No. 825,292. PATENTED JULY 10, 1906.

A. L. E. BERGERT.

MEANS FOR DISTRIBUTING MINE RESIDUES.

APPLICATION FILED MAR. 28, 1905.

4 SHEETS—SHEET 1.

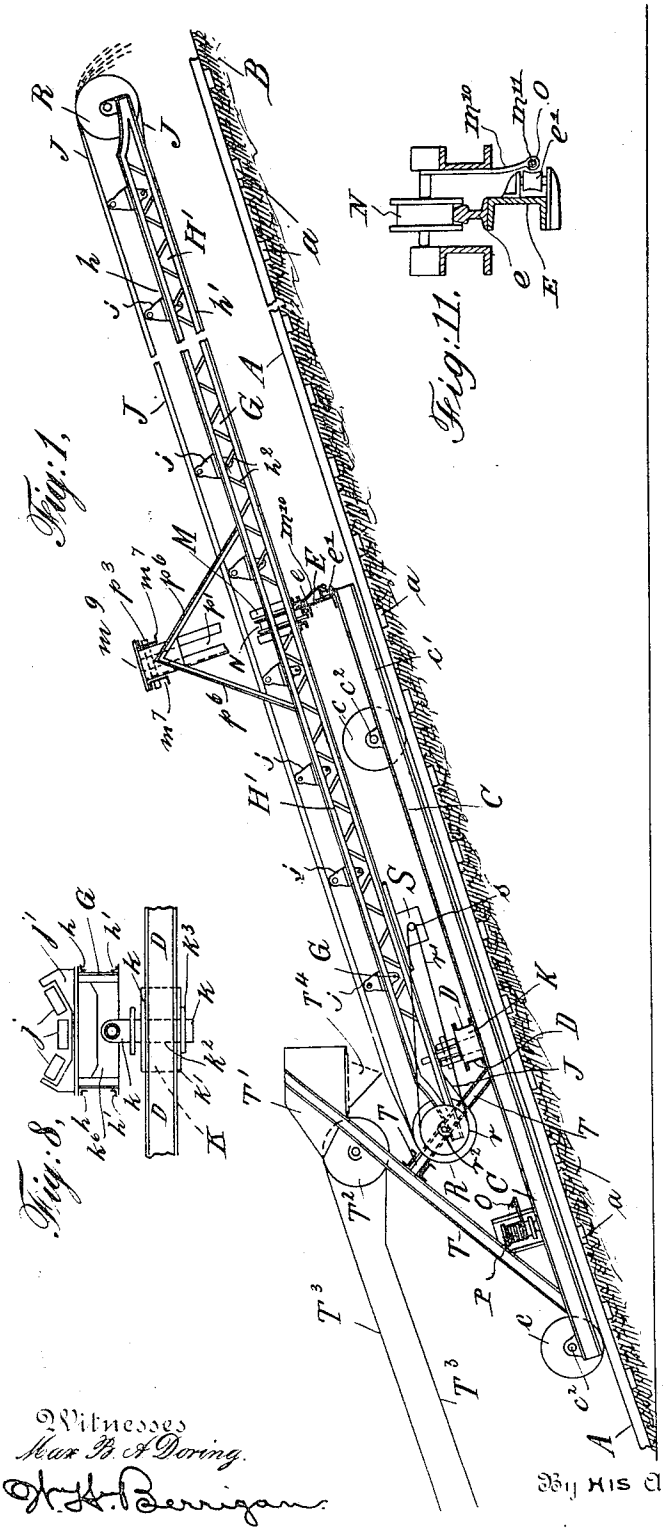


Fig. 1.

Fig. 11.

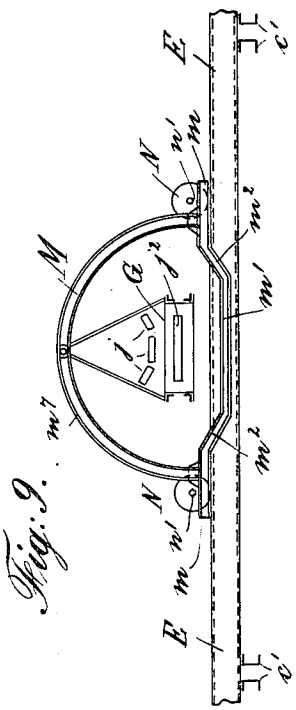


Fig. 9.

Fig. 8.

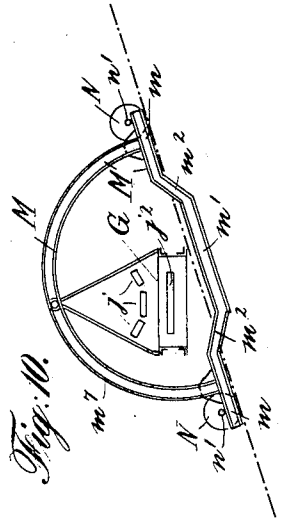


Fig. 10.

Witnesses
Max B. A. Doring.
H. H. Berrigan.

Inventor
August Ludwig Emil Bergert,
By his Attorney Wm. Ostermeel

No. 825,292. PATENTED JULY 10, 1906.

A. L. E. BERGERT.

MEANS FOR DISTRIBUTING MINE RESIDUES.

APPLICATION FILED MAR. 28, 1905.

4 SHEETS—SHEET 2.

Fig. 12.

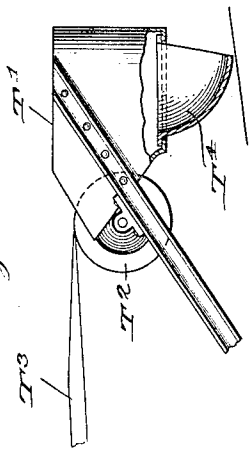


Fig. 2.

Witnesses
Max B. A. Doring.
H. H. Berrigan.

Inventor
August Ludwig Emil Bergert,
By his Attorney Wm Oldenael

No. 825,292. PATENTED JULY 10, 1906.

A. L. E. BERGERT.

MEANS FOR DISTRIBUTING MINE RESIDUES.

APPLICATION FILED MAR. 28, 1905.

4 SHEETS—SHEET 3.

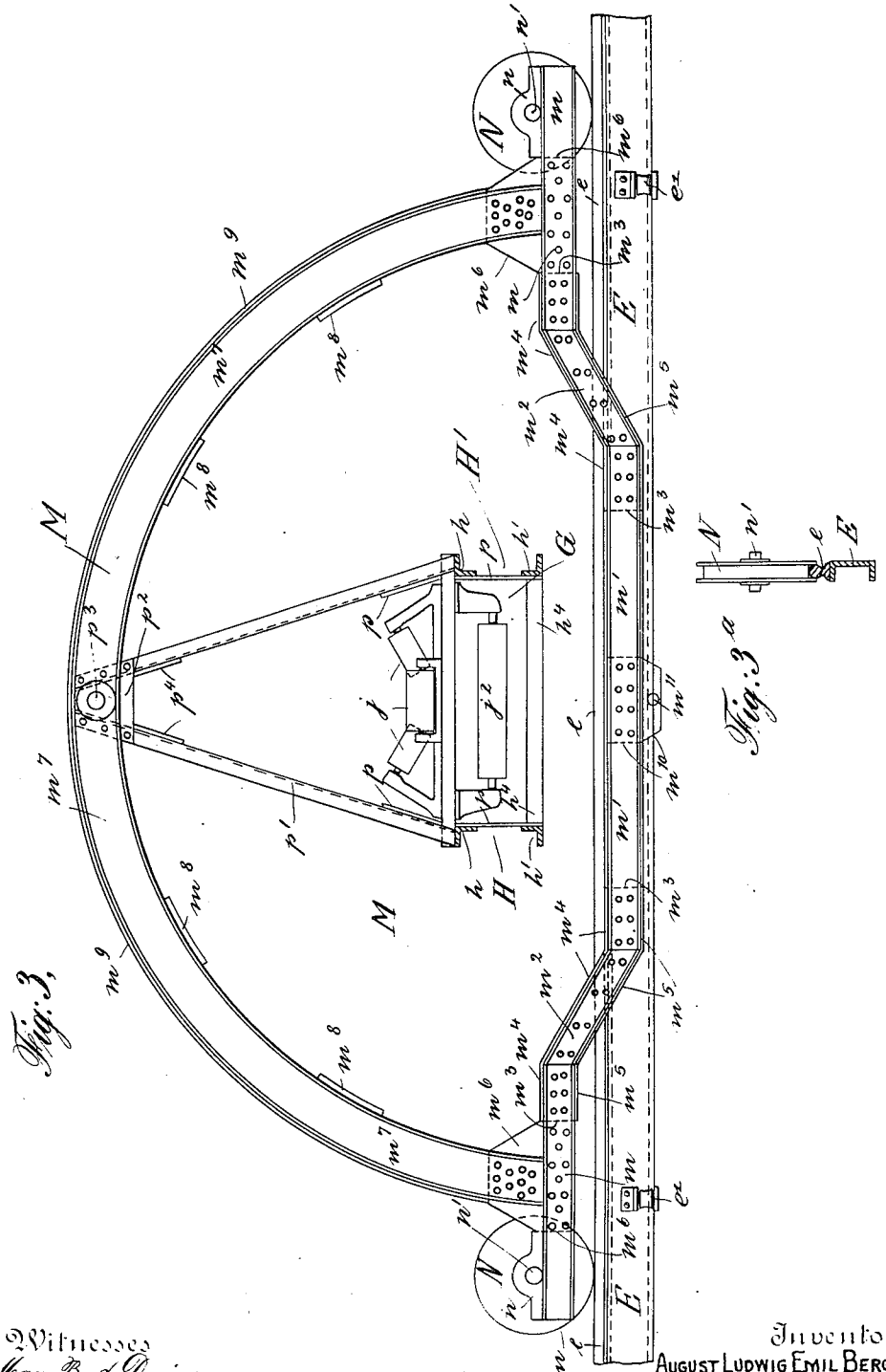


Fig. 3.

Fig. 3a

Witnesses
Max B. A. Doring.
H. H. Berrigan.

Inventor
August Ludwig Emil Bergert,
By his Attorney Hans Oesterreich

No. 825,292. PATENTED JULY 10, 1906.

A. L. E. BERGERT.

MEANS FOR DISTRIBUTING MINE RESIDUES.

APPLICATION FILED MAR. 28, 1905.

4 SHEETS—SHEET 4.

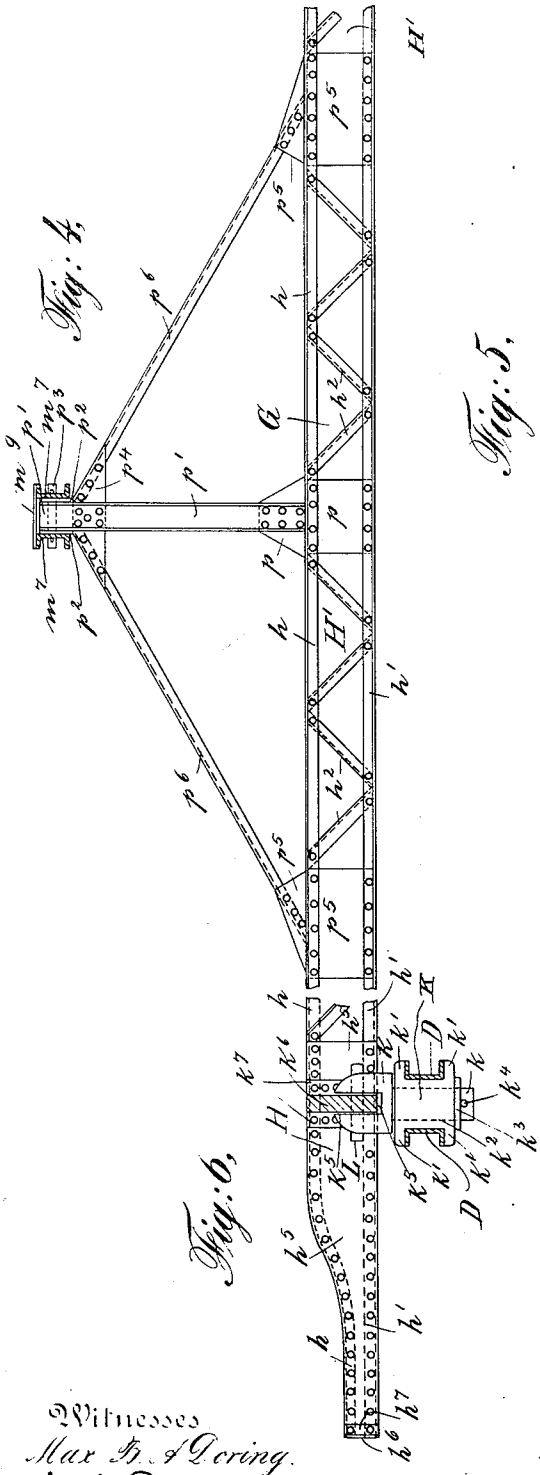


Fig. 4.

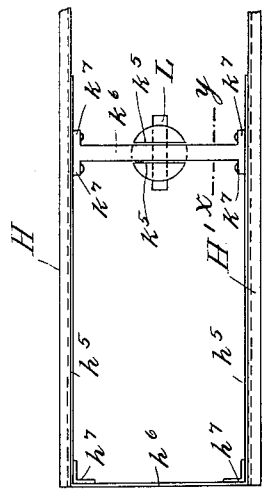


Fig. 5.

Fig. 6.

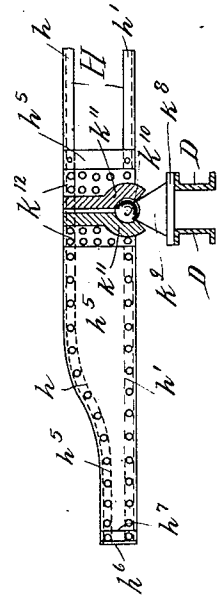


Fig. 7.

Witnesses
Max F. Doring.
H. H. Berrigan.

Inventor
August Ludwig Emil Bergert,
By his Attorney Hans Oesterreich

UNITED STATES PATENT OFFICE.

AUGUST LUDWIG EMIL BERGERT, OF JOHANNESBURG, TRANSVAAL.

MEANS FOR DISTRIBUTING MINE RESIDUES.

No. 825,292. Specification of Letters Patent. Patented July 10, 1906.

Application filed March 28, 1905. Serial No. 252,489.

To all whom it may concern:

Be it known that I, AUGUST LUDWIG EMIL BERGERT, a subject of the German Emperor, residing at Johannesburg, Transvaal, have invented certain new and useful Improvements in Means for Distributing Mine Residues and for other Similar Purposes, of which the following is a specification.

This invention has reference to apparatus intended more particularly for distributing mine residues—that is to say, to apparatus intended for conveying to and dumping or depositing such residues upon a mine-dump or depositing site.

The invention is applicable generally for conveying and distributing over a limited area any kind of granular, pulverulent, or fragmentary substances or materials.

The apparatus comprises a wheeled frame or carriage which is adapted to traverse a track or rails laid on the dump or depositing site, upon the top of which frame or carriage is mounted a structure which pivotally supports a boom or jib carrying an endless conveyer belt or band, onto the receiving end of which is led the material to be conveyed and distributed. The structure which is mounted on the carriage is constructed to provide a curved track radial to the pivot or point about which the boom swings, upon which radial track a vehicle which supports the boom at or in proximity to the center of its length is free to travel as the boom is swung to either side of the main track or the rails upon which the wheeled carriage runs.

The boom carrying the conveyer-belt is pivoted at its rear extremity in such a way that it can swing in the plane of the carriage to either side of the main track and so that it may oscillate about its longitudinal axis to prevent the belt being inclined transversely when the boom is swung to either side of the main track.

My invention will be described in detail by aid of the accompanying drawings, in which—

Figure 1 represents a side part sectional elevation of the apparatus located on a dump or depositing site. Fig. 2 represents the apparatus in plan. Fig. 3 is a front elevation of the vehicle which serves for supporting the boom and conveyer-belt at or about the center of their length drawn to an enlarged scale. Fig. 3^a is a detail view of the vehicle and the curved track upon which it runs. Fig. 4 is a detail of the boom drawn to an enlarged scale, Fig. 5 is a plan of the rear end of the boom, showing the pivot about which it swings. Fig. 6 is a sectional elevation on line x y of Fig. 5. Fig. 7 is a sectional elevation of the rear end of the boom, illustrating a modification in the pivot about which it swings. Fig. 8 is a detail view of the arrangement of the pivot supporting the boom. Fig. 9 is a front elevation of the vehicle which supports the boom at or about the center of its length and part of its radial track, showing the boom in its central position or parallel with the lines of the main track. Fig. 10 is a view similar to Fig. 9, showing the conveyer-belt and boom in a position at right angles to that in which they are shown in Fig. 9 or at right angles to the main rails or tracks. Fig. 11 is an enlarged view of the forward end of the carriage, showing the means for supporting the boom; and Fig. 12 is an enlarged view of a part of Fig. 1, showing the chute T^4 and the conveyer.

In Fig. 1, A represents the rails which constitute the main track laid on the surface of the inclined dump or depositing site B, a being sleepers carrying the rails A.

C is a square or rectangular frame mounted on the wheels c and adapted to traverse along the rails or track A. As illustrated, this frame C is shown comprising two parallel channel or U irons c' at either side, which at their extremities carry the bearings c^2 for the axles of the wheels c and the two angle or L irons c^3, fixed between the U-irons c' at one end and the I or H iron c^4, fixed between the U-irons c' at the other end. This frame C is strengthened by means of the diagonal rods or bars c^5 c^6.

On top of the frame or carriage C is fixed another structure comprising two U-irons D, arranged transversely of the main track A, and a semicircular or approximately semicircular U-iron E, connected at its extremities to the two channel-irons D. F represents radial or approximately radial I or H irons, which serve for strengthening and supporting the curved channel-iron E by connecting it with the two transverse channel-irons D.

G represents a jib or boom which serves for carrying the conveyer-belt J, which effects the distribution of the residues or other material on the surface of the dump B. This boom G consists of two parallel lattice girders H H′, consisting of the top and bottom angle-irons h h' and the angle-iron braces h^2. The girders H H′ are stayed by means of the diagonal bars or plates h^3 and the transverse

plates or bars h^4. (See Fig. 2.) The rear end of the boom G is constructed so that it may swing in either direction or to either side of the main track A. The pivot about which the boom swings is shown consisting of a block k, which forms the support for the pivot-pin k, secured between the two channel-irons D at the center of their length and formed with lugs or projections k', projecting over and under said channel-irons D. As seen in Fig. 6, the block K is formed with a hole k^2, in which is revolubly supported the pin k.

k^3 is a washer, and k^4 a split pin or the like on the end of the pin k, below the block K, for retaining the pin k in position therein. The boom G is capable of swinging in the plane of the dump B about the pivot-pin k in block K. Across the top of the pin k is formed a slot k^5, into which fits a plate or transverse piece k^6, pivoted or otherwise fixed between the lattice girders H H' by means of the end flanges k^7.

L is a key or pin which passes through holes formed in the top of the pin k and passes through a coincident hole formed in that portion of the transverse plate k^6 which is located in the slot k^5. (See Figs. 5 and 6.) The boom G is free to oscillate about the pin k in a plane at right angles to its longitudinal axis. The ends of the angle-irons h h' are rigidly connected by means of transverse plates h^5, riveted to the angle-irons h h' inside the girders H H', and by means of an end plate h^6, fixed to angle-pieces or brackets h^7 at the extremities of the angle-irons h h' of the lattice girders H H'.

In Fig. 7, illustrating a modified construction of the pivot for the boom G, D represents the two parallel channel-irons forming the cross-beam secured on the top of the carriage or frame C. At the center of this cross-beam D is fixed a plate k^8, formed with a conical projection k^9 and with a spherical head or ball k^{10} at the top. The ball or sphere k^{10} fits into a spherical socket k^{11}, formed in halves and riveted at the ends in flanges k^{12} to the side plates h^5 and angle-irons h h' of the boom G.

Secured on the top of the semicircular track or U-iron E is a corresponding semicircular rail e, and mounted upon and adapted to traverse this rail e is a vehicle M. (Illustrated in detail in Fig. 3.) This vehicle is employed for supporting the boom G and conveyer-belt J at or about the center of their length. The vehicle facilitates the movement of the boom G about the pivot k when it is swung to either side of the main track A. The vehicle comprises a bottom frame, preferably of the shape shown, which consists of two end pieces m, a central portion m', arranged somewhat lower than the end pieces m, and two inclined parts m^2, connecting the inner ends of the end pieces m with the ends of the central parallel member m'. These several parts are shown of U-section. The end pieces m are connected to the inclined parts m^2 and the central member m' by means of a plate m^3, placed on the inside and riveted to the three pieces, and bars m^4 m^5, riveted on the top and bottom of the same parts. The bottom frame of the vehicle consists of two such girders arranged parallel, or if the frame of the vehicle is shaped to follow the curvature of the track then arranged concentrically. Between the two girders are arranged the wheels N, on which the vehicle traverses the rail e. Bearings n, fixed on the end pieces m of the frame, are provided for the axles n' of the wheels N. When the frame is made of two straight and parallel members, the axles of the wheels are set radially to the pivot k about which the boom G swings. To the ends of this frame and at either side are riveted or otherwise attached gusset-plates m^6, and to these gusset-plates m^6 are riveted or otherwise fixed the semicircular or arched girders m^7, also shown of U-section and connected underneath by means of the plates m^8 and at the top by means of the curved plate m^9. To the front of the vehicle, outside the semicircular track E, is riveted a plate m^{10}, formed with a hole m^{11} or provided with other means for attaching to it a wire or other flexible hauling-rope O for the boom G. This wire rope O is arranged to run round the semicircular track E, as shown in Fig. 2. To the front of the semicircular U-iron E are fixed a number of vertically-disposed guide-rollers e', over which runs the wire rope O.

On the carriage C, at the rear of the boom G, is located a winch provided with a vertically-disposed drum P, (see Fig. 2,) round which the hauling-rope O is coiled. As shown in Fig. 2, the frame carrying the winch consists of the two parallel I-irons o and the two transverse and parallel I-irons o', secured thereto. It will now be understood that when the drum P of the winch is rotated the vehicle M is hauled round the semicircular track E according to the direction of rotation of the drum P.

The boom G is pivotally suspended inside the semicircular or arched upper portion m^7 of the frame of the vehicle M. The means whereby this is effected are illustrated more particularly in Figs. 3 and 4 of the drawings. To the lattice girders H H' on the inside are riveted plates p, which project above the top angle-iron h for some distance. To these plates p are riveted two channel-irons p', which are inclined inward from the bottom to the top and are connected at the top by means of the plates p^2, one at each side. The rivets fixing these plates p^2 are countersunk in the plates, so as to offer no obstruction to the movement or oscillation of the boom G in the arched frame. The upper ends of the two channel-irons p' and their connecting-plates p^2 fit between the two channel-irons

m^7 forming the arched frame, and they are pivotally connected in said arched frame by means of a pin p^3, which passes through holes formed in the two channel-irons m^7 and through coincident holes formed in the plates p^2.

At or in proximity to the top of the channel-irons p' by which the boom G is suspended in the arched frame and at each side thereof are fixed two plates p^4, and at a suitable distance from the plate p, attached to the lattice girders H H', are fixed plates p^5, to which are riveted angle-irons p^6, which latter at their other ends are riveted to the fixed plates p^4, fixed to the channel-irons p'.

Mounted in suitable bearings at each end of the boom G are drums R, round which runs the conveyer-belt J. For the purpose of driving the conveyer-belt J a motor S of any suitable construction may be fixed to the under side of the boom G, preferably in proximity to the rear end thereof or in any other suitable position, and motion be transmitted therefrom to the pulley r on the spindle r^2 of the drum R through the medium of a driving-belt r' from the pulley s on the motor-shaft. In order to support the conveyer-belt J as it travels from the receiving to the delivery end of the boom G, idlers or rollers j, revolubly supported in idler-frames j', are fixed at suitable distances apart on the top of the two top angle-irons h. (See Fig. 8.) For the purpose of preventing the conveyer-belt J sagging as it returns to the receiving end of the boom G return-idlers j^2 (see Fig. 3) may be arranged inside the boom G and be supported therein by suitable means.

At the rear of the boom G and fixed to the carriage or wheeled frame C is a structure consisting of the channel-irons T, which serves for carrying a hopper T' and drum T^2 of the main feed-belt T^3. (See Fig. 1.) The main feed-belt T^3 at one end receives the material to be distributed and at the other end delivers it into the hopper T'. In the bottom of the hopper T' is fixed a rotatable conical chute T^4, constructed to deliver the material onto the conveyer-belt J in a forward direction or in the direction of travel of the belt J.

It will be apparent that the girders or beams for the frame of the carriage C and also for the structure supporting the semicircular rail or track, the vehicle traversing said track, and also for the boom may be of any other suitable section or sections, or wooden beams may be employed in the construction of some of these parts.

In Figs. 1 and 2 of the drawings the boom G is shown in its central position and depositing the material at the top of the dump B. When the material being deposited reaches the level of the dump at this point, the position of the boom G is altered and the dumping continued. The boom G is altered from time to time as required between its two extreme positions at the ends of the semicircular track E or at right angles in two directions to the position in which it is shown in Figs. 1 and 2. The movement of the boom G is effected by rotating the drum P of the winch by hand or power in the desired direction, which causes the vehicle M, supporting the boom G and conveyer-belt J, to travel round on the semicircular track or rail e. As the direction of the boom G is altered the conical delivery-chute T^4 is rotated to cause the material to be delivered onto the center of the belt J and in the direction in which the belt is traveling. When the boom G is swung round, it moves round the pivot-pin k, and as it is being moved round it simultaneously oscillates in a direction at right angles on the other pivot-pin L and its point of suspension inside the arched upper frame m^7 of the vehicle M. This prevents the inclining or tilting of the conveyer-belt J transversely, which would cause the material being conveyed to fall over the edges of the belt J when the latter is swung to either side of the main track A.

In Fig. 10 the boom G (and with it the conveyer-belt J) is shown in the position it assumes when it is swung into a position at right angles to that in which it is shown in Figs. 1 and 2. When the dump B has been filled up within the range of travel of the boom G, the wheeled frame or carriage C is moved up the main track A until the end of the boom G projects over the edge of the dump B, and the distribution of the material then continued. The distributer is moved up the dump from time to time as required.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. In apparatus of the nature specified a conveyer-belt and a boom supporting said belt, said boom being capable of swinging in a plane the angle of which to the horizontal is constant and of oscillating about its longitudinal axis, for the purpose set forth.

2. In apparatus of the nature specified, a conveyer-belt and a boom carrying said belt said boom being capable of moving in a plane parallel with the surface of the dump and simultaneously oscillating about its longitudinal axis, as set forth.

3. In apparatus of the nature specified, a boom pivotally supported at one end in such manner that it can swing in a plane the angle of which to the horizontal is constant and also oscillate about its longitudinal axis to prevent the belt being inclined transversely, a conveyer-belt carried by said boom and means located at the extremities of said boom over which said conveyer-belt travels, for the purpose set forth.

4. In apparatus of the nature specified, a carriage or vehicle adapted to move along the dump, a boom pivotally supported on said carriage in such a way that it can swing in a plane the angle of which to the horizon-

tal is constant and also oscillate about its longitudinal axis, and a conveyer-belt carried by said boom, for the purpose set forth.

5. In apparatus of the nature specified, a wheeled frame or carriage adapted to move along the dump, a boom pivotally supported on said carriage in such a way that it can swing in a plane the angle of which to the horizontal is constant and oscillate about its longitudinal axis, drums revolubly carried on the extremities of said boom, an endless conveyer-belt running over said drums, and means for supporting the boom at a point between its point of connection with the carriage and the delivery end of the belt, for the purpose set forth.

6. In apparatus of the nature specified, a wheeled frame or carriage adapted to move along the dump, a boom pivotally supported on said carriage in such a way that it can swing in a plane the angle of which to the horizontal is constant and oscillate about its longitudinal axis, drums revolubly carried on the extremities of said boom, an endless conveyer-belt running over said drums, means for driving the belt carried by the boom, a frame or structure carried by the carriage said structure forming a curved track and a vehicle adapted to travel on said curved track in which vehicle the boom is pivotally supported, as and for the purpose set forth.

7. In apparatus of the nature specified, in combination, a wheeled frame or carriage adapted to move along the dump or depositing site, a semicircular or curved track mounted on said carriage, a boom pivotally supported on said carriage in such a way that it can swing in a plane parallel with the surface of the dump and simultaneously oscillate about its longitudinal axis, a conveyer-belt carried by said boom, a vehicle adapted to traverse the semicircular or curved track said vehicle supporting the boom in such manner that the boom can swing about its point of attachment to said vehicle, and means for traversing the vehicle round said curved track to vary the position of the boom, for the purpose set forth.

8. In apparatus of the nature specified, in combination, a wheeled frame or carriage adapted to move along the dump or depositing site, a structure mounted on said frame or carriage forming a semicircular or curved track, a boom pivotally attached at one extremity to the wheeled frame or carriage in such manner that it can swing in a plane the angle of which to the horizontal is constant and simultaneously oscillate about its longitudinal axis, a vehicle adapted to traverse the semicircular or curved track, said vehicle comprising an arched frame in which the boom is pivotally suspended at or about the center of its length, means for traversing said vehicle round said semicircular or curved track to alter the position of the boom, an endless conveyer-belt carried by said boom, and means carried by the boom for driving said belt, as and for the purpose set forth.

9. In apparatus of the nature specified, in combination a carriage adapted to travel on the dump or depositing site, a semicircular or curved track mounted on said carriage, a boom pivotally attached at one extremity to the carriage in such a manner that it can swing in a plane the angle of which to the horizontal is constant and simultaneously oscillate about its longitudinal axis, a vehicle adapted to traverse the semicircular or curved track said vehicle having an arched upper frame in which the boom is pivotally suspended, a rope fixed to said vehicle for moving it round the semicircular or curved track, means for hauling the rope in either direction to move the vehicle and boom in either direction along said semicircular or curved track to alter the position of the boom, drums or rollers revolubly carried at the extremities of said boom, an endless conveyer-belt running round said drums, a motor carried by the boom, and means for driving the conveyer-belt through one of the drums from said motor, as and for the purpose set forth.

10. In apparatus of the nature specified, in combination, a wheeled frame or carriage adapted to move along the dump or depositing site, a structure fixed to said carriage forming a semicircular or curved track, a vehicle adapted to traverse said track constructed with an arched upper frame, a boom pivotally attached at one extremity to the carriage in such manner that it can move in a plane the angle of which to the horizontal is constant and simultaneously oscillate about its longitudinal axis, said boom being pivotally suspended inside the arched upper frame of the vehicle traversing the semicircular or curved track, a conveyer-belt carried by the boom, a motor carried by the boom, means for driving the conveyer-belt from said motor, a rope attached to the vehicle, guide-rollers attached to the semicircular or curved track round which said rope runs, a winch provided with a vertical drum round which said rope is coiled and means for operating the winch to haul the vehicle and boom round the semicircular or curved track in either direction, substantially as described.

11. In apparatus of the nature specified, in combination, a wheeled frame or carriage adapted to move along the dump or depositing site, a structure mounted on said carriage forming a semicircular or curved track, a vehicle adapted to traverse said track in either direction said vehicle constructed with an arched upper frame, a boom pivotally attached at one extremity on the carriage in such manner that it can swing in a plane the angle of which to the horizontal is constant and oscillate about its longitudinal axis, said

boom being pivotally suspended in the arched upper frame of the vehicle traversing the semicircular or curved track, drums carried at the extremities of said boom, outward and return idlers at suitable distances apart along the length of the boom, an endless conveyer-belt running over the drums at the extremities of the boom and on the outward and return idlers, a motor carried by the boom, means for driving the conveyer-belt through one of the drums from said motor, a flexible rope fixed to the vehicle traversing the curved track, guide-rollers fixed to the semicircular track over which said rope runs, and a winch mounted on the carriage provided with a vertical drum round which the rope is coiled to haul the vehicle and boom round the semicircular or curved track in either direction, as and for the purpose set forth.

12. In apparatus of the nature specified, in combination, a wheeled frame or carriage adapted to travel along the dump or depositing site, a structure mounted on said carriage, a boom comprising two longitudinal sides or members and two transverse plates forming between them a spherical socket, a plate carried by the structure or carriage said plate being formed with a conical projection and a spherical head on said projection fitting the spherical socket to allow the boom to swing in a plane the angle of which to the horizontal is constant and to allow it to oscillate about its longitudinal axis, substantially as described and shown.

13. In apparatus of the nature specified, in combination, a track laid on the dump or depositing site, a wheeled frame or carriage adapted to traverse said track, a structure mounted on said carriage forming a semicircular or curved track, a vehicle mounted on said semicircular or curved track and constructed with an upper arched or semicircular frame, a boom pivotally supported at one extremity on the carriage and pivotally suspended in the arched frame of the vehicle traversing the curved track in such manner that the boom can move in a plane the angle of which to the horizontal is constant and oscillate about its longitudinal axis, said boom carrying outward and return idlers, drums mounted on the extremities of said boom an endless conveyer-belt running round said drums and on said outward and return idlers, a motor carried by the boom, a pulley fixed on the shaft of one of the drums, a belt for driving the drum through said pulley from the motor, a hopper and rotatable conical chute for delivering the material to be distributed onto the receiving end of the belt in the direction of movement of the latter, a flexible hauling-rope attached to the vehicle traversing the curved track, guide-rollers attached to said curved track over which said rope runs, and a winch mounted on the carriage provided with a vertical drum round which the flexible hauling-rope is coiled for moving the rope in either direction to haul the vehicle and with it the boom and conveyer-belt round the semicircular or curved track in either direction or to either side of the main track, substantially as described and shown.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

AUGUST LUDWIG EMIL BERGERT.

Witnesses:
CHAS. OVENDALE,
R. OVENDALE.