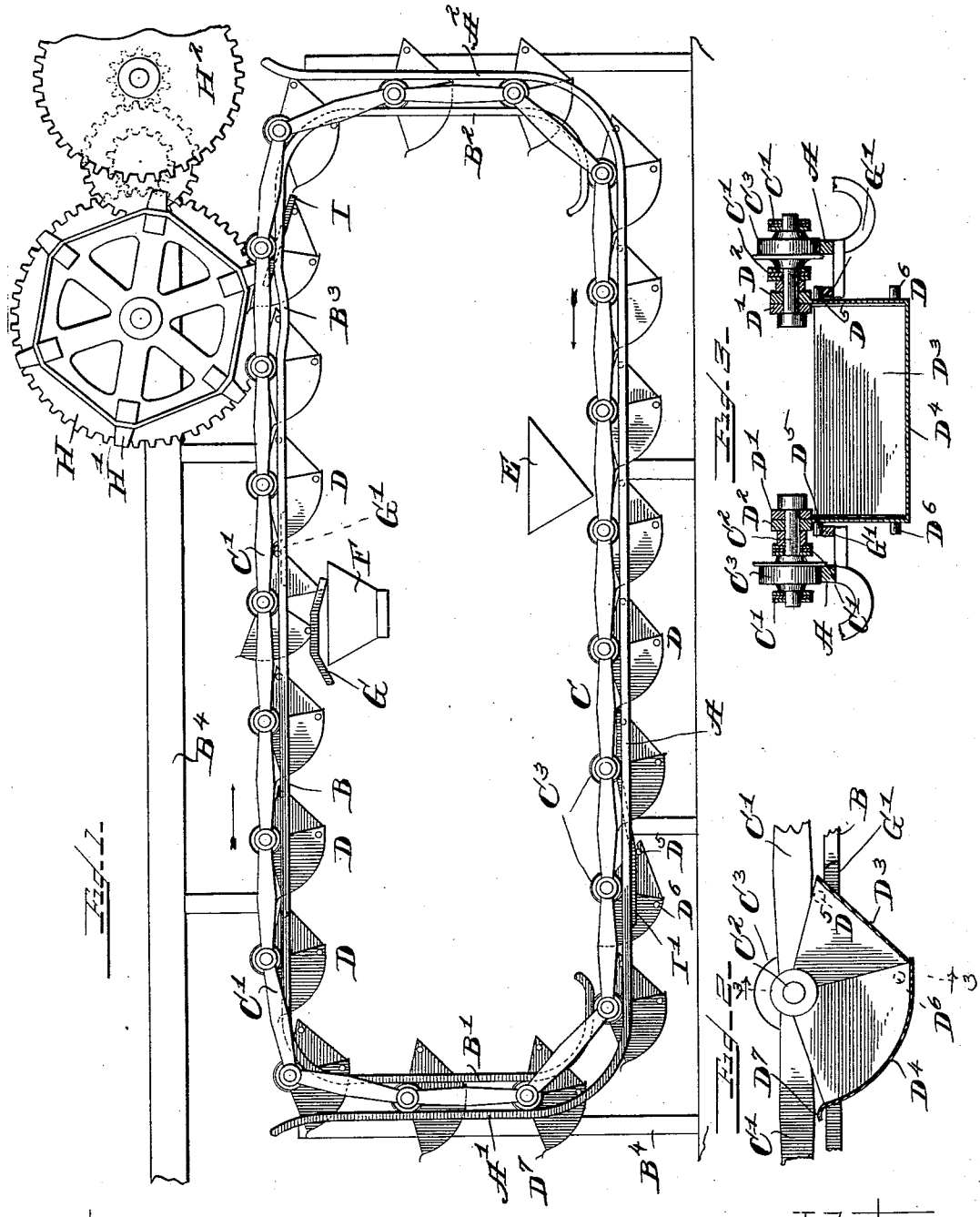
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C. H. NOTTER.

BUCKET CONVEYER.

APPLICATION FILED DEC. 8, 1902.

NO MODEL.



Witnesses—

G. A. Pamberschmidt

Geo. L. Chindahl

Inventor—

Charles H. Notter

By Luther L. Miller.

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 750,886. Patented February 2, 1904.

UNITED STATES PATENT OFFICE.

CHARLES H. NOTTER, OF CHICAGO, ILLINOIS.

BUCKET CONVEYER.

SPECIFICATION forming part of Letters Patent No. 750,886, dated February 2, 1904.

Application filed December 8, 1902. Serial No. 134,328. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. NOTTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bucket Conveyers, of which the following is a specification.

The object of this invention is the production of a bucket conveyer for handling coal, ore, ashes, and similar substances, a conveyer that is automatic in loading and dumping the buckets, and one wherein the feed to the buckets may be continuous.

In the accompanying drawings, Figure 1 shows in side elevation an embodiment of my invention. Fig. 2 is a detail view showing in side elevation a portion of the supporting-track, one of the endless conveyer-chains, and a bucket. Fig. 3 is a transverse section through a bucket and the chains on dotted line 3 3 of Fig. 2.

In the construction of a conveyer embodying the improvements herein shown I provide a supporting two-rail lower track A, each rail of which has an upwardly-extending guide-arm A′ and A^2 at opposite ends thereof and formed continuous therewith. I also provide the corresponding two-rail upper track B, each rail having similar guide-arms B′ and B^2, extending downwardly from the ends of the supporting-track B. The track B lies directly over the track A, the corresponding rails of said tracks A and B and the guide-arms thereof lying in the same vertical plane. The upper track B is provided with a curved depression B^3, into which the supporting-wheels of the buckets (to be hereinafter described) descend when the endless conveyer-chain is being engaged by the teeth of the driving-wheel, (also to be hereinafter described.)

The tracks A and B are mounted rigidly upon the supporting-frame B^4 of any suitable construction. When the conveyer is placed within a building, the adjacent parts of the building may and sometimes do constitute this supporting-frame, the form and arrangement of which are quite unimportant.

Two double endless conveyer-chains C are provided, each comprising a series of two-part links C′, joined together by the pivotal studs C^2, forming the bearing-pins for said links. Each of the studs C^2 is provided with a flanged rotatable wheel C^3, adapted to run upon the tracks A and B. The coinciding studs of the two conveyer-chains are alined and at their inner ends support a separable two-part bucket D of clam-shell construction. The pivotal supporting-bearings D′ and D^2 of said bucket are rotatably mounted upon said studs. The bearings D′ form a part of one member of the bucket—to wit, D^3—and the bearings D^2 a part of the other member of the bucket—to wit, D^4. The portion D^3 of the bucket at its side and bottom fits within the corresponding (other) part D^4 of the bucket, and the weight of material within the bucket tends to hold the parts in a closed position. Near its upper edge and projecting outward from its opposite sides the part D^3 of the bucket is provided with two roller-studs D^5, and near the bottom of the bucket and projecting from the sides of the part D^4 are two similar roller-studs D^6, the latter studs for opening the bucket, as will more fully appear hereinafter. The upper edge of the portion D^4 of the bucket is curved rearwardly in a lip D^7, and the buckets are intended to be placed so close together that this lip will overlie the upper edge of the part D^3 of the next succeeding bucket, thus forming an unbroken line of carrying-receptacles.

E is a feed-spout through which the substance to be elevated is delivered to the buckets, and F is a discharge-hopper, into which the substance after being elevated is discharged by the separation of the two parts of the buckets.

G is an opening-cam for the buckets. One of these cams is placed on each side of the line of buckets and over the receiving-hopper F and in position to be engaged by the roller-studs D^6 on the side and near the bottom of the part D^4 of each of the buckets.

G^7 is a retaining-rail adapted to be engaged on its upper face by the roller-stud D^6 to hold the portion D^3 of the bucket from being tilted with the other part, D^4, of said bucket.

H is a driving-wheel, one of which is provided for each of the endless chains C. It is provided with teeth H′, placed at suitable in-

tervals to engage the rear ends of the links C′ of the chains C, and the drive-train H^2 rotates said driving-wheel, and thus moves the endless line of buckets around the circuit formed by the tracks A and B.

The fact that the elevator-buckets overlap at one edge makes it necessary to provide some means at diagonally opposite corners of the rectangle formed by the tracks A and B to permit an overlying bucket to descend and an underlying bucket to ascend without tilting the adjacent ascending or descending bucket. This I provide by the tilting-cams I and I′, the former near the track B for engaging the roller-studs D^5 at opposite sides of the portion D^3 of the buckets and to cause said bucket to be tilted sufficiently to withdraw the upper edge of the portion D^3 from beneath the lip D^7 of the next preceding bucket. The tilting-cam I′ is also adapted to engage said roller-stud D^5 and tilt said bucket to raise the curved lip D^7 away from the adjacent edge of the preceding bucket, so that said last-mentioned bucket may rise without jostling the bucket which follows it.

The feed-spout E, discharge-hopper F, opening-cam G, drive-wheel H, drive-train H^2, and tilting-cams I and I′ are suitably mounted upon the supporting-frame B^4.

In operation the drive-wheel H is rotated and the two double endless conveyer-chains C moved upon the tracks A and B and the guide-arms B′ and B^2 in the direction indicated by the arrows in Fig. 1. The overlapping lip D^7 at one edge of each bucket closes the spaces between the buckets, so that a continuous discharge through the spout E may be maintained. This discharge is regulated with relation to the rate of travel of the chain, so that the buckets will be substantially filled as they pass beneath the spout E. As the line of buckets progresses with the wheels C^3 rolling upon the track A the roller-studs D^5 at each side of the buckets strike the tilting-cam I′ and incline the bucket sufficiently to permit the bucket just preceding it to rise clear of the overhanging lip D^7 of the tilted bucket. The wheels C^3 roll upward upon the arm A′ until the pull of the chain draws them into contact with the arm B′. The buckets proceed upward, forming in a horizontal line as their wheels roll out upon the upper tracks B. As each bucket comes into a position over the discharge-hopper F the roller-studs D^5 ride up on the retaining-rail G′, the roller-studs D^6 engaging and being delayed by the rising side of the opening-cam G, the effect of which is to hold the portion D^3 of the bucket from being tilted, while the portion D^4 of said bucket is moved pivotally to open the lower part of the separable bucket and permit the discharge of its contents into the hopper F. As the open bucket proceeds the roller-studs D^6 pass downward upon the declivity of the opening-cam G, permitting the portion D^4 of the bucket to resume its normal closed position, and the roller-studs D^5 pass the retaining-rail G′. The bucket from this point passes on empty, its supporting-wheels traveling through the depression B^3, where the rear ends of the links of the conveyer-chain C are engaged by the projections H′ of the drive-wheel H. Just before reaching the curve in the track B, where the chain C turns downward, the roller-studs D^5 pass under the tilting-cam I. The downward inclination of the tilting-cam rocks the bucket upon its supporting-pivots and withdraws its then forward edge from beneath the overhanging curved lip of the next preceding bucket which is next to descend. In their downward course the wheels C^3 bear against the arm B^2, being guided by the arm A^2 until the chain approaches its lower horizontal position, when the wheels bear upon the arm A^2. The distance between the arms A′ and B′ and the arms A^2 and B^2 is very slightly greater than the diameter of the wheels, and the length of the tracks A and B is made to conform quite closely to the length of a chain of a given number of links, so that an undue looseness of the chain will not occur.

The feed-spout E and the discharge-hopper F may be placed at any desirable points in the length of the tracks A and B, and, as is apparent, the general outline of the figure described by said tracks may be varied from the rectangular form illustrated. It is also clear that the pivotal studs C^2 may be replaced by a single shaft extending across the bucket and that many other changes in construction and arrangement of the parts herein shown may be resorted to; also, that many modifications and alterations in the form of said parts may be made without departing from the spirit and scope of my invention. Wherefore I desire to have it understood that I do not limit myself to the exact embodiment herein shown and described.

I claim as my invention—

1. In a bucket conveyer, in combination, an endless conveyer-chain movably supported; a driving means for said chain; a series of buckets pivotally supported on said chain, each bucket overlapping the next adjacent bucket on one side thereof; and stationary means engaged by said buckets for tilting the buckets to clear their overlapping edges at points where the conveyer-chain changes its direction of travel.

2. In a bucket conveyer, in combination, a double endless conveyer-chain movably supported; a driving means for said chain; a series of buckets pivotally supported on said chain, each bucket overlapping the next adjacent bucket on one side thereof; and a cam for tilting the buckets to clear their overlapping edges at points where the conveyer-chain changes its direction of travel.

3. In a bucket conveyer, in combination, a two-part track comprising an upper portion

and a lower portion arranged in a vertical plane, the lower portion having an upwardly-extending track-arm at each end thereof, and the upper portion having two similar track-arms, each extending parallel with the corresponding arm of the lower portion; an endless conveyer-chain having supporting-wheels for rolling upon said track; a driving means for said chain; a series of conveyer-buckets pivotally supported on said chain, each bucket overlapping the next adjacent bucket on one side thereof; and a cam for tilting the buckets to clear their overlapping edges at a point where the conveyer-chain changes its direction of travel.

4. In a bucket conveyer, in combination, a two-part track comprising an upper portion and a lower portion arranged in a vertical plane, the lower portion having an upwardly-extending track-arm at each end thereof, and the upper portion having two similar track-arms each extending parallel with the corresponding arm of the lower portion; an endless conveyer-chain having supporting-wheels for rolling upon said track; a driving means for said chain; a series of two-part buckets pivotally supported on said chain, the parts of said bucket being pivotally connected; a projection extending from one of the parts of said buckets; and a delay-cam for engaging said stud and opening the buckets.

5. In a bucket conveyer, in combination, a supporting-track; an endless conveyer-chain having supporting-wheels for rolling upon said track; a driving means for said chain; a series of two-part buckets pivotally supported on said chain, the parts of said bucket being pivotally connected; a retaining-stud on one of the pivoted parts of said bucket; a fixed retaining-rail for said stud; a stud on the other pivoted part of said bucket; and a delay-cam for engaging said last-mentioned stud to open the bucket.

CHARLES H. NOTTER.

Witnesses:
K. A. COSTELLO,
L. L. MILLER.