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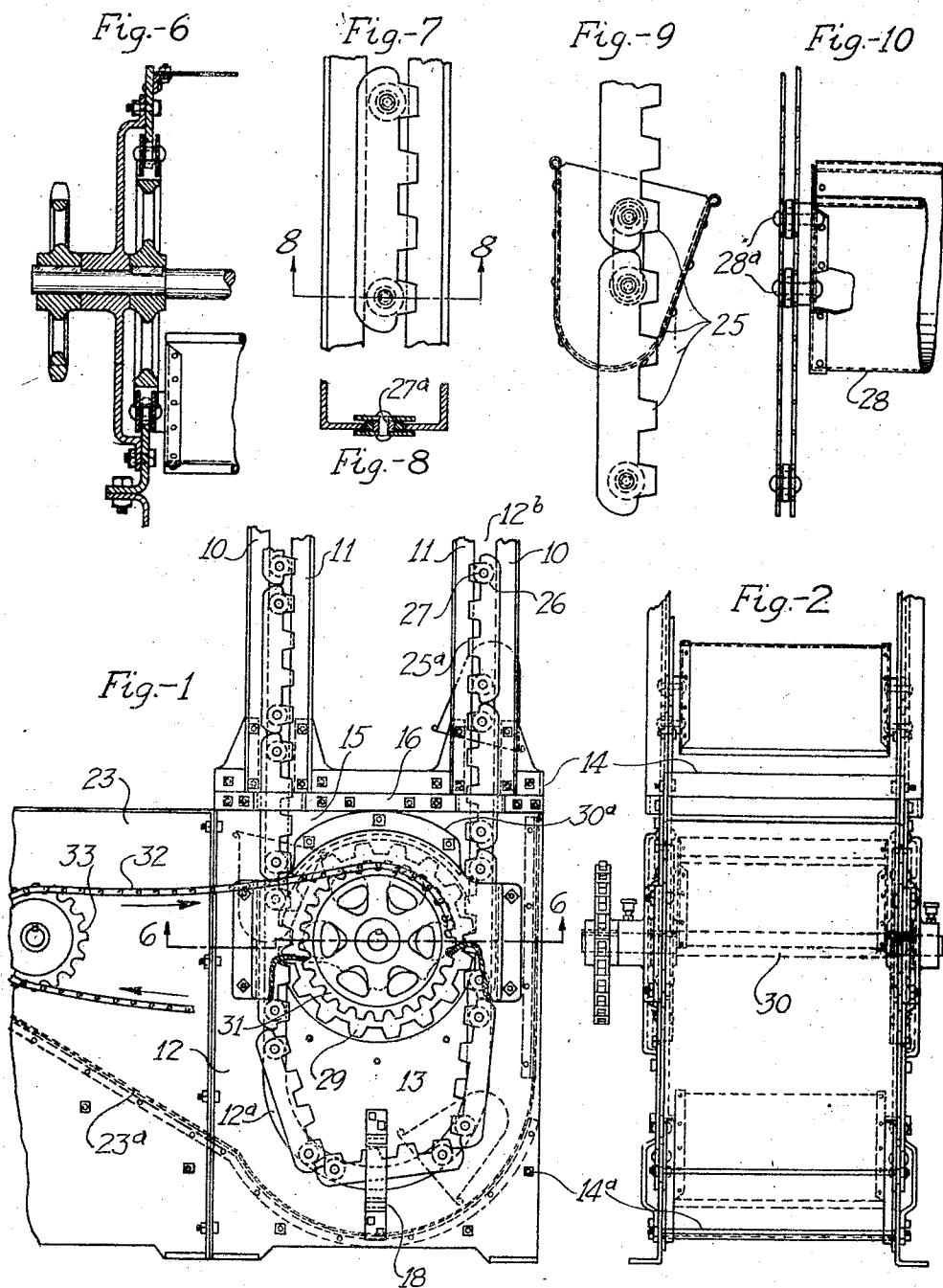
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G. B. READ

ELEVATOR

Filed August 26, 1922

3 Sheets-Sheet 1



Witnesses
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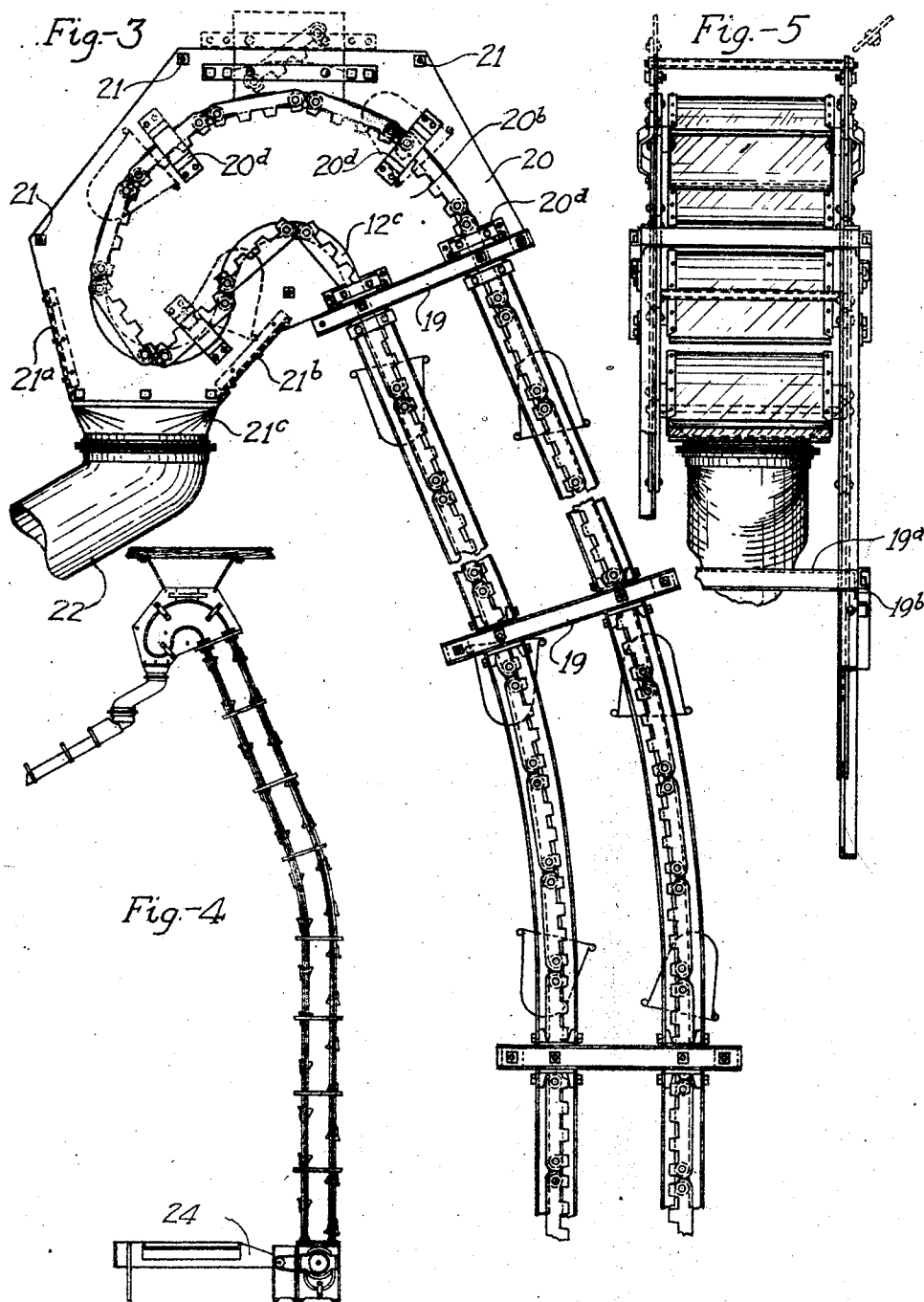
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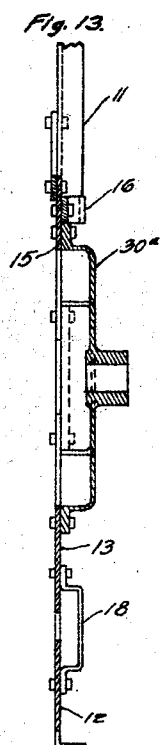
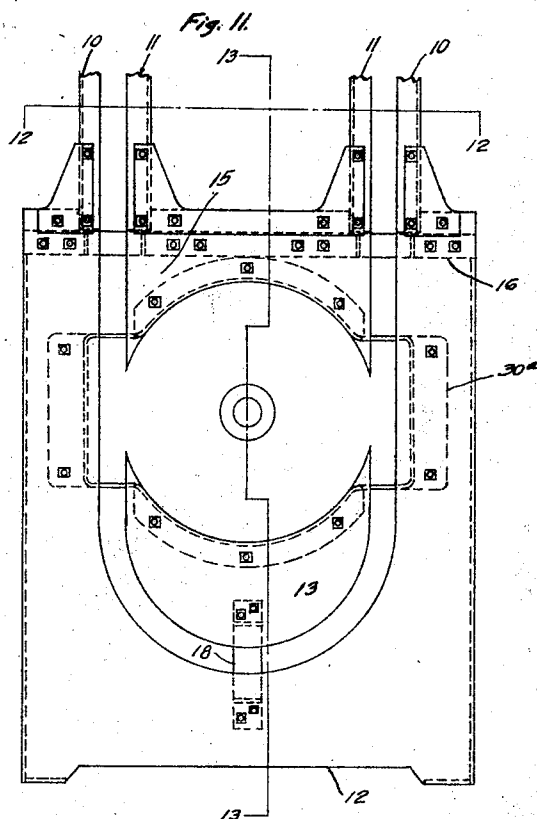
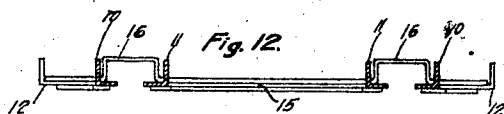
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3 Sheets-Sheet 3



WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE B. READ, OF BLOOMINGTON, ILLINOIS.

ELEVATOR.

Application filed August 26, 1922. Serial No. 584,392.

To all whom it may concern:

Be it known that I, GEORGE B. READ, a citizen of the United States of America, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Elevators, of which the following is a specification.

My invention relates to elevators and has special reference to an elevator designed to handle grain and the like.

The invention comprises a framing including a boot and head portion and intermediate reach portions connected with the head and boot and the fashioning of the connected members to form supports and a guide-channel for plural cog rack units constituting a train or succession of units in connection with which carrier buckets or flights are supported. Also, the invention includes the relationing of a gear or sprocket wheel to a cog rack train, whereby active driving force is applied directly to the cog train at a point intermediate of the elevating reach thereof and also serving as a support of the return cog rack reach whereby the cog rack units intervening between said wheel and the bottom of the boot are relieved from stress or strain either from the elevating run or actions or from the weight of the return run.

The invention also includes the special fashioning of the cog units whereby they are adapted to co-act in conjunction with flanged members of the framing parts and body portions of the head and boot that are respectively arranged and fashioned to form a continuous travel way for the cog rack train.

The invention also includes minor matters of structural detail and combination of parts hereinafter more particularly described and claimed.

Figure 1 is a side elevation, showing the boot portion of the elevator and extension framing members constituting an intermediate part between the boot and the head of the elevator.

Figure 2 is a rear elevation of Figure 1.

Figure 3 is a side elevation of the head portion of the elevator and a portion of in-

tervening framing members between said head and the boot.

Figure 4 is a side elevation of the elevator in complete assembly.

Figure 5 is a rear elevation showing the head section and attached swivel spout.

Figure 6 is a transverse sectional view in part on the line 6—6 of Figure 1 and illustrates the manner of relationing a drive shaft and gear wheel to the framing structure and the relationing of said gear wheel to cog rack members.

Figure 7 is a side elevation of a portion of framing members and a cog rack unit illustrating the manner of relationing the same.

Figure 8 is a cross sectional view on the line 8—8 of Figure 7.

Figure 9 is a detail view showing the manner of relating a carrier bucket to cog rack members, and,

Figure 10 is a front elevation showing the same subject matter as disclosed in Figure 9.

Fig. 11 is a front elevation of the boot member shown in Fig. 1 with the cog train units and drive mechanism omitted;

Fig. 12 is a top plan view, with parts in section, of the boot member below the plane indicated by the line 12—12; and

Fig. 13 is sectional view taken on the line 13—13, of Fig. 11.

The inventive thought is directed to an improvement over elevators employing sprocket chains in connection with carrying buckets or flights, wherein difficulties connected with breakage, etc., accompanying the use of sprocket chains, are eliminated and furthermore, to the saving cost and the reduction of driving force to the minimum of horse-power.

Referring to the drawings, 10 and 11, are framing members, the same in the instance here exemplified being formed from angle bars and arranged in pairs as shown and in spaced relation (into side members) to form channel ways in conjunction with associated members for guiding and supporting a cog rack train which serves, in connection with buckets or flights, as a carrying means in an elevator.

12, refers to side members of the elevator boot, the same being cut out at its central portion in elongated arc form, this inner edge forming the outer boundary of a travel-way 12^a.

13, is a side wall portion, or plate, similarly fashioned in arcuate shape having its outer edge spaced from the inner edge of side wall portion 12 and, in addition to serving as closure members for the side of the boot, also serves at its outer edges, as the opposed member to the edge of wall 12 of the travel-way 12^a. The side wall members 13 are secured together in spaced relation by means of transverse bar members 14 as at their upper end and by rods as 14^a at their lower portions.

15, is also an interior side wall member, its outer marginal edges having the same relative space relation with respect to side wall members 12 as interior plate or wall member 13 to form a continuation of the travel-way space, said side wall member 15 being connected to side wall member 12 of the boot by means of transverse bar members 16, and side wall members 13 are secured to the outer side wall member 12 by means of offset strap or bar as 18, the offset portion serving to provide clearance for the travel of cog rack members hereinafter referred to.

The intermediate framing members 10 and 11 between the head and boot are connected at their lower ends with the boot by means of suitable bolts and nuts and are spaced apart intermediate their length to form a rectangularly shaped frame by means of transverse bars 19 at the sides, by means of similar transverse bars as 19^a at the opposed width portion of the frame, said bars being fashioned with downwardly extending spacing of members 19^b deflected from the body of the bars which seat against the inner faces of the opposed framing members 10 and 11.

To the upper extremities of framing members 10 and 11 is attached a head member comprising side plate members 20 attached to framing members 10 and 11 by means of cast plate members as 20^a, said side plate members being cut out centrally in arcuate fashioning as shown in Figure 3, the inner edges of the cut out portion registering with the inner edge of the outer framing members 10.

20^b is also a side plate member, having confirmatory arcuate fashioning with that of the inner edge of side plate 20 and is spaced therefrom to a degree that facilitates its outer edge registering with the inner edge of framing members 11, thereby forming in the head the continuation 12^c of the travel way 12^a and 12^b respectively, in the boot and framing members. The side plate 20^b is secured to the plate 20 by means of offset strap members 20^a, corresponding in function and purpose to strap member 18 con-

nected with the boot. The side plate members 20 are suitably spaced apart by means including rods, as 21, and transverse closure members 21^a, 21^b, adjacent to discharge portion of the head.

21^c is a chute member attached to the delivery portion of the head.

22 is a swivel spout relationed to the head in common well known manner.

23 are side extension members from the boot and are suitably secured to the latter and serve in conjunction with a transverse bottom portion 23^a, as a chute for delivering grain to the elevator boot.

24 is a cross conveyor pivotally related to extension members 23 and arranged with reference to the chute portion to discharge grain thereinto for delivery to the bottom portion of the elevator boot. As the cross conveyor and chute structure is not a part of my present invention, detailed reference thereto is therefore omitted.

25, are cog rack sections hereinafter referred to as cog rack units. Referring to the cog rack units, 25^a are short bar members fashioned respectively at one edge with cog teeth.

26, are roller members, interposed between said short bar members and are pivoted thereto by means of pins, 27, said pins being fixed in connection with said bar members in a manner to formally unite them in such definite space relation as to accommodate the interposition of the roller members in a free turnable relation. Spacing blocks may be interposed in place of the rollers if desired.

27^a, is a spacing member interposed between the bar members and serves as a bearing for rollers 26. (See Figure 8.)

The fashioning of the cog unit members is such that they may be entered into the travel way of the elevator structure and the relative portioning between the roller members and the travel way is such that when so entered said rollers will be in easy travel relation with said travel way in the framing, boot and head members which conjointly form the complete travel way.

A plurality of said cog rack units are designed to be disposed in the travel way of the elevator structure including a number sufficient to constitute a train comprehending at least a continuous run extending from the boot portion of the elevator to a point at the downwardly inclined travel way portion of the head, whereby force supplied successively to cog rack sections will cause advancement of the complete train in the elevating reach portion and will effect carrying successively of said rack sections to a point in the travel way in the head where gravity will act to advance said sections through the continuing way in the head and thereafter through the return reach section

of the elevator to a position where the applied force may again be exerted upon the units successively when functioning in connection with the elevating reach portion of the train. Of course, any number of rack sections may be employed as may be desired, either to constitute a complete unending train (with sufficient clearance provision provided) or any number less than a complete unending train except, of course, that a sufficient number are required, as before explained, to constitute a complete elevating reach.

The adaptability of the cog rack train to work with a greater or lesser number of unit sections makes it possible to remove sections of the complete train in case of breakage or injury as, for instance, to a bucket member. This feature is one of advantage in the practical working of the elevator.

So far as the theory of structure is concerned, it is designed that the cog rack train shall comprise wholly independent units that are designed to be moved progressively within the travel way through the application of a co-acting cog or sprocket wheel acting successively in each rack unit. However, in practice it is necessary that buckets or flights shall be attached to the train and in the instance of the use of buckets as herein exemplified, shall be supported in definite positioning and, in view of this fact, the buckets, 28, herein shown are attached to certain adjacently located united rack sections by means of pivot members, as 28^a. (See Figures 9 and 10.) This manner of pivotally relating the buckets to the rack units facilitates deflection from a straight line travel of the unit sections in their course through the arcuate way portions of the travel way but permitting such relative turning between said bucket and rack units that the former may be caused to maintain the proper positioning to facilitate both their carrying and upsetting function for discharge in the practical working of the elevator.

I have provided means for affecting travel of the cog rack train within the travel way in the elevator structure which includes a sprocket or cog wheel 29, affixed to shaft 30, the latter being supported centrally by plate members 30^a affixed to side members of the boot, said plate members being fashioned with a depression to facilitate a degree of seating of the sprocket wheel.

Sprocket wheel 29 is spaced from the travel course in the bottom portion of the boot section, a considerable distance for the purpose of providing clearance space for the accumulation of grain therein and furthermore, to avoid friction in the co-action of said sprocket wheel with the cog rack frame. Means provided for driving

sprocket wheels 29, include a sprocket wheel 31, fixed to shaft 30 and driven by a sprocket chain 32, from a driven source as by a sprocket wheel 33. When sprocket chain 32 is driven in the direction of the arrow in Figure 1, sprocket wheel 29 will be turned and its teeth will successively engage with the teeth of the cog rack units to cause a progressive movement of the complete train of the latter to cause the buckets or flights to progressively travel to the bucket section for loading and upwardly for discharge and thereafter for substantial gravity return under the constantly receding support of tooth members of sprocket wheel 29, in opposed position to those on the opposite side which are acting to advance the cog rack train. In the defined co-active relationing of the cog wheel 29, with the successive cog rack units, it will be noted that the unit rack sections in the boot that are interposed between the lifting cog tooth of the sprocket tooth and the supporting cog tooth are thus left free from any stress either from the action of the driving sprocket wheel 29, or the weight of the return run of cog rack units and associated buckets. This relief from strain is desirable in the practical and economical working of the device.

What I claim is:

1. In an elevator, in combination, a boot member, its side portions provided with a travel way therein, a head member provided with a travel way therein, side members connecting the head and boot, provided each with travel ways therein registering with the travel ways, respectively, in the head and boot members, a plurality of disconnected cog units disposed within the continuous travel way formed by the connected boot head and side members, buckets connected at intervals of the reach, formed by the abutting cog units, a sprocket wheel, co-operating with the cog unit train, adapted to cause the same to be advanced within the travel way.

2. In an elevator, in combination, an elevator frame work, including boot, head and intervening connecting members, each provided with a travel way therein, respectively in register, to support and direct members of a conveyor element, a plurality of separate conveyor units abuttingly arranged within the travel way, carrier buckets disposed at intervals of the reach, formed by such units, supported on selected units, and means for advancing said cog unit train throughout the course of the elevating leg of the travel way, and in position with respect to the travel way of a return leg thereof where gravity action will return them into position to be engaged and advanced by advancing means.

3. In an elevator, in combination, an elevator frame work, a boot member, the side

walls thereof provided with a U-shaped travel way, a head member, the side walls thereof provided with a reverse curve, laterally and downwardly extending travel way therein, side framing members connecting the boot and head members, each provided with a pair of travel ways therein, registering with the travel ways in the boot and head, conveyor means comprising separate units, provided with cog members thereon, adapted to be arranged in successive contact relation throughout the course of one leg of said travel way, a cog wheel co-operating with said units, adapted to advance said units successively in one leg of said travel way and into position within the head member, where gravity may act upon said units successively to cause them to be returned for engagement with said cog wheel, and means for turning said cog wheel, bucket members disposed at intervals in connection with said cog train and suitably supported in connection with selected cog units.

4. In an elevator, in combination, a boot member, its side portions provided with a continuous travel way, a head member provided with a travel way therein extending laterally and downwardly into extended loop form, side members connecting the head and boot, provided each with a pair of travel ways therein, registering with the travel ways respectively in the head and boot members, a plurality of disconnected cog units, comprising spaced bar members with intervening roller members pivoted at their respective ends and provided each upon a marginal edge with cog members adapted to be arranged successively within the travel way, and in contact relation in their upward travel course, a cog wheel adapted to successively engage said cog units to cause the train to be advanced within the travel way, bucket members disposed at intervals with respect to the rack train and secured to selected cog units.

5. In an elevator, in combination, a frame work provided with a continuous travel way for a conveyor element, a plurality of disconnected cog rack units co-actively related for travel relation within said travel way and to form, in assembled relation, a cog rack train, carrier members connected to two adjacent units of the cog rack train, and means active to advance the cog rack train within the travel way in the elevator structure.

6. In an elevator, a frame comprising boot, head, and intermediate sections provided with a continuous travelway there-through, a plurality of non-connected units provided with cog members thereon adapted to form a train of abutting members during elevating projection, carrying members mounted on selected pairs of units of the

train, and means acting progressively on the separate units of the train to effect elevation of the same.

7. In an elevator, a frame comprising boot, head, and intermediate sections provided with a continuous travelway there-through including abrupt deflection at a point in the travelway of the head for co-action with carrying unit members to facilitate abrupt deflection of unit members of the train in promoting material discharge from carrying members thereon, a plurality of non-connected units abutably related constituting an elevating train, carrying means on selected units of said train, and means acting progressively on the separate units for advancing the abutted units to positions with respect to the separate units to facilitate gravity acting progression thereon within the return leg of the travelway.

8. In an elevator, in combination, an elevator frame work, including a boot, head and intervening connecting members, each provided with a travel way therein respectively in register to support and direct members of a conveyor element, a plurality of separate conveyor units abuttingly arranged within the travel way, carrier buckets disposed at intervals of the reach, formed by such units, supported on selected units, and means intervening between the terminals of said cog trains for engaging each leg thereof for causing elevation of one leg and supporting the rear members of the opposed leg.

9. In an elevator, a frame provided with a continuous travelway therein, a plurality of non-connected abutable carrying units constituting a train therein, grain supporting members mounted on selected pairs of units of said train, and means for advancing said train.

10. In an elevator, a frame provided with a continuous travelway therein, a plurality of non-connected abutable, carrying units constituting a train therein, grain supporting members mounted on selected pairs of units of said train, and means acting progressively on the train units for advancing the train.

11. In an elevator, a frame provided with a continuous travelway therein constituting elevating and return ways for carrying means, a plurality of non-connected units abutably related constituting an elevating train, carrying means on selected units of said train, and means acting progressively on the separate units for advancing the abutted units to positions with respect to the separate units to facilitate gravity acting progression thereon within the return leg of the travelway.

In testimony whereof I affix my signature.

GEORGE B. READ.