

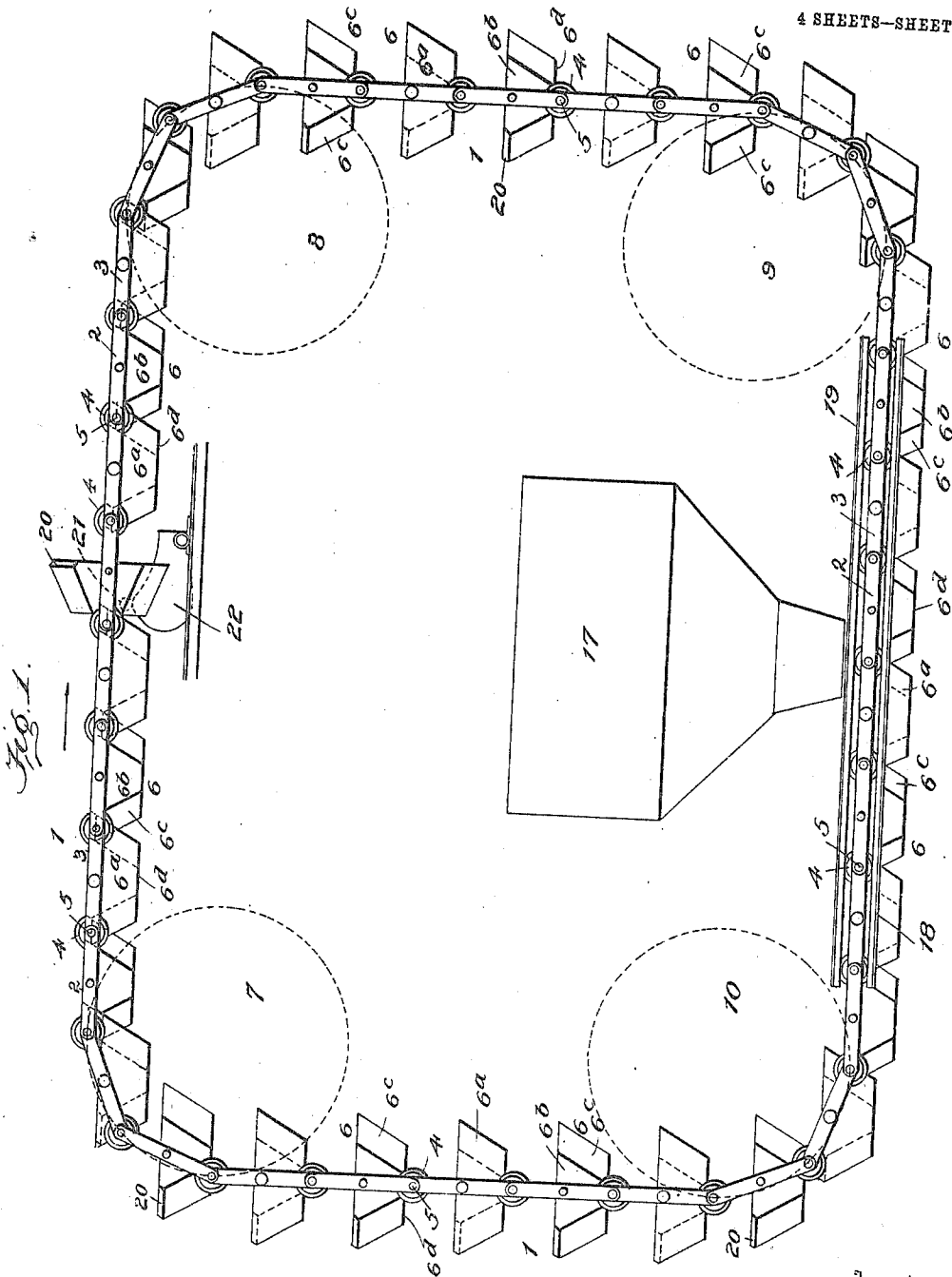
No. 811,125.

PATENTED JAN. 30, 1906.

B. H. BUCHER.
CONVEYER.

APPLICATION FILED MAR. 16, 1904.

4 SHEETS—SHEET 1.



Witnesses

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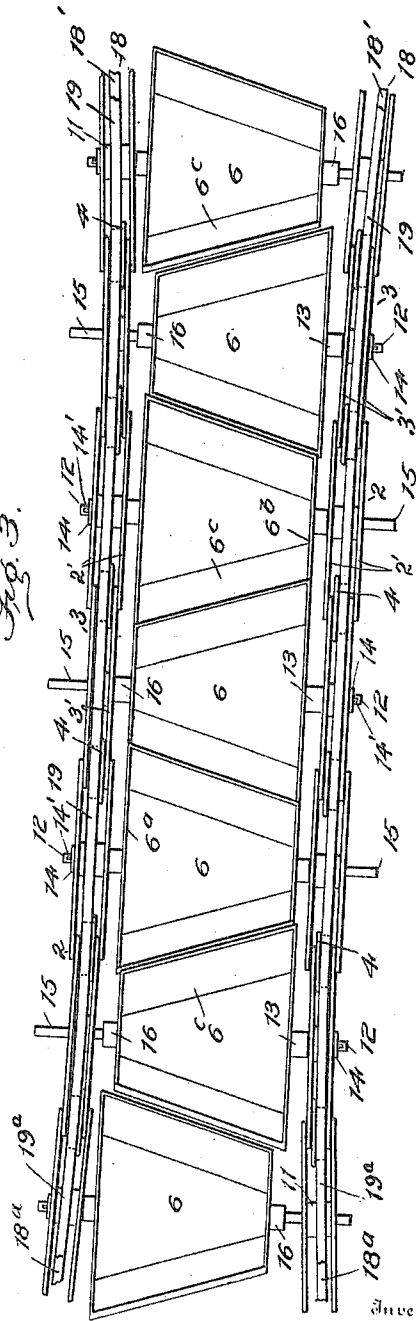
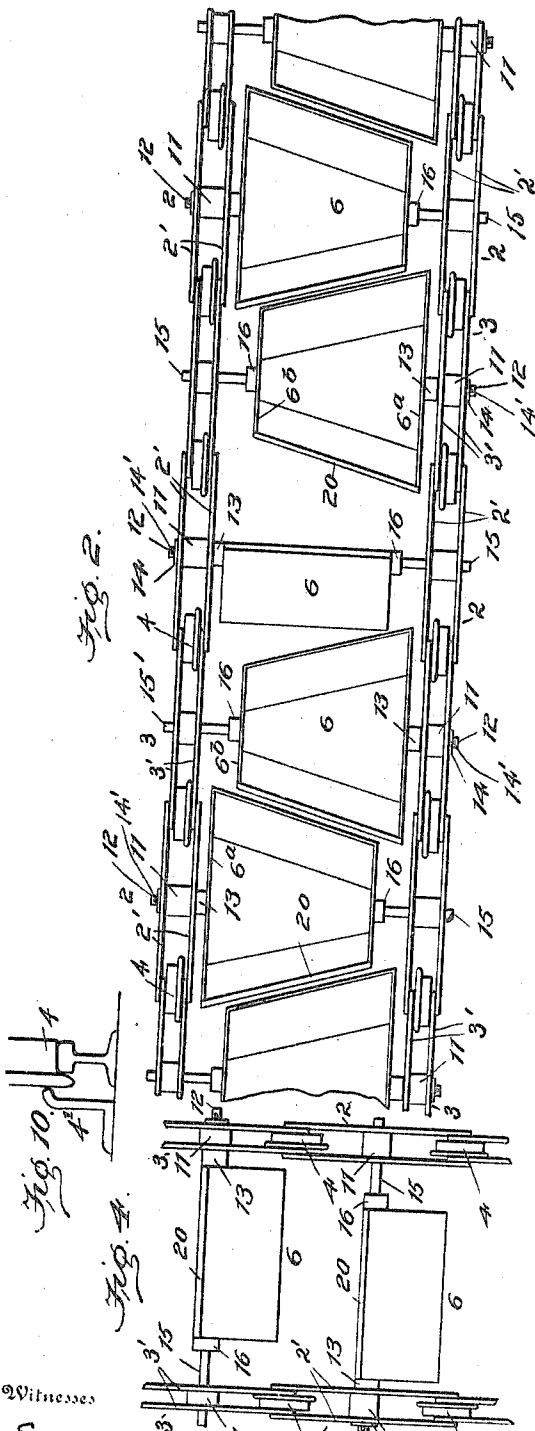
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Witnesses

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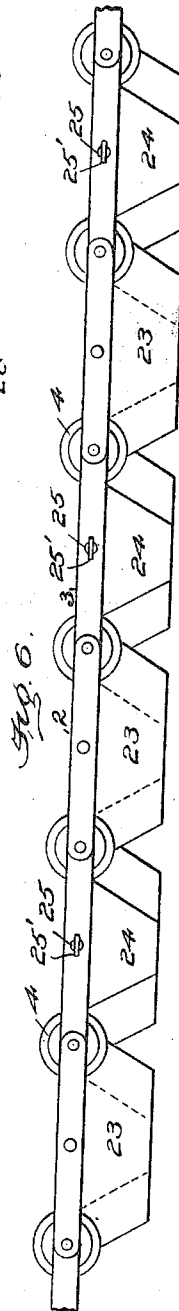
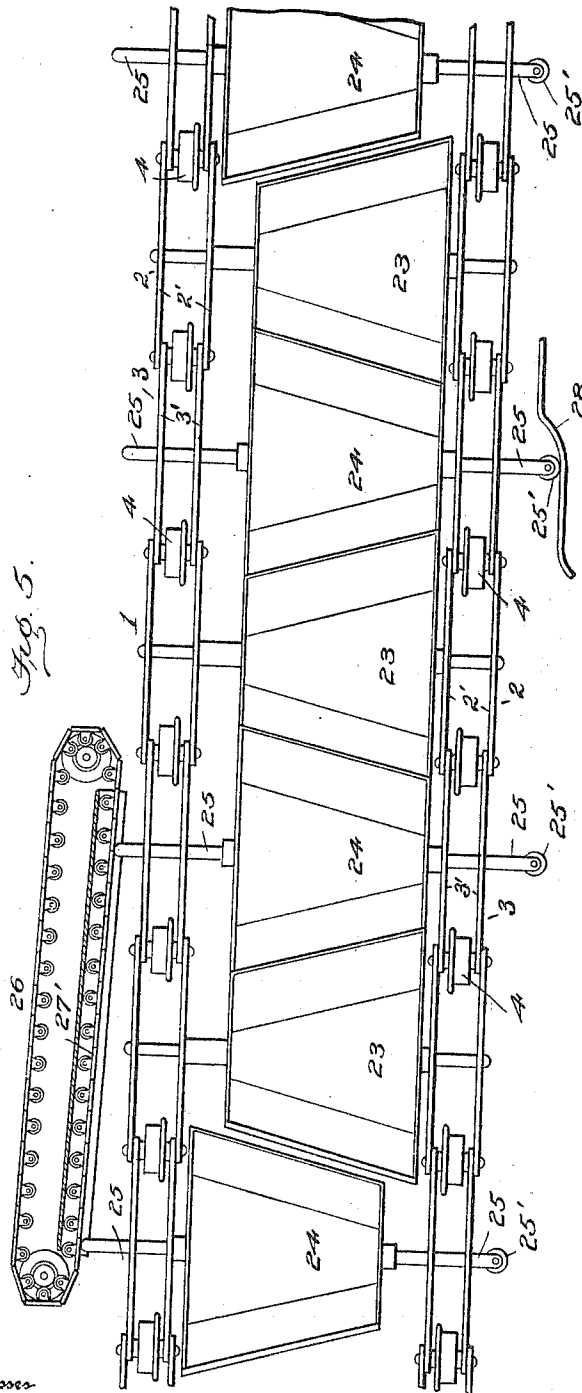
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4 SHEETS—SHEET 3.



Witnesses

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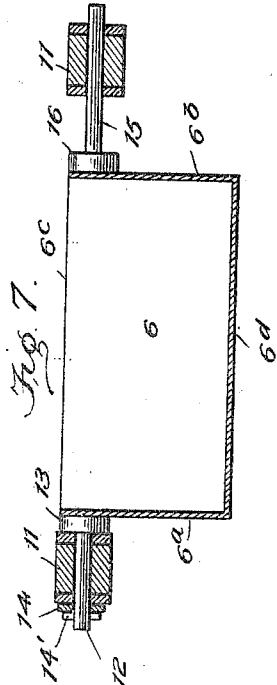
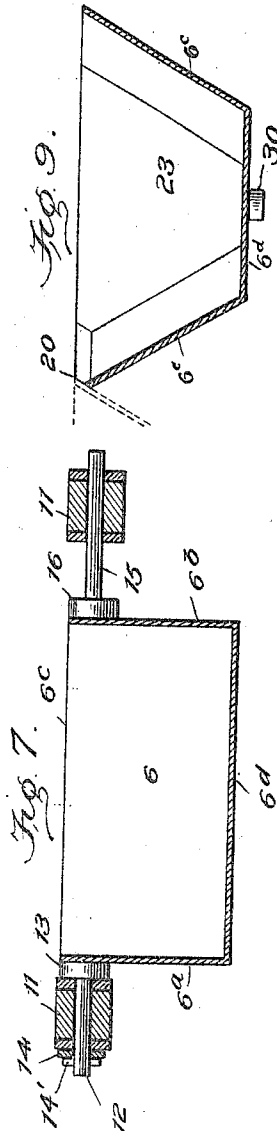
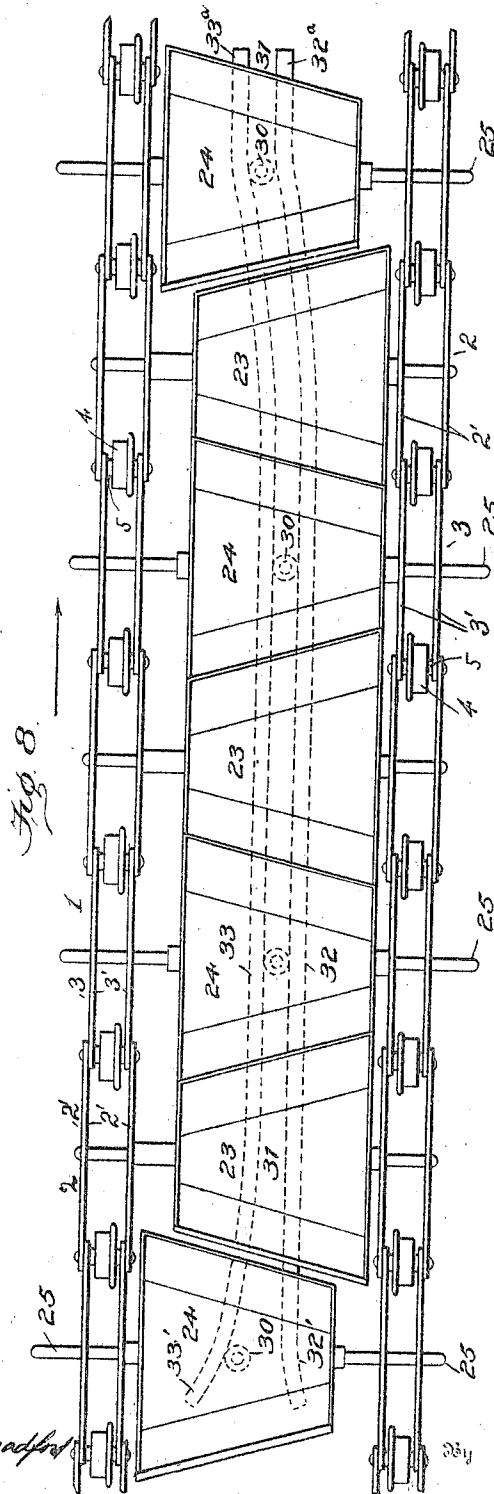
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4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

BERTRAM H. BUCHER, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY, OF COLUMBUS, OHIO.

CONVEYER.

No. 811,125.

Specification of Letters Patent.

Patented Jan. 30, 1906.

Application filed March 16, 1904. Serial No. 198,453.

To all whom it may concern:

Be it known that I, BERTRAM H. BUCHER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Conveyers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in conveyers of the swinging-bucket type, in which the adjoining sides of adjacent buckets are normally separated from each other, but at the point of loading of the buckets are brought together, so as to close the spaces between the adjacent buckets in order to prevent the spilling of any material between them.

In the drawings, Figure 1 is a side elevation of a conveyer embodying my improvements. Fig. 2 is a plan view of a section of a conveyer, showing the buckets spaced apart in their normal relation to each other. Fig. 3 is a plan view of a conveyer, showing the buckets pressed together ready to receive charges of material. Fig. 4 is an end elevation of a section of a vertical leg of the conveyer. Fig. 5 is a plan view of a conveyer, showing a modified form of mechanism for closing the buckets together. Fig. 6 is a side elevation of a series of the buckets shown in Fig. 5. Fig. 7 is a vertical transverse section through one of the buckets. Fig. 8 is a plan view of a conveyer, showing still another modified form of mechanism for closing the buckets together and separating them again. Fig. 9 is a vertical longitudinal section of one of the buckets shown in Fig. 8. Fig. 10 is a detail view.

In the drawings, 1 represents the chain or carrier of a conveyer system. This chain or carrier may be of any of the types now used for supporting and advancing gravity-actuated buckets. Preferably I have shown it as made up of links 2, formed of pairs of side bars 2' 2', pivotally connected at each end to links 3, formed of pairs of side bars 3' 3'. 4 represents antifriction-rollers mounted on the end bars 5, which pivotally connect the pairs of bars 2' 2' and 3' 3' together. Two strands of this chain arranged parallel to each other and extended around the pathway of the conveyer are used, the buckets 6 being arranged between the said strands.

7, 8, 9, and 10 indicate pairs of sprocket-

wheels arranged so as to direct the course of travel of the buckets in a well-known manner, although curved guide-rails may be employed instead of these sprockets when desired.

Power may be applied for driving the chains or carrier in any well-known manner.

The buckets 6 are formed with the parallel end walls 6^a 6^b, the former being considerably wider than the latter, the side walls 6^c, oppositely tapered relative to the longitudinal axis of the bucket and the bottom wall 6^d. The buckets are trapezoidal in plan view and in horizontal cross-section. They are so arranged on the chains or carrier relative to each other that the larger end 6^a of each bucket is adjacent to the smaller ends 6^b of its adjoining buckets. The buckets are mounted so as to be free to swing about a horizontal axis to deliver their loads.

11 represents bearing-blocks secured between the bars 2' 2' of the links 2. At its larger end 6^a each bucket 6 has secured to it a shaft or journal 12, which is mounted in one of the said bearing-blocks 11.

13 is a boss or projection on the bucket, arranged to bear against the inner bar 2' of one of the links 2. This boss or projection may be formed integral with the end wall 6^a of the bucket or may be separately formed and rigidly secured thereto.

14 is a washer arranged on the outer end of the shaft or journal 12, and 14' is a key for holding the washer in position on the shaft or journal.

The boss or projection 13 and the washer 14 serve to hold the bucket rigidly relative to the chain-link at its larger end. To the narrower end 6^b of the bucket is secured a relatively long shaft or journal 15, which is mounted in the bearing-block 11 of the adjacent chain-link.

16 is a boss or projection carried by the end wall 6^b, which limits the inward movement of the chain-link relative to the bucket, the said link being free to move laterally along the shaft or journal 15.

Normally the chains of the conveyer system are separated from each other, as shown in Fig. 2, supporting the buckets in such manner that their smaller ends are in planes nearer the center line between the chains than their larger ends 6^a. This being the case, there is an open space between the buck-

ets which permits of their rotating freely on their respective axes and insures that the buckets will not collide with each other as they pass around the head-wheels or corner-guides of the conveyer system. As the journals or shafts 15, carried by the small ends 6^b of the buckets, are free to move longitudinally relative to the bearings 11, it will be seen that by applying lateral pressure to either one or both of the strands of chain that each bucket which has its large end 6^a supported by the strand of chain which is moved laterally will be caused to move longitudinally relative to its adjacent buckets, bringing the ends of the buckets into alinement with each other and closing the spaces between the sides of the adjoining buckets.

In Fig. 3 is shown one method of causing the chains of the conveyer system to be moved laterally relative to each other, so as to close the space normally existing between the buckets. 17 represents a hopper or any other of the well-known devices arranged to deliver material to the buckets. 18 indicates the track-rails, which support the rollers 4 on the lower horizontal flight of the conveyer. They are bent inwardly at 18' in proximity to the said hopper 17. 19 represents rails arranged above and parallel to the rails 18 at the point where they are bent inwardly and are adapted to prevent rollers 4 from leaving the rails 18 and to insure that the chains of the conveyer system will be forced toward each other, so as to close the spaces between the buckets. After the buckets have been loaded the chains are again separated to their normal distance apart, the rails 18 and 19 being curved, as indicated at 18^a and 19^a, respectively, to accomplish this result. The operation of this device for causing sections of the chains to approach each other, thereby closing the spaces between the buckets supported by said sections, will be readily understood. The rollers 4 of the chains at either side of a bucket enter the narrowed guideway provided for them in proximity to the loading-point, and as they enter this narrowed guideway they laterally press the links of the chains at either side of the system, which carry them toward each other, simultaneously moving the buckets supported by the said links so as to cause the adjacent sides of adjoining buckets to approach each other and to close the passage-way between them. The buckets may be provided with lips, each of which is adapted to overlap the adjoining lip of an adjacent bucket when the sides of the buckets are caused to approach each other, so as to close the space between them. I have shown one edge of each bucket beveled or cut away, as indicated at 20, and adapted to have the lip of the adjacent bucket overlap it when the sides of the buckets are pressed together, so as to close the passage-way between them.

21 represents antifriction-rollers carried by the buckets and arranged, preferably, near the bottom thereof. They are adapted to engage with a tripping device 22, arranged so as to tilt and empty the buckets at the desired point. This tripping device may be of any of the types now known in the art.

In Fig. 5 I have shown a modified form of conveyer in which the same result is accomplished as in the conveyer just described, but in which the buckets are mounted somewhat differently, and the chains which support them at either side do not move laterally relative to each other. In this construction the alternate buckets (indicated at 23) are mounted with their wider ends nearer to their alternate strands of chain than their narrower ends, these buckets being held from longitudinal movement and the chains being held from lateral movement relative to each other. The other series of buckets 24 have at either end relatively long journals or shafts 25, which extend for some distance beyond the sides of the chain-links and are mounted rotatively therein and adapted to move longitudinally between the two strands of chain. 26 is an endless guiding-conveyer arranged adjacent to the path of the journals or shafts 25 of the buckets on the lower horizontal flight in proximity to their point of loading and at one side of the conveyer system. This guiding-conveyer is arranged with its flight 27' in the path of travel of the journals or shafts 25 at the larger ends of the longitudinally-movable buckets 24 and at an angle to the line of travel of the chains, so that as the buckets advance the end of the journal or shaft of each bucket 24 engages with a conveyer-section of the flight 27' and is pressed so as to cause its respective buckets 24 to move longitudinally to close the passage-way between it and its adjoining buckets 23. 28 is a guide arranged adjacent to the course of the conveyer and adapted to be engaged by antifriction-rollers 25', mounted at the ends of the journals or shafts 25, which extend from the narrow ends of the buckets 24. These rollers engage with the said guide after their respective buckets have been filled, and the buckets are thereby moved longitudinally to again open the spaces between them and the adjacent buckets 23.

In Fig. 8 still another form of mechanism for causing one set of buckets to move longitudinally relative to another set while the buckets of the latter are held against longitudinal movement is shown. In this construction the buckets 23 and 24, mounted as in the construction last described, are each provided on their bottoms with an antifriction-roller 30. 31 is a guideway formed between two bars 32 33, arranged beneath the lower horizontal flight of the conveyer in proximity to the point at which the buckets are to be loaded. The bars 32 33 are flared or curved,

as indicated at 32' 33', respectively, to insure that the rollers 30 will be properly directed into the guideway between the said bars. As the conveyer moves forward the rollers 30 successively engage with the bar 33, and the further movement of the conveyer causes the bucket 24, controlled by its roller 30, operating in the guideway 31, to be moved longitudinally relative to its adjacent buckets. The bars 32 33 are again curved at 32^a 33^a, so as to cause the rollers 30 to separate the buckets 24 from their adjacent buckets 23 in order to permit of the free rotation of the buckets and to avoid collisions as they pass around the head-wheels.

In Fig. 10 I have indicated one means for preventing the longitudinal movement of the buckets on the upper and lower parts of the horizontal flights, where it is essential that the carrier-chains should be at their normal distance apart and the buckets free to swing relative to each other. 4' is a guide-rail arranged longitudinal of the path of travel of the bucket and inside of the flanges of the rails 4. One of these rails may be arranged at either side of the conveyer, so that when the buckets are traveling along the parts of their course provided with these guide-rails it will be impossible to move them longitudinally relative to each other and the chains at either side of the conveyer will be maintained at their normal distance apart.

While in the drawings I have indicated several forms of constructions of conveyers embodying my invention, it will be understood that I do not limit my invention to these several forms, as numerous other constructions may be used which will come within the spirit of my invention.

What I claim is—

1. In a conveyer, the combination with an endless carrier of a series of gravity-buckets trapezoidal in horizontal cross-section, each bucket having its sides arranged parallel to the adjacent sides of its adjoining buckets, substantially as set forth.

2. In a conveyer, the combination with an endless carrier, of a series of gravity-buckets trapezoidal in horizontal cross-section, each bucket having its sides arranged parallel to the adjacent sides of its adjoining buckets and normally separated therefrom, substantially as set forth.

3. In a conveyer, the combination with an endless carrier, of a series of gravity-buckets trapezoidal in horizontal cross-section, each bucket having its sides arranged parallel to the adjacent sides of its adjoining buckets and normally separated therefrom, and means for causing the said adjacent sides of adjoining buckets to approach each other so as to close the passage-ways between them, substantially as set forth.

4. In a conveyer, the combination of a series of gravity-buckets, each bucket having

a relatively narrow and a relatively wide end, the wider end of each bucket being arranged adjacent to the narrower ends of its adjoining buckets and normally out of alinement with said ends and the adjacent sides of adjoining buckets being parallel to each other and normally spaced apart, and means for moving the buckets longitudinally relative to each other to cause the buckets to approach each other and close the space between them, substantially as set forth.

5. In a conveyer, the combination of a series of longitudinally-tapering buckets, the wider end of each bucket being arranged adjacent to the narrower end of its adjoining buckets and the buckets being normally spaced apart, substantially as set forth.

6. In a conveyer, the combination of a series of longitudinally-tapering buckets, alternate buckets being oppositely arranged so that the wider end of each bucket is adjacent to the narrower ends of its adjoining buckets, the buckets being normally spaced apart, and means for causing the buckets to approach each other so as to close the passage-ways between them to prevent the spilling of material during the loading of the buckets, substantially as set forth.

7. In a conveyer, the combination of a series of longitudinally-tapering buckets, alternate buckets being oppositely arranged so that the wider end of each bucket is adjacent to the narrower ends of its adjoining buckets, the sides of the said buckets being parallel to each other and the adjacent ends of the adjoining buckets being normally out of alinement with each other so as to space the buckets apart, and means for causing the buckets to approach each other to close the passage-ways between them, substantially as set forth.

8. In a conveyer, the combination of a series of longitudinally-tapering buckets, alternate buckets being oppositely arranged so that the wider end of each bucket is adjacent to the narrower ends of its adjoining buckets, the adjacent sides of the adjoining buckets being parallel to each other and the adjacent ends of adjoining buckets being held normally out of alinement with each other so that the buckets will be spaced apart, and means for moving the buckets longitudinally relative to each other to close the passage-ways between them when they are being loaded, substantially as set forth.

9. In a conveyer, the combination of a series of longitudinally-tapering buckets, each bucket being arranged with its wider end adjacent to the narrower ends of its adjoining bucket, the pair of chains or carriers supporting the buckets at their opposite ends, and holding said buckets so that there is normally a space between them, and means for moving the chains laterally relative to each other so as to cause the buckets to approach

each other and close the space between them, substantially as set forth.

10. In a conveyer, the combination with a pair of transporting chains or carriers, of a series of buckets mounted between said chains or carriers, each bucket being trapezoidal in horizontal cross-section and arranged with its wider end adjacent to the narrower ends of its adjoining buckets, the adjacent ends of the adjoining buckets being out of alinement with each other and the adjacent sides of the adjoining buckets being parallel with each other and normally spaced apart, and means for moving the said chains or carriers laterally relative to each other so as to move the buckets longitudinally of each other and close the passage-ways between them, substantially as set forth.

11. In a conveyer, the combination with a pair of transporting chains, of a series of buckets mounted between said chains and normally spaced apart, each bucket being trapezoidal in horizontal cross-section, the buckets being alternately fixed against longitudinal movement and free to move longitudinally apart, and means for moving the movable buckets longitudinally of the fixed ones to close the spaces between them, substantially as set forth.

12. In a conveyer, the combination with the endless carrier, of a series of gravity-buckets supported thereby the adjacent sides

of adjoining buckets being normally spaced apart and means for causing the buckets to move longitudinally relative to their adjoining buckets to close the passage-ways between their adjacent sides to prevent spilling of material between the buckets during the loading thereof, substantially as set forth.

13. In a conveyer, the combination with a bucket - transporting device, of a series of buckets supported thereby, the adjacent sides of adjoining buckets being normally spaced apart, and means for causing each bucket at predetermined intervals to move longitudinally relative to its adjoining buckets to close the passage-ways between the said buckets.

14. In a conveyer, the combination with a bucket - transporting device of a series of buckets supported thereby, the adjacent sides of adjoining buckets being normally spaced apart, means for actuating said bucket-transporting device, and means for closing the spaces between the buckets by causing the buckets to move longitudinally relative to each other.

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

BERTRAM H. BUCHER.

Witnesses:

JOHN L. V. BONNEY,
ROBERT G. LORD.