

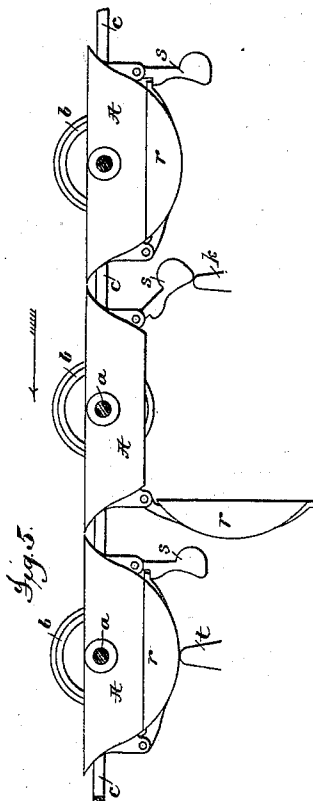
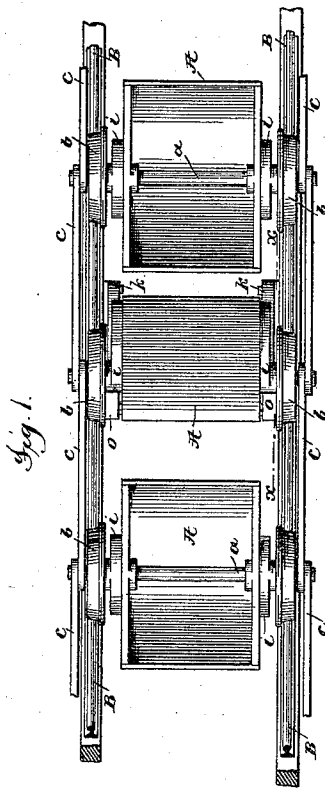
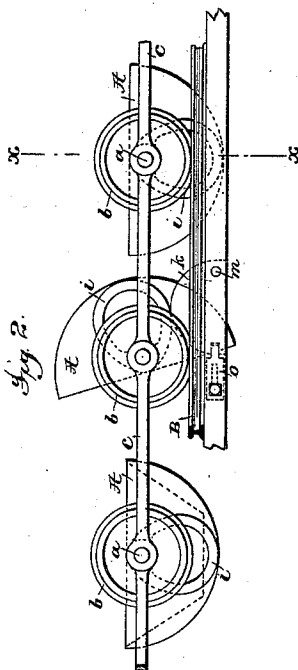
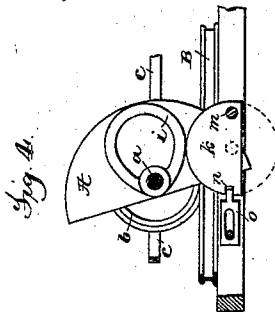
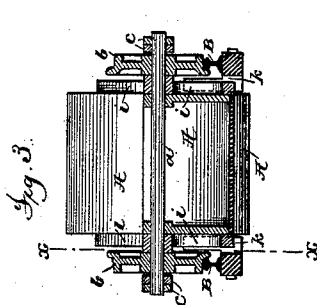
(No Model.)

4 Sheets—Sheet 1.

G. W. McCASLIN.
CONVEYER.

No. 387,241.

Patented Aug. 7, 1888.



Attest:
Geo. H. Otto.
J. A. Kory.

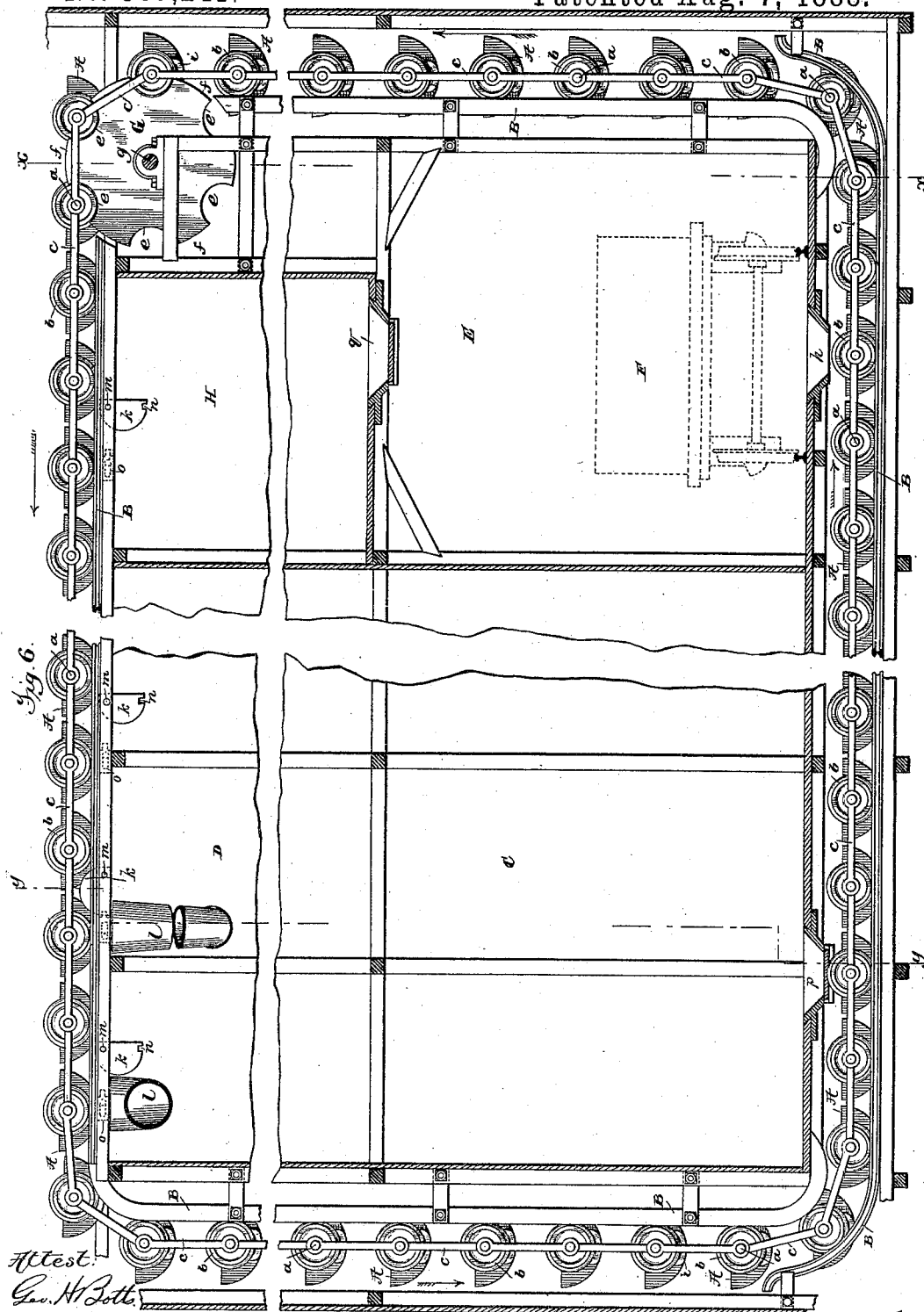
Inventor:
Gerritt H. McCaslin.
By *Mason & Philip*
Attys.

G. W. McCASLIN.

CONVEYER.

No. 387,241.

Patented Aug. 7, 1888.



Attest:
Geo. H. Zott
J. A. Hovey.

Inventor: George W. McCaslin
by Thomas Phillips
Attys.

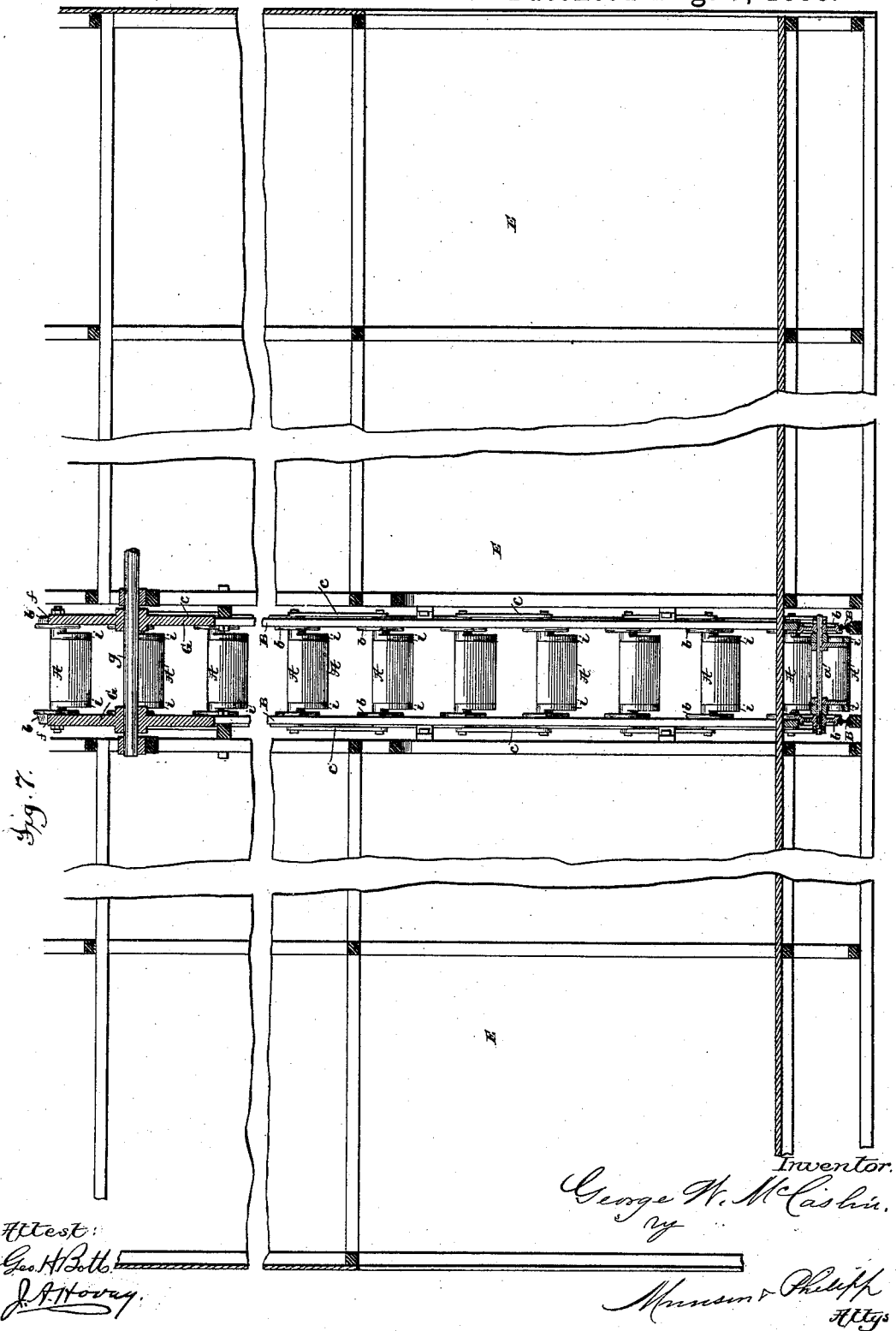
(No Model.)

4 Sheets—Sheet 3.

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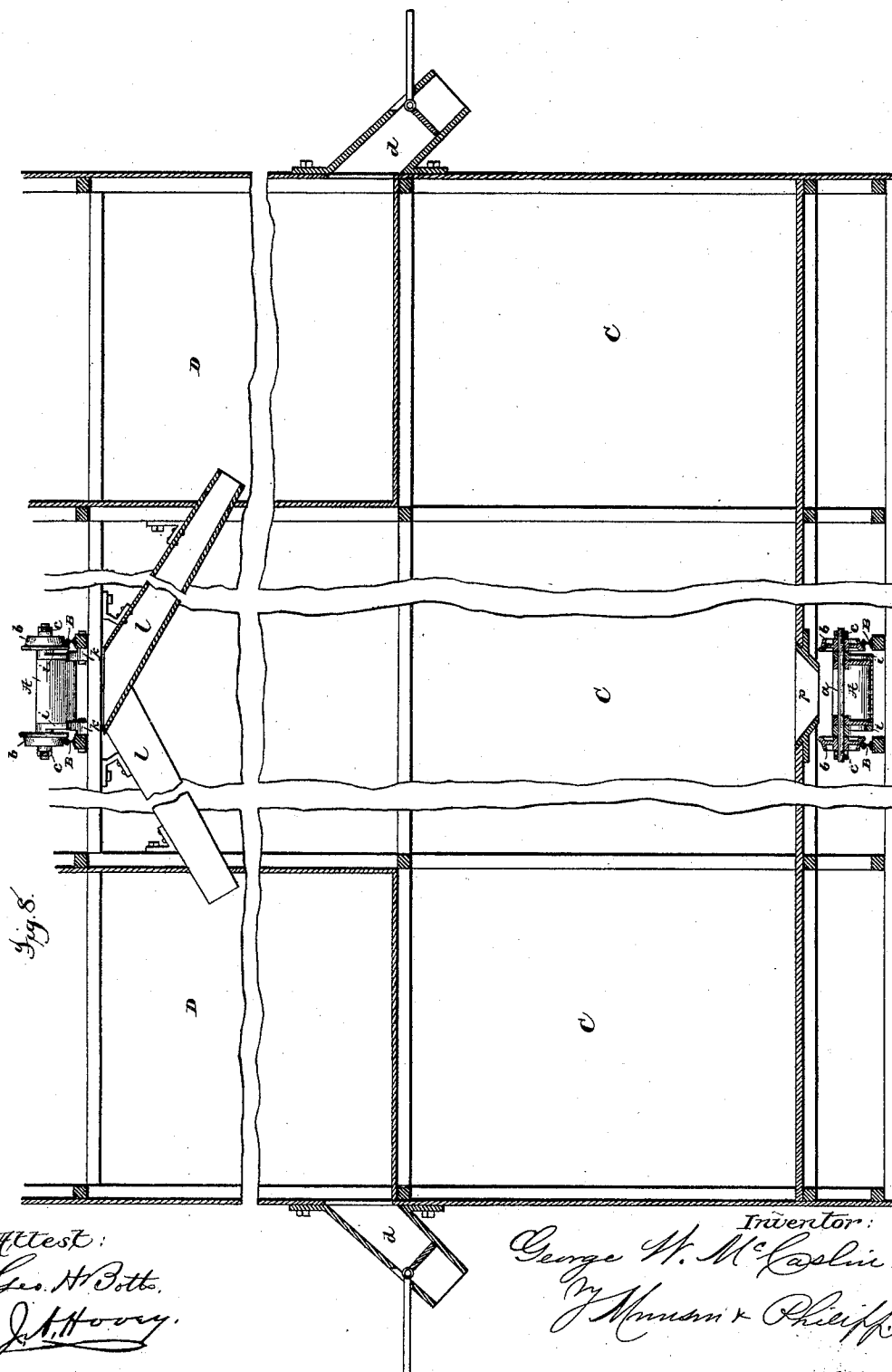
4 Sheets—Sheet 4.

G. W. McCASLIN.

CONVEYER.

No. 387,241.

Patented Aug. 7, 1888.



Attest:
Geo. H. Babb.
J. H. Hoory.

Inventor:
George W. McCaslin.
By Munson & Phelps.

Attest:

UNITED STATES PATENT OFFICE,

GEORGE W. McCASLIN, OF NEW YORK, N. Y.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 387,241, dated August 7, 1888.

Application filed December 16, 1886. Serial No. 221,764. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. McCASLIN, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain Improvements in Conveyers, of which the following is a specification.

My invention relates to the class of conveyers comprising a number of receptacles pivotally hung at points above their centers of gravity and connected to form a continuous endless series by links. The conveyer is mounted on and driven through the medium of sprocket-wheels, and the receptacles are supported on wheels which roll on tracks.

Conveyers of this general class are usually employed for transferring from one point to another such loose materials as coal, grain, and the like, and the receptacles are provided with devices for dumping them at certain points in their line of travel.

My invention consists, partly, in the general arrangement or mounting of the conveyer with respect to a building or warehouse for the storage of grain, coal, and the like; partly in the manner of mounting the conveyer-receptacles in the endless linked connector; partly in the devices employed for dumping the receptacles, and partly in the peculiar arrangement of the overlapping tracks at the points where the conveyer changes direction, whereby the employment of sprocket carrying-wheels at these points is avoided, all as will be more fully set forth hereinafter, and carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figures 1 to 4 are views illustrating the construction of the conveyer proper, Fig. 1 being a plan view of a portion of the conveyer comprising three receptacles, Fig. 2 a side elevation of the parts shown in Fig. 1, Fig. 3 a vertical transverse section on line *xx* in Fig. 2, and Fig. 4 a vertical section on lines *xx* in Figs. 1 and 3. Fig. 5 is a side elevation illustrating a modification in the construction of the conveyer, that will be hereinafter described. Fig. 6 is a sectional elevation of a warehouse arranged for the storage of coal, grain, and the like, illustrating the manner of mounting the conveyer for operation therein, whereby the material may be transferred from a car, for example, on the lower

floor or level to bins or chutes at a higher level, or vice versa. Fig. 7 is a sectional elevation of the warehouse, taken on line *xx* in Fig. 6, looking toward the right; and Fig. 8 is a similar view taken on line *yy* in Fig. 6, looking toward the left. In Figs. 6, 7, and 8 the conveyer is drawn to a much smaller scale than in the first four figures.

Referring first to Figs. 1 to 4, I will describe the construction of the conveyer proper. A is one of a series of like receptacles or buckets pivotally hung or mounted above their centers of gravity, in order that they may always remain upright normally. Each bucket is in the form of a semi-cylinder and the pivotal axis is arranged at or near the axis of the cylinder. In the present case the bucket is hung on a shaft, *a*, in such a manner as to swing or oscillate freely thereon. On each end of the shaft *a* is mounted a track-wheel, *b*, of suitable size, adapted to run on track-rails B. The several buckets so constructed and provided are coupled together in a continuous and endless series by means of rigid links *c*, arranged in pairs and having eyes in their ends, through which shafts *a* pass and in which they turn freely. By the arrangement of the buckets in a "continuous" series I mean that the rigid links *c* are of such a length that the adjacent lips or edges of the buckets when on a horizontal track will touch, or nearly so, and the buckets will thus form a practically continuous receptacle. As the bucket is hung at its middle in order that its upper surface shall always stand substantially horizontal, it follows that the link *c* from center to center of its eyes will have the same length as the bucket. My conveyer has these distinguishing characteristics—namely, the receptacles are "gravity-buckets" in the sense that they normally retain their upright position whether moving vertically, horizontally, or along an incline; they form a substantially continuous conveyer; each bucket is supported at its center upon track-wheels, and each bucket is coupled to the next adjacent by a rigid link, whereby the buckets are distanced.

In order that the buckets may be dumped properly at the delivery-points in whichever direction they may be moving, I provide each bucket with a cam, *d*. (Best seen in Fig. 4.)

This cam is symmetrical in order that it may engage properly another cam, *k*, on the track in whichever direction the bucket may be moving. The cam *i* has an oval form and is mounted on the end of the bucket below the pivot. The cam *k* is preferably of the symmetrical semicircular form shown, as this form enables it, in conjunction with cam *i*, to effect the dumping gradually and without jar in whichever direction the bucket may be moving. I have described but one cam *i* in the bucket and one cam *k* on the track; but in order to effect the dumping with the least side strain on the parts of the conveyer I employ a cam *i* on each end of the bucket and a pair of cams *k* on the track in the paths, respectively, of the cams *i*. The cams *i* and *k* are constructed to tilt the bucket in dumping about to the position shown in Figs. 2 and 4.

In order to effect the dumping at different points in the line of travel of the conveyer, for reasons that will be more fully explained hereinafter, I arrange pairs of cams *k* at the several dumping points along the track and so construct each pair that it may be turned down out of the way, and thus rendered inoperative at will. The means I prefer to employ for effecting this is illustrated in Fig. 4. At one side the cams *k* are pivotally mounted on studs *m*, and at the opposite sides they are provided with recesses *n*, adapted to receive sliding locking-bolts *o*. This bolt holds the cam up in operative position. When it is withdrawn, the cam will swing down out of the path of the cam *i* on the bucket.

Referring now to Figs. 6, 7, and 8, I will describe the manner of mounting and operating the conveyer. In said figures, C represents the storage chambers or bins of an ordinary warehouse; D, the elevated pockets at the sides of the warehouse, from which the material can pass through suitable chutes, *d*, to conveyances brought alongside, and E a chamber or part of the warehouse into which a railway-car, F, or other conveyance can be run preparatory to unloading its contents. Fig. 6 best illustrates the arrangement of the conveyer with respect to the warehouse. It is, in fact, mounted in the manner of an endless belt around the chambers of the warehouse, extending horizontally under the floor, thence up at one end to the top or upper part above the pockets D, thence across, and thence down again at the other end of the warehouse. At the upper and lower portions of its route the wheels *b* of the conveyer run on horizontal tracks, and at the ascending and descending portions of its route they run preferably on vertically-arranged tracks. At the two lower angles, where the course of the conveyer changes from the horizontal to the vertical, the tracks B overlap and are curved to ease the wheels *b* around the corner. The horizontal track is on the outside and the vertical track on the inside, and the distance apart of the concentric tracks at the curve is a trifle greater than the diameter of the track-wheel *b*. This construc-

tion of the track obviates the necessity of an idler carrier-wheel at these turning-points. At one of the upper angles, (by preference,) where the course of the conveyer changes from horizontal to vertical, I mount a pair of driving-wheels, G, in the nature of sprocket-wheels, on a shaft, *g*, which may be driven from any source of power. The conveyer passes over the wheels G, which have particular circular peripheral recesses *e* of the proper size, and properly spaced to receive the track-wheels *b* of the conveyer, and the parts *f* of the wheels G take between said track-wheels, and by acting upon them drive the conveyer. The wheels G will drive the conveyer equally well in either direction.

The object I have in view in arranging the flanged track-wheels *b* to engage recesses in the sprocket-wheel G, instead of arranging said wheel to engage the pivots or wheel-axes, is that the wheels *b* serve as flanged sleeves at the points where the axes engage the sprocket-wheel. I thus effect an important economy in being able to dispense with the flanged sleeves that would otherwise be required in addition to the wheels. With the conveyer arranged and driven in the manner described, let it be assumed that it is desired to transfer coal (for example) from the car F to one of the pockets D. The shaft *g* and wheels G will be set in motion, so as to move the conveyer in the direction of the arrows and the coal in the car will be dumped (in the usual manner) into a hopper, *h*, located in the chamber or part E and directly over the conveyer. As the continuous series of buckets moves along under the hopper, the coal will fall in a continuous stream from the hopper into same. As the buckets stand close together, none of the coal can fall through between them, and consequently it will all be caught and carried along by the conveyer. As the full buckets pass from the horizontal to the vertical part of the course of the conveyer, gravity keeps them right side up, as will be well understood. As they pass from the vertical to the upper horizontal part of the course, they again assume their first positions and move on in a continuous series. It is not essential that the upright tracks shall be vertical; but I find it economizes space very materially to arrange them in this way, and this economy is sometimes very important. The dumping-cams *k* along the upper track, B, are arranged one pair adjacent to each chute *l* destined to receive the coal discharged from the bucket and deliver it into one of the pockets D. These dumping-cams *k* and the corresponding cams, *i*, on the buckets have been hereinbefore described, and I need only say here that one set of dumping-cams will be required at each dumping-point, but that only one set will be or need be operative at any given time. In Fig. 6 all the cams *k* are represented as inoperative and hanging down except one set.

Of course a chute at one of the dumping-points may be made to convey the coal into the storage-room C of the warehouse, instead of

into a pocket D; or, if the coal is to be transferred from the storage-room C to the car F, it can be fed to the conveyer through a suitable hopper, *p*, in the floor of room C and discharged into a bin, H, over the car, and then allowed to run through a hopper, *q*, in the bottom of said bin into the car. Thus it will be seen that by means of the simple arrangement herein shown the coal or other material may be conveyed from a car to any part of a warehouse, from one part of the warehouse to another part and from any part of a warehouse to a car, and this is effected by a single endless conveyer the path of which is in a single vertical plane and wholly devoid of twists or lateral curves.

My conveyer is designed to be stiff laterally, and it has no joints to enable it to flex between the pivotal axes of the buckets. This latter construction enables me to bring the buckets close together without danger of accidental collision from flexure of the links between them. I prefer to make the buckets semi-cylindrical, as this form yields the greatest capacity; but so long as they are capable of rotating freely on their pivots without collision when arranged in a continuous series, as described, the form is not essential.

In Fig. 5 I have shown how buckets mounted and arranged in a continuous endless series to form a conveyer may be dumped or emptied by other means than that hereinbefore described. As shown in this figure, the buckets are provided with hinged bottoms *r*, which are normally held closed by catches *s*. When the buckets are thus constructed, a stud or cam projection, *k*, similar to those before described, will be so placed on the track as to trip the catch *s* at the proper time and allow the bottom *r* to fall, and thus permit the material in the bucket to fall out. A second similar stud or cam projection, *t*, placed on the track ahead at the proper point, serves to raise the hinged bottom to its place, when the catch *s* will again engage and hold it. This construction and operation is clearly illustrated in Fig. 5.

In the application of my conveyer as herein shown for elevating materials it will be seen that the endless system of connected buckets passes entirely around the chambers containing the coal or other material, its lower horizontal portion receiving the material, its upper horizontal portion delivering the material, its ascending portion elevating the material, and its descending portion returning empty. I thus avoid the transfer of the material from one conveyer to another and the use of a special elevator.

Having thus described my invention, I claim—

1. The combination, to form a conveyer, of an endless series of pivotally-mounted gravity-buckets, A, the rigid links *c*, connecting and distancing said buckets and coupled at their

ends to the pivots of said buckets, and the track-wheels on the pivots of said buckets and supporting the centers of the latter, substantially as set forth.

2. The combination, with the pivotally-mounted gravity-buckets A, provided with oval symmetrical cams *i* on their ends, the connecting-links *c*, and supporting-wheels, of the dumping-cam *k*, of symmetrical form, arranged along the track in the path of the cams on the buckets, said cams being relatively arranged, substantially as described, whereby the buckets are tilted on their pivots, for the purpose set forth.

3. The combination, with the buckets A, of semi-cylindrical form and provided with pivots at their axes, of the distancing-links connecting said buckets in series and coupled to the buckets at their pivots, the bucket having the same length substantially as the connecting-link, whereby the lips or adjacent margins of the buckets are brought together, for the purpose set forth.

4. An apparatus comprising an upper and lower chamber in a structure, adapted to receive and hold materials such as coal and the like, an endless and continuous conveyer having connected gravity-buckets which stand close together when receiving, and supporting track-wheels for said buckets, the driving sprocket-wheels, and a track on which said track-wheels run, said track comprising a lower portion below the said lower chamber, an upright portion for the ascending part of the conveyer, an upper portion over the said upper chamber, and an upright portion for the descending part of the conveyer, said track lying wholly in a vertical plane, as set forth.

5. An apparatus comprising the elevated chambers or receptacles, as D and H, with chutes *l*, leading into the upper part thereof, and the lower chambers or receptacles, as E and C, with outlets, as *k* and *p*, in their floors, the horizontal track below the lower chambers, the horizontal track over the upper chambers, and the two vertical or upright tracks, all of said tracks being in the same vertical plane, the endless conveyer having supporting-wheels mounted on said tracks, the dumping-cams on said upper track, and the driving-wheels G of said conveyer, substantially as set forth.

6. The combination, with the buckets of the conveyer and their cams *i*, of the dumping-cam *k*, pivoted at one side, and the locking-bolt *o*, adapted to engage and support the other side of said cam, substantially as and for the purpose set forth.

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

GEO. W. McCASLIN.

Witnesses:

J. A. HOVEY,

JAS. J. KENNEDY.