(No Model.) 4 Sheets—Sheet 1.

O. GULBRANDSEN.

CONVEYING MACHINE.

No. 553,403. Patented Jan. 21, 1896.

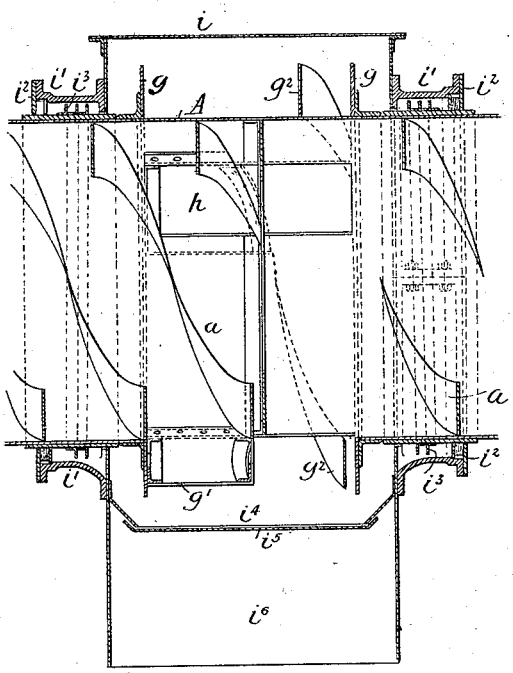

Fig. 1.

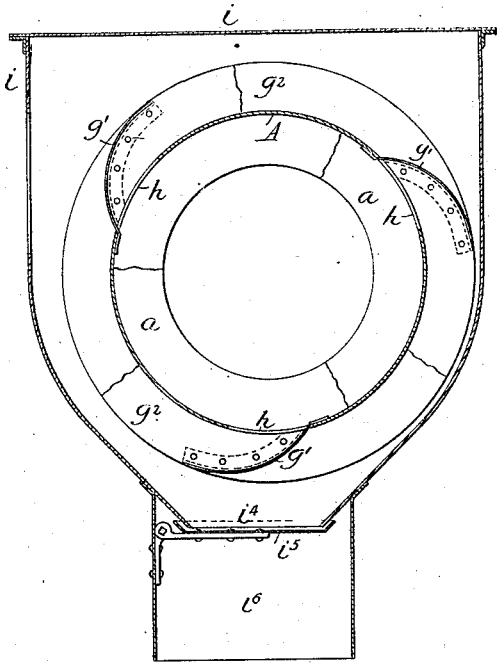

Fig. 2.

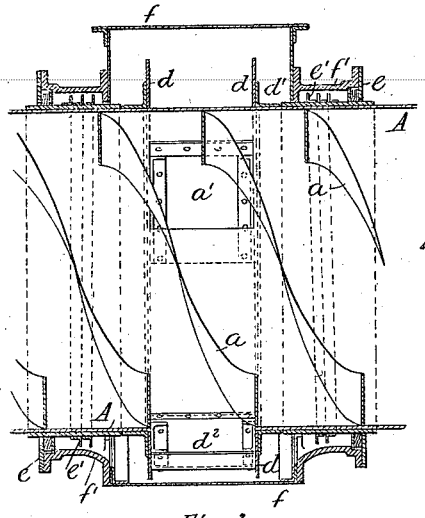

Fig. 3.

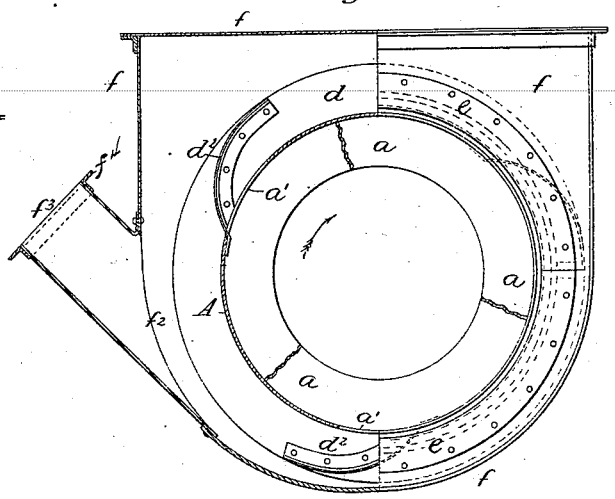

Fig. 4.

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(No Model.)

4 Sheets—Sheet 2.

O. GULBRANDSEN.

CONVEYING MACHINE.

No. 553,403. Patented Jan. 21, 1896.

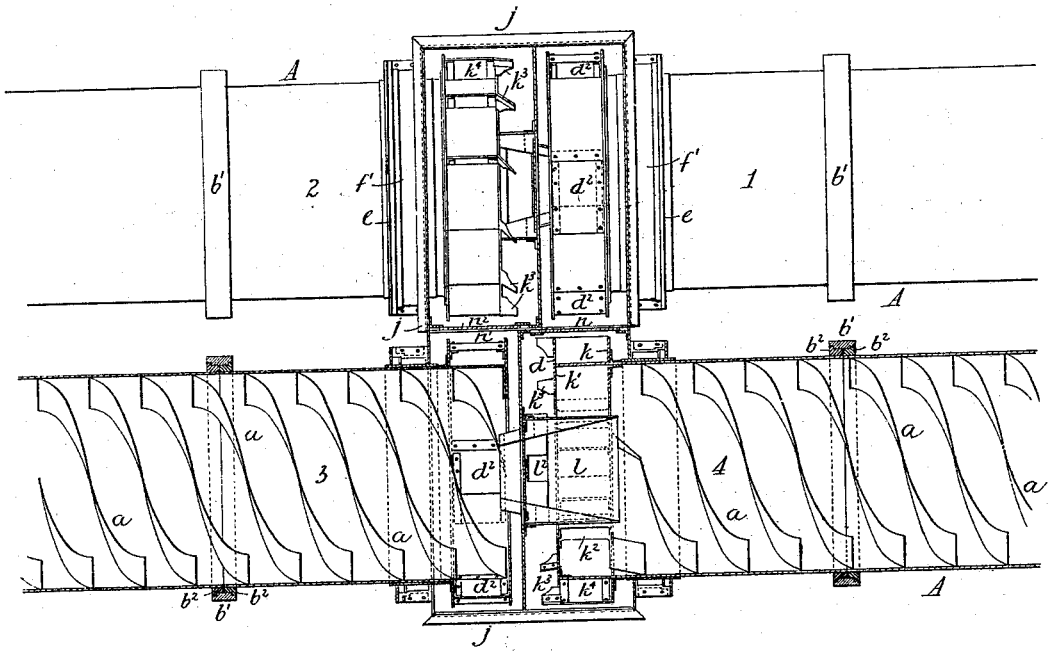

Fig. 5.

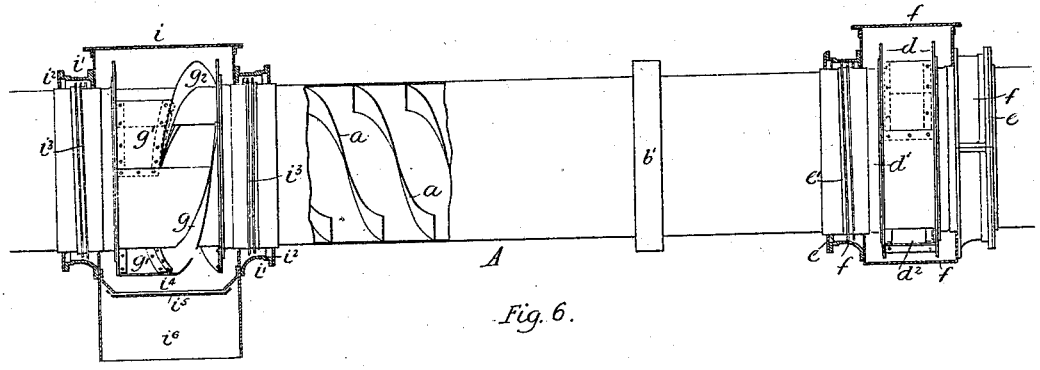

Fig. 6.

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(No Model.) 4 Sheets—Sheet 3.

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CONVEYING MACHINE.

No. 553,403. Patented Jan. 21, 1896.

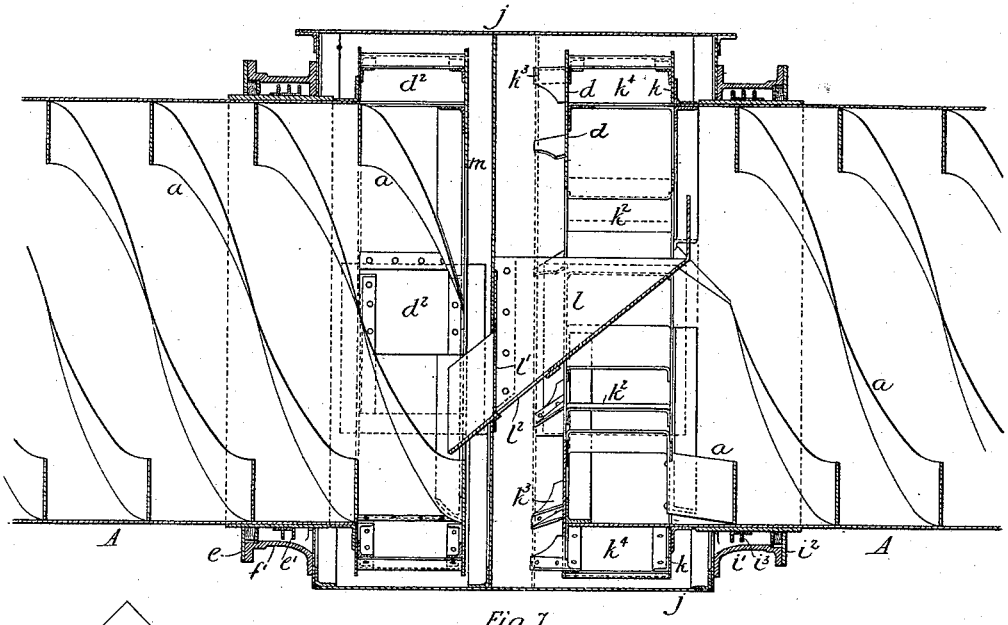

Fig. 7.

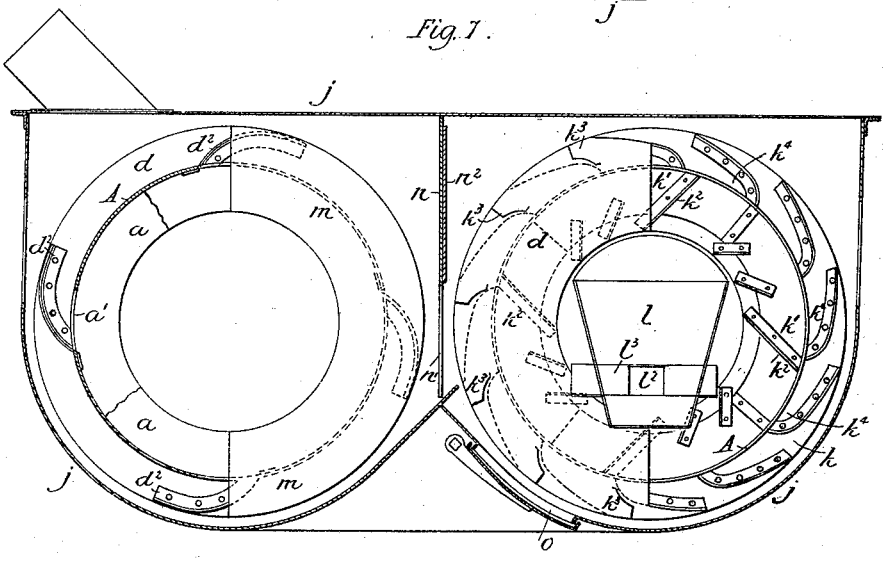

Fig. 8.

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(No Model.) 4 Sheets—Sheet 4.

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CONVEYING MACHINE.

No. 553,403. Patented Jan. 21, 1896.

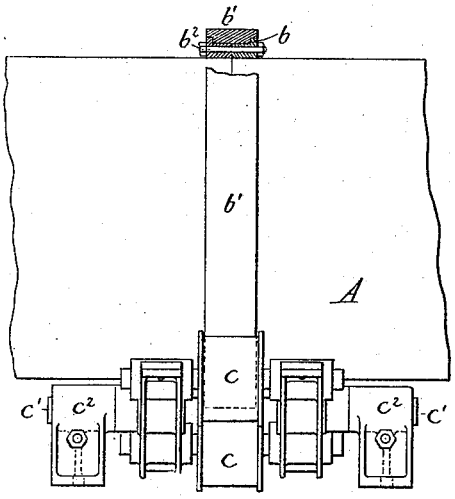

Fig 9.

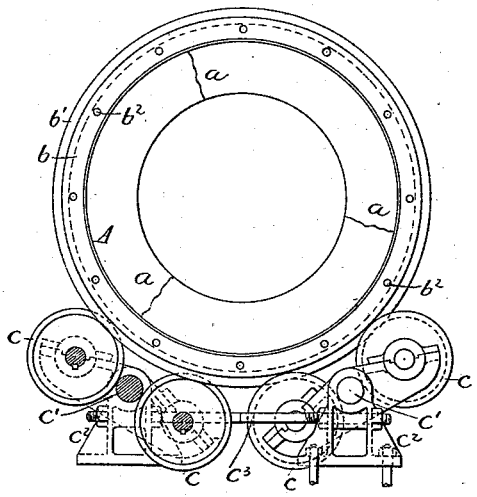

Fig 10.

WITNESSES:

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his ATTORNEYS.

UNITED STATES PATENT OFFICE.

OTTO GULBRANDSEN, OF SYRACUSE, NEW YORK.

CONVEYING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,403, dated January 21, 1896.

Application filed April 10, 1895. Serial No. 545,204. (No model.)

To all whom it may concern:

Be it known that I, OTTO GULBRANDSEN, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Conveying-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention is directed to improvements in machines for conveying or transporting grain and other materials of a like nature, and more particularly to machines of this class in which the conveyance or transportation is effected by the rotation of spirally-arranged feeding or propelling blades.

The invention has for its objects the improvement of the construction, operation, and efficiency of this class of machines generally; the production of means by which the material in any desired quantities may be received or discharged at any point or points along the length of the machine; the provision of facilities by which the course of the material may be changed at will; the provision of means for rendering the machine perfectly dust-proof; the production of the machine in sectional parts, whereby the expansion is reduced to the minimum and whereby the said sections may be arranged side to side or offset to economize in floor-space, and to provide for the transfer and change of course of the material, and the utilization of different sections for different materials; the utility for reducing the temperature of heated material; the provision for obtaining complete control of the material both in the direction of its course and in bulk, and the construction of a machine practically free from liability to disorder.

I will now describe in detail my improved conveying-machine in its preferred form, but I do not wish it understood that I confine myself thereto, as my invention is susceptible of embodiment in other forms, and the following description and accompanying drawings are merely for the purpose of illustrating one form of structure capable of carrying my invention into effect.

In the said drawings, Figure 1 is an enlarged longitudinal sectional view of a discharging-station. Fig. 2 is an enlarged transverse sectional view of the same. Fig. 3 is an enlarged longitudinal sectional view of a receiving-station. Fig. 4 is an enlarged transverse sectional view of the same. Fig. 5 is an enlarged plan view, partly in section, of the arrangement of four conveying-machines with connecting-station. Fig. 6 is an enlarged plan view, partly in section, of the conveyer, showing in elevation a receiving and a discharging station. Fig. 7 is an enlarged longitudinal sectional view of the connected receiving and discharging ends of two machines. Fig. 8 is a transverse view, partly in section, of the connecting-station for the four-machine arrangement. Fig. 9 is a side elevation, partly in section, of the frictionless support for the machine, and Fig. 10 is a transverse view of the same.

Like letters of reference denote like parts in the several figures of the drawings.

In the said drawings, A denotes the conveyer, which consists of a cylindrical shell provided in the interior with a number of spirally-arranged conveyer-blades *a a*, preferably riveted in place to the inner side of the shell. The conveyer proper with its blades are rotated through any desired source of power and to reduce friction the conveyer is supported at intervals on roller-bearings, which I will now describe. At each of said intervals the shell is provided with two rings *b b*, which are recessed on their adjacent sides to form a seat for a tire *b'*, the latter conforming on its inner side to said seat and held thereto by the clamping action of the rings through bolts and nuts b^2 b^2 connecting same. The rollers are shown at *c c* and are mounted in pairs on rock-frames pivoted at *c'* in standards c^2 c^2. These standards are adjustably connected together by a bolt-rod c^3, screw-threaded at its ends and provided with securing-nuts whereby the said pairs of rollers may be adjusted to or from each other to provide a proper bearing for the tire which rests thereon.

At suitable intervals along the length of the conveyer are made openings *a' a'* which

correspond in number to the number of conveyer-blades employed, and at each side of said openings are secured flanges or plate-rings d d, riveted to the outer side of the shell by the use of angle-iron rings d' d'. Secured to these flanges d by riveting or otherwise are scoops d^2 d^2 arranged at said openings, the bottom of a scoop being secured to one side of an opening, while the mouth of a scoop extends some distance beyond the other side of the opening for a purpose to be presently explained. Beyond the flanges d, but adjacent thereto, are annular flanges e e and between the flanges d and e are a number of spirally-arranged blades e' secured to the outer side of the shell. Such is the construction of parts auxiliary to the receiving-station, which consists of a casing f, the under side of which is semicylindrical and preferably eccentrically arranged in relation to the conveyer proper. This casing incloses that part of the conveyer between the flanges d, and is provided with dust-proof packing-rings f', which are extended to meet the flanges e formed on the exterior of the conveyer, and making a dust-proof joint. The spiral blades e' before referred to further co-operate to render the structure dust-proof by conveying the accumulations of dust in the packing-ring back to the casing. At a point preferably in the side of the casing is an inlet-opening f^2 by which the material is fed to the conveyer, and extending from said inlet-opening is a chute f^3 having a removable closure or cap f^4. The conveyer rotates in the direction indicated by the arrow, and the scoops in turn carry the material upward until by gravity it falls therefrom through the openings to the interior of the conveyer, through which it is propelled by the spiral blades. As before stated, the scoops are made of a comparatively great depth, the walls extending considerably beyond the end of the opening, and this provision insures the retention without danger of loss of the material from other receiving-stations until the same passes therefrom through the openings to the interior of the conveyer. The casing for convenience in assembling the structure is made in two halves, as is also the packing-ring, bolts being employed to connect the parts.

Referring now to the construction of the discharge-station and the parts auxiliary thereto, g g denote flanges or plate-rings, similarly constructed to the flanges d, which are secured to the outer side of the shell, and g' g' are scoops, one for each spiral blade a, which scoops are each secured at one side to a flange g and at the other side to the terminating end of a spiral blade g^2 secured to the outer side of the shell and terminating at its other end with the opposite flanges g, to which it is connected. Discharge-openings h are made in the shell at the base or bottom of the scoops g', each of said openings extending from one flange g to the other flange g on the exterior of the conveyer. The outer spiral blades g^2 conform in position to the inner blades a, and form at their termination one side of the scoops g'. A casing i incloses these parts and is provided with dust-proof joints i' and similarly constructed to the casing for the receiving-station. Dust-proof rings i^2 and dust-conveyer blades i^3 co-operate with the dust-proof rings in a manner similar to that before described in reference also to the receiving-station.

In the bottom of the discharging-casing i is an opening i^4 controlled by a closure preferably in the form of a hinged door i^5, and extending from said opening downward is a chute i^6, as shown. The material coming through the conveyer from the receiving-station will, when it reaches the discharge-openings, fall therefrom to the bottom of the casing i, and if the door i^5 is lowered or open the material will discharge through the chute i^6.

When no discharge of material is desired, the door i^5 is closed and the material as it falls from the openings to the bottom of the casing is carried over by the outer spiral blades into the path of the scoops g', which return it to the interior of the conveyer, through which it passes to such place as a discharge is desired. The opening i^4 may be controlled to any desired extent by the door i^5, and if said door is but partly open only a portion of the bulk of material will be discharged, while the remainder will be taken up by the scoops g' and conveyed farther.

Referring now to Figs. 7 and 8, it will be observed that by my invention I am enabled to arrange any number of conveyers in series for the purpose of controlling the direction of flow of the material, for simultaneously handling different materials, for reducing the temperature of heated material, and for economizing floor-space. I have shown in these figures four conveyers arranged side by side in parallel relation with the adjacent ends of same inclosed by what I term a "connecting-station." In these figures the general structure is similar to that hereinbefore described in reference to the detailed description of Figs. 1 to 5 inclusive.

The conveyers are provided with spirally-arranged inner conveyer-blades, and are mounted to rotate on roller-bearings. I have numbered these conveyers 1 2 3 4, Nos. 1 and 3 being provided with receiving ends and Nos. 2 and 4 with discharging ends, all of said ends being inclosed by a casing j. The discharging ends are each provided with an end flange d, which extends beyond and within the conveyer, and adjacent to this flange is a second flange k, similarly arranged to the flange d. To that portion of the flange k within the cylinder are connected the ends of the conveyer-blades, and at the points of connection the flange is cut away to provide a communication between the spiral channels formed by the blades and a series of inside pockets k', formed by tangentially-arranged plates k^2, interposed between and

connected to the interior portions of the flanges d and k, and by the casing to which said plates extend. The material as it is fed forward by the blades finds its way through the openings or cut-away portions of the flange k and from thence passes to the interior pockets k' and is retained until by the revolution of the casing said pockets are brought in turn uppermost and inverted and all of the material falls therefrom into the funnel-shaped mouth of a chute l, which is arranged well into this delivery end, as shown. This chute extends through a partition in the connecting-station and into the receiving end of the adjacent section of conveyer. This chute is provided with a door l', preferably of the sliding type, as shown, and which closes said chute transversely. In the under side of the chute is an opening l^2, controlled also by a door l^3, preferably of the sliding type, and these doors are operated from the outside of the casing by suitable connections. (Not here shown.) The door l' controls the flow of material into the receiving-conveyer, and the same may be closed or opened to any desired extent. When the door l^3, which controls the opening l^2, is open, the material falls therethrough to the bottom of the casing, from whence it is scooped up by the outer scoops k^4, which are secured between the outer portions of the flanges d and k, and the material is then disposed of in a manner presently to be described. On the outer side of the flange d are projections k^3 which direct the accumulated material in the bottom of the casing to the outer scoops k^4.

The conveyers numbered 2 and 4 are provided with receiving ends which are similarly constructed to the receiving ends described in reference to Figs. 1 and 3, inasmuch as scoops d^2 and openings a' are employed to carry the material from the casing to the inside of the conveyer. The spiral conveyer-blades a terminate with and are connected to a flange or plate-ring m, which is connected to the end of the cylinder and is extended beyond the periphery of same to form the sides of the scoops d^2.

n is a partition which separates the conveyers longitudinally, and the same is provided with an opening n' controlled by a door n^2. As before stated in reference to the discharging end of conveyer No. 1, the material having fallen to the bottom of the casing and from thence been scooped up by the outside scoops k^4, said material as it is carried over is deposited through the opening n' into the receiving end of conveyer No. 4, the door n^2 having been previously opened, and is carried therefrom by the scoops d^2 into said conveyer and thence in a direction the reverse of its original course. By partially opening both of the doors l' and l^3 a portion of the material will be carried to and through conveyer No. 4 in the manner just described, and the remainder will be carried to and through conveyer No. 2. In the bottom of the casing is an opening controlled by a hinged door o, by the opening of which, the door n^2 being first closed, the material in any desired quantity may be withdrawn.

Any number of doors such as have been herein referred to may be employed, and sight-doors are provided at suitable points for making observations. The stations also are preferably provided with removable covers, and, as before stated, the parts are made in halves bolted together.

I claim as my invention—

1. In a conveying machine, the combination with a revoluble cylinder provided with internally arranged fixed spiral conveying blades, and with a tire clamped between recessed flanges on the interior of the cylinder, a bearing for said tire consisting of rollers arranged in pairs, each pair being mounted in boxes on rock arms, standards in which is journaled a shaft supporting said rock-arm, and a bolt passed through said standards and provided with inner and outer binding nuts for adjusting the relative positions of the pairs of rollers with respect to said tire.

2. In a conveying machine, the combination with a cylinder capable of revolution having internal spirally arranged conveyer blades and openings in its side each communicating with a channel or space between two blades, external scoops one for each opening, a fixed casing surrounding that portion of the cylinder having the openings and scoops, having an opening controlled by a closure, annular flanges on the cylinder beyond the casing, and dust proof rings interposed between said annular flanges and the sides of the casing to provide a dust proof connection.

3. In a conveying machine, the combination of a rotary conveyer provided with internal spiral conveyer blades and external scoops leading to the interior, and external spiral conveyer blades terminating at said scoops.

4. In a conveying machine, the combination of a revoluble cylinder provided with internal spiral conveyer blades, and having openings in the sides thereof, one for each blade, scoops for said openings, external spiral conveyer blades terminating at said scoops and annular flanges adjacent to said scoops and to the other terminations of the external blades.

5. In a conveying machine, the combination of a revoluble cylinder provided with internal spiral conveyer blades, and openings in its sides one for each passage between the blades, scoops for said openings, external spiral conveyer blades terminating at said scoops, annular flanges adjacent to said scoops and to the other terminations of the external blades, and a casing surrounding said external blades and flanges and provided with an opening in its bottom having a closure for controlling the discharge of the material.

6. In a conveying machine, the combination of a revoluble cylinder provided with interior spirally arranged conveyer blades, interior

pockets located at the end of the cylinder at the terminus of said blades, exterior pockets at said end, and a casing inclosing the end.

7. In a conveying machine, the combination, with a rotary conveyer having a discharge end provided with pockets communicating with the interior, of a second conveyer in alignment therewith and having a receiving end provided with scoops leading to the interior, and a casing inclosing said ends and having a partition, and a chute having one end adjacent to the pockets in the discharging end, and having its other end projecting through the partition into the receiving end.

8. A conveying machine comprising a rotary conveyer having a discharging end provided with internal and external pockets, the latter having projections, a second conveyer in alignment therewith having a receiving end provided with scoops leading to the interior, a third conveyer in parallelism with the first conveyer and having a receiving end in transverse alignment with the discharging end of the first conveyer, said receiving end being provided with scoops leading to the interior, a fourth conveyer in alignment with the third conveyer having a discharging end provided with internal and external pockets, the latter having projections, and a casing surrounding said ends having a vertical longitudinal partition provided with an opening controlled by a closure, and vertical transverse partitions, and chutes passed through said transverse partitions, each of said chutes being provided with a funnel mouth adjacent to a discharging end and with its other end projecting into a receiving end, and provided with a closure for the main opening, and with an opening in its lower side controlled by a closure, all substantially as and for the purposes set forth.

9. In a conveying machine, the combination of a rotary conveyer having in its interior a plurality of spirally arranged conveyer blades, and at the termination of said blades a series of tangentially arranged receiving and discharging pockets communicating with the space between two blades, and a chute the mouth of which is adjacent to said pockets for the purpose set forth.

10. In a conveying machine, the combination of a rotary cylinder having on its interior a plurality of spirally arranged conveyer blades, two flanges at the end of said cylinder, the inner one of which is perforated at its juncture with the terminating blades, pockets located between said flanges and at said perforations, the outer flange having an annular opening, and a chute the mouth of which projects through said latter opening to the inner flange.

11. In a conveying machine the combination with a rotary cylinder having conveying blades and a discharging end provided with discharging pockets, a second rotary conveyer having conveying blades and a receiving end provided with scoops leading to the interior, a fixed casing inclosing the ends of both conveyers and provided with a partition separating said ends, and a chute passed through said partition to provide a communication between the conveyers, having controllable openings.

12. A conveying machine comprising a series of revoluble cylindrical sections, each of which is provided with a plurality of internally arranged spiral conveyer blades, said sections being arranged longitudinally and transversely in pairs with a receiving end of one station adjacent to the discharging end of another section, said receiving and discharging ends being and operating substantially as described, and a casing surrounding the adjacent ends of said sections, and provided with partitions having controllable openings therein, and means whereby the course of the material may be controlled in the manner set forth.

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

OTTO GULBRANDSEN.

Witnesses:
FRANK HOPKINS,
JOHN H. COX.