

April 19, 1938.

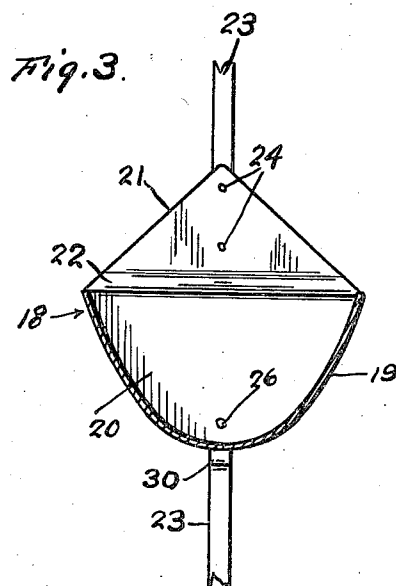
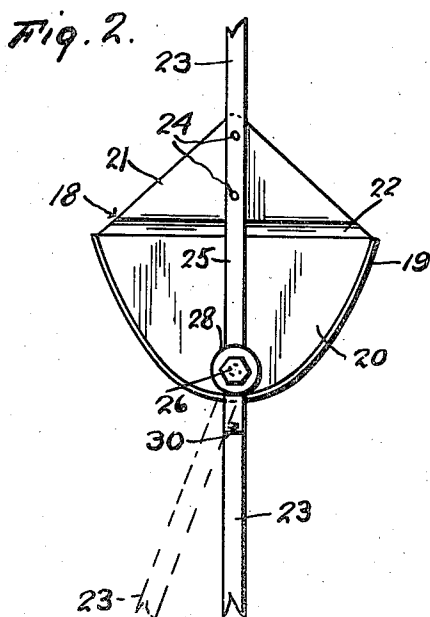
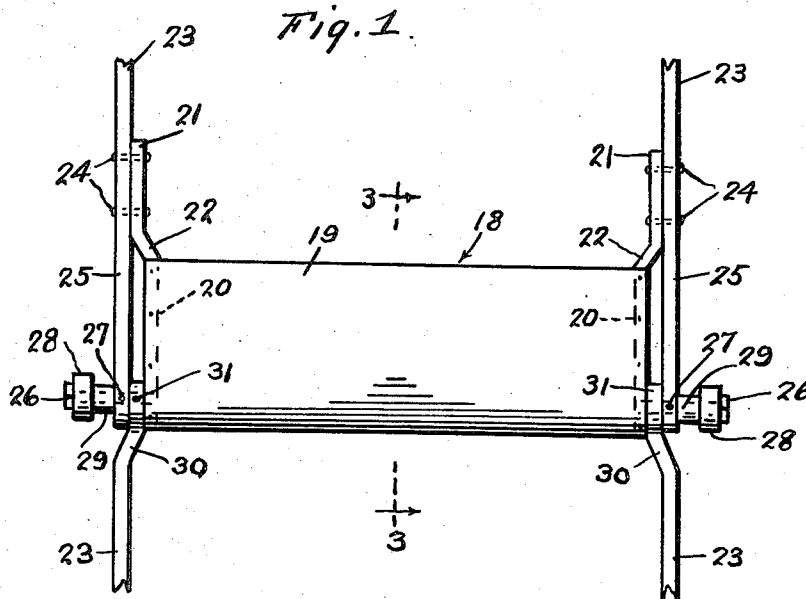
J. B. KUCERA

2,114,928

GRAIN ELEVATOR

Filed May 14, 1937

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

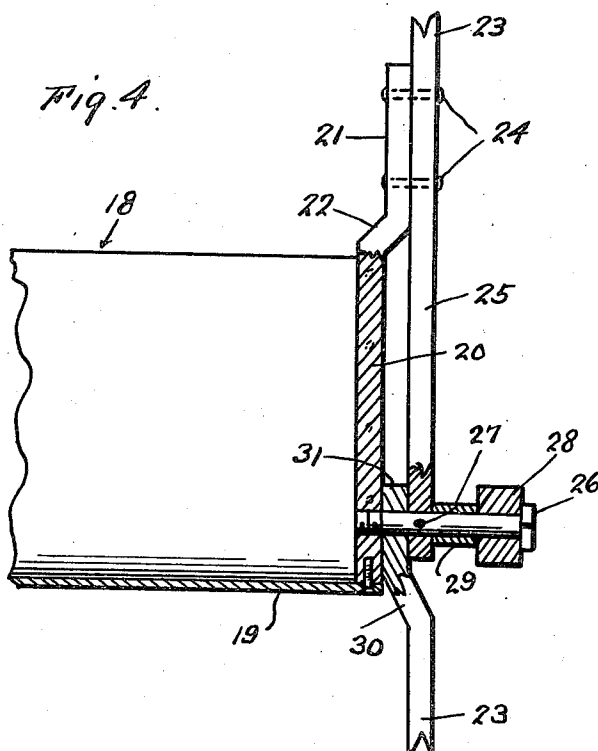


Fig. 5.



Fig. 6.

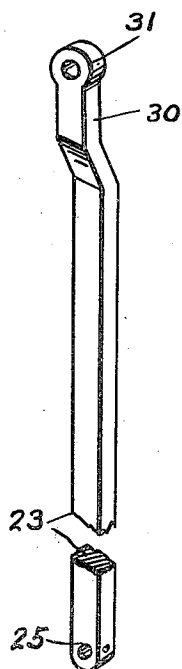
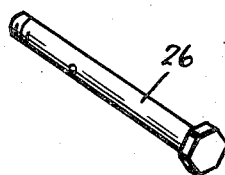


Fig. 7.



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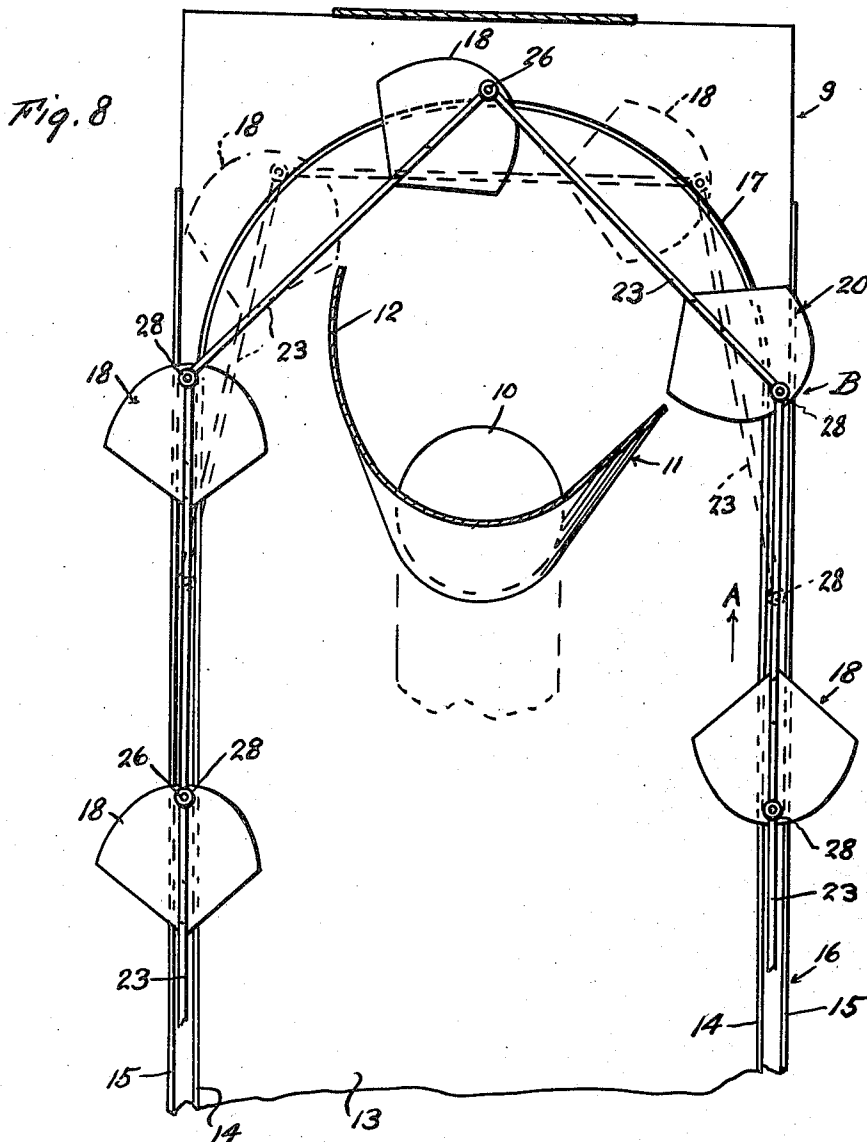
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GRAIN ELEVATOR

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,114,928

GRAIN ELEVATOR

Joseph B. Kucera, Traer, Iowa

Application May 14, 1937, Serial No. 142,704

1 Claim. (Cl. 198—151)

This invention relates to a structurally novel and improved elevator for farm use expressly designed to handle grain, for example, loose corn and the like.

5 I am sufficiently conversant with the general state of the prior art to which the invention relates to appreciate that many different types of track constructions, power propulsion devices, and endless bucket-type conveyors have been
10 adopted and utilized with varying degrees of success. Hence, in carrying into practical effect the principles of the present inventive conception, I have set out to do this through the use of a structural assemblage characterized by comparatively
15 new structural distinctions and features of refinement all carefully selected and mechanically coordinated to permit desired results to be attained in a more practicable and satisfactory manner.

20 One phase of the finally completed and accepted arrangement has to do with what is believed to be an ingenious bucket-equipped endless conveyor construction, this being characterized by specifically new buckets and an equally
25 practicable link-type endless chain.

An outstanding objective is, therefore, realized through the use of novel so-called chain units each of which includes a full capacity bucket and rigidly attached lifting, lowering, and dumping
30 links secured to opposite ends of said bucket.

An equally important accomplishment satisfactorily reducing to practice another object of the conception is a track structure expressly designed to coact with the aforementioned type
35 conveyor whereby to perfect what is believed to be a new principle of dumping properly timed to insure smooth and reliable action whereby to adequately accommodate the special conveyor and to safeguard its uninterrupted substantially auto-
40 matic action.

Other features and advantages will become more readily apparent from the following description and drawings.

45 In the drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a fragmentary elevational view showing what is believed to be the essence of the inventive conception in so far as it relates to the
50 bucket-equipped conveyor means.

Figure 2 is an end elevation of the arrangement depicted in Figure 1.

Figure 3 is a vertical or cross-sectional view taken approximately on the plane of the line
55 3—3 of Figure 1.

Figure 4 is a fragmentary view partly in section and partly in elevation showing the particular link and bucket construction.

Figures 5, 6 and 7 are perspective drawings of the important detail in the bucket and link construction. 5

Figure 8 is a fragmentary detail view, in section and elevation, showing the track construction and load receiving and discharging hopper.

Reference being had first to Figure 8, wherein a portion of the general assemblage is shown more or less along diagrammatic lines, it will be observed that the two principal phases of the inventive conception appear sufficiently illustrated to disclose the principle of tracking and dumping. All that is necessary in so far as this aspect of the invention is concerned is to call attention to the fact that the numeral 9 designates an appropriate inclosure or housing. This is provided with a discharge or outlet opening as at 10 designed to lead to any appropriate source of deposit such as a corn or grain bin (not shown). Coordinated with the discharge opening is the load reception hopper 11, this being of appropriate construction and preferably including an up-
20 standing shield or guard 12 on one side. One of the vertical upstanding side walls of the housing structure is denoted by the numeral 13 and this is a duplicate of the opposed wall (not shown). Both walls are therefore provided with fixed inner and outer guides 14 and 15 which cooperate in providing a track 16 for the novel conveyor means to be hereinafter specifically described. The main feature here to be noted is the fact that the connective or web portion of the inner track
25 14 is formed into a substantially semi-circular arch as indicated at 17, and this has its crest or crown portion disposed perpendicularly and directly above the load reception hopper 11. The curvature of this feature 17 of the track is expressly designed to cooperate with the particular endless conveyor means now to be described. 40

Briefly, the conveyor means comprises duplicate chains of an endless type composed of interconnected links, the links being directly attached
45 to the buckets. It is believed, however, that a better conception of the chief novelty may be exemplified by focusing the attention on the individual units which go to make up the endless chain. That is to say, the individual bucket and
50 link units which form the sections or component parts of the conveyor means as a general assemblage provide the important distinctions in said endless conveyor means. Referring to Figures 1 to 4, it will be observed that each bucket is de- 55

noted by the numeral 18 and comprises a suitable longitudinally or horizontally elongated receptacle portion 19. Closing heads, of a segmental type, 20 are riveted or otherwise fastened in the opposite ends of said trough-like receptacle 19. Each head has its upper end extended to form an adapter wing 21, this being substantially triangular and laterally and outwardly offset as indicated at the point 22. The rigid dumping, lifting and lowering link 23 is riveted or otherwise rigidly secured thereto as indicated at 24. This riveting connection 24 is made at a point intermediate the ends of said link 23, permitting one end 25 to extend down alongside the head 20 in spaced parallelism. At this point and on opposite ends of the bucket, I provide outstanding studs 26 here shown in the form of simple screw-threaded and headed bolts (see Figure 7). This means that the head 20 is formed with a screw-threaded hole and that the threaded shank of the bolt is threaded into said hole permitting the headed end of the shank to project at right angles to the closing head 20 of the bucket. The adjacent lower end of the part 25 of the link is apertured to permit passage of the bolt 26 there-through, the two parts being rigidly secured together as indicated at the point 27. As shown to advantage in Figure 4, there is a roller 28 mounted for idling on the outer headed end of the stud or bolt 26. This roller is fashioned to ride between the flanges or guides 14 and 15 of the aforesaid track 16. Located between the roller and the link 25 is a spacing collar 29 which constitutes an anti-friction element. Incidentally, in practice, a sprocket device is used to drive the endless conveyor chain and bucket arrangement (not shown) which sprocket is so made as to engage between the link 25 and the roller 28. Consequently the spacing sleeve 29 serves as an anti-friction element to reduce wear on the bolt 26. Also in this arrangement what may be called the outer end of each link is laterally offset in a direction inward toward the bucket end or head, as indicated at the point 30, said offset end terminating in an eye 31 which forms a well balanced and properly protected fulcrum for the bucket-end. It follows, therefore, that each bucket is in effect fulcrumed for pivoting between the laterally offset end 30 of the succeeding pair of links 23. This means, therefore, that ends 25 of the same links in the preceding pair constitute braces, these being rigidly attached in parallelism to the head 20. In other words, by extending the end 25 down, in relation to the drawings, and making the connection 27 with the fulcrum studs or bolts 26, a rigid assembly is insured.

It is also to be mentioned at this point that by providing the wings or extensions 21, the capacity of each bucket is increased and likewise convenient attachment is afforded for the lifting, lowering, and dumping links 23. Obviously, therefore, each bucket has spaced parallel arms or links 23 rigidly attached to the ends thereof for carrying the buckets up, dumping the buckets, and then lowering the buckets in a prescribed orbital path.

Reference being had again to Figure 8, it will be observed that the intake portion of the hopper 11 is disposed on a plane slightly below the beginning of the turn in the track 17. Consequently, as the conveyor moves up in the direction of the arrow A in Figure 8, as each bucket reaches the imaginary line B, its links, already traveling over the crown of the part 17, serve to bodily tilt the bucket inwardly. This begins to dump the bucket as soon as it approaches the hopper. As before indicated, the fulcruming action takes place by the swinging of the bucket in the bearing eyes 31 of the next succeeding pair of links in the next succeeding bucket unit.

To consider the principle of operation otherwise, it may be said that the chain links in the endless conveyor means travel in perpendicular lines until the curved end of the track formation is reached, whereupon the links 23 become levers for actually tilting or tipping the bucket to dumping position. By properly proportioning the length of the links with respect to the curvature of the feature 17, the operation is properly timed so that when the bucket being dumped is ready to move on its downward flight, it has been completely inverted and its contents discharged into the hopper 11. Thus, as before stated, the track and dumping means is one phase of the conception, while the conveyor means, irrespective of track and supporting structure, is the other phase of the invention.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary.

While the preferred embodiment of the invention has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

I claim:

An elevator of the class described comprising pairs of track means, each including inner and outer vertical flanges, a flange of arch-shape connecting the inner flanges of each pair of track means together at each end of the track means, a load receiving hopper placed between the upper portions of the track means and under the upper arched flanges, a plurality of buckets, each of substantially trough-shape in cross section and end pieces for the buckets each having an upper extension offset outwardly, a long pivot pin extending outwardly from the lower end of each end piece, a roller on the outer end of each pivot pin for engaging the track means and its arches, a pair of endless members each composed of elongated links, each link having one end fastened to the pivot pin, means for fastening the link, an appreciable distance from its fastened end to the extension of an end piece in a rigid manner, the opposite end of each link having an eye therein for receiving the pivot pin of an adjacent bucket to pivot on said pin and a sprocket engaging sleeve on each pin between the roller and the fastened end of a link.

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