No. 769,156. PATENTED SEPT. 6, 1904.

J. J. EVERSON.

MACHINE FOR CLEANSING AND SEPARATING ROAD MAKING MATERIAL.

APPLICATION FILED APR. 5, 1904.

NO MODEL. 4 SHEETS—SHEET 1.

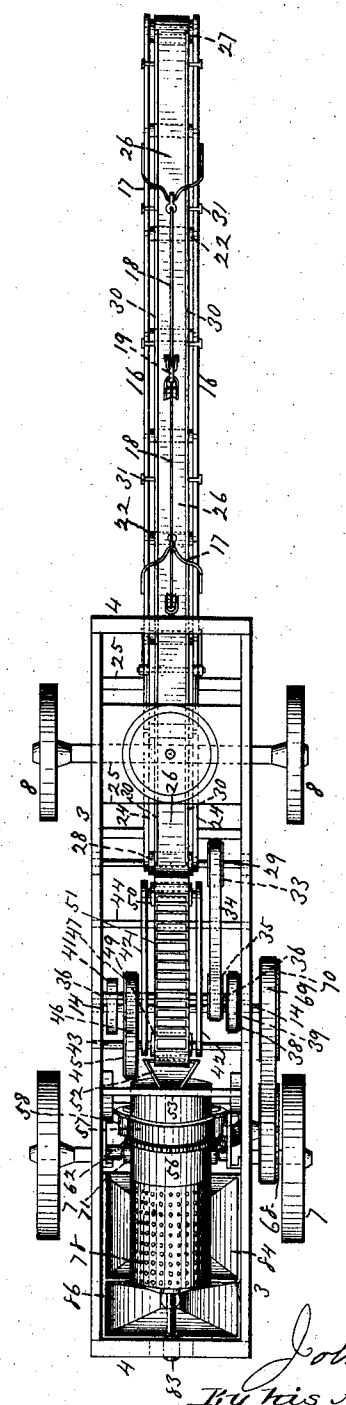


Fig. 1.

WITNESSES:

A. L. Hood.

C. L. Baker.

INVENTOR:

John J. Everson.

By his Atty.

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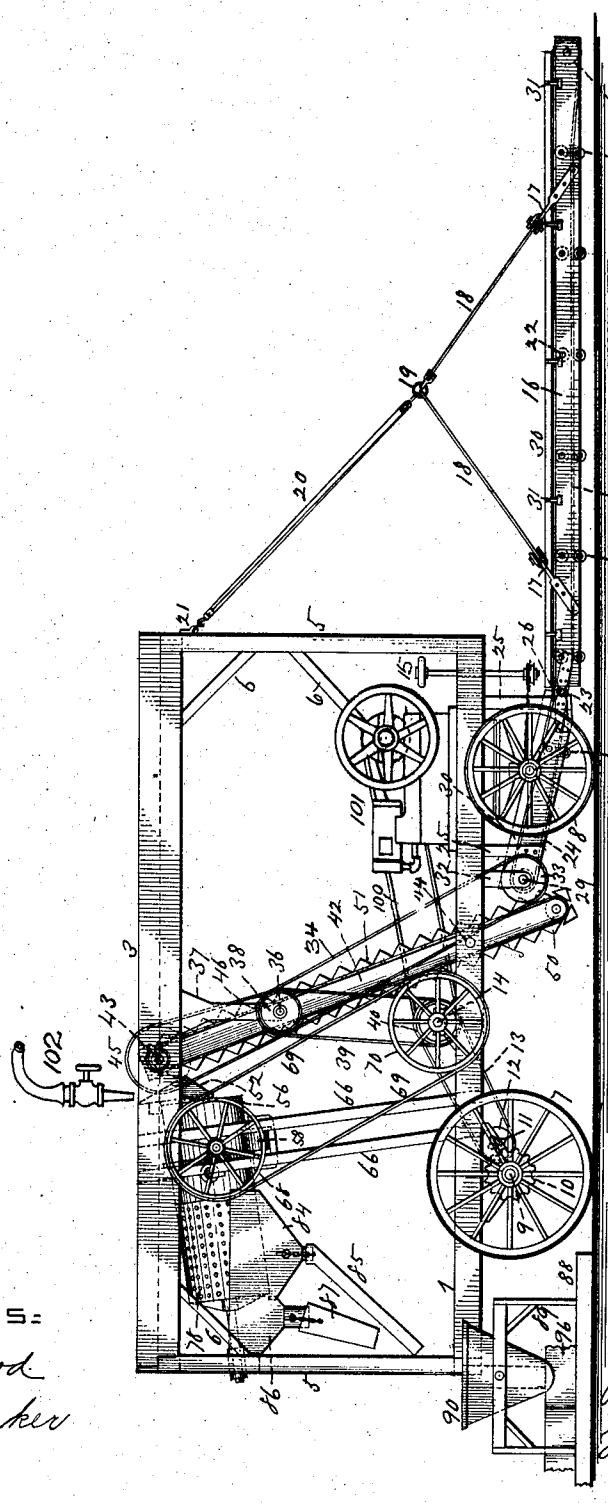


Fig. 2.

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NO MODEL. 4 SHEETS—SHEET 3.

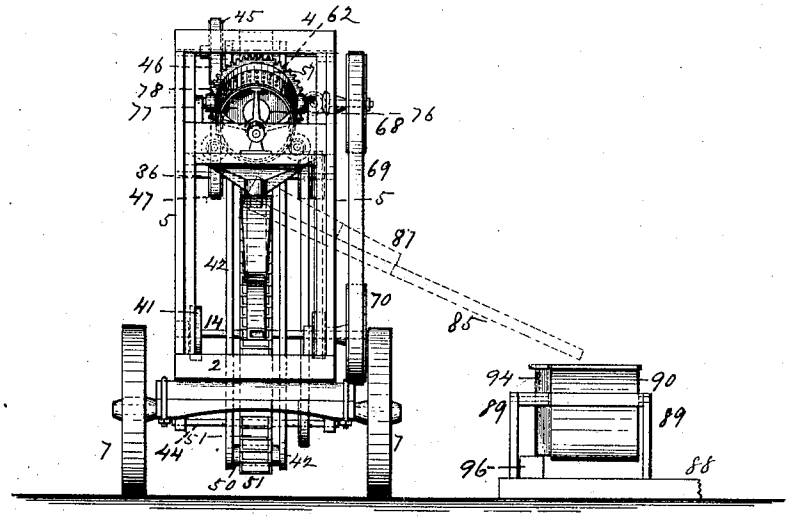


Fig. 3.

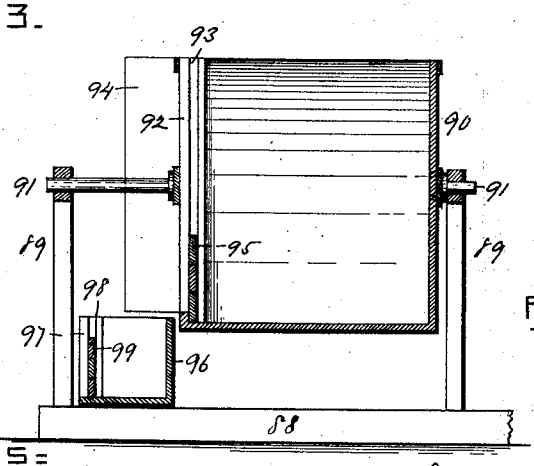


Fig. 4.

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NO MODEL. 4 SHEETS—SHEET 4.

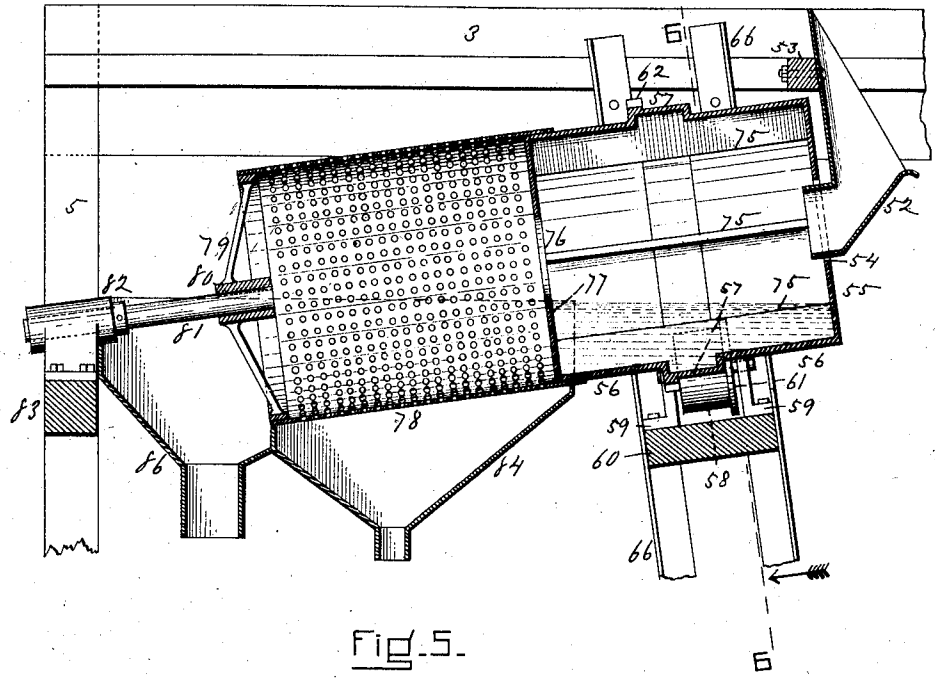


Fig. 5.

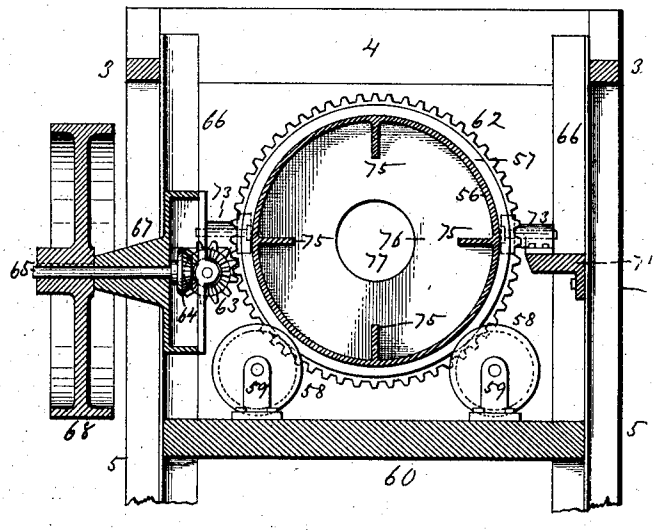


Fig. 6.

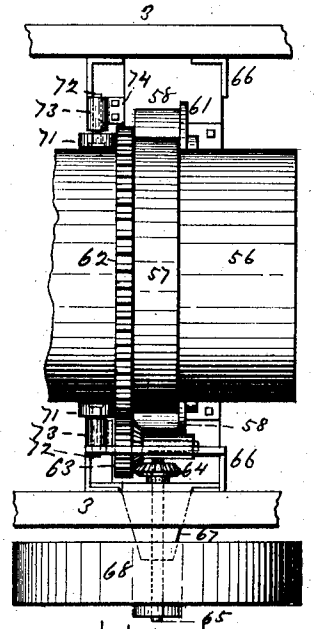


Fig. 7

WITNESSES:
A. L. Hood.
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No. 769,156. Patented September 6, 1904.

UNITED STATES PATENT OFFICE.

JOHN J. EVERSON, OF NEWTON, MASSACHUSETTS.

MACHINE FOR CLEANSING AND SEPARATING ROAD-MAKING MATERIAL.

SPECIFICATION forming part of Letters Patent No. 769,156, dated September 6, 1904.

Application filed April 5, 1904. Serial No. 201,626. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. EVERSON, a citizen of the United States, residing in Newton, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Machines for Cleansing and Separating Road-Making Material, of which the following is a specification.

This machine is particularly adapted for receiving, cleansing, separating, and discharging road-making material which has already been in use—as for example, the material in a macadamized road which has become worn and requires to be repaired.

This invention has for its object to provide in an improved machine (which is adapted to move along the road by traction in the ordinary manner) mechanism whereby the material from the road-bed is received and conveyed to a bucket elevator, is lifted by said elevator and delivered through a hopper into a revolving drum and conveyed by gravity into a revolving screen, which separates the smaller stones, sand, mud, and water from the large stones and delivers them through a spout into a car, from which the mud and water can run off into a settling-trough, while the larger stones are conducted into a separate hopper and spouted into the street to be used on the road-bed. The smaller stones and sand are removed and used for sidewalk-laying, road-building, &c.

The nature of the invention is fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a traction-vehicle provided with mechanism embodying my invention. Fig. 2 is a side elevation of the same, a gas-engine being illustrated diagrammatically in position and a portion of a water-feed being also illustrated. Fig. 3 is an elevation looking from the left. Fig. 4 is a cross vertical section of the car and trough below described. Fig. 5 is a sectional view illustrating the drum, the screen, and the adjacent hoppers. Fig. 6 is a section taken on line 6, Fig. 5. Fig. 7 is a plan view of a portion of the drum, illustrating its operating mechanism.

Similar characters of reference indicate corresponding parts.

The frame of the vehicle comprises the lower side rails 1, the lower cross-bars 2, the upper side rails 3, the upper cross-bars 4, the four corner-posts 5, and the braces 6. This frame is intended to sustain a steam-engine or other suitable motor and is supported by driving-wheels 7 and forward wheels 8, the shaft 9 of the driving-wheels being provided with a gear-wheel 10, Fig. 2, adapted to engage a gear 11 on a suitable counter-shaft mounted on the frame, said counter-shaft having mounted on it a pulley 12, which is connected by a belt 13 with a suitable pulley on the driving-shaft 14, said pulley not being illustrated in the drawings, but being behind the pulley 40, below described. The traction mechanism and its connections with an ordinary motor make no part of the invention.

15 represents an ordinary brake mechanism.

16 represents a pair of parallel vertically-set long side rails supported in a normally horizontal position by means of a pair of bails 17, which are connected to the lower ends of supporting rods or chains 18, whose upper ends are secured to a ring 19. This ring is connected by a cord-and-pulley mechanism 20 with a bracket 21, secured to the frame of the machine or vehicle, whereby the bars 16 may be raised and lowered. These bars sustain and are connected by pairs of horizontal rollers 22, the rollers in each pair being arranged one above the other. The inner ends of these bars are hinged at 23 to a pair of similar but shorter bars 24, disposed at an upward incline and supported by hangers 25, extending down from the portion 1 of the frame, said bars 24 also supporting rollers 22. The two sets of bars 16 and 24 sustain an endless belt 26, said belt extending over and around a pulley or roll 27, supported by the outer ends of the bars 16, and the pulley or roll 28 between and at the inner ends of the bars 24, said roll 28 being fast on the shaft 29. (See Figs. 1 and 2.) The belt 26 rests upon the pairs of rollers 22, and at the opposite edges of said belt there are placed boards or guards 30, supported by small brackets 31,

secured to the bars 16 and 24. The shaft 29 is supported by brackets or hangers 32 and has mounted on it a pulley 33, which is connected by a belt 34 with a pulley 35, Fig. 1, on the shaft 36, supported by the brackets or hangers 37, secured to the top rails 3. On the same shaft 36 there is mounted a pulley 38, Fig. 1, which is connected by a belt 39 with the pulley 40 on the driving-shaft 14, said driving-shaft being provided with a suitable pulley 41, Fig. 1, which can be connected by a belt 100 with a gas-engine or other motor, (illustrated diagrammatically at 101,) and thus transmit motion not only to the endless belt 26, but to the traction-wheels 7.

42 represents a pair of inclined bars supported near their upper ends loosely on the horizontal shaft 43, sustained by the bars 3, and toward its lower end by a rod 44, supported by the lower bars 1. Mounted on the shaft 43 is a pulley 45, which is connected by a belt 46 with the pulley 47 on the shaft 36, said shaft 36 being, as above mentioned, connected by the pulley 38, belt 39, and pulley 40 with the driving-shaft 14. The bars 42 constitute an inclined frame reaching down to and slightly under the inner ends of the bars 24 and supporting at their opposite ends rollers 49 and 50, the roller 49 being fast on the shaft 43. Around these rollers there is disposed a bucket elevator 51, which is actuated by the shaft 43. The upper end of this elevator extends over the mouth of a hopper 52, Figs. 1, 2, and 5, supported by the frame and more particularly by a cross-bar 53. The larger mouth of this hopper faces the upper end of the bucket elevator, and the smaller mouth extends into a suitable central opening 54 in the wall 55 of an inclined cylindrical drum 56. This drum is provided with the annular raised bearing-surface 57, which rests on rolls 58, Figs. 5, 6, and 7, supported by brackets 59, sustained by a cross-bar 60. These rolls 58 are provided with annular flanges 61, which overlap one edge of the annular raised surface 57, whereby the main portion 58 of the rolls provides a bearing for the part 57 between the said flanges 61 and an annular gear 62, extending from the portion 57 next its opposite edge. The cross-bar 60 makes a part of a frame, preferably of metal, which comprises the two inclined parallel bars 66, bolted to the upper and lower rails 3 and 1 and set at right angles to the axis of rotation of the drum 56. The gear 62 is engaged by a gear-wheel 63 on the bevel-gear 64, actuated by the horizontal shaft 65, having bearings in a box 67, supported by one of the bars 66, said shaft 65 having mounted on it a pulley 68, which is connected by a belt 69, Figs. 1 and 2, with a pulley 70 on the shaft 14. Small rollers 71, Figs. 1, 6, and 7, are mounted on studs 72, having bearings in boxes 73, supported by brackets 74 on the frame 66, said rollers bearing against one face of the gear 62 and, in connection with the flanges 61, operating to confine the drum to the rotative movement communicated by means of the pulleys 68 and 70, bevel-gear 64, and gear 62 and prevent side or endwise movement.

The drum 56 is provided on its inner surface with longitudinal radial shelves 75, the object of which is below described, and the end wall 76 has a central opening 77, as shown in Fig. 5. 78 is a tubular and cylindrical screen provided with numerous perforations and open at both ends. One end of this screen is pressed over the lower end of the drum 56, and the other end is provided with a spider 79, whose tubular hub 80 is keyed to a shaft 81, which is adapted to rotate in a suitable box 82. Directly under this screen is a hopper 84, provided with a downwardly-extending pipe 85, which may be of stiff or flexible material, as desired, and under the lower end or mouth of this screen is another hopper 86, provided with a flexible and flexibly-mounted outlet-tube 87. These hoppers may be distinct or may consist of two chambers in one construction and preferably extend across the frame from one rail, 3, to the other, as illustrated in Fig. 1.

In connection with the machine proper that is to say, the apparatus above described and supported by or contained in the traction-vehicle—there is used in practice a car which is intended to rest on the sidewalk 88 and to be moved as the apparatus is propelled in order to be in position under the lower end of the pipe 85. This car comprises a frame 89 and a receptacle or hopper 90, supported thereby, said hopper being open at its upper end and preferably wider at its mouth than at the bottom. This hopper is pivotally supported in the frame 89, as illustrated in Figs. 2, 3, and 4, by means of pivots 91, and one of the vertical sides of the hopper or receptacle—namely, the side facing the main machine—is provided with a vertical opening 92, having vertical grooves 93 in its opposite edges, said opening being flanked on both sides by vertical boards 94, extending outward at right angles on opposite sides of the pivot 91, said boards serving to guide the material from the interior of the receptacle 90 into a longitudinally-placed trough 96. Sliding within these grooves 93 are horizontal removable boards 95, over which the contents of the receptacle 90 flow into the trough 96. This trough is very long, frequently one hundred to two hundred feet and is intended to be stationary on the sidewalk near its edge or on the street next the curb and to reach at least to the next catch-basin or sewer-opening and is provided with a vertical outlet 97, having vertical grooves 98, in which are removable boards 99, similar to the construction above described in the trough 90.

The practical operation of the machine is as follows: The machine is propelled by any desired power to a road containing available

material to be cleansed and separated, such as macadam which has become more or less worn and needs repairing. The machine having been brought to a stop, the long trough 96 having been placed, as above described, so that it reaches to a catch-basin, and the receptacle or car 90 having been placed in the position indicated in the drawings, the stones and sand or dirt are thrown upon the belt or conveyer 26, and the pulley 41 having been connected to the engine the stones, &c., are conveyed by the belt between the guards 30 horizontally to the end of the bars 16 and then in an upward incline to the bucket elevator 51, said conveyer having been operated by means of the pulley 28, belt 34, pulley 35, shaft 36, pulley 38, and the driving-shaft 14, on which is mounted the driving-pulley 41. The stones, sand, &c., are transferred by the conveyer 26 to the bucket elevator 51, which is operated by the roller 49, shaft 43, pulley 45, belt 46, pulley 47, shaft 36, belt 39, and pulley 40 on the driving-shaft 14. The buckets on the elevator deliver the material into the hopper 52, which conducts it into the drum 56, which is rotated on an inclined plane by means of the gear 62, 63, and 64, the stud 65, pulley 68, belt 69, and pulley 70 on the driving-shaft 14. Water is conducted through a hose 102, Fig. 1, or other means into this drum through the hopper 52, and the rotation of the drum causes the water, sand, and stones to become thoroughly rolled and shaken up, the shelves 75 acting as agitators and successively carrying the material partly to the top of the drum and then dropping it, whereby the stones are thoroughly washed and loosened from the dirt and sand. The material then passes by gravity through the opening 76 into the screen 78, which rotates with the drum and is also set on an incline. The smaller stones, sand, mud, and water pass through the perforations in the screen into the hopper 84 and are conducted through the pipe 85 into the receptacle or car 90. The larger stones pass by gravity from the screen into the hopper 86 and through the flexible spout 87 onto the road-bed. The mud and water which are conducted to the receptacle or car 90 flow through the passage 92 over the top board or slat 95 into the trough 96. These boards or slats 95 are put in place one by one as the car fills in order to bar the sand and small stones and prevent them from passing through the passage 92 into the trough. The sand and small stones remaining in the receptacle 90 can be removed at convenience and used for sidewalk-building, &c. The slats or gates 99 in the trough operate to allow the mud to settle, while the water passes off into catch-basins or elsewhere, as desired.

The object of making the pipe 87 flexible is to enable it to be swung from side to side, and thus spread the stones on the road as the machine moves along.

This traction-vehicle is moved as desired, there being suitable clutches or equivalents thereof between the traction-wheels and the engine whereby the power may be applied to the traction-wheels whenever necessary. This, however, makes no part of the invention and is not illustrated. When the machine is operating in the manner above described in receiving, cleansing, separating, and discharging road-making material, the vehicle is stationary. When the vehicle is moved to another point in the road, the car or receptacle 90 is carried or drawn to a proper point for receiving the material from the pipe 85. The trough, however, remains stationary, as it is very long, until the road-bed for the entire length of the trough has been operated upon. Thus when a road-bed becomes worn, and especially a macadamized road-bed, the material is shoveled or dumped upon the conveyer 26, carried to the bucket elevator, dropped into the hopper 52, and, together with a stream of water, thereby transferred to the rotating drum 56, tossed about and cleansed therein and transferred to the screen 78, from which screen the larger stones—that is, such as are available for road-making—are spouted out onto the road, and the smaller stones, sand, mud, and water are conducted to the car or receptacle 90, from which the mud and water flow out into the trough 96. The sand and smaller stones remaining in the car are thus separated and rendered available for top layers for road-building, sidewalk-building, or other purposes. The mud in the trough settles to the bottom, and the water therein is conducted to the nearest catch-basin.

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

1. In a machine of the character described, the inclined frame comprising the bars supported by the frame of the machine and extending downward and rearward therefrom, the guards, and rollers between said guards; the swinging frame comprising the normally horizontal bars, the guards, and rollers between said guards, the inner end of this frame being hinged to the said inclined frame; the conveying-belt extending between the bars in the swinging frame and the bars in the inclined frame; mechanism for imparting movement to said conveying-belt; mechanism for lifting and lowering the swinging frame; an elevator supported by the machine, and with its buckets moving upward from the inner ends of the bars included in the inclined frame; a rotary agitating and washing drum supported by the frame of the machine; and a separating-screen opening into said drum, for the purpose set forth.

2. In a machine of the character and for the purpose described, the frame; the rotary inclined drum comprising the cylindrical wall provided on its outer surface with a central,

annular, raised bearing-surface; the annular gear on the drum next one edge of the raised surface; brackets supported by the frame; rolls supported by said brackets and provided on one edge with the annular flanges, the main portion of said rolls constituting bearings for the said raised surface, and the flanges extending over the edge of said raised surface which is opposite the edge next the said annular gear; the inclined parallel bars supported by the frame and set at right angles to the axis of rotation of the drum; the shaft and bevel-gears supported by one of said inclined bars; and rollers supported by brackets on the inclined bars, and bearing against the outer face of the annular gear, whereby the said raised surface and annular gear are, during the rotation of the drum, held between the said rollers and flanges, for the purpose set forth.

3. In a machine of the character described, and comprising a conveyer, an elevator, a rotary agitating and washing drum, and a separating-screen, all connected and operating with relation to one another; the car pivotally supported by a frame and provided with a vertical opening in one side; separately-removable horizontal gates or boards in said opening; the vertical horizontally-extending flanges or boards located next said opening and extending outward from the car; the trough provided with removable gates in one side, and located next the side of the car containing the opening; the pipe extending from directly beneath the screen to a point directly over the car; and the outlet-tube extending from a point under the lower end of the screen to a point directly over the trough, for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN J. EVERSON.

Witnesses:

HENRY W. WILLIAMS,

A. K. HOOD.