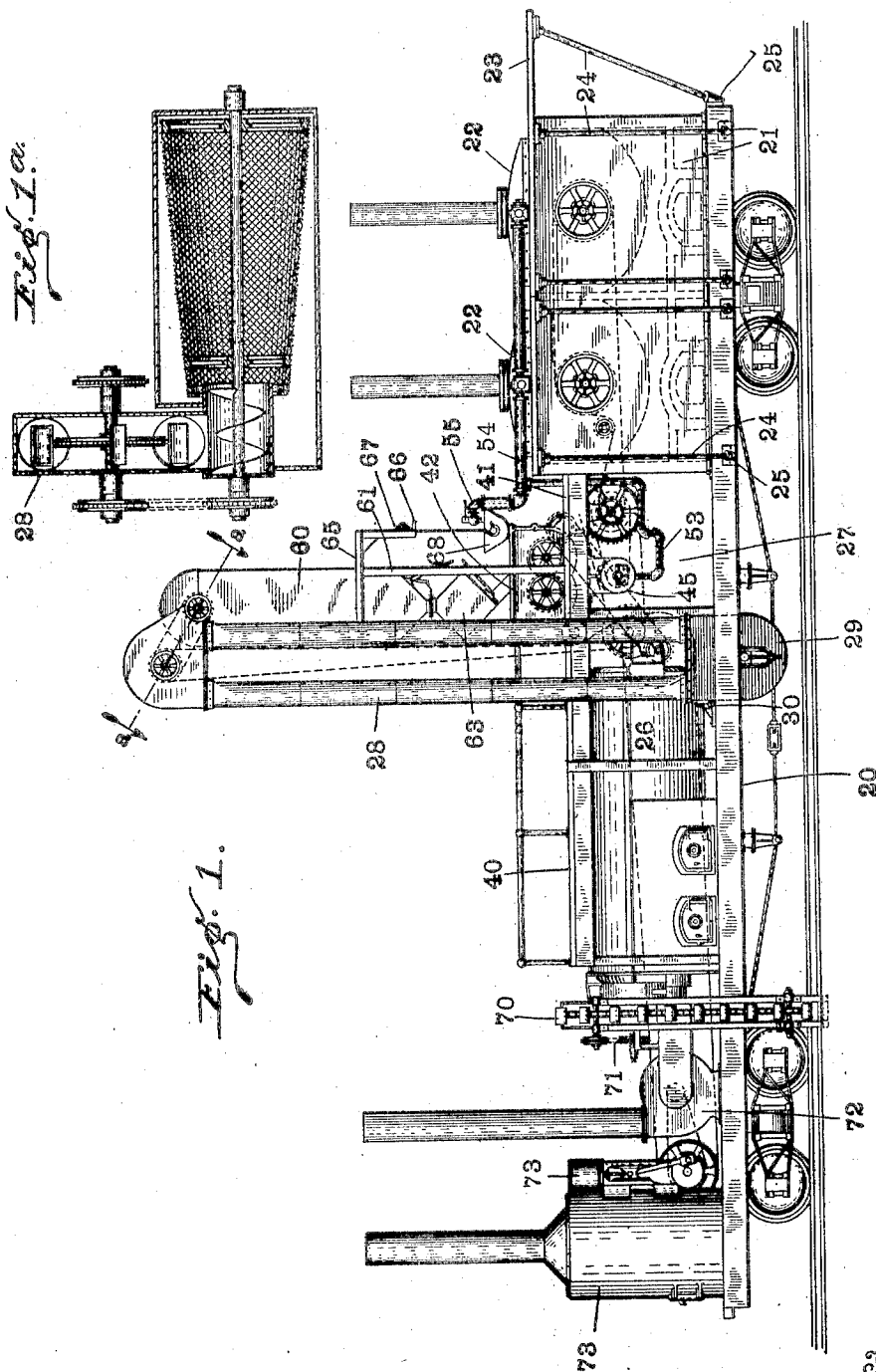


No. 797,356.

PATENTED AUG. 15, 1905.

F. A. HETHERINGTON.
RAILWAY PAVING PLANT.
APPLICATION FILED MAR. 31, 1905.

7 SHEETS—SHEET 1.



Witnesses
Frank A. Lohle
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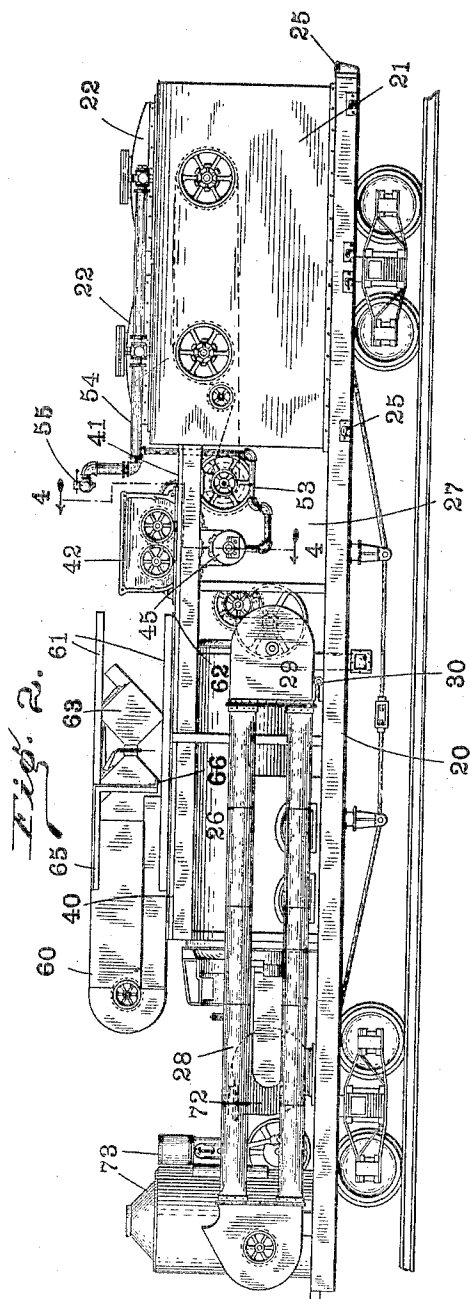
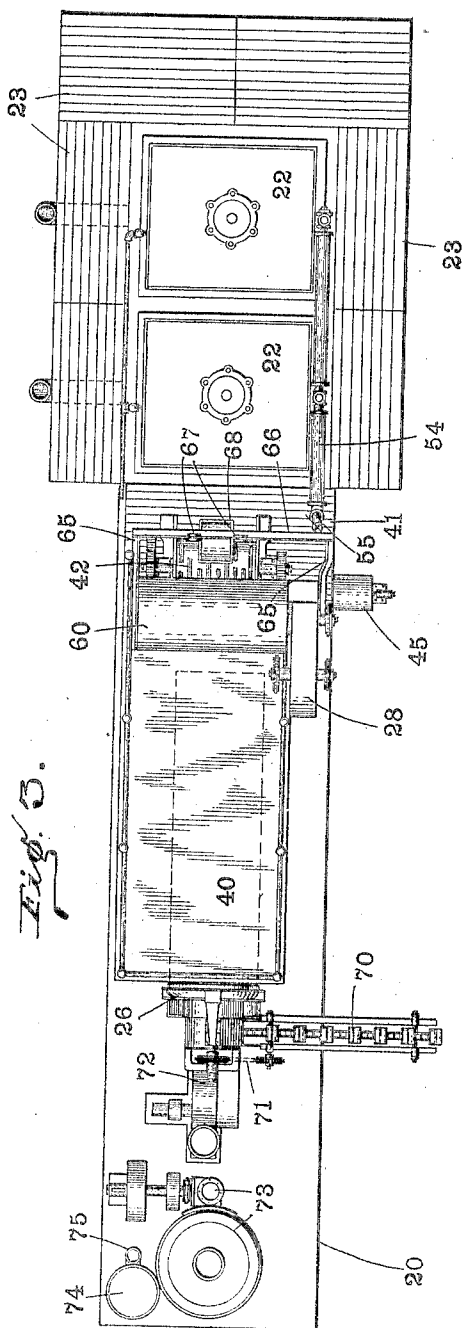
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7 SHEETS—SHEET 2.

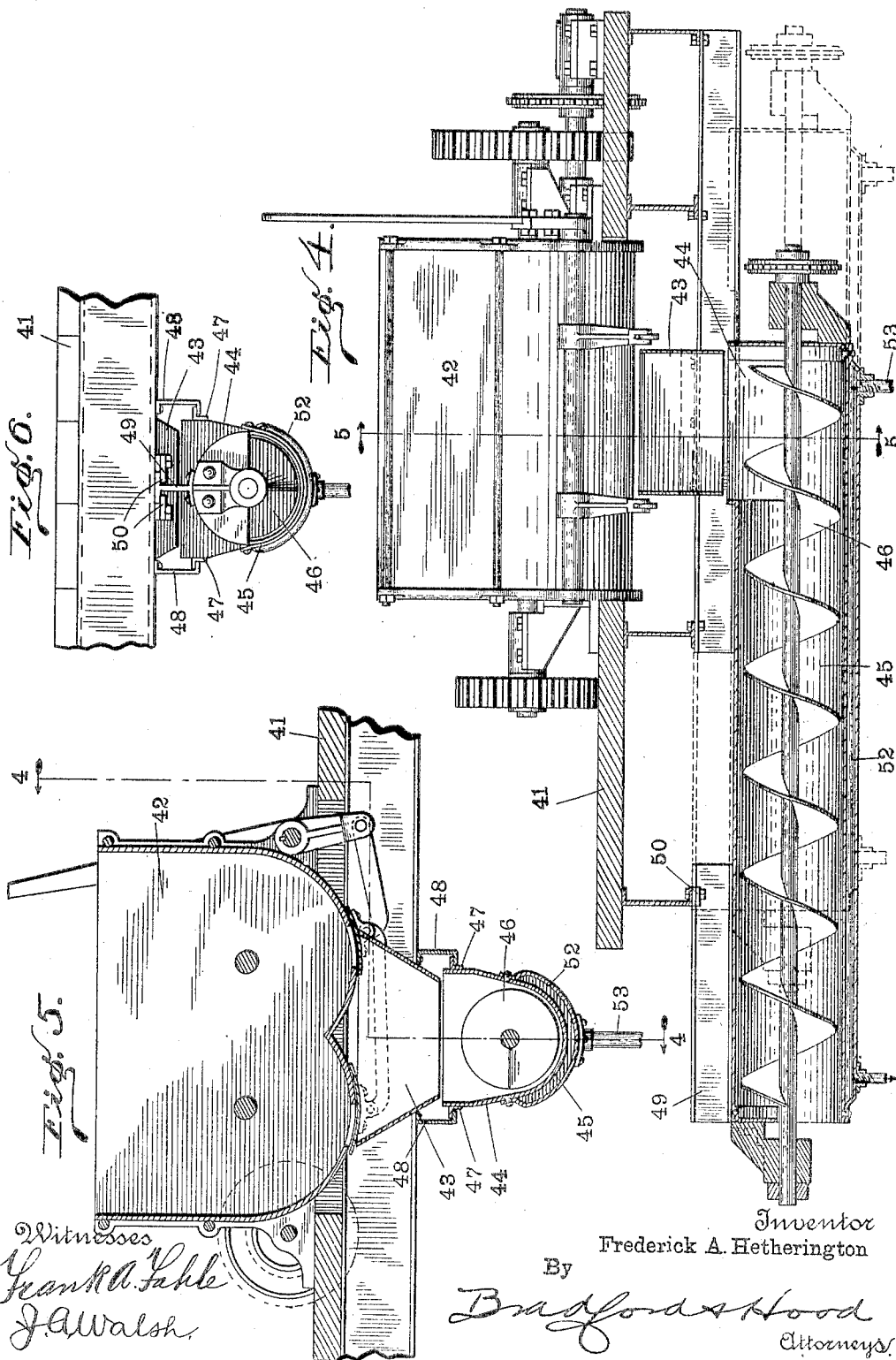


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7 SHEETS--SHEET 3.

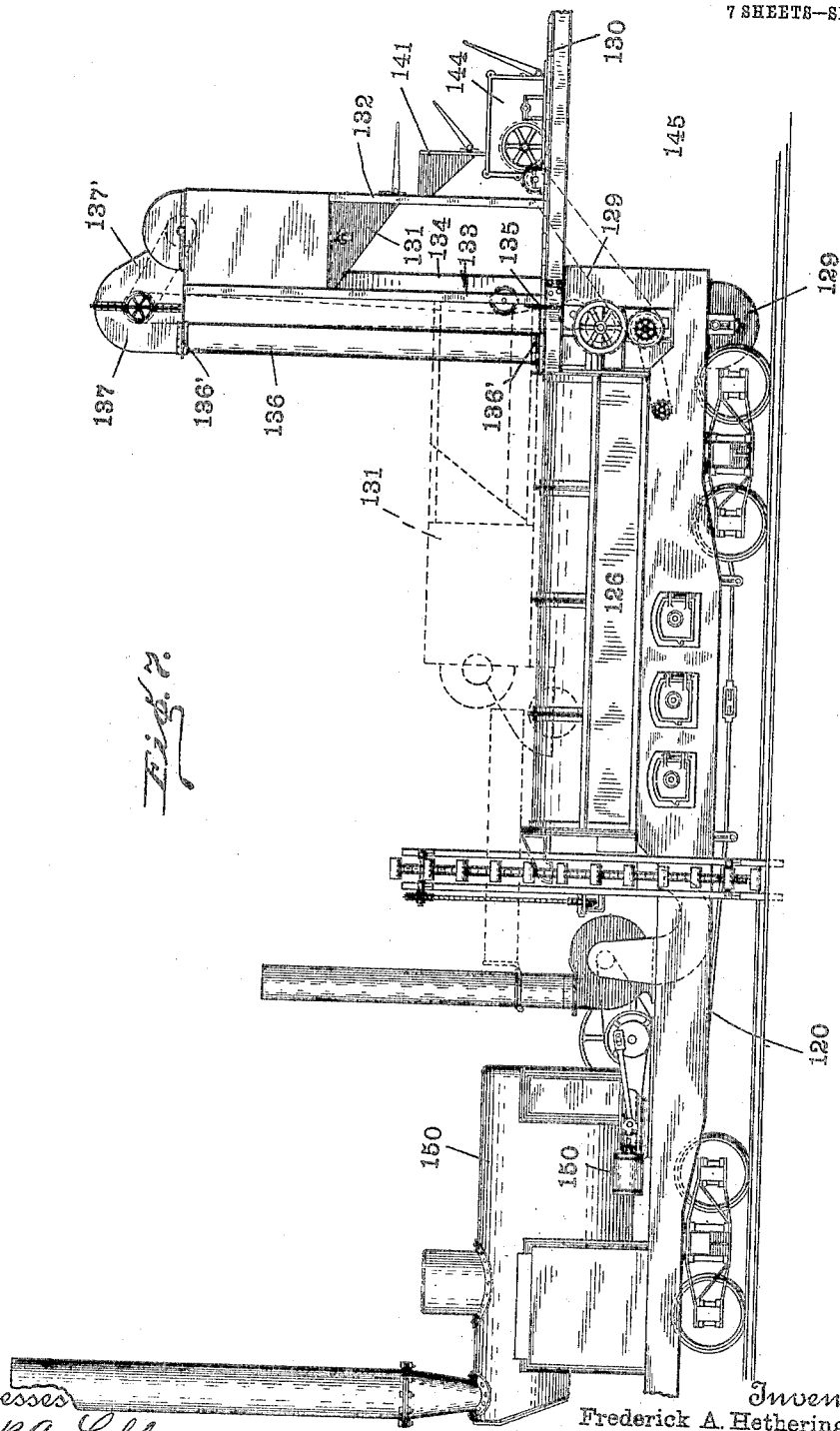


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7 SHEETS—SHEET 4.



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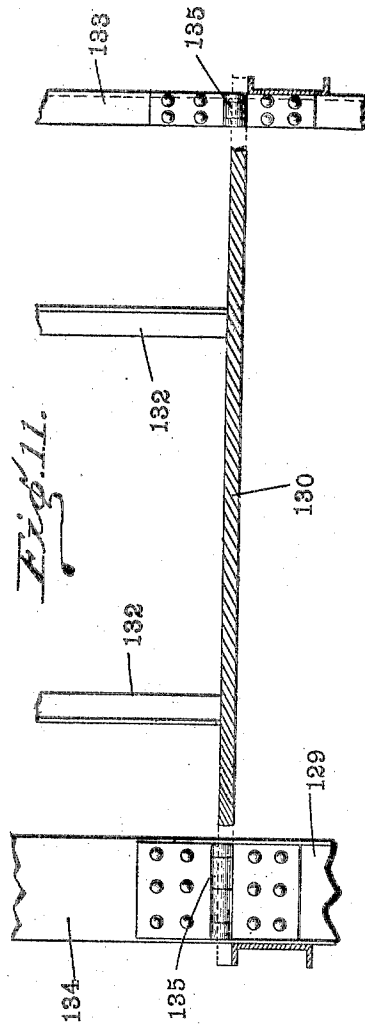
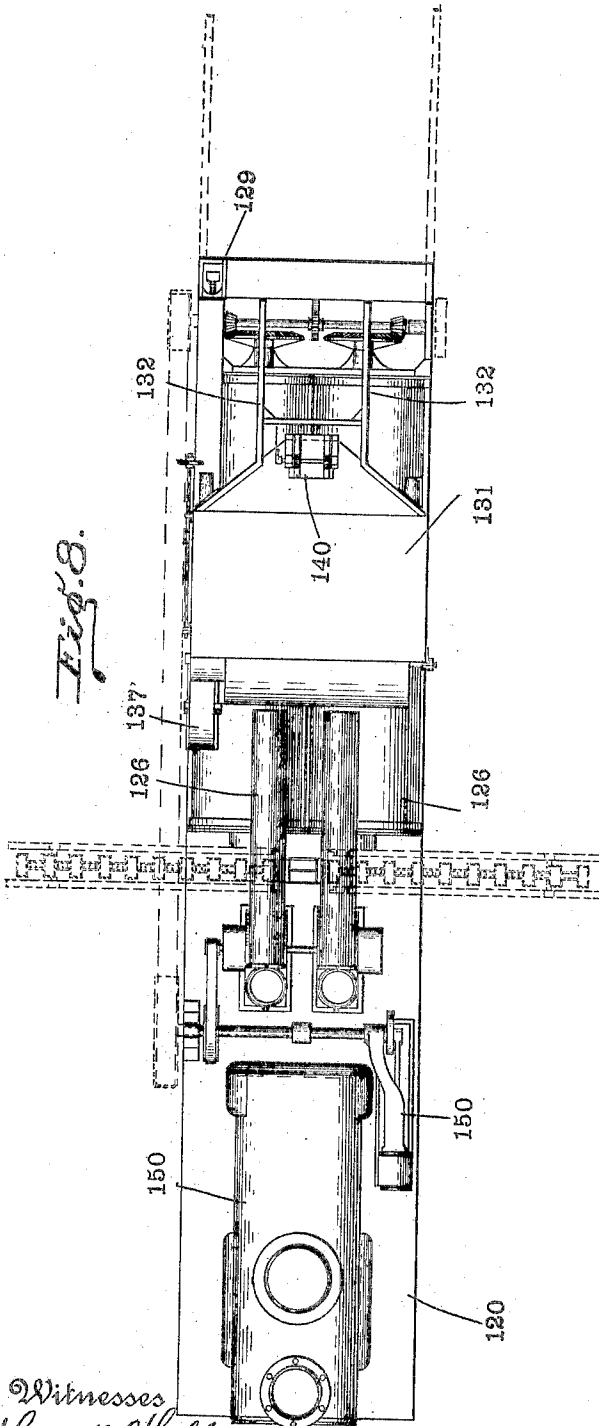
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No. 797,356.

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APPLICATION FILED MAR. 31, 1905.

7 SHEETS—SHEET 5.



Witnesses
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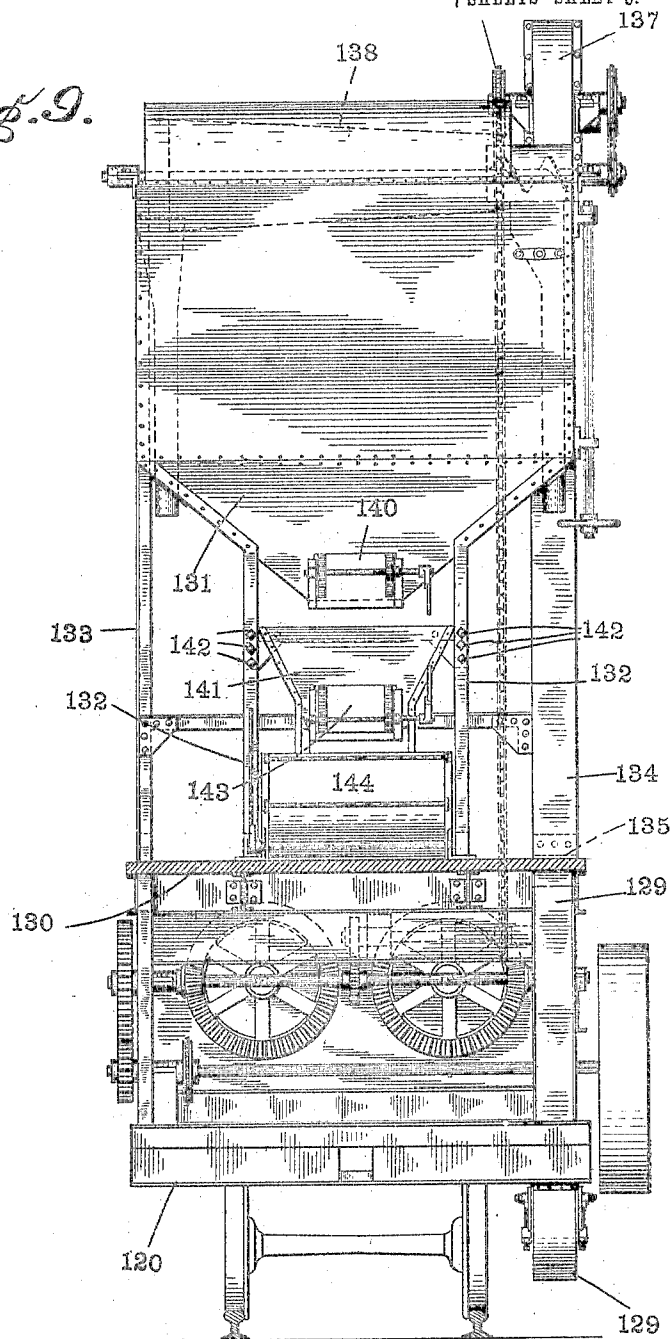
No. 797,356.

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APPLICATION FILED MAR. 31, 1905.

7 SHEETS—SHEET 6.

Fig. 9.



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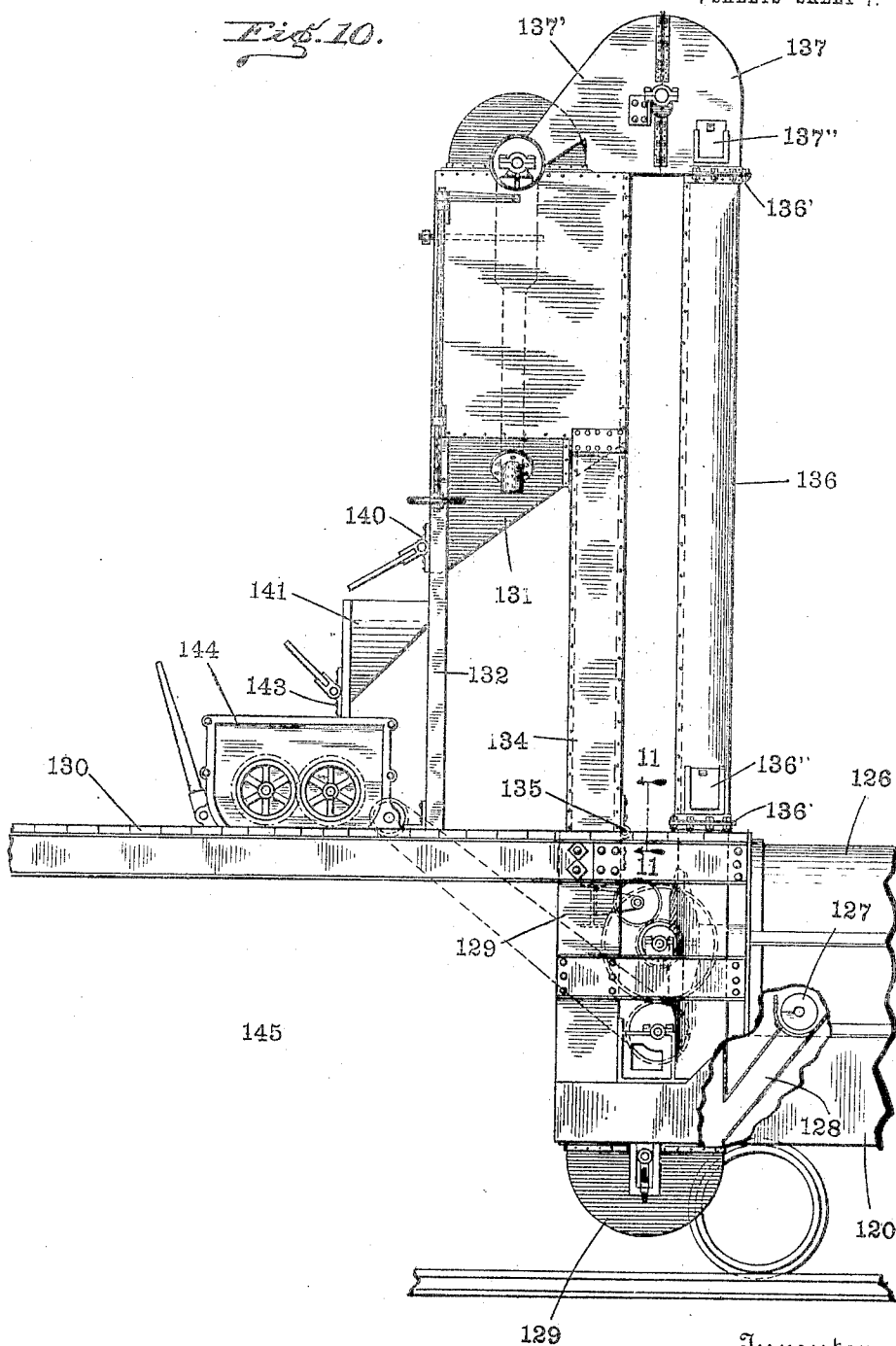
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7 SHEETS—SHEET 7.

Fig. 10.



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UNITED STATES PATENT OFFICE.

FREDERICK A. HETHERINGTON, OF INDIANAPOLIS, INDIANA.

RAILWAY PAVING PLANT.

No. 797,356.

Specification of Letters Patent.

Patented Aug. 15, 1905.

Application filed March 31, 1905. Serial No. 253,097.

To all whom it may concern:

Be it known that I, FREDERICK A. HETHERINGTON, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Railway Paving Plants, of which the following is a specification.

In the operation of railway portable plants for preparing paving materials the efficiency depends very largely upon the convenience of arrangement of the several mechanisms by which the different materials are treated, mixed, and delivered to the wagons in which the finished product is to be carried to the point of paving. In addition to this the various mechanisms should be so assembled that they may be brought to operative position with as little delay as possible and also such that all portions which in operation project beyond the standard limits permissible in the construction of railway-cars may be quickly and easily brought within such limits, the arrangement being such that as few parts as possible be operatively disassociated.

The objects of my present invention are therefore to produce a construction in which the storage bin or bins may be brought within the required transportation limits without being entirely detached from the structure or taken apart and also such that the hot-sand elevator may be similarly brought within the transportation limits without disassembling the same.

A further object of my invention is to produce a complete plant upon a single car, the arrangement of the various parts being such as to afford all necessary room for manipulation and also such that all of the parts may be quickly brought within transportation limits and quickly returned to operative position.

A further object of my invention is to provide improved means for delivering the mixed and finished product to wagons under such conditions that said product will not become materially cooled during such delivery.

A further object of my invention is to produce such improvements in details of construction as may be hereinafter described and claimed.

The accompanying drawings illustrate my invention.

Figure 1 is a side elevation of my improved one-car plant with the parts in operative position. Fig. 1^a is a section on line *a a* of Fig. 1. Fig. 2 is a similar view with the va-

rious parts brought within transportation limits. Fig. 3 is a plan of the structure shown in Fig. 1. Fig. 4 is a vertical section, on an enlarged scale, on line 4 4 of Figs. 2 and 5. Fig. 5 is a section on line 5 5 of Fig. 4. Fig. 6 is an elevation of the delivery end of the delivery-chute. Fig. 7 is a side elevation of the drier-car of a two-car plant, showing the application of the improved storage-bin and sand-conveyer as mounted on a two-car plant. Fig. 8 is a plan of plant shown in Fig. 7 with the various parts shown as folded down to within transportation limits. Fig. 9 is an elevation, on an enlarged scale, of the right-hand end of the plan shown in Fig. 7. Fig. 10 is an elevation of the storage-bin and hot-sand elevator with the adjacent end of the sand-drier and the mixer from a side opposite to that shown in Fig. 7 and on the same scale as Fig. 9, and Fig. 11 is a transverse section on line 11 11 of Fig. 10.

Referring particularly to Figs. 1 to 6, inclusive, 20 indicates a car of any desirable and suitable construction, preferably of the steel type. Supported upon one end of the car 20 is a furnace or furnaces 21, over which are arranged suitable melting-kettles 22. Flanking the tops of the melting-kettles on three sides are platforms or running-boards 23, which are detachably supported in position by means of detachable struts 24, the lower ends of which are detachably supported in sockets 25, secured to the car. Arranged upon the car 20 at some distance from the furnace 21 is a sand-drier 26, the delivery end being preferably arranged adjacent the furnace 21, but at such distance therefrom as to leave a considerable space 27 therebetween. Arranged to one side of the sand-drier at its delivery end is the hot-sand elevator 28, which may be of any well-known construction. The boot 29 of this elevator extends down through an opening formed in the floor of the car, and the elevator as a whole is pivoted upon a hinge 30, so that it may be swung down alongside the drier, as shown in Fig. 2, or may be erected to the position shown in Fig. 1. Supported above the drier and immediately to one side of the plane of the elevator 28 is a platform 40, which connects with (or is or probably will be integral with) the mixer-platform 41, which bridges this space 27. The mixer-platform 41 is provided with an opening over which the mixer 42 of any desired type is mounted. This mixer discharges into a fixed hopper 43, which in turn discharges into a

hopper 44, formed at the inner end of a tubular chute 45, within which is journaled a screw conveyer 46. The tube 45 is provided at its inner end upon opposite sides with angle-irons 47, the horizontal flanges of which rest and slide upon the lower horizontal flanges of a pair of oppositely-arranged channels 48, which are secured to the under side of the mixer-platform 41.

Secured to the upper side of the outer end of the tube 45 is a short section of an I-bar 49, the upper flanges of which rest and slide upon a pair of fingers 50, secured to the platform 41, the arrangement being such that the delivery-chute may be projected transversely of the car to the position shown in full lines in Fig. 4, where the hopper 44 is immediately beneath the hopper 43 and the open delivery end of the chute projects beyond the side of the car in order that mixed material may be delivered directly from this tube to a wagon driven alongside the car and beneath the projecting end of the chute, or the chute may be returned transversely to the position shown in dotted lines in Fig. 4, where all parts of the chute lie entirely within the planes of the sides of the car.

In order that the mixed material may be kept from chilling during the time of transportation from the mixer to the receiving-wagon, and thus choking the delivery-chute, I jacket said chute by means of a steam-jacket 52 and connect one end of said jacket by means of a flexible pipe connection 53 with a suitable source of steam—for instance, the steam-jackets 54 of the asphalt-delivery pipe 55—which leads from the kettles 22 to a point above one side of the mixer-platform.

The sand-bin 60 is supported upon a suitable frame 61, the two front legs of which rest upon the mixer-platform 41, while the two rear legs are attached by hinges 62 to the platform 40 41, the arrangement being such that the entire bin structure may be swung upon the hinges 62, so as to be folded down upon the platform 40 or swung up to the operating position. (Shown in full lines in Fig. 1.) The frame 61 carries any suitable measuring apparatus 63 for delivering the material from the storage-bin 60 to the mixer, and this measuring mechanism swings with the frame 61. Pivoted at 64 to the storage-bin-supporting frame at opposite ends thereof are arms 65, the outer ends of which are connected by a trolley-track 66, upon which is mounted a trolley 67, which supports the asphalt-measuring bucket 68 in position where it may return beneath the discharge end of the asphalt-pipe 55 and from thence to a point of delivery to the mixer 42.

Supported at its upper end upon the receiving end of the drier is a cold-sand elevator 70, the lower end of which rests upon the ground, this elevator being driven by a suitable chain train 71 from the drum-shaft of

the drier. Arranged at this end of the drier is the usual suction-fan 72, by means of which the hot gases of combustion from the furnace of the drier are drawn through the drier. At this end of the car I mount a power plant 73, which in this case may consist of a steam-boiler and steam-engine adapted to drive the various machines forming part of the plant. Adjacent this power plant is an air-storage tank 74, which is supplied by a suitable air-pump 75.

The air-tank is connected by suitable pipes to the melting-kettles, and the steam-pipes are connected to the boiler in any suitable manner; but these various pipes have been omitted in the drawings, as they would be in most cases carried beneath the platform, and there is nothing special in their arrangement.

It will be noticed that by the arrangement shown I have succeeded in bringing together upon a single car all the machinery requisite to properly prepare paving material ready for laying, yet the arrangement is such that there is plenty of room for the operators in the manipulation of the machine.

It will be readily apparent that the folding sand-bin and hot-sand elevator may be readily adapted for a two-car plant. Such an adaptation is illustrated in Figs. 7 and 11, inclusive, the car carrying the melting-kettles being omitted, as the construction of such car will be substantially identical as that shown in my Patent No. 585,867. In this two-car plant the drier-car 120 carries near one end a sand-drier 126, the delivery end of which lies adjacent the mixer end of the car. In the two-car plant this drier will preferably be of the twin-drum type, as illustrated in the drawings, in order to furnish sufficient capacity.

The hot sand from the two drums will be delivered to a cross-conveyer 127, which delivers to a chute 128, leading to the boot-section 129 of the hot-sand elevator. This boot-section is fixed on the car, and its top extends slightly above a mixer-platform 130. This mixer-platform 130 is detachably secured at its ends to the superstructure of the drier-car 120 and the kettle-car (not shown) in any desirable manner, such as shown in my patent heretofore referred to. Arranged above the drier-car ends of the platform 130 is the hot-sand bin 131, which is supported by suitable outer legs 132 and a pair of inner legs 133 and 134, the leg 134 being hollow and of a size to form a continuation of one leg of the hot-sand elevator. The two legs 133 and 134 are attached to the superstructure of the drier-car by hinges 135, thus permitting the entire sand-bin structure to be swung down to the position indicated in dotted lines in Fig. 7. In order to permit this movement, the hot-sand elevator is formed with a removable leg 136, which corresponds to the leg 134, said leg being provided at its ends with flanges 136', by means of which it may be attached

to and detached from the main portion of the elevator structure. A suitable door 136" permits access to the interior of this leg for a purpose which will appear. Secured to the sand-bin so as to form a connection between the two legs of the hot-sand elevator is the head 137, which is provided with a delivery-spout 137', which delivers to a suitable screen 138, journaled in the upper end of the hot-sand-bin structure. A door 137" furnishes access to the interior of the head 137. A valve 140 controls the outlet from the sand-bin and delivers to a measuring-receptacle 141, which is detachably secured to the legs 132 by suitable bolts 142. The delivery-opening of this measuring-receptacle is controlled by a valve 143, and this is arranged when in action so as to deliver to the mixer 144, of any desired type, mounted on the platform 130 at a point above the passage-way 145, which is formed between the adjacent ends of the two cars. The drier-car also carries a power plant 150 of any well-known type.

In operation the parts are assembled in positions shown in full lines in Figs. 7 and 10. When it is desired to transfer the apparatus, the operator by opening doors 136" and 137" may detach separately two pairs of links of the bucket-chain and remove the leg 136, together with a portion of the elevator-chain substantially equal in length. The entire remaining bin and elevator structure may then be swung downward on the hinges 135 to the positions shown in dotted lines in Fig. 7.

The various smoke-stacks and the cold-sand elevators 160 will be either folded down, as indicated in dotted lines, or detached and laid at various vacant points on the platform for transportation.

I claim as my invention—

1. In a portable paving plant, the combination, with a portable platform, a sand-drying mechanism carried thereby, of a hot-sand elevator carried by said platform and adapted to receive material from said drier, a hot-sand-storage bin pivotally supported upon the platform upon a horizontal axis, whereby it may be folded down upon the structure for transportation.

2. In a portable paving plant, the combination, with a portable platform, of a drier mounted thereon, an operating-platform carried by the main platform and arranged over the drier, a mixer, and means for conveying material from said drier to the mixer.

3. In a portable paving plant, the combination, with a portable platform, of a drier mounted therein, a melting-kettle also mounted on the platform a short distance from the drier, a mixer-platform bridging said space above the main platform, a mixer mounted thereon, and a cross-conveyer arranged beneath said mixer and adapted to deliver material beyond the side of the car.

4. In a portable paving plant, the combi-

nation, with a portable platform, of a drier arranged thereon, a mixer arranged above the platform, a cross-conveyer arranged beneath said mixer to receive material therefrom, and means for supporting said cross-conveyer whereby its discharge end may be projected beyond or may be retracted within the side line of the portable platform.

5. In a portable paving plant, the combination, with a portable platform, of a drier mounted thereon, a supplemental platform arranged over the drier and projected beyond the same, a mixer carried by the projected end of said platform, and means arranged beneath said projected end of the platform for receiving and delivering the mixed materials from the mixer.

6. In a portable paving plant, the combination, with a portable platform, of a drier mounted thereon, a melting-kettle also mounted thereon a short distance from the adjacent end of the drier, a mixer-platform arranged to bridge said space, a mixer mounted on said platform, means for delivering material from the drier and kettle to said mixer, and a transverse conveyer arranged beneath said platform and adapted to receive material from the mixer and deliver the same beyond the side of the portable platform.

7. In a portable paving plant, the combination, with a portable platform, of a drier mounted thereon, a melting-kettle also mounted thereon a short distance from the adjacent end of the drier, a mixer-platform arranged to bridge said space, a mixer mounted on said platform, means for delivering material from the drier and kettle to said mixer, a transverse conveyer arranged beneath said platform and adapted to receive material from the mixer and deliver the same beyond the side of the portable platform, and means for supporting said transverse conveyer whereby its discharge end may be projected beyond or retracted within the side line of the portable platform.

8. In a portable paving plant, the combination, with a portable platform, of a drier mounted thereon, a melting-kettle also mounted thereon a short distance from the adjacent end of the drier, a mixer-platform arranged to bridge said space, a mixer mounted on said platform, means for delivering material from the drier and kettle to said mixer, a transverse conveyer arranged beneath said platform and adapted to receive material from the mixer and deliver the same beyond the side of the portable platform, and means for heating said transverse conveyer.

9. In a portable paving plant, the combination, with a portable platform, of a drier mounted thereon, a melting-kettle also mounted thereon a short distance from the adjacent end of the drier, a mixer-platform arranged to bridge said space, a mixer mounted on said platform, means for delivering material from the drier and kettle to said mixer, a trans-

verse conveyer arranged beneath said platform and adapted to receive material from the mixer and deliver the same beyond the side of the portable platform, means for supporting said transverse conveyer whereby its discharge end may be projected beyond or retracted within the side line of the portable platform, and means for heating said transverse conveyer.

10. In a portable paving plant, the combination, with a vehicle, of a drier mounted thereon, a melting-kettle also mounted thereon, a mixer-platform, a mixer mounted thereon, a storage-bin pivotally mounted upon the vehicle on a horizontal axis, and an elevator pivotally mounted upon the vehicle upon a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin.

11. In a portable paving plant, the combination, with a vehicle, of a drier arranged thereon, a melting-kettle arranged adjacent one end of the drier a short distance therefrom, a mixing-platform arranged to bridge the space between the drier and kettle, a mixer mounted thereon, a storage-bin pivotally mounted on the vehicle upon a horizontal axis adjacent the mixer, and an elevator also pivotally mounted on the vehicle on a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin.

12. In a portable paving plant, the combination, with a vehicle, of a drier arranged thereon, a melting-kettle arranged adjacent one end of the drier a short distance therefrom, a mixing-platform arranged to bridge the space between the drier and kettle, a mixer mounted thereon, a work-platform arranged adjacent the mixer and over the drier, a storage-bin pivotally mounted on the vehicle upon a horizontal axis adjacent the mixer, and an elevator also pivotally mounted on the vehicle on a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin.

13. In a portable paving plant, the combination, with a vehicle, of a drier arranged thereon, a melting-kettle arranged adjacent one end of the drier a short distance therefrom, a mixing-platform arranged to bridge the space between the drier and kettle, a mixer mounted thereon, a storage-bin pivotally mounted on the vehicle upon a horizontal axis adjacent the mixer, an elevator also pivotally mounted on the vehicle on a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin, and a transverse conveyer arranged to receive and deliver material from the mixer.

14. In a portable paving plant, the combination, with a vehicle, of a drier arranged thereon, a melting-kettle arranged adjacent one end of the drier a short distance there-

from, a mixing-platform arranged to bridge the space between the drier and kettle, a mixer mounted thereon, a work-platform arranged adjacent the mixer and over the drier, a storage-bin pivotally mounted on the vehicle upon a horizontal axis adjacent the mixer, an elevator also pivotally mounted on the vehicle on a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin, and a transverse conveyer arranged to receive and deliver material from the mixer.

15. In a portable paving plant, the combination, with a vehicle, of a drier arranged thereon, a melting-kettle arranged adjacent one end of the drier a short distance therefrom, a mixing-platform arranged to bridge the space between the drier and kettle, a mixer mounted thereon, a storage-bin pivotally mounted on the vehicle upon a horizontal axis adjacent the mixer, an elevator also pivotally mounted on the vehicle on a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin, a conveyer-chute arranged beneath the mixer, a conveyer mounted therein, and means for supporting said chute whereby it may be transversely shifted beneath the mixer.

16. In a portable paving plant, the combination, with a vehicle, of a drier arranged thereon, a melting-kettle arranged adjacent one end of the drier a short distance therefrom, a mixing-platform arranged to bridge the space between the drier and kettle, a mixer mounted thereon, a work-platform arranged adjacent the mixer and over the drier, a storage-bin pivotally mounted on the vehicle upon a horizontal axis adjacent the mixer, an elevator also pivotally mounted on the vehicle on a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin, a conveyer-chute arranged beneath the mixer, a conveyer mounted therein, and means for supporting said chute whereby it may be transversely shifted beneath the mixer.

17. In a portable paving plant, the combination, with a vehicle, of a drier arranged thereon, a melting-kettle arranged adjacent one end of the drier a short distance therefrom, a mixing-platform arranged to bridge the space between the drier and kettle, a mixer mounted thereon, a storage-bin pivotally mounted on the vehicle upon a horizontal axis adjacent the mixer, an elevator also pivotally mounted on the vehicle on a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin, a conveyer-chute arranged beneath the mixer, a conveyer mounted therein, means for supporting said chute whereby it may be transversely shifted beneath the mixer, and means for heating said conveyer-chute.

18. In a portable paving plant, the combination, with a vehicle, of a drier arranged thereon, a melting-kettle arranged adjacent one end of the drier a short distance therefrom, a mixing-platform arranged to bridge the space between the drier and kettle, a mixer mounted thereon, a work-platform arranged adjacent the mixer and over the drier, a storage-bin pivotally mounted on the vehicle upon a horizontal axis adjacent the mixer, an elevator also pivotally mounted on the vehicle on a horizontal axis, said elevator being arranged to receive material from the drier and deliver the same to the storage-bin, a conveyer-chute arranged beneath the mixer, a conveyer mounted therein, means for supporting said chute whereby it may be transversely shifted beneath the mixer, and means for heating said conveyer-chute.

19. In a portable paving plant, the combination, with a mixer, of a conveyer-chute arranged to receive material from said mixer, a conveyer mounted therein, and means for supporting said chute whereby it may be shifted beneath the mixer.

20. In a portable paving plant, the combination, with a mixer, of a conveyer-chute arranged to receive material from said mixer, a conveyer mounted therein, means for supporting said chute whereby it may be shifted beneath the mixer, and means for heating said conveyer-chute.

21. In a portable paving plant, the combination, with a mixer, of a conveyer arranged beneath the mixer, and means for supporting said conveyer whereby its delivery end may be projected or retracted.

22. In a portable paving plant, the combination, with a mixer, of a conveyer arranged beneath the mixer, means for supporting said conveyer whereby its delivery end may be projected or retracted, and means for heating said conveyer.

23. In a portable paving plant, the combination with a vehicle, of a drier arranged thereon, a melting-kettle arranged thereon a short distance from the adjacent end of the drier, a mixer-platform bridging said space, a mixer arranged thereon, a work-platform arranged over the drier, a storage-bin pivotally mounted on a horizontal axis adjacent the mixer and adapted to be folded down upon the work-platform, and an elevator arranged adjacent the drier at one side thereof and pivotally mounted on a horizontal axis upon the vehicle in such manner that it may be folded down alongside the drier, said elevator being

arranged to receive material from the drier and deliver the same to the storage-bin.

24. In a portable paving plant, the combination, with a portable platform, of a drying mechanism mounted on said platform, a melting-kettle also mounted on said platform a short distance from the drier, and a mixer supported between the drier and kettle at an elevation above the platform.

25. In a portable paving plant, the combination, with a portable platform, of a drying mechanism, mounted on said platform, a melting-kettle also mounted on said platform a short distance from the drier and means arranged beneath the mixer for receiving material therefrom and transferring the same transversely to discharge beyond the side of the platform.

26. In a portable paving plant, the combination with a portable platform, of a drier mounted on said platform, a mixer supported above the platform at an elevation therefrom and a work-platform arranged over the drier.

27. In a portable paving plant, the combination with a vehicle, of preparing mechanism carried by said vehicle, a mixer supported by the vehicle at an elevation therefrom, a means arranged beneath the mixer for receiving material therefrom and for transferring the same transversely to discharge beyond the side of the vehicle.

28. In a portable paving plant, the combination with a car of a drier mounted thereon, a melting-kettle also mounted on the vehicle a short distance from the drier, a mixer supported between the drier and kettle at an elevation from the main platform, and means arranged beneath the mixer for receiving material therefrom and for transferring the same transversely to discharge beyond the side of the car.

29. In a portable paving plant, the combination with a vehicle, of a drier mounted thereon, a melting-kettle also mounted on the vehicle a short distance from the drier, a mixer supported between the drier and kettle at an elevation from the main platform, and a work-platform arranged over the drier and adjacent the mixer.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 29th day of March, A. D. 1905.

FREDERICK A. HETHERINGTON. [L. S.]

Witnesses:

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JAMES A. WALSH.