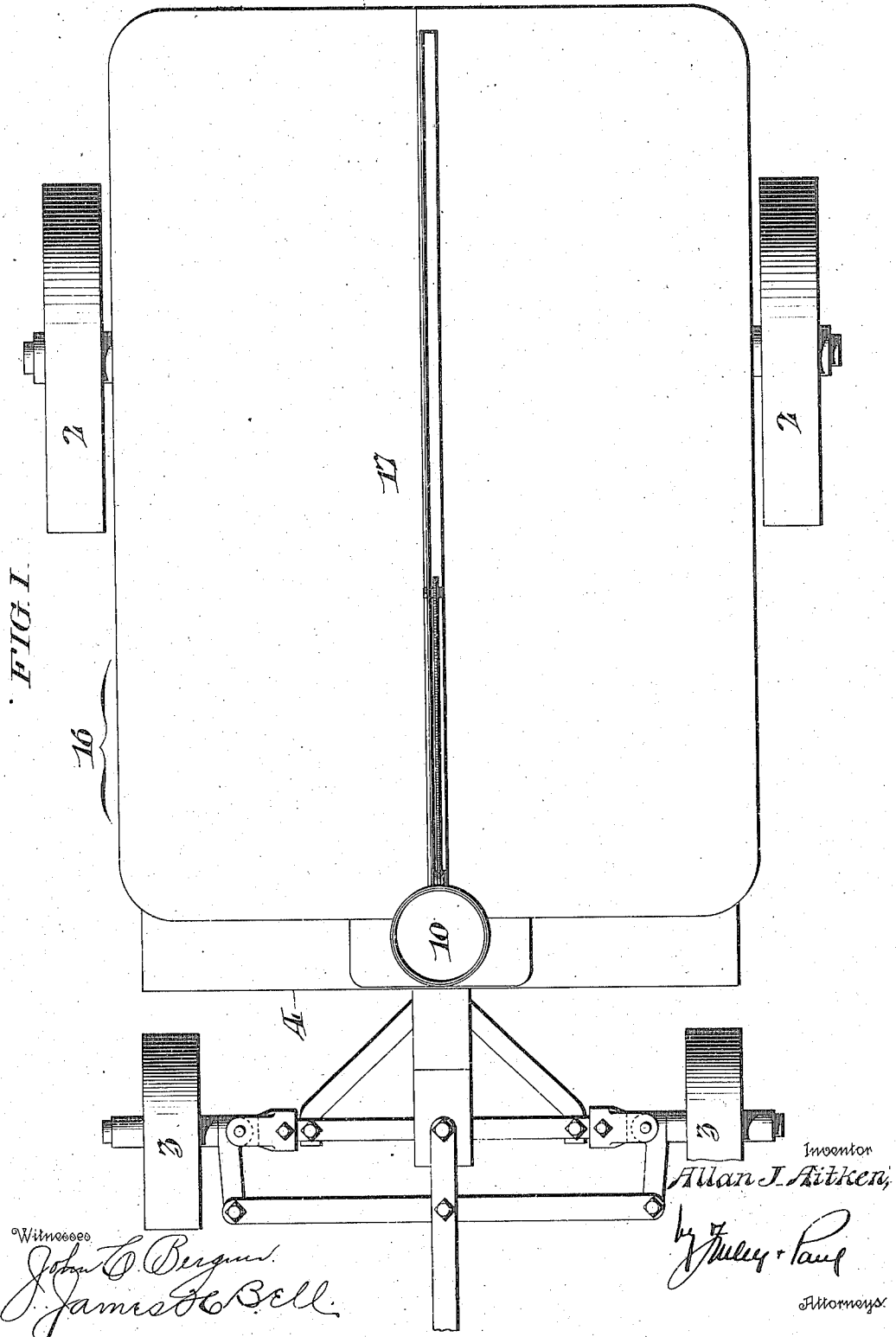


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APPLICATION FILED APR. 14, 1913.

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6 SHEETS—SHEET 1.



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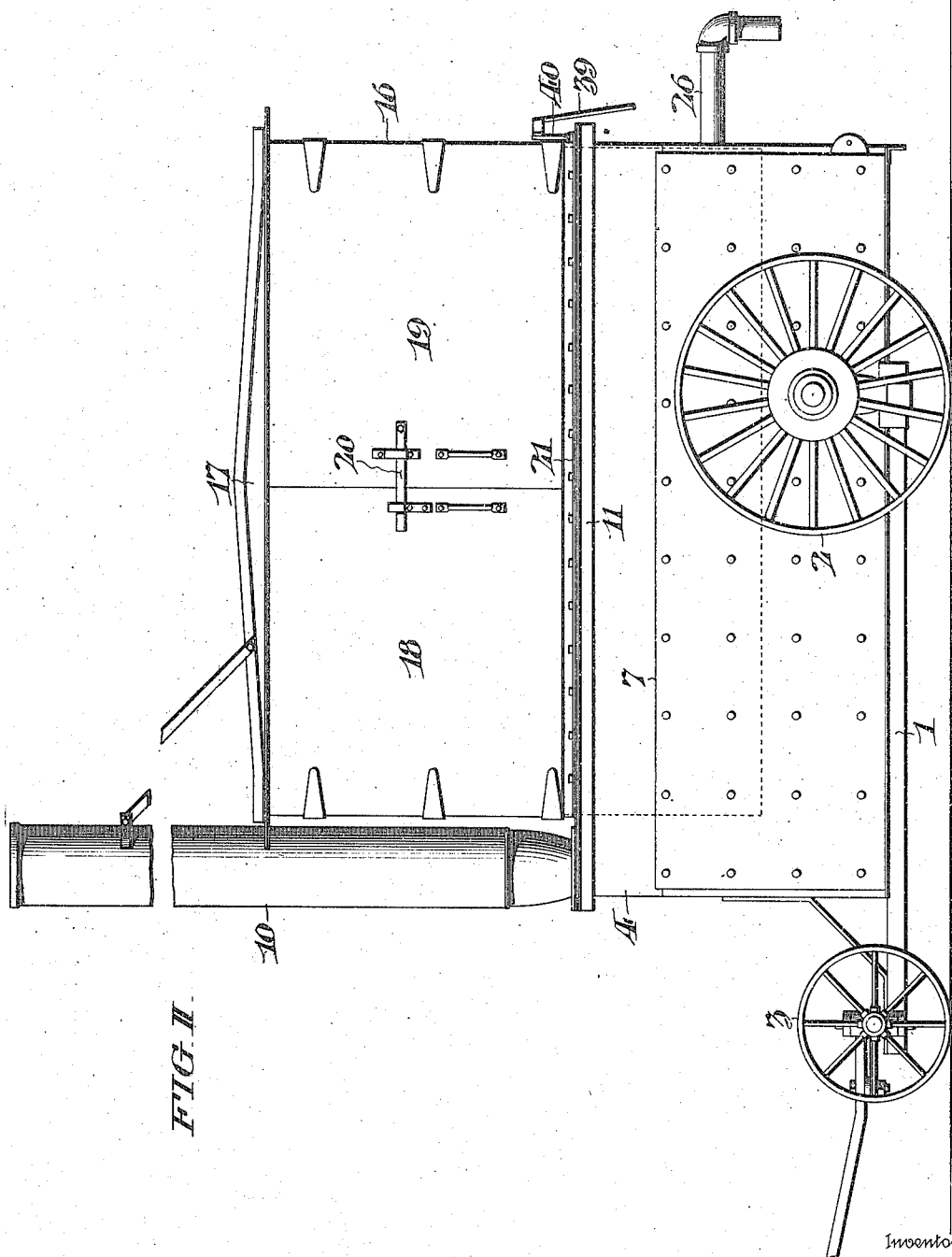


FIG. II.

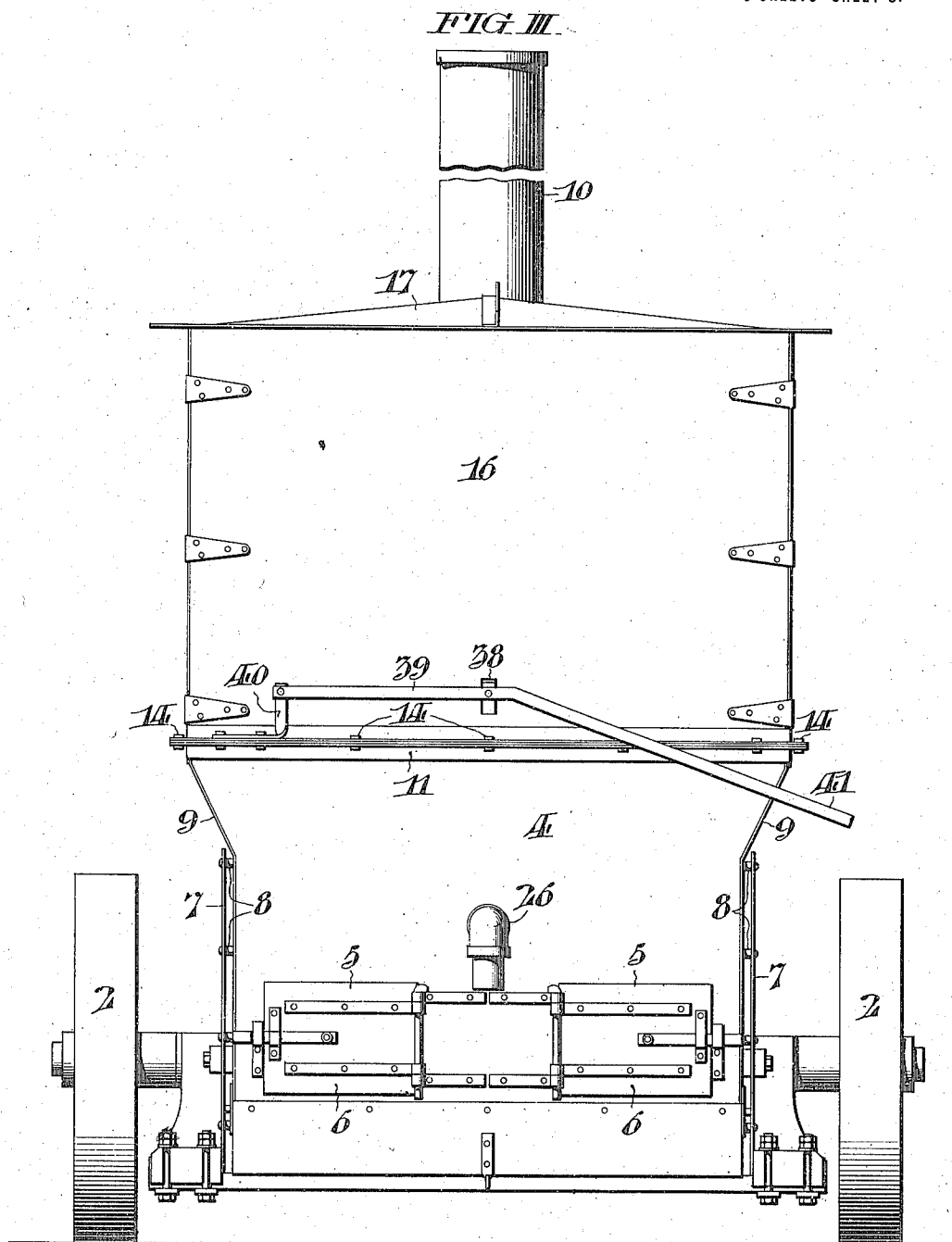
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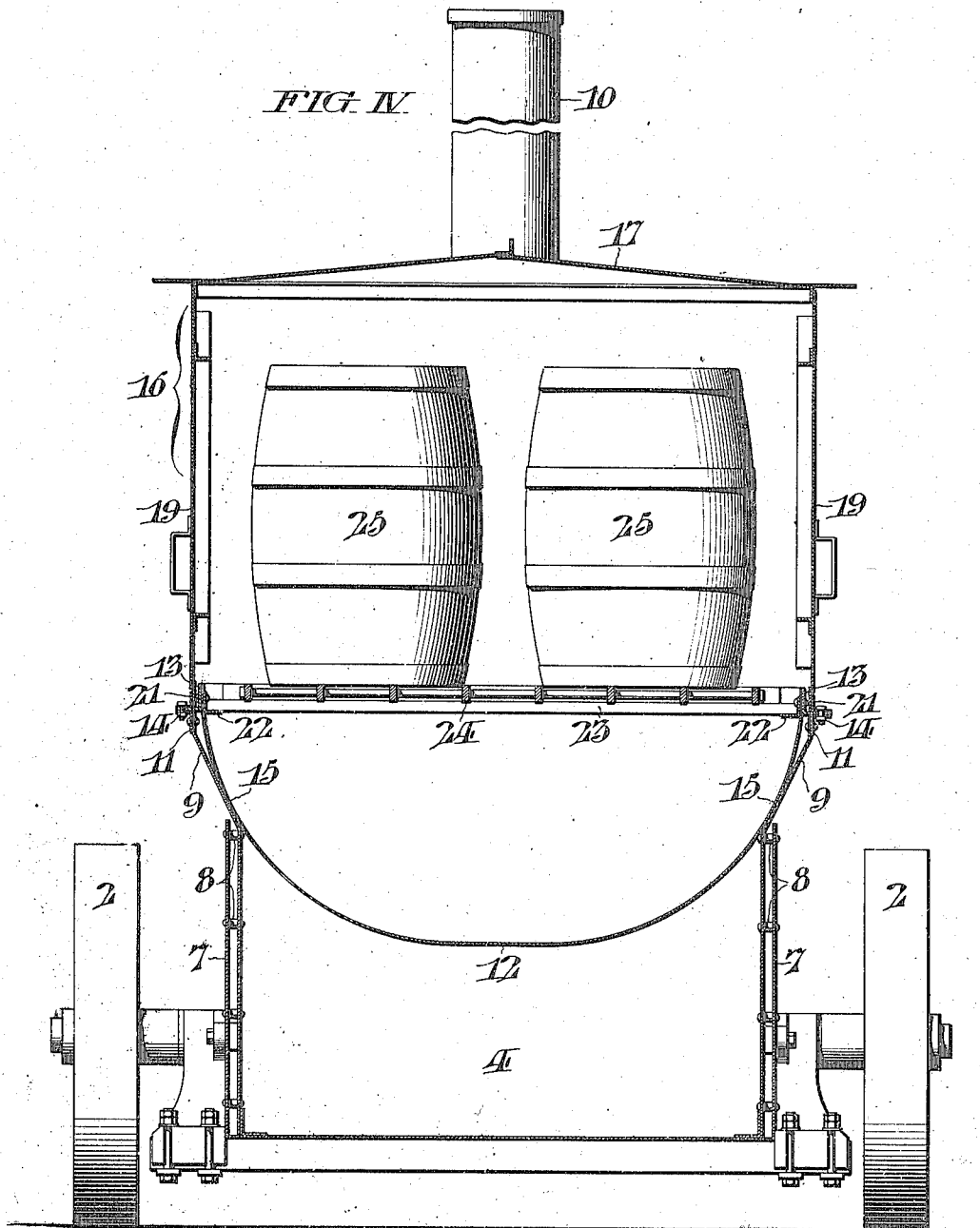


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FIG. V.

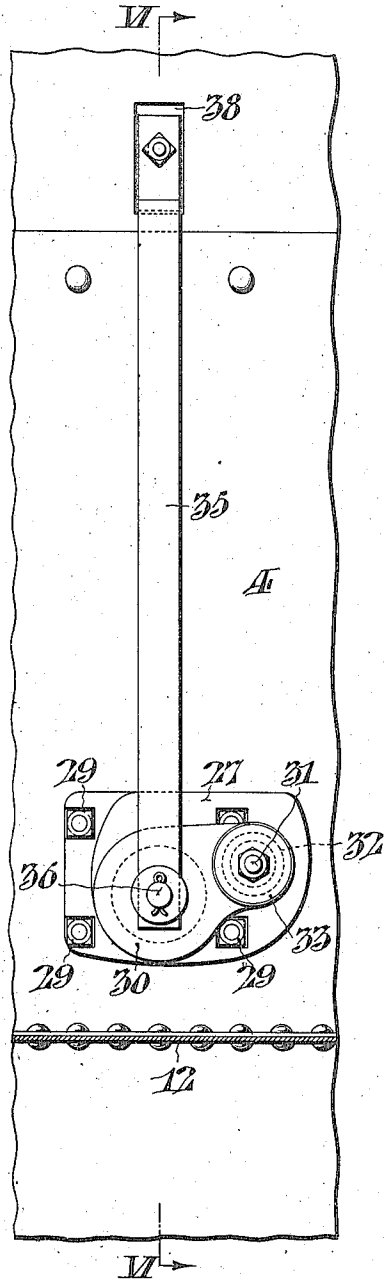
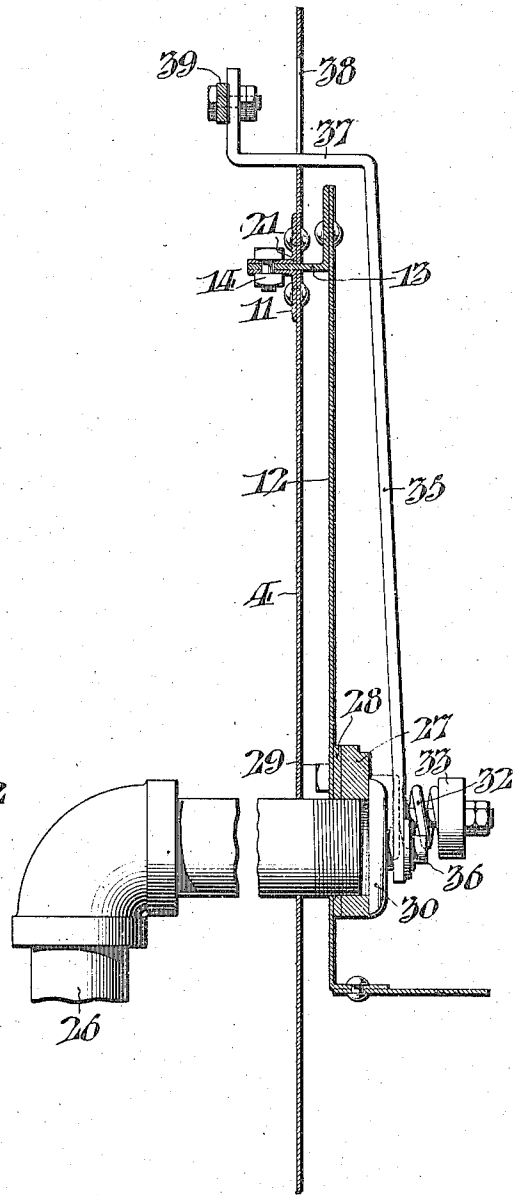


FIG. VI.



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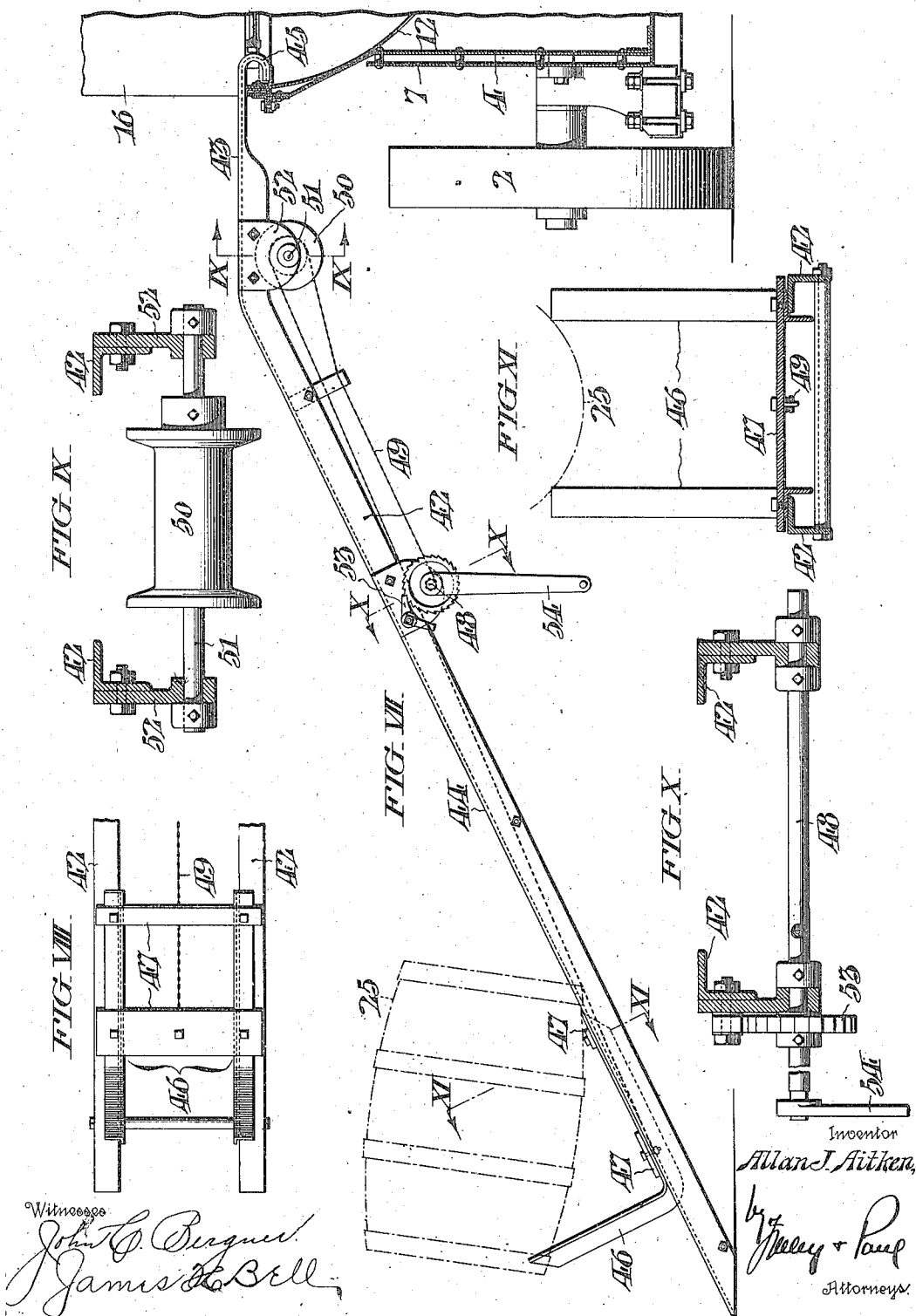
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Patented July 17, 1917.
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UNITED STATES PATENT OFFICE.

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HEATING APPARATUS FOR BITUMINOUS MATERIALS.

1,234,091.

*Specification of Letters Patent.

Patented July 17, 1917.

Application filed April 14, 1913. Serial No. 760,862.

To all whom it may concern:

Be it known that I, ALLAN J. AITKEN, of the city of Buffalo, county of Erie, State of New York, have invented certain new and useful Improvements in Heating Apparatus for Bituminous Materials, whereof the following is a specification, reference being had to the accompanying drawings.

The invention relates more particularly to an apparatus for melting asphalt, tar, pitch or other bituminous materials, wherein a melting tank is heated from a fire box arranged underneath the same.

Some of the objects of the invention are to provide a fire box which is so constructed and arranged relative to the melting tank that only so much of the tank as contains the material being melted is subjected to the direct heat of the fire box.

To also provide a construction of melting tank which may be readily detached from the fire box for renewing or replacing; and to further provide a supporting rack which is located above the melting tank, so that the receptacles containing the material to be melted may be placed upon the rack, so that the material as it is melted from the receptacles, will be discharged into the tank.

Other objects of the invention will in part be obvious and will in part be hereinafter more fully disclosed.

The drawings, which show by way of illustration, one embodiment of the invention, Figure I, is a top plan view of an apparatus embodying the invention,

Fig. II, is a side elevation of the same.

Fig. III, is a rear view of the same.

Fig. IV, is a vertical section through the apparatus.

Fig. V, is a detail view, partly in section, showing the valve for closing the outlet, and the manner of supporting and operating the same.

Fig. VI, is a detail in vertical section on the line VI—VI of Fig. V.

Fig. VII, is a detail partly in section, showing a hoist, whereby the barrels are placed in the heating apparatus.

Fig. VIII, is a detail showing a top plan view, the carriage for the barrel and the supporting track therefor.

Fig. IX, is a sectional view on the line IX—IX of Fig. VII.

Fig. X, is a sectional view on the line X—X of Fig. VII.

Fig. XI, is a sectional view on the line XI—XI of Fig. VII.

The invention consists generally of a supporting structure or frame, which is mounted on wheels, so that it may be readily portable, and on this frame is carried a fire box, which is provided with a supporting frame at its upper edge, on which rests the melting tank or kettle. This fire box adjacent to its upper end is tapered outwardly and contacts with the tank at a point adjacent its upper end, so as to prevent the heat from the fire box contacting with the tank above the point where said tank on the inner surface is covered with the material to be melted. Supported on this tank is a rack on which may be placed the receptacles containing the material to be melted, and the tank and the receptacles are covered by an inclosing hood.

Referring more in detail to the drawings, the invention consists of a supporting frame 1, which may be of any desired construction, and this frame is carried by wheels 2, 2, which support the rear end of the frame, and wheels 3, 3, which support the forward end of the frame. These wheels 3, 3, are preferably so attached to the frame that they may be readily turned for guiding the movement of the frame during the transportation of the apparatus. The frame, 1, supports a fire box 4. This fire box is preferably formed of sheet metal, and is rectangular in cross section. Within the fire box may be placed a suitable grate, which is the usual construction, and is not shown. The fire box at the rear end thereof is closed by doors 5, 5, which are supported by suitable hinges, and are held closed by a suitable latch indicated at 6. In order to reinforce and strengthen the side walls of the fire box so as to prevent the same from buckling under the intense heat of the fire, reinforcing plates 7, 7, are secured to the side walls of the fire box by spacing washers 8, and suitable securing bolts or rivets. These reinforcing plates effectively prevent any buckling of the side walls of the fire box as above noted. The side walls of the fire box at the upper edges thereof are bent outwardly so as to form inclined portions 9, 9. A suitable stack 10, is secured to the front end of the fire box.

An angle iron frame 11, (see Figs. IV and VI) is riveted to the upper edge of the

fire box, both at the sides and ends thereof, and forms a support for the melting tank or kettle 12. This melting tank is preferably formed of sheet metal and is curved transversely, as clearly shown in Fig. IV. The tank is also provided with straight end walls as shown in Fig. VI. At the upper end of the tank and extending entirely about the same, is an angle iron 13, which is riveted to the tank, and which is adapted to rest upon the angle iron supporting frame 11, secured to the fire box. Suitable bolts 14, hold the supporting angle iron frame of the tank on the supporting angle iron frame of the fire box. By removing these bolts the tank may be readily removed from the fire box, and renewed or replaced as desired.

The tank is preferably so curved in cross section that it contacts with the inclined portion 9, of the fire box, as at the points 15. This contact between the tank and the side wall of the fire box restricts the heating area of the tank, that is, the portion of the tank subjected directly to the intense heat from the fire box, to points or portions which are substantially below the level of the bituminous material which is melted in the tank. By this arrangement of the parts it will be noted that the inner face of the tank, which is exposed to the heat, is covered by the material being melted, and this prevents the burning out of the tank adjacent its upper edges, or at portions thereof where it is not protected by the material. The melting tank is so placed as to provide a space between the end walls of said tank and the end walls of the fire box, and this affords means for the circulation of the heated products of combustion from the grate through these spaces at the ends of the tank. Covering the entire tank is an inclosing hood 16, which is also preferably formed of sheet metal, and said hood is rectangular in cross section, and is also covered by a suitable roof 17. At each side of the inclosing hood there are provided doors 18, and 19, which are hinged to the end walls of the hood, and these doors may be closed by a suitable latch 20. At the lower end of the hood is an angle iron frame 21 (see Fig. VI), which is riveted thereto, and this frame is adapted to rest upon the angle iron frame of the tank, and is secured to the fire box by the removable bolts 14.

Located within the tank and extending along the upper side edges thereof are supporting plates 22. Resting on the supporting plates and extending across the top of the tank are cross bars 23, which may be of any suitable number, and these cross bars support a rack 24. The inclosing hood is preferably formed of such dimensions that barrels 25, containing the bituminous material may be placed on the rack 24. The side doors of the inclosing hood are for the purpose of permitting the placing of the barrels

on the rack. The head of the barrel is removed and said barrel is placed on the rack with the open end down, so that the heat from the fire box will gradually cause the material within the barrels to become heated and to be discharged from the barrels through the rack into the melting tank, and thus the melting tank is supplied with the bituminous material.

The bituminous material is withdrawn from the melting tank through a discharge pipe 26. This pipe 26, extends through the side wall of the fire box, and is threaded into a supporting valve seat 27. This valve seat rests against a sheet of asbestos 28, and is firmly held against the end wall of the tank by clamping bolts 29. The opening through the valve seat is closed by a valve 30. This valve 30, is pivoted at 31, to the valve seat. A spring 32, surrounding the stem on which the valve is pivoted, forces the valve against its seat. The spring engages the valve at one end, and at its other end bears against a washer 33, held on the stem by suitable nuts 34. The valve is moved to uncover the opening in the valve seat by a rod 35. This rod is pivoted at 36, to the valve, and extends upwardly above the top of the tank, where it is bent laterally as at 37, and extends through the opening 38, in the end wall of the inclosing hood. A lever 39, is pivoted to the rod intermediate its ends. Said lever is fulcrumed upon a bracket 40. By lifting the outer end 41, of the lever, the rod is raised, and the valve moved to uncover the opening in the valve seat, while a downward pressure of the lever will press the rod and close the valve. It will be noted that the valve is left entirely within the melting tank, and the rod extends up through the material over the top of the tank to a point where it may be readily operated as described. This placing of the valve within the melting tank prevents said valve from clogging, owing to the cooling of the material in and about the parts of the valve. Furthermore, that portion of the pipe which extends from the tank through the outer wall of the fire box will be subjected to the action of the heated products of combustion, so that although the outer end of the pipe is exposed to the atmosphere and will be cooled off, the inner end will be kept heated and thereby prevent the valve from setting.

In order to remove the tank for replacing or repairing of the same, the discharge pipe 26, is removed from the threaded valve seat, which it engages, the holding bolts 14, are removed, which allows the inclosing hood to be set aside, so that the tank can be readily lifted from the fire box.

In order to facilitate the placing of barrels of bituminous material on the supporting rack within the inclosing hood, there is

provided a hoisting mechanism shown in detail in Figs. VIII to XI, inclusive. This hoisting device consists of spaced side tracks or supports 42. These tracks are formed with a horizontal portion 43, and an inclined portion 44. The inner end of the horizontal portion is bent as at 45, so as to rest on the supporting bar extending along the side edge of the tank. The other end of the supporting track rests on the ground. These tracks are connected at spaced intervals so as to hold the same in fixed relation to each other. Slidably mounted on the supporting track is a carriage 46. This carriage is formed of two angle irons arranged so as to slide on the tracks, and so as to prevent lateral movement of the carriage relative to the tracks. These angle irons are connected by cross pieces 47. The barrel 25, shown in dotted lines in Fig. VII, rests on the cross piece 47, and the outer upwardly bent ends of the angle irons forming the carriage. When the carriage is on the inclined portion of the track, said barrel is substantially horizontal as shown in said figure. It will be apparent, however, that when the carriage is brought to the horizontal section of the track, said barrel will tilt so as to be set vertically on its head, and this facilitates the placing of the barrel upright on the rack within the inclosing hood. As a means for moving the carriage on the track, there is provided a shaft 48. A chain 49, or other flexible device, is connected at one end to the carriage, and at its upper end passes over a sheave block 50, mounted on a suitable shaft 51, journaled in lugs 52, carried by the track, and the other end of said chain is connected to a reel on said shaft 48. A pawl and ratchet 53, holds the reel in various positions, and a crank arm 54, serves for turning the reel.

From the above description it will be apparent that the barrel or receptacle containing the asphalt or other bituminous material may be readily hoisted on to the supporting rack within the inclosing hood, and the heat from the fire box will gradually heat the material within the barrel, which will be discharged through the rack into the melting tank or kettle. It will also be apparent that only so much of the melting tank as is covered by the melted material is subjected to the intense heat of the fire box, which prevents the burning out of the unprotected portions of the tank. It will be further apparent that this tank may be readily removed for replacing or repairing, also that the valve for controlling the discharge of the bituminous material is entirely surrounded by the melted material, which keeps all the parts thereof warm and free from clogging by any cooling of the material on valve box which is further facilitated by the fact that the portion of the outlet pipe be-

tween the tank and the outer wall of the fire box is always kept warm, and that by the above features there has been provided a heating apparatus for bituminous material which is simple in construction and durable and free from many of the objections heretofore encountered in this character of device.

It is obvious that minor changes and details of construction and arrangement of parts can be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described my invention, I claim:

1. A heating apparatus for bituminous material, including a fire box having a supporting frame at its upper edges, a melting tank, an angle iron riveted to said melting tank and adapted to rest on said supporting frame, means for detachably connecting the angle iron to said supporting frame, a hood for said melting tank attached to said supporting frame, said melting tank having an angle iron at its upper edge attached to the inner face thereof, and a supporting rack located within said hood, and mounted on said angle iron at the inner face of the melting tank.
2. A heating apparatus for bituminous material including a fire box having substantially vertical side walls which are bent outwardly at their upper ends forming inclined portions, a supporting frame at the upper face of said inclined portions of the fire box, a melting tank, an angle iron attached to the upper edge of said melting tank and adapted to rest on said supporting frame, means for detachably connecting said angle iron to said supporting frame, said melting tank being curved so as to contact with the inclined portions of the fire box whereby the upper portions of the tank above the normal surface of the material in the tank are protected from the direct heat of the fire box.
3. A heating apparatus for bituminous material including a fire box having substantially vertical side walls which are bent outwardly at their upper ends forming inclined portions, a supporting frame at the upper face of said inclined portions of the fire box, a melting tank, an angle iron attached to the upper edge of said melting tank and adapted to rest on said supporting frame, means for detachably connecting said angle iron to said supporting frame, said melting tank being curved so as to contact with the inclined portions of the fire box whereby the upper portions of the tank above the normal surface of the material in the tank are protected from the direct heat of the fire box, a hood attached to said supporting frame, said melting tank having an angle iron at its upper face at the inner

edge thereof, and a supporting rack located in said hood and mounted on said angle iron on the inner face of the melting tank.

4. A heating apparatus for bituminous material including a fire box having a supporting frame at its upper edges, a melting tank mounted on said supporting frame, a hood mounted on said frame for covering said tank, an outlet pipe for said tank adjacent the lower end thereof, a vertically operated slide valve located within the tank for closing said outlet pipe, a rod attached

to said valve and extending above said tank, said rod being bent laterally and projecting through an opening in the hood, and means connected to the outer end of the rod for operating the same. 15

In testimony whereof, I have hereunto signed my name at Buffalo, New York, this 7th day of April, 1913.

ALLAN J. AITKEN.

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