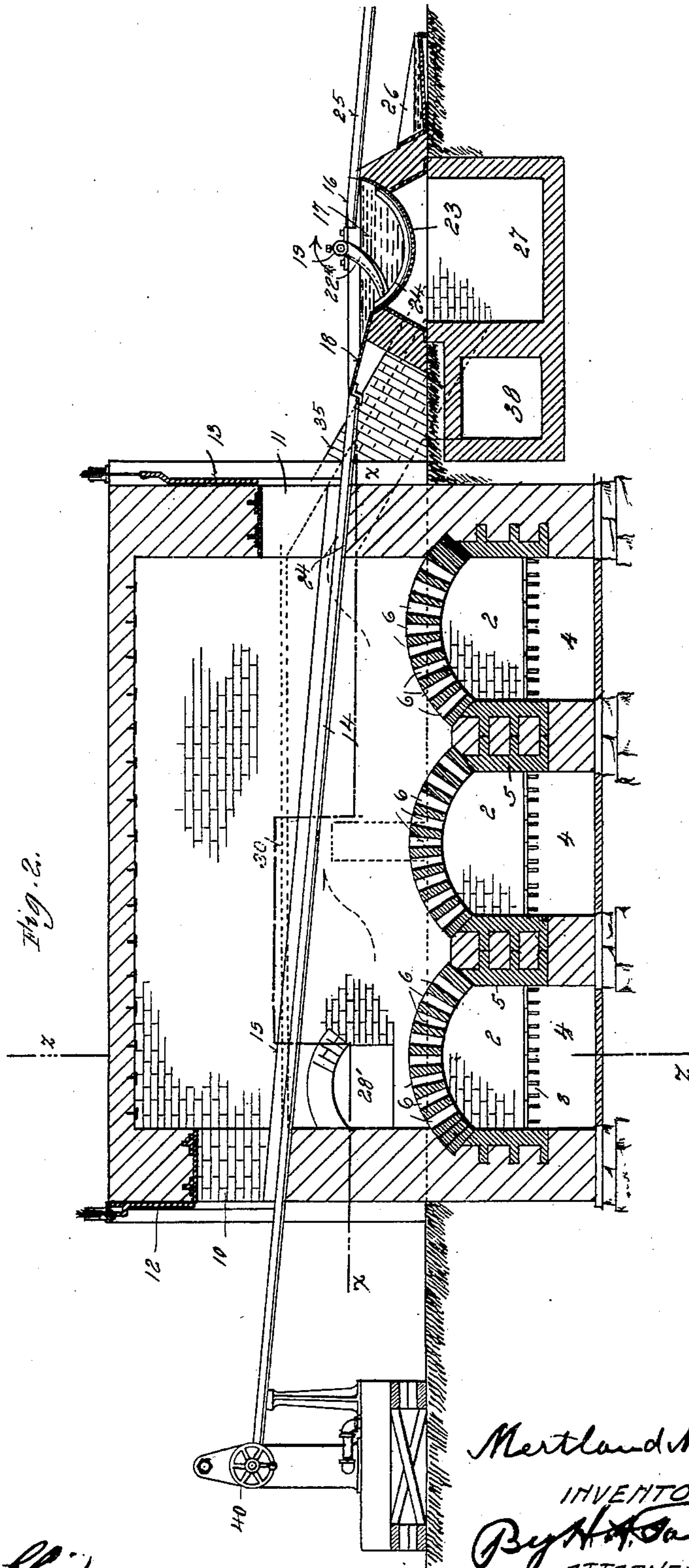
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3 Sheets—Sheet 2.



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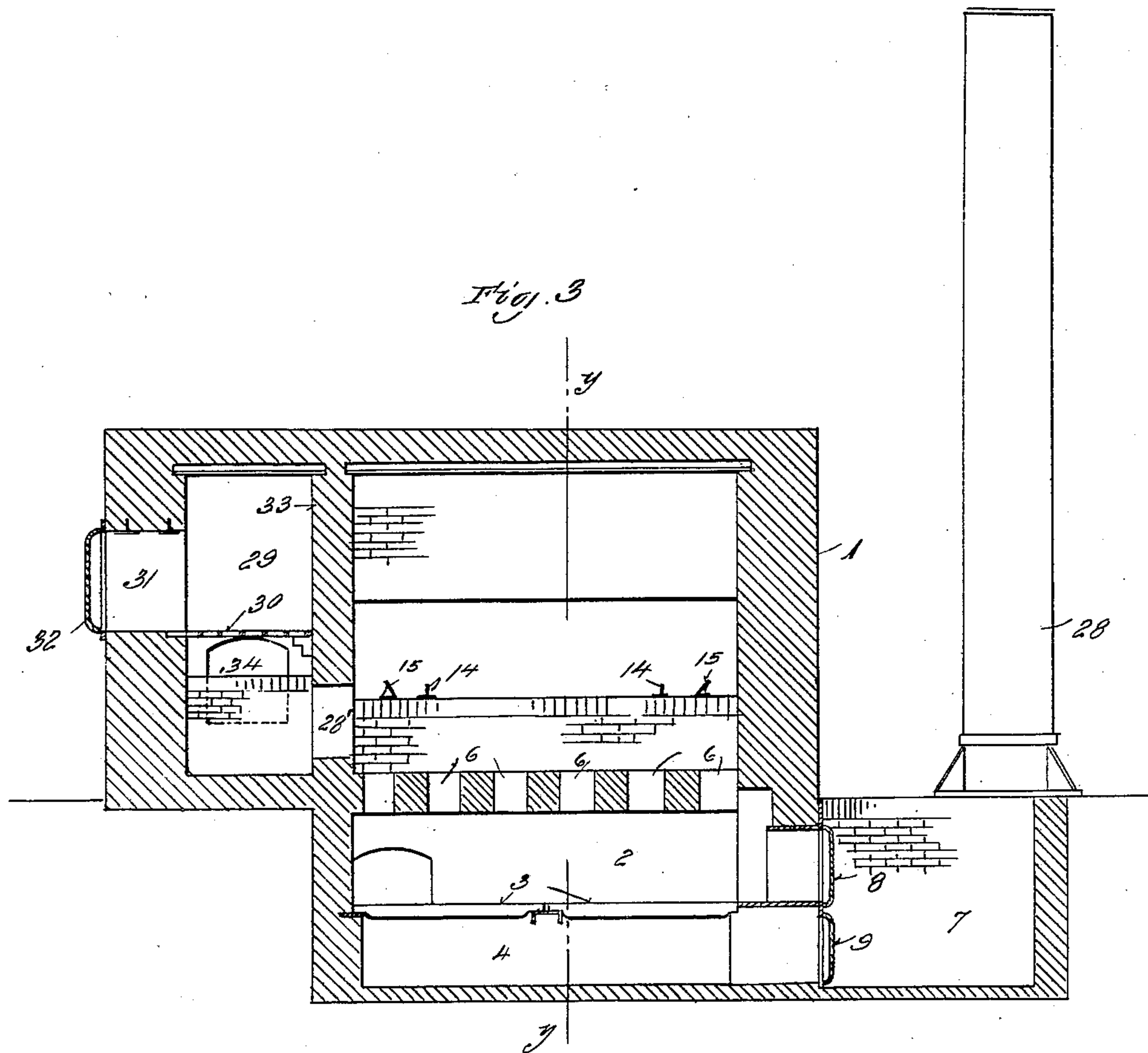
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3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR COATING IRON PIPES.

SPECIFICATION forming part of Letters Patent No. 677,570, dated July 2, 1901.

Application filed March 14, 1901. Serial No. 51,100. (No model.)

*To all whom it may concern:*

Be it known that I, MERTLAND M. HEDGES, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Apparatus for Coating Iron Pipes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to apparatus for coating iron pipes, being more particularly devised for the purpose of coating soil-pipes with tar, and has for its object to provide a construction whereby manual labor in connection with such operations may be reduced to a minimum and the handling of the pipe may be rendered largely automatic.

To these ends the invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a plan view of an apparatus embodying my invention in one form, the same being partly in section upon the line  $x x$  of Fig. 2. Fig. 2 is a longitudinal sectional view taken on the line  $y y$  of Fig. 3, and Fig. 3 is a transverse sectional view taken on the line  $z z$  of Fig. 2.

In said drawings, 1 indicates an oven in which the pipes are heated previously to being dipped in the tank or vat containing the coating material. This oven may be constructed of any suitable material—as, for instance, brick—strengthened by metallic beams, as shown. In the lower part of the oven and preferably below the surface of the soil there are located a plurality of furnaces 2, three such furnaces being shown in the present instance, although their number may be varied as desired. In my preferred form of construction each furnace comprises a grate 3, below which is an ash-pit 4 and above which the fuel rests between side walls 5, being inclosed at the top by a perforated arch 6, which permits the products of combustion to pass upward from the furnace into the interior of the oven. In order to provide convenient access to the furnaces, there is provided at one side of the oven a firing-pit 7, and each furnace is provided with a firing-

door 8 and ash-door 9, accessible from said pit. The oven is provided at one end with a receiving-opening 10 and at the other end with a discharge-opening 11, preferably on a lower level than the receiving-opening. The receiving-opening is controlled by a vertically-sliding door 12, which may be provided with any suitable means for operating the same, and the discharge-opening is provided with a similar door 13.

Through the oven 1 there extend from its receiving to its discharge opening ways or rails 14, located at a suitable distance apart to support the pipes thereon by their cylindrical portions, said rails or ways being preferably inclined from the receiving to the discharge end of the oven, so that the pipes will descend along the same by gravity. At each side of the way thus formed are located parallel guard-rails 15, which serve to maintain the pipes upon the rails 14 by coming into contact with the ends of the pipes in case they have any tendency to roll off the rails 14. The rails 14 extend beyond the discharge end of the oven to a vat or tank 16, located adjacent to said end of the oven and adapted to receive the coating material 17, which may consist of tar or any suitable composition and which is maintained in a fluid condition by conducting the products of combustion from the oven 1 underneath said vat or tank in the manner hereinafter described. I prefer to provide an inclined plane 18 of a width at least equal to the length of the pipes to be operated upon and extending from the ends of the rails 14 to the body of the vat or tank at an inclination preferably somewhat greater than that of the rails. Extending longitudinally above the vat or tank 16 is a shaft 19, which may be driven in any suitable manner—as, for instance, by being provided with a sprocket-wheel 20, to which rotary motion is imparted by a sprocket-chain 21 from any suitable source of power. Secured upon the shaft 19 are arms 22, preferably curved, four being shown in the present instance, although their number may be varied, and the bottom 23 of the tank 16 is preferably curved to conform to the path of the ends of these arms, which extend almost, but not quite, to said bottom. Extending transversely across the



curved bottom of the tank are curved supporting ways or ribs 24, preferably two in number and located at a distance apart about equal to that separating the rails 14. The outermost arms 22 are so arranged as to pass close to the sides of these supporting-rails. It will be observed that the arms 22 are not all in the same plane, but are successively set back a trifle from one end of the series to the other, so that as the pipe rests thereon it will not be horizontal, but will be slightly inclined toward one end, which is preferably the enlarged end, which is provided with the socket or bell usually present in such pipes. Inclined ways 25 extend from the rear edge of the vat or tank 16 to the point of discharge of the coated pipes, and underneath these arms 25 is located a drip-tray 26, which receives the surplus of tar or other coating material from the pipes after they are discharged from the vat. The front ends of the ways 25 preferably extend over the rear portion of the tank, as shown, to receive the pipes as they fall from the arms 22.

In order to maintain the tar or other coating material in the vat 16 at a temperature such as to keep it in a fluid condition, I provide underneath said vat or tank a flue 27, connected at one end with a stack or other suitable discharge 28, while its other end is connected with the interior of the oven 1, so that the products of combustion from the oven will heat the vat 16 and its contents. This connection may be a direct one, but I prefer to employ the construction shown in the accompanying drawings, in which the products of combustion pass from the oven 1, through an opening 28', into a lateral chamber 29, provided with grates 30 and with charging-openings 31, closed by doors 32. This lateral chamber, which may be conveniently constructed as a portion of the oven itself, as shown, being separated therefrom by a partition-wall 33, constitutes a heating-chamber in which the pipe-fittings may be readily heated by placing them upon the grates 30. The opening 28' is at the front end of the chamber 29, beneath the grate-bars thereof, and at the rear end of the chamber 29, and preferably also beneath the level of the grate-bars, there is an outlet-opening 34, connecting with or forming part of a flue 35, which extends to and connects with the flue 27. At the point of junction of these two last-mentioned flues I prefer to locate a second vat or tank 36, adapted to contain tar or a suitable composition by means of which the fittings may be coated. This second vat is heated by means of the flues 35 and 27 and is preferably located at a level lower than that of the drip-tray 26, which latter is connected therewith by a pipe or passage 37, so that the tar or composition accumulating in the drip-tray may flow into and replenish the supply in the fittings-vat 36.

In order to prevent overheating of the tar or other material in the dipping-vats, I pro-

vide a by-pass flue 38, extending from the flue 35 at a point in advance of its junction with the flue 27 to a point in said flue 27 located between the tank 16 and the stack or discharge 28. A valve 39, located in the flue 35, may be so turned as to divert the products of combustion from the flue 27 into the by-pass flue 38, and thereby prevent overheating of the vats.

I have shown at 40 a testing-machine located in front of the oven 1, the rails 14 being extended in front of said oven to said testing-machine, as it is usual to test these pipes immediately before coating them.

The apparatus thus constructed operates in the following manner: The discharge-door 13 of the oven being closed and the receiving-door 12 being open, the pipes after being tested are placed upon the ways or rails 14 and descend along the same by gravity, passing into and through the oven until their further progress is arrested by the closed door 13. During this movement of the pipes they are held in place upon the ways or rails 14 by means of the guard-rails 15. The heat and products of combustion from the furnaces serve to heat the pipes which are in the oven to the desired temperature, and after being sufficiently heated the door 13 is opened and they are permitted to successively pass down the remainder of the incline to the vat or tank 16. The foremost pipe will enter the vat and, being submerged in the tar or liquid composition therein, rest upon the supports 24. As the shaft 19 revolves the arms 22 thereon descend into the vat or tank and passing under the pipe therein lift the same and carry it upward, retaining it in position upon the arms owing to their curvature. If there are other pipes on the incline immediately adjacent to the tank, they will be crowded back by the pipe which is being lifted out of the tank, so as to permit this latter to pass upward clear of them. As soon as said pipe and the arms 22 are raised to a sufficient height the next pipe rolls into the tank and receives its coating. As the shaft 19 continues to rotate the arms 22 support the pipe in an inclined position, as hereinbefore described, so that tar or composition in the interior thereof may drain out of the pipe back into the vat along with the surplus tar or composition on the outside of the pipe. As the arms approach a vertical position the pipe carried thereby escapes from them and rolls down the incline furnished by the rails 25, passing clear of the path of the arms 22 before these latter have descended far enough to reengage the pipe. During its passage along the rails 25 the coated pipe delivers any further surplus of coating material into the drip-tray 26, and the coated pipe is finally delivered at the end of said rails 25 and suitably disposed of.

It will be observed that the operation of coating the pipes is practically automatic and that a large proportion of the manual labor



heretofore employed in the operation of coating may be dispensed with, thereby materially reducing the cost of the process, while at the same time its rapidity is increased.

5 It will be understood, of course, that where the fittings chamber and vat are employed the fittings, which are smaller and lighter than the pipes, may be readily charged into the chamber 29, upon the grates 30 of which they  
10 will rest until sufficiently heated, whereupon they may be withdrawn and submerged in the fittings-vat 36, and thereby coated.

The employment of the surplus heat and products of combustion of the heating-oven  
15 for the purpose of heating the pipe-coating vat materially reduces the cost of the operation, and where this surplus heat is also employed to heat the fittings and the vat in which they are coated the economy in pro-  
20 duction is still further increased.

It is obvious that modifications in the details of construction and arrangement of the parts may be made without departing from the principle of my invention, and I there-  
25 fore do not wish to be understood as limiting myself to the precise construction hereinbefore described, and shown in the drawings.

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

1. An apparatus for coating pipes comprising an oven for heating the pipes, a vat or tank located adjacent to said oven and adapted to contain a coating material, and an inclined way extending through the oven and to the vat or tank, substantially as described.  
35

2. An apparatus for coating pipes comprising an oven for heating the pipes, a vat or tank located adjacent to said oven and adapted to contain a coating material, an inclined way extending through the oven and to the vat or tank, whereby the heated pipes are successively fed by gravity into said tank, and automatic mechanism for successively  
40 discharging the pipes from said tank, substantially as described.

3. An apparatus for coating pipes comprising an oven for heating the pipes, said oven being provided with a discharge-opening controlled by a door, a vat or tank located adjacent to said oven and adapted to contain a coating material, and an inclined way extending through the oven and through the discharge-opening thereof to the vat or tank,  
50 substantially as described.

4. In an apparatus for coating pipes, the combination, with an oven for heating the pipes, provided with receiving and discharge openings at different levels, and doors controlling said openings, of a vat or tank located adjacent to the discharge-opening and adapted to contain a coating material, and an inclined way extending through the oven from the receiving-opening to and through  
60 the discharge-opening and to the vat or tank, substantially as described.

5. In an apparatus for coating pipes, the

combination, with an oven for heating the pipes, said oven being provided with receiving and discharge openings at different levels, 70 and doors for controlling said openings, of a vat or tank located adjacent to the discharge-opening and adapted to contain a coating material, and an inclined way extending from a point outside of the oven through the receiving-opening thereof and also through the oven and its discharge-opening to the vat or tank, substantially as described. 75

6. An apparatus for coating pipes comprising an oven for heating the pipes, a vat or tank located adjacent to said oven and adapted to contain a coating material, an inclined way extending through the oven and to the vat or tank, and a discharge-flue extending from the oven underneath the vat or tank to heat the  
80 same, substantially as described. 85

7. An apparatus for coating pipes comprising an oven for heating the pipes, a vat or tank located adjacent to said oven and adapted to contain a coating material, an inclined way 90 extending through the oven and to the vat or tank, a stack or discharge, a flue extending from the oven underneath the vat or tank to the stack or discharge, said flue being provided with a damper between the oven and  
95 the vat, and a by-pass extending from said flue between the oven and damper to a point in said flue between the vat and discharge, substantially as described.

8. In an apparatus for coating pipes, the 100 combination, with an oven having inclined ways, of a vat or tank located at the lower end of said ways, a rotating shaft extending longitudinally above said vat, and arms secured to said shaft and adapted to successively lift  
105 the pipes from said vat, said vat being provided with means for supporting the pipes in the path of said arms, substantially as described.

9. In an apparatus for coating pipes, the 110 combination, with a heating-oven provided with inclined ways, of a coating-vat located at the lower end of said ways, a rotating shaft located above said vat and provided with arms, said vat being provided with means for  
115 supporting the pipes in the path of said arms, and inclined ways arranged at the discharge side of said vat to receive the pipes as they are discharged from said arms, substantially as described. 120

10. In an apparatus for coating pipes, the combination, with a heating-oven having inclined ways, of a coating-vat located at the lower end of said ways, a rotating shaft extending longitudinally above said vat, and  
125 arms secured to said shaft and successively set back thereon so as to lift and support the pipes in an inclined position, substantially as described.

11. In an apparatus for coating pipes, the 130 combination, with a heating-oven having inclined ways, of a coating-tank located at the lower end of said ways and provided with a bottom having curved supporting-rails there-



on, and a rotating shaft provided with arms, the ends whereof pass close to the bottom of the tank and below the upper edges of the supporting-rails thereon, substantially as described.

12. In an apparatus for coating pipes, the combination, with a heating-oven having inclined ways, of a coating-vat located at the lower end of said ways, a rotating shaft having arms to lift the pipes from said vat, inclined ways extending from the discharge side of said vat to receive the pipes as they are discharged from the arms, and a drip-tray located underneath said last-mentioned ways, substantially as described.

13. In an apparatus for coating pipes, the combination, with a heating-oven, and a coating-vat adjacent thereto, of inclined ways extending through the oven to the vat and consisting of parallel supporting-rails, on which the cylindrical portions of the pipes may roll by gravity, and guard-rails located outside of said supporting-rails, substantially as described.

14. In an apparatus of the character described, the combination, with a pipe-heating oven, a pipe-coating vat located adjacent thereto, and inclined ways extending through said oven to said vat, of a fittings-heating chamber located adjacent to said oven, a fit-

tings-coating vat located adjacent to said pipe-coating vat, and a flue extending from said oven through said fittings-heating chamber and underneath both vats, substantially as described.

15. In an apparatus of the character described, the combination, with a heating-oven, and a pipe-coating vat adapted to receive the pipes from said oven and provided with means for discharging the pipes from said vat, of inclined ways to receive the pipes as they are discharged from said vat, a drip-tray located beneath said inclined ways, and a fittings-coating vat located adjacent to said drip-tray and adapted to receive the discharge therefrom, substantially as described.

16. In an apparatus for coating pipes, a heating-oven having in its upper portion an inclined way along which the pipes may travel by gravity, and a suitable outlet for the products of combustion, said oven having in its lower portion heating-furnaces separated from the upper portion by perforated arches, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MERTLAND M. HEDGES.

Witnesses:

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INEZ M. AUGUSTINE.