

No. 702,894.

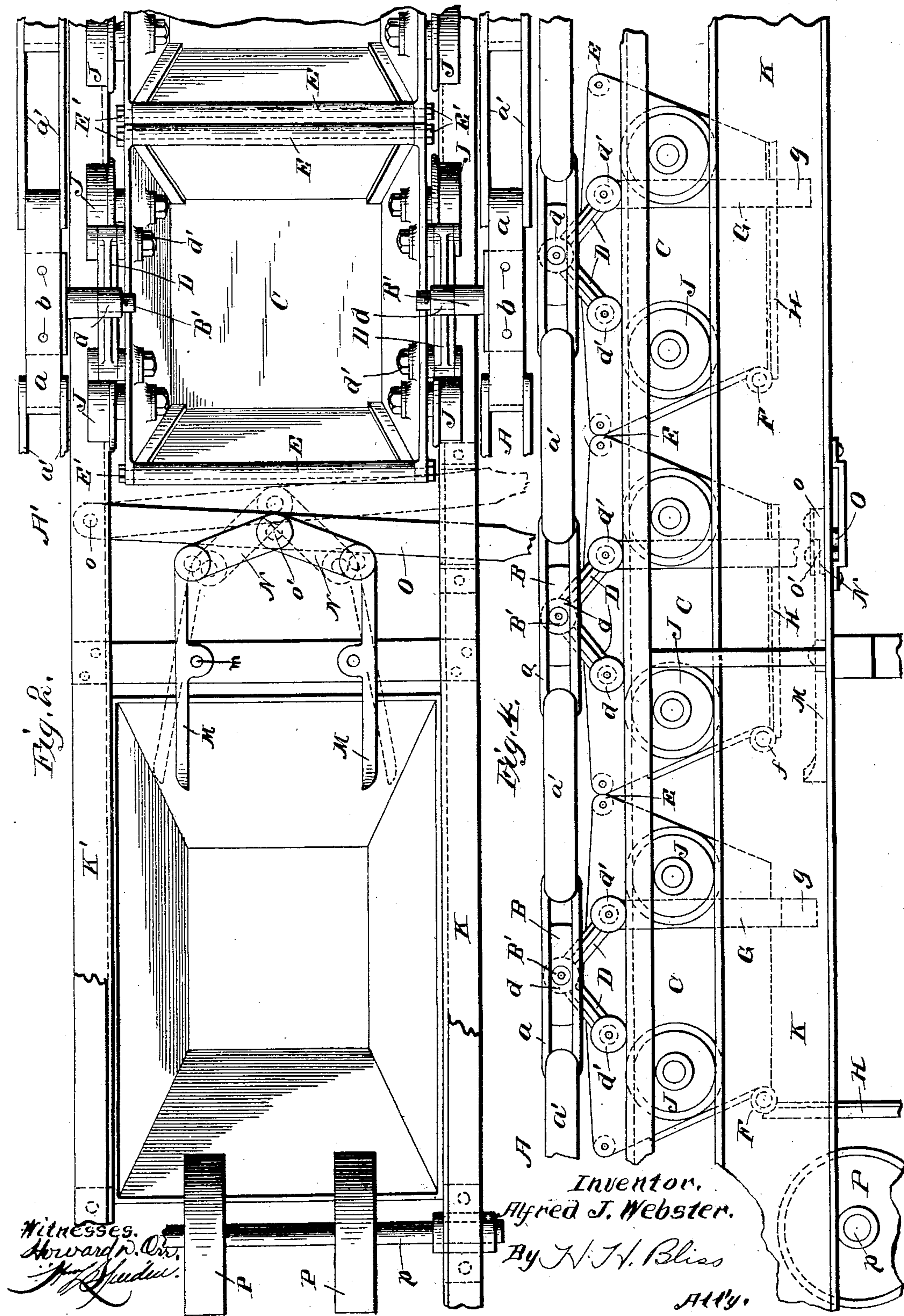
Patented June 17, 1902.

A. J. WEBSTER.
CONVEYER.

(Application filed Sept. 14, 1895.)

(No Model.)

2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

ALFRED J. WEBSTER, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY, OF COLUMBUS, OHIO.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 702,894, dated June 17, 1902.

Application filed September 14, 1895. Serial No. 562,486. (No model.)

To all whom it may concern:

Be it known that I, ALFRED J. WEBSTER, 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; and I do declare the following to be a full, clear, and exact description of the invention, such as 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.

Figure 1 is a side elevation of a sufficient portion of a conveying apparatus to illustrate the method of embodying my improvements. Fig. 2 is a plan of a part thereof on a larger scale. Fig. 3 is a cross-section. Fig. 4 is a side elevation of a part, showing the method of closing the buckets.

In the drawings, A A' indicate two chains, which may be of any usual form, though I prefer for most purposes to employ chains having links of the character illustrated.

a indicates bent strap or flat bar links, and a' indicates coupler-links arranged alternately with the strap-links a. The links a are each provided with blocks or bars B, inserted between the top and bottom parts and secured by rivets or otherwise, as at b.

B' is a stud or arm projecting inward from the block or plate B and serving as the pivot for partly supporting the carrying-bucket.

The buckets are each indicated as a whole by C. As concerns their shape at the sides and ends, they may be made in any suitable way; but I prefer to have them of about the character shown—that is to say, with ends and sides which slope inward and downward somewhat. At each end of each bucket there is a support provided by means of two arms D, which are preferably cast integral and have three eyes, the eye d being at the joint of the arms and those at d' being at their ends. The lower ends are pinned or otherwise fastened to end parts of the bucket. The eye at d is pivoted to the arm B', that extends inward from the link-bar. The buckets are so poised with respect to the pivotal support that they shall hang as truly centrally as pos-

sible and in such a manner as to be supported and travel uniformly horizontally. The adjacent edges of the buckets come approximately together, and to insure a closing of the space between them with means that shall avoid friction I employ tubes or movable rods, as at E. In the construction shown these are pieces of pipe, through which pass shouldered and threaded rods which extend from the outside of one bucket end piece to the outside of the other and through them both, so that the rods can be firmly fastened by the nuts at E', the tubes, however, being free to rotate. When the buckets are suspended in their normal position, the pipes or tubes E are brought into easy contact each with the next and are held together in such a way as to provide a practically tight closing of the space between them to prevent the escape downward of any of the material with which they are loaded; but at the same time the contacting surfaces can smoothly roll one upon the other freely, so there is no cramping or binding of either of the buckets.

There are places in the path of the buckets—as, for instance, where they begin to pass from a straight line to a curved line when reaching a wheel, and vice versa when leaving a wheel—where there is liability for the side wall of the leading bucket to impinge upon the upper edge of the following bucket, due to unevenness of loading, swaying motion, &c. By having an antifriction-roller of the character of one of the tubes E this bearing of one bucket against another is prevented from severely scraping, straining, or wearing, as a rolling contact is provided.

The bottom of each bucket is held in place by a hinge and a spring clasp or latch. The hinge is indicated by F and may be of any suitable sort. As shown, there are two pairs of eyes, one part of one pair being riveted to the back wall of the bucket, as at f, and the other part of the pair being riveted to the bottom, as at f'.

f² is a hinged rod passing through the eyes of the two pairs and serving as a pintle for their articulation.

G indicates spring-latches. They are secured to the respective end pieces of the bucket and are adapted to have their oper-

ative ends *g* swing outward laterally and back, so that the shoulders can be released from or engaged with the under sides of the swinging bottoms *H*.

5 I indicates the wheel at that end of the elevator where the chain and buckets begin to rise. This wheel also may be of any preferred form adapted to engage with and guide or drive the chains. Adjacent to it there is
10 arranged a guideway adapted to engage with corresponding guide parts on each of the buckets. The latter consist of flanged wheels *J J*, which are arranged in pairs, each pair lying outside of the end pieces of the bucket
15 and have their axes in such horizontal plane as advantageously to support the load.

I prefer under most circumstances to support the buckets throughout their entire travel by means of these wheels and the opposing rails or equivalent guides, as well as to have such guides immediately adjacent to the driving or guiding wheels.

As shown, the horizontal parts of the conveyor comprise horizontal guide rails or bars
25 at *K K'*. At the place where the buckets approach the wheels these guide rails or bars are curved to follow lines more or less approximately concentric with the wheels, as shown at *K²*. The action of the parts just
30 described will be readily understood. The buckets in turn move along the said guideways, and as they successively reach the curved guide each is lifted by the chain moving around the wheel *I*. At first the rear
35 wheel *J* is carried away from the guide, the front wheel still bearing against it at *K²*, as shown in Fig. 1, the bucket remaining, as will be seen on inspection of the drawings, horizontal at all times. At *L* there is a supplementary guide inside of the chains and
40 opposite and parallel to that at *K²*. It commences at just about the horizontal plane where the load of the bucket is removed from the outer guide *K²* entirely and acts to prevent any undue swinging of the bucket relative to the chain. From this plane both the guides *K²* and *L* are carried upward on substantially vertical lines until they approach the upper guide-wheel, where they are again
45 curved around its axis in substantially the same manner as that above described.

I have shown a conveyor having its parts so arranged that the material to be transported can be delivered thereto on the "lower
55 run" and discharged therefrom at any desired point on the "upper run."

Heretofore many devices have been experimented with in the attempt to secure a perfect discharge of conveyor-buckets of this
60 sort and also to secure such discharge at any of several points.

One of the objects of the present invention has been to produce a mechanism of the simplest character possible by which all of these
65 ends can be attained.

At *M* there are two trip arms or levers respectively pivoted at *m* on a cross-bar lying

below the path of the buckets. They are connected at their ends by means of a toggle-joint *N* to an operating bar or lever *O*, the
70 latter being pivoted at *o* to a suitable part of the frame and at *o'* to the toggle-joint. This lever or handle can be placed at will in either of two positions, as shown by full and dotted lines in Fig. 2.

When the parts are in the position indicated by the full lines, the trip arms or levers *M M* are in their inactive position and are so situated that the spring-latches *G* move past them normally without impinging upon them; but
80 if said parts be put in the position indicated by the dotted lines in Fig. 2 the free ends of the trip bars or levers *M* are thrown out into the path of the latches *G*, and as a result when the latter reach them the sustaining-shoulders below the bucket-bottoms are moved outward and the latter are released, whereupon the load from each bucket is instantly dropped into whatever hopper or chute is provided for its reception.

It will be understood that in most cases there will be a series of the trip devices, so that the material can be carried from one point to another as desired and discharged where wanted.

The bottoms are automatically closed immediately after the loads in the buckets are entirely discharged by another simple effective device, which consists of one or more rollers or wheels, as at *P*, mounted to rotate with
100 or roll upon a shaft at *p* transverse to the path of the conveyor and below it. The top part of the periphery of the wheel or wheels is in a horizontal plane a short distance below the normal plane of the bottom. After the bottom has been tripped and dropped it will impinge upon the wheel or wheels *P* shortly after dropping and the latter will swing it back to its horizontal position and compel it to open the latches *G* by pressing against the inclined
105 inner edges of their lower ends, and as soon as it has been pressed up far enough the catch-bars spring into place below it, and it is ready to receive another load.

I am aware that prior to my invention it
115 has been proposed to retain the swinging bottom of a conveyor in closed position by means of spring-pressed arms arranged at the sides of the bucket and to release such bottom by means of stationary abutments adapted to
120 contact with the locking-arms. Such a construction is objectionable, however, because it necessitates dumping every bucket at the same point. With my construction, as above pointed out, it is possible to readily move the
125 arms *M* into such position as to permit the buckets to pass over the same without being dumped, if desired. Again, it has been proposed to secure the hinged bottom of a conveyor-bucket in its closed position by a catch
130 secured to the side of the bucket opposite the hinge connection of the bottom and to employ a swinging arm arranged centrally between the track-rails on which the buckets

are supported for releasing said catch; but with such a construction and arrangement the catch and operating-arm are both in the path of the material escaping from the bucket and are liable to be damaged thereby. In my construction the catches are arranged at the ends of the bucket out of the path of the material escaping therefrom.

What I claim is—

1. In a conveyer, the combination of the propelling-chains, a block secured to each chain and provided with an inwardly-extending pin, a bucket, and arms connected to the bucket at one end and having their other ends pivotally connected to the inwardly-extending pins, substantially as set forth.

2. In a conveyer, the combination of the two parallel propelling-chains, blocks secured to said chains in line with each other, guide-rails arranged at one side of and extending parallel to the chains, a bucket having guide-wheels fitted to ride on said rails, and arms pivotally connected to the blocks and also connected to the bucket, substantially as set forth.

3. In a conveyer, the combination with a series of buckets arranged to form a continuous trough when in line with each other, of antifriction-rollers arranged at the adjacent edges of each pair of buckets, substantially as set forth.

4. In a conveyer, the combination of a guideway, an endless propelling mechanism, and a series of buckets, connected to said propelling mechanism and each having guide wheels or rollers mounted so as to travel on the guideway, and an antifriction-roller, E extending transversely of the bucket and adapted to receive the thrust of the adjacent bucket, substantially as set forth.

5. In a conveyer, the combination of the propelling-chains, a series of buckets connected therewith and having hinged bottoms, a catch connected to one of the walls of each bucket to hold the hinged bottom in a closed position, a tripping device, and means for adjusting said tripping device laterally toward and from a position in the path of a projection on each of said catches, substantially as set forth.

6. In a conveyer, the combination of the parallel propelling-chains, a series of pins or studs, B', rigidly secured to each of said chains and extending inwardly therefrom, a bucket arranged between said chains, and two sets of supporting-arms, D, pivotally supported on transversely-alined pins or studs, B', at their upper ends and having their lower ends connected to the walls of the bucket, substantially as set forth.

7. In a conveyer, the combination of the parallel endless propelling-chains, the blocks, B, secured to said chains at regular intervals and each having an inwardly-extending fulcrum stud or pin, which is in line with a corresponding oppositely-extending pin, a series of buckets, and the oppositely-inclined inte-

gral supporting-arms, D, fulcrumed at their center upon one of said pins or studs, B', and having their ends connected to the bucket, there being two sets of said arms for every bucket, one on one end and one on the other, substantially as set forth.

8. In a conveyer, the combination, with the propelling-chains, and the buckets connected to said chains to move therewith and having hinged bottoms, of latches secured to the buckets and adapted to maintain the bottoms thereof in their closed positions, and a horizontally-movable lever fulcrumed below the buckets, and means for moving said lever into or from the path of the latches, substantially as set forth.

9. In a conveyer, the combination with the propelling-chains, and the bucket connected to said chains to move therewith and having a vertically-swinging bottom, of spring-latches connected to opposite sides of the bucket and adapted to extend below the bottom to hold the latter in its closed position, two levers fulcrumed below the bucket for releasing the latches from the bottom, an operating-lever, and a toggle-joint connecting the operating-lever with the latch-levers, substantially as set forth.

10. In a conveyer, a series of buckets arranged each closely adjacent to the next, a carrier for the buckets moving from one line to another, and an antifriction-roller secured to each bucket and lying between the adjacent edges thereof and adapted to contact with the adjacent bucket, substantially as set forth.

11. In a conveyer, the combination with the buckets arranged in series edge to edge, and each having a downward-inclined wall adjacent to the neighboring bucket, of an antifriction-roller carried by said bucket near the upper edge of the said inclined wall and adapted to contact with the neighboring bucket at times of swinging of either of the buckets, substantially as set forth.

12. In an endless conveyer the combination of the chains, the series of buckets, the pivots between each bucket and the chains arranged centrally above the bucket, the track having the horizontal section and the upwardly-extending sections, the supporting roller or wheel at the end of the bucket in front of the central transverse plane thereof and adapted to rest continuously against said horizontal and vertical track-sections and the joining devices between the bucket and the said pivots and connected to the bucket at points in rear of its said central transverse plane, whereby as the bucket travels upward the inner part thereof has support against the thrust from the said wheel, substantially as set forth.

13. In a conveyer the combination of the endless chain, the buckets, each united by pivotal connections to the chains at points above the centers, vertically, of the buckets, and two wheels at each end of each bucket

below the top portion thereof, a horizontal track upon which both of said wheels rest in common, and vertical tracks, one bearing against the outside of one wheel, and the other against the inside of the other wheel, substantially as set forth.

14. The combination with a conveyer-bucket, of a support for uniting it with a chain comprising diverging arms connected with the end parts of the bucket, and having a hinge or pivotal bearing for connection with the chain where the said arms join, substantially as set forth.

15. In a conveyer the combination with a pair of parallel chains, of a series of buckets arranged between the chains, supports for uniting the buckets with the chains, each support comprising diverging arms which are connected with a bucket at separated points, hinge or pivotal connections between the chain and the said supports, supporting rollers or wheels connected with the buckets, and

tracks upon which said wheels run, substantially as set forth.

16. In a conveyer the combination of a pair of parallel chains, suspended swinging buckets arranged between the said chains, supports for connecting the buckets with the chains, each comprising a pair of diverging arms which are secured to the ends of the buckets at points respectively in front and rear of the axis of suspension for that bucket, and pivotal or hinge connections between the chains and the said supports, the said diverging arms being so arranged as to bring the said pivotal or hinge connections for the buckets near the top portions thereof, substantially as set forth.

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

ALFRED J. WEBSTER.

Witnesses:

CHARLES W. MILLER,
ADIN S. HARTLE.