

G. H. MUELLER.

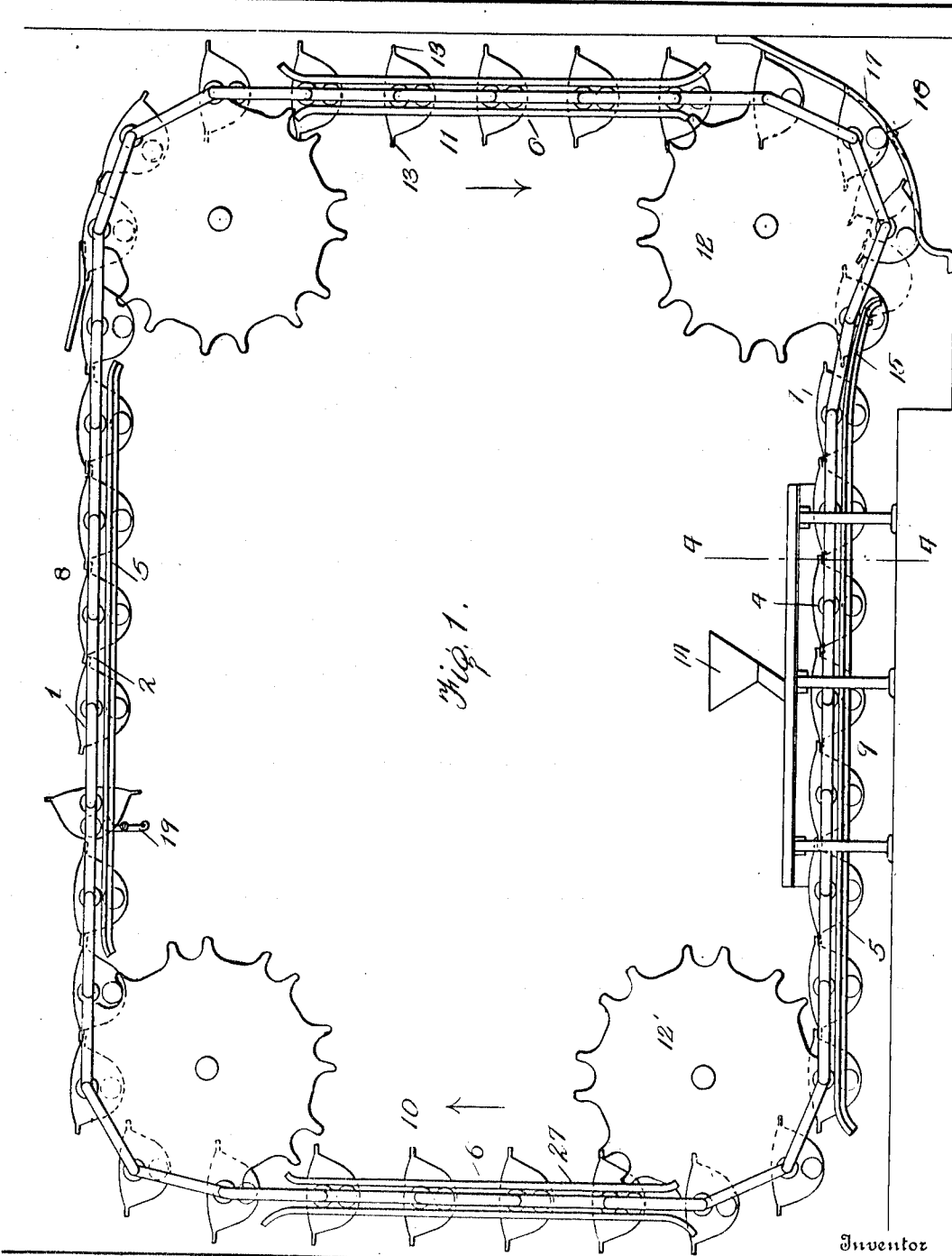
CONVEYER.

APPLICATION FILED APR. 8, 1908.

1,054,305.

Patented Feb. 25, 1913.

3 SHEETS—SHEET 1.



Inventor

Witnesses

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3 SHEETS--SHEET 2.

Fig. 3.

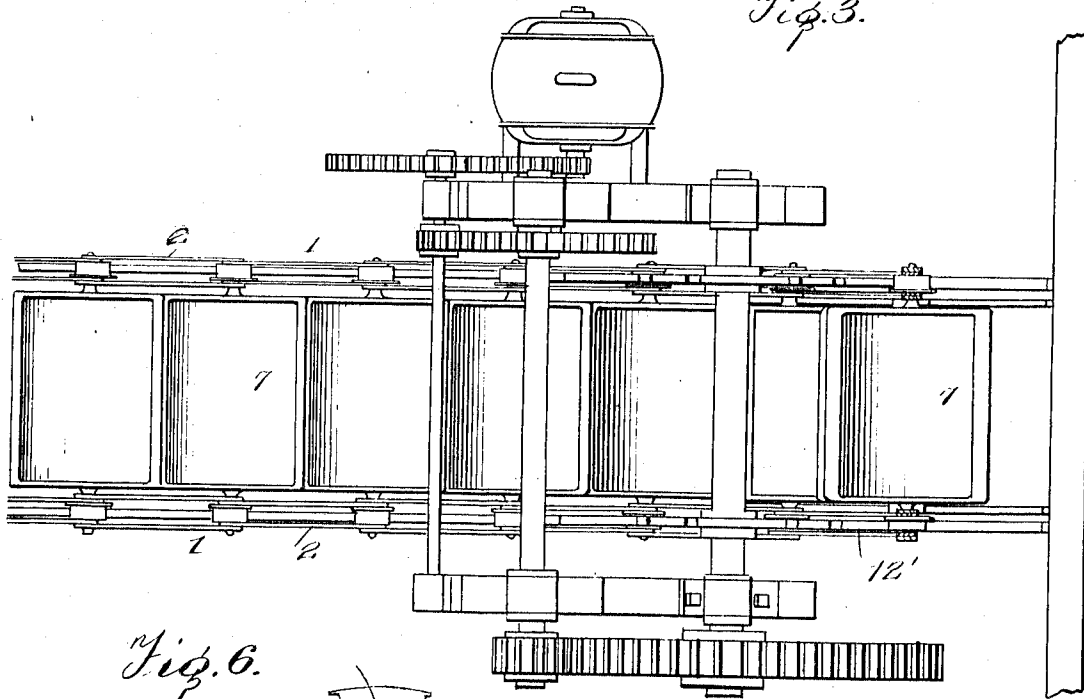


Fig. 6.

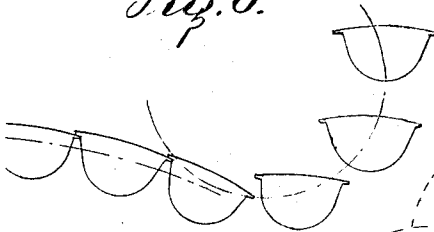
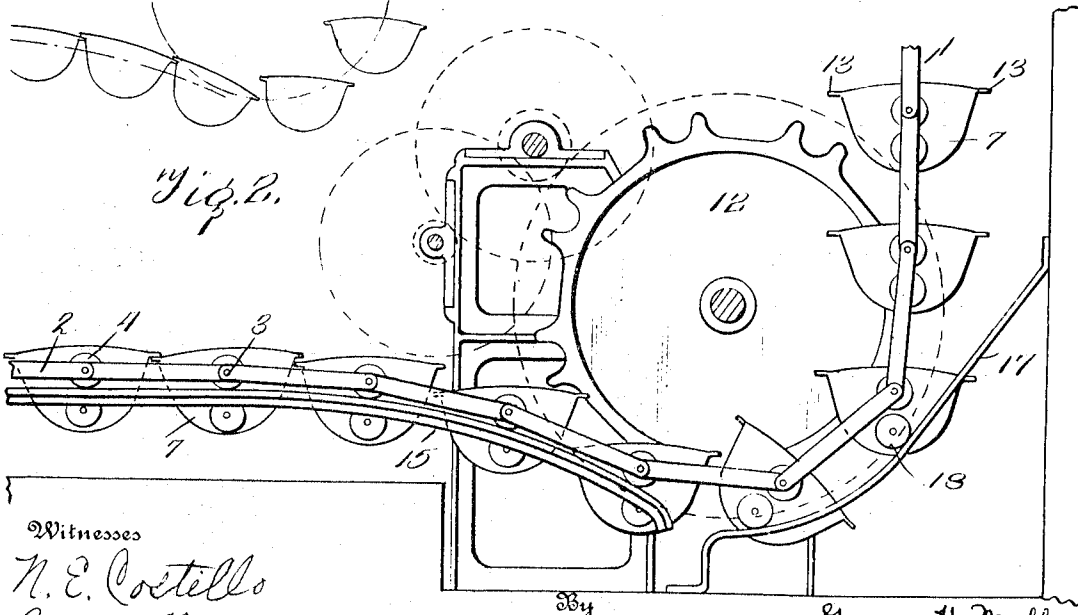


Fig. 2.



Witnesses

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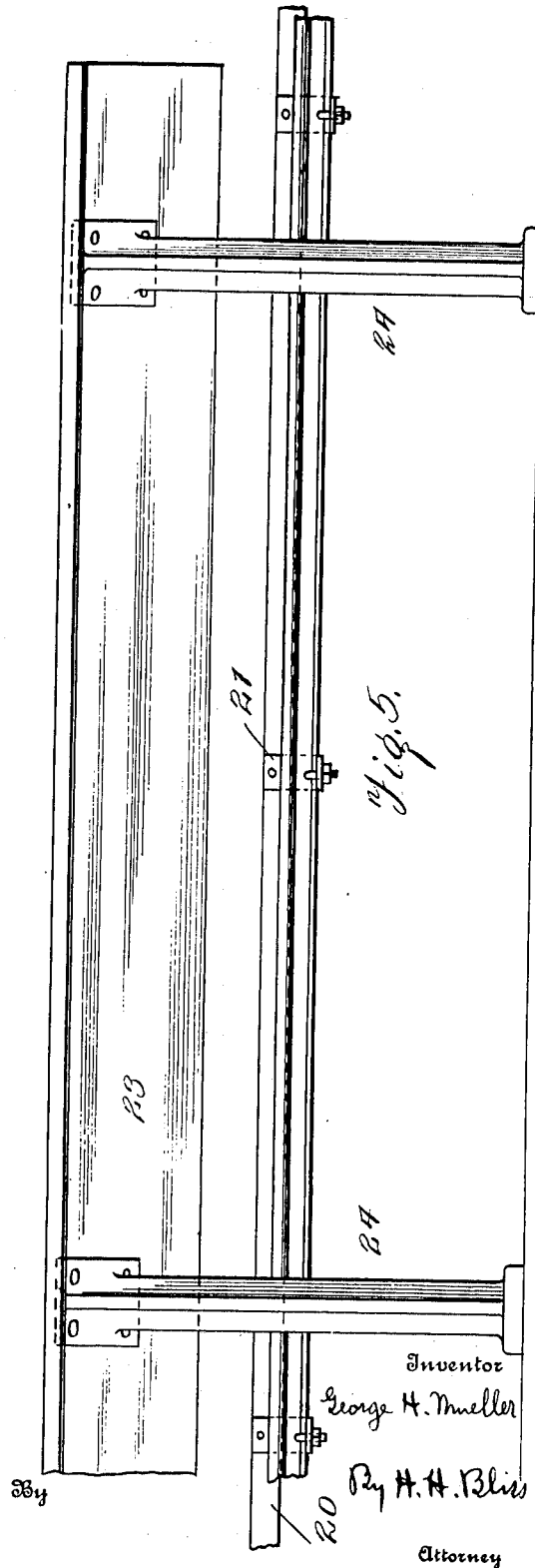
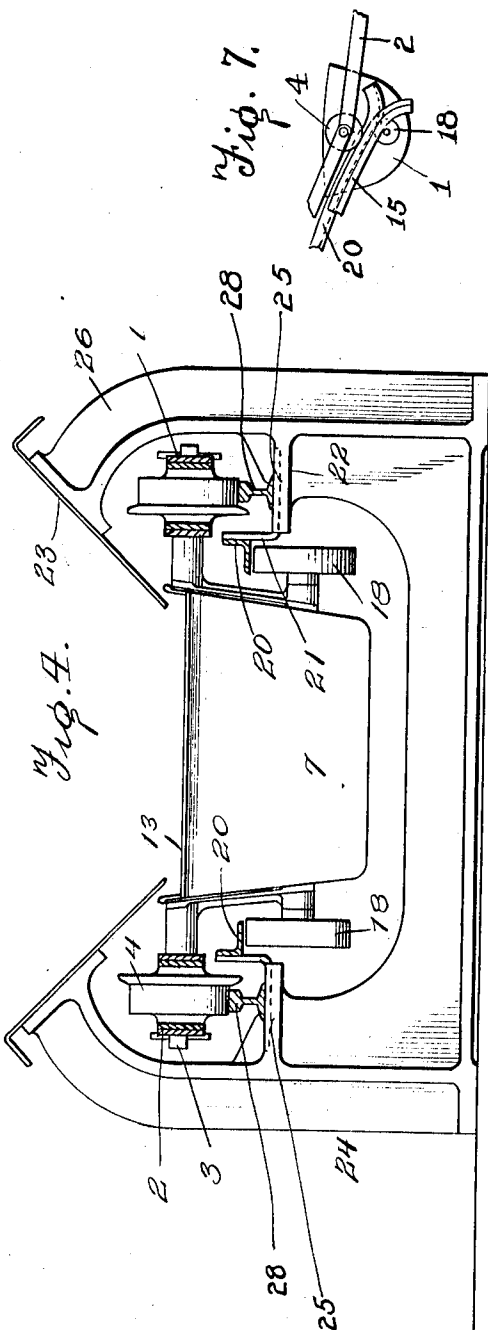
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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CONVEYER.

1,054,305.

Specification of Letters Patent.

Patented Feb. 25, 1913.

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To all whom it may concern:

Be it known that I, GEORGE H. MUELLER, 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 drawing.

This invention relates to swinging bucket conveyers and has for its object to provide improved means for changing the lap of the overlapping lips with which the buckets are provided and improved means for maintaining the buckets in horizontal position while traversing certain sections of the path of the conveyer.

Figure 1 of the drawings is a side elevation of a conveyer embodying the improvements provided by this invention. Fig. 2 is a side elevation of the lower right hand corner of the conveyer. Fig. 3 is a top plan view of the parts shown in Fig. 2. Fig. 4 is a cross sectional view along the line 4-4 of Fig. 1. Fig. 5 is a side elevation of a section of the lower run of the conveyer. Fig. 6 illustrates the improper lapping of the buckets which my invention is intended to correct. Fig. 7 is an enlarged detail of the receiving end of the chain supporting and guard rails.

In the drawings, 1 indicates the chains from which are suspended the buckets, each of these chains being made up of a series of pairs of parallel links 2, each pair being joined to the next pair by means of the pintle 3. These pintles carry between the link bars of each chain the track rollers 4 which engage with the horizontal and vertical track rails 5 and 6, respectively. Freely suspended from two opposite pintles are buckets 7 which carry the material to be conveyed. The drawings show the path of the conveyer as having the upper and lower horizontal sections 8 and 9 and the vertical sections 10 and 11, this showing being sufficient to illustrate the mode of application of my invention, although it is to be understood that the conveyer may travel over any desired form of path.

At the curves where the conveyer passes from the horizontal to the vertical section of its course, sprocket wheels 12, 12' are shown adapted to engage with the chain pintles and change the buckets smoothly

from one direction of travel to another. This invention, however, is equally applicable to conveyers in which fixed stationary curved guide rails are used instead of sprocket wheels. Each of the buckets is provided at each end with an overlapping lip 13 in order that the material may be loaded into the buckets from the hopper 14 without falling between the adjacent edges of two successive buckets. A well-recognized difficulty in using this overlapping lip construction has arisen from the interference of the lips with each other at the point corresponding to the lower right-hand corner of Fig. 1 of the drawings. To overcome this difficulty various devices have been suggested and employed for causing the lip of a bucket in advance to rest on top of the lip of the bucket next in the rear of it as the buckets enter upon the horizontal section of track above which the loading hopper is mounted. The means here illustrated for accomplishing this purpose is as follows: The conveyer after leaving the sprocket wheel 12 ascends a gradual incline 15 for a short distance before entering upon the horizontal section of its travel.

In order to prevent the buckets from assuming the position shown in Fig. 6, as they pass around and leave the sprocket wheel, the cam guide rail 17 is mounted beneath the sprocket wheel with its active face generally parallel to the path of the conveyer and terminating approximately beneath the center of this sprocket wheel. This cam guide rail engages the trip wheels 18 which are usually used upon the buckets of conveyers of this type to cooperate with the tripping mechanism indicated conventionally at 19 to unload the material. The trip wheel of a descending bucket comes easily and smoothly into engagement with the cam guide rail and as the bucket passes around the sprocket wheel it is given an inclination downwardly from left to right, due to the fact that the vertical distance from the circumference of the sprocket wheel to the cam guide rail gradually decreases. By inclining the bucket in this manner the projected horizontal distance from tip to tip of any one bucket is considerably shortened and the lip of the bucket next in advance passes the lip of the inclined bucket without interference, as the forward bucket ascends the short incline 15. After the buckets have entered

upon the lower horizontal section of their path they pass under the loading hopper and receive charges of the material to be conveyed. When the buckets have been unloaded on the upper horizontal section of travel, there is frequently left in the bottom of the buckets a small portion of material, especially if the material which is being conveyed is of a damp or sticky character. These remaining portions of the charge cause the buckets to assume inclined positions during their descent and as they approach the loading hopper. In this way the advantage gained by the use of overlapping lips is nullified and the material finds its way between the buckets to the floor under the loading hopper. To cause the buckets to be held exactly to their horizontal position as they travel over this part of their path, I have provided the guard rail 20 positioned to engage with the upper sides of the trip wheels, as shown in the drawings. These guard rails are preferably angle irons and can be bolted to the brackets 21 secured to the track supports 22. There is shown in the drawings a desirable frame construction for supporting the track rails 28, the guard angles and the loading guard plates 23. The single casting 24 used for this purpose is provided with the ledges 25 on either side to support the rails 28 and guard angles and has the upwardly extending arms 26 to which the guard plates are secured. By this mode of construction a perfectly rigid frame support is provided which preserves the accurate alinement of the rails and the guard angles. At its ends, each guard angle is curved upwardly, that it may engage the trip wheels on the buckets without shock or jar. Similar guard rails may be employed at any point along the conveyer. Fig. 1 shows a double guard angle 27 such as would be used with vertical and curved sections of track.

What I claim is:

1. In a pivoted bucket conveyer, the combination with the chains and buckets pivotally suspended from the chains and provided with overlapping lips, of guiding devices directing the chain and buckets along a path lying in different horizontal planes, and of stationary means external to the conveyer and to the guiding devices for tipping the buckets rearward from a horizontal position, the path of the conveyer being upwardly inclined to the horizontal at points immediately in advance of said tilting means.

2. In a pivoted bucket conveyer, the combination of guiding devices, an endless chain, buckets pivotally mounted therefrom and having overlapping lips, a wheel on each bucket in vertical alinement with the axis of suspension of the bucket, a guide rail adjacent to a curved section of the path of the conveyer in the rear of a horizontal sec-

tion and adapted to engage the said wheels to tilt the bucket rearward, the guide rail being substantially concentric with the said curved section of the path of the conveyer, and means for inclining the buckets upwardly in advance of the tilting mechanism.

3. In a pivoted bucket conveyer, the combination with guiding devices, an endless chain, buckets pivotally supported from the chain and having overlapping lips, of loading mechanism, an unloading mechanism, a trip wheel on each bucket in the vertical plane of the axis of bucket suspension, cooperating with the unloading mechanism, and a lap changing device comprising the bucket tilting cam guide rail adapted to engage the trip wheel on each bucket and means for elevating the rear edge of the bucket in advance of the tilted bucket with respect to the said tilted bucket.

4. In a lap changing device for pivoted bucket conveyers of the overlapping lip type, an extended bucket tilting guide rail concentric with a curved section of the conveyer path, and wheels on the buckets for engaging therewith the guide rail adapted to carry the wheels on the buckets in advance of the tops of the buckets throughout the length of said rail.

5. In a pivoted bucket conveyer, the combination with guiding devices, a chain and buckets, of rollers mounted on the buckets in the same vertical plane and a different horizontal plane from that of the axis of suspension, and a guard rail vertically between said rollers and the axis of suspension of the buckets engaging said rollers to maintain the buckets level.

6. In a pivoted bucket conveyer, the combination with guiding devices, chain and buckets having overlapping lips, of loading mechanism, unloading mechanism, trip wheels in the vertical plane of the axis of bucket suspension and below said axis, cooperating with the unloading mechanism, and a guard rail engaging the upper side of said trip wheels to hold the buckets level.

7. In a pivoted bucket conveyer, the combination with guiding devices, a chain and buckets, of rollers mounted on the buckets in the same vertical plane and a lower horizontal plane from that of the axis of suspension, and a guard rail engaging the upper side of said rollers to maintain the buckets level.

8. In a pivoted bucket conveyer, the combination of guiding devices, an endless chain, buckets pivotally mounted thereon and having overlapping lips, a wheel on each bucket in vertical alinement with the axis of suspension of the bucket, a sprocket wheel engaging with said chain for altering its direction from vertical to horizontal, a guide rail adjacent to said sprocket wheel and positioned to engage the wheels to tilt the buckets rearward, said guide rail termi-

5 nating abruptly at a point approximately in vertical alinement with the center of the sprocket wheel, and means for inclining the buckets upward in advance of the tilting device.

10 9. In a pivoted bucket conveyer, the combination of guiding devices, an endless chain, buckets pivotally mounted thereon and having overlapping lips, a wheel on each bucket in vertical alinement with the axis of suspension of the bucket, a sprocket wheel engaging with said endless chain to alter its direction from vertical to horizontal, a guide rail adjacent to said sprocket
15 wheel and positioned to engage the wheels on the buckets and tilt the buckets rearward,

said rail terminating abruptly at a point approximately in vertical alinement with the center of said sprocket wheel, and an inclined rail the lower end of which is adjacent the end of the aforementioned guide rail, the end of said inclined rail positioned a distance away from the abruptly terminating guide rail equal to or greater than the diameter of the wheels. 20 25

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

GEORGE H. MUELLER.

Witnesses:

CHAS. M. SNIDER,
G. J. HADDOCK.