

May 3, 1932.

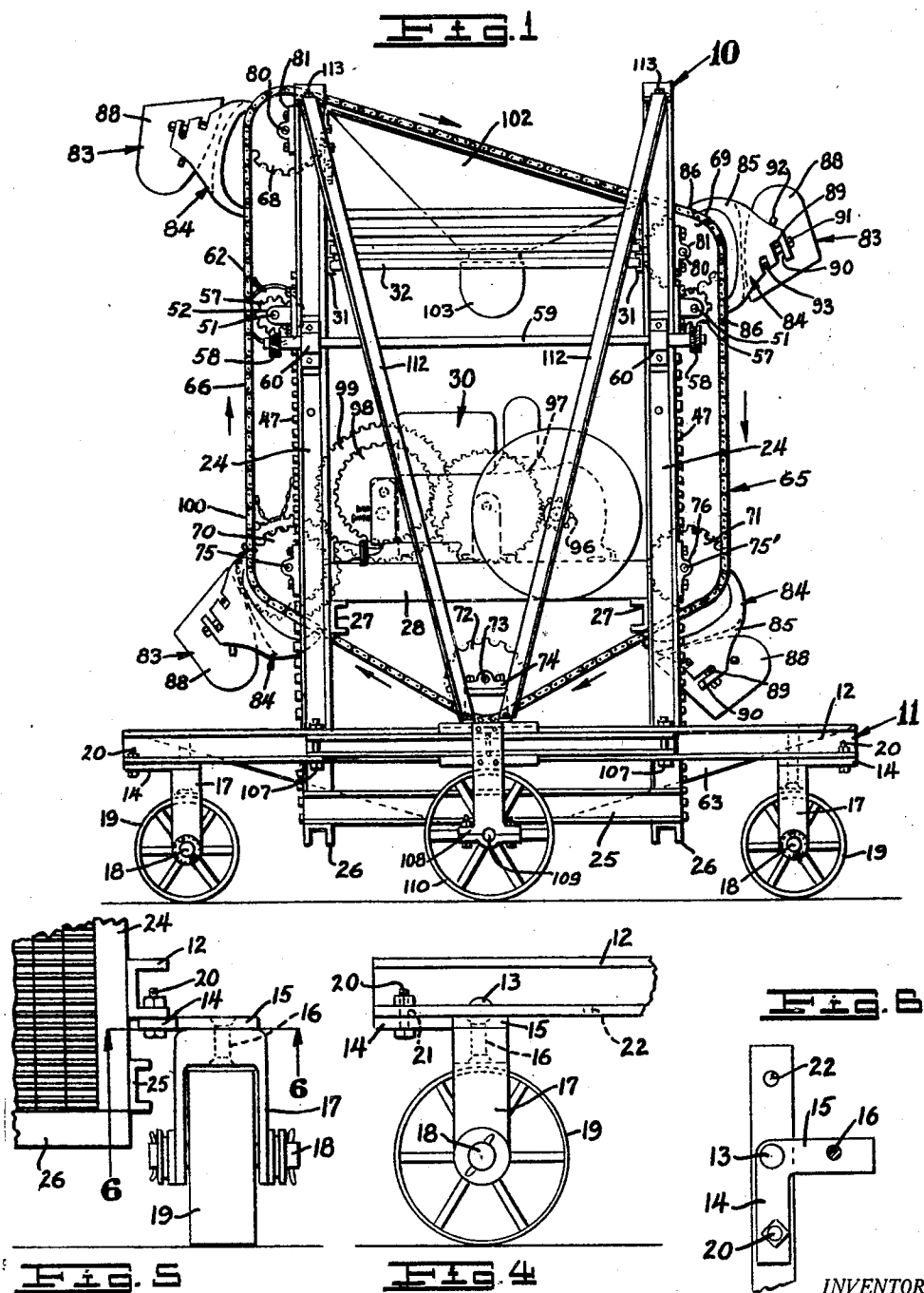
I. J. KUERT

1,856,873

ELEVATING CONVEYER

Filed Oct. 23, 1929

4 Sheets-Sheet 1



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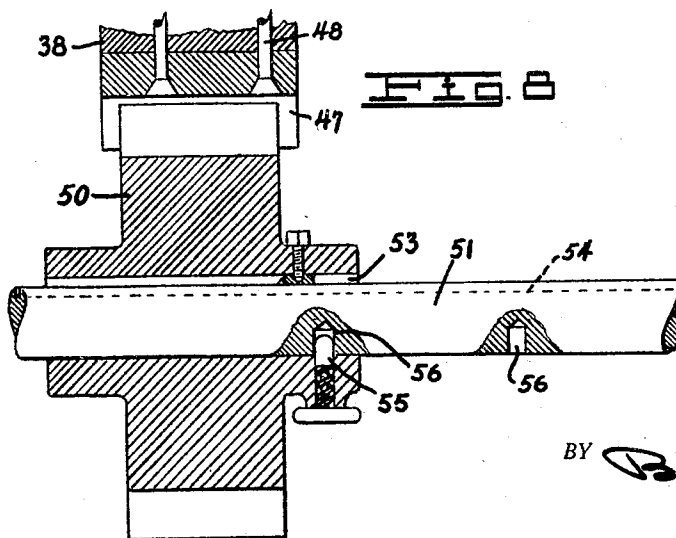
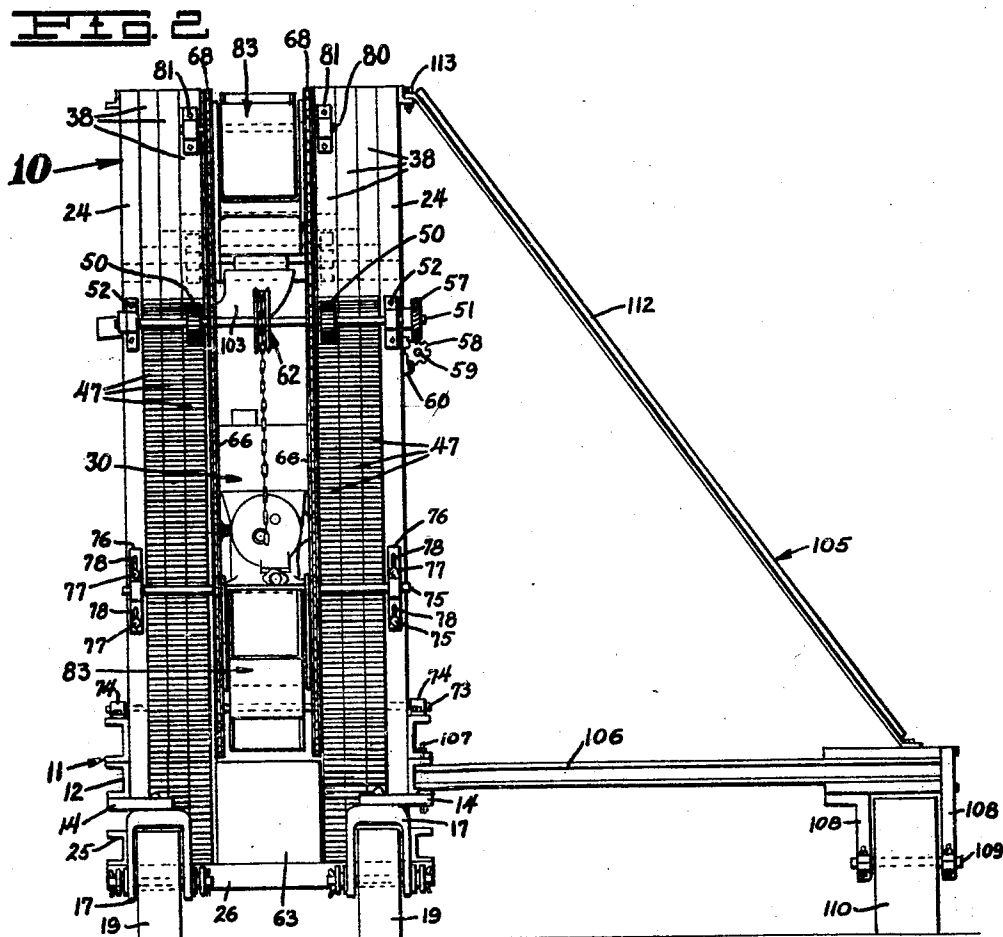
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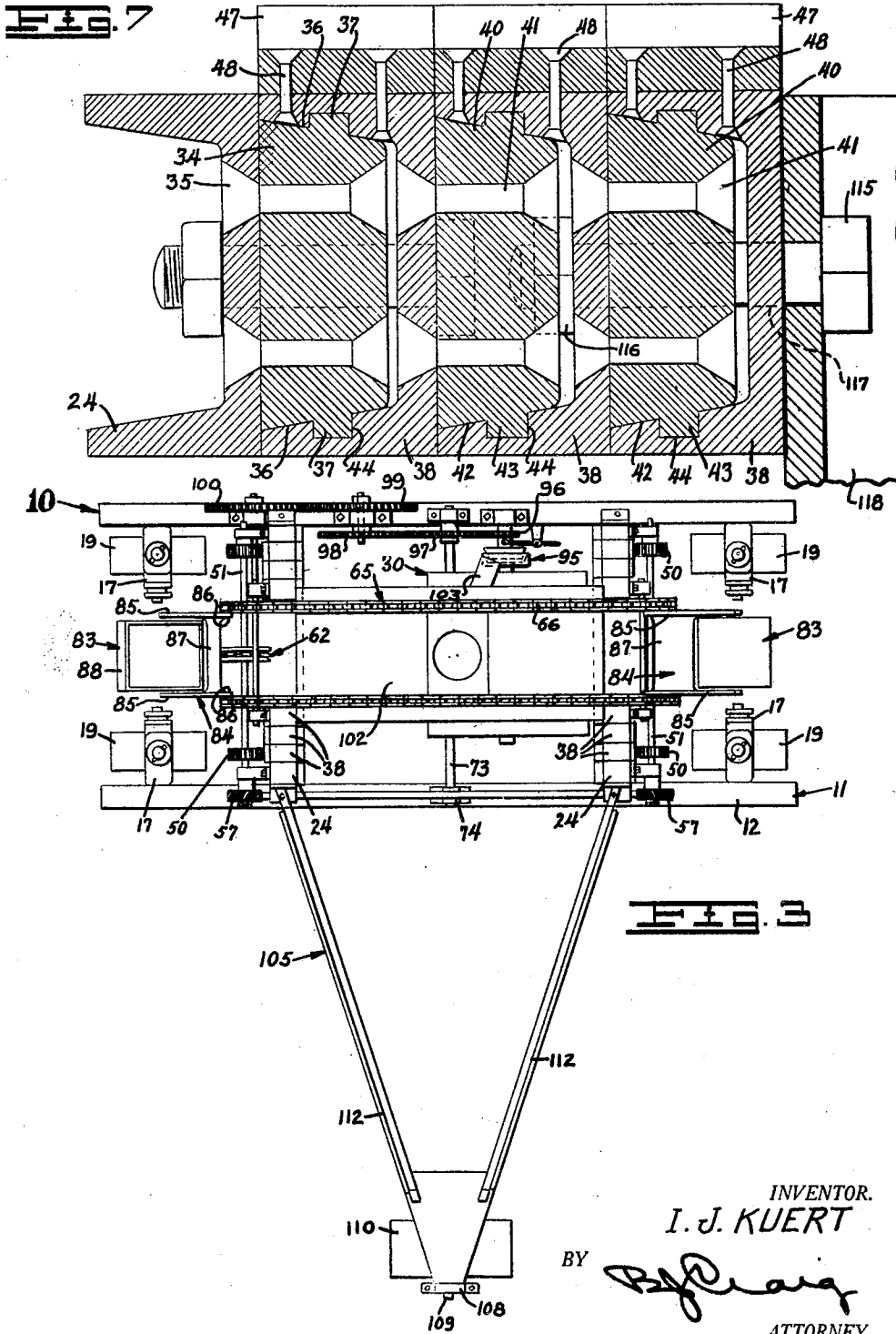
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FIG. 10

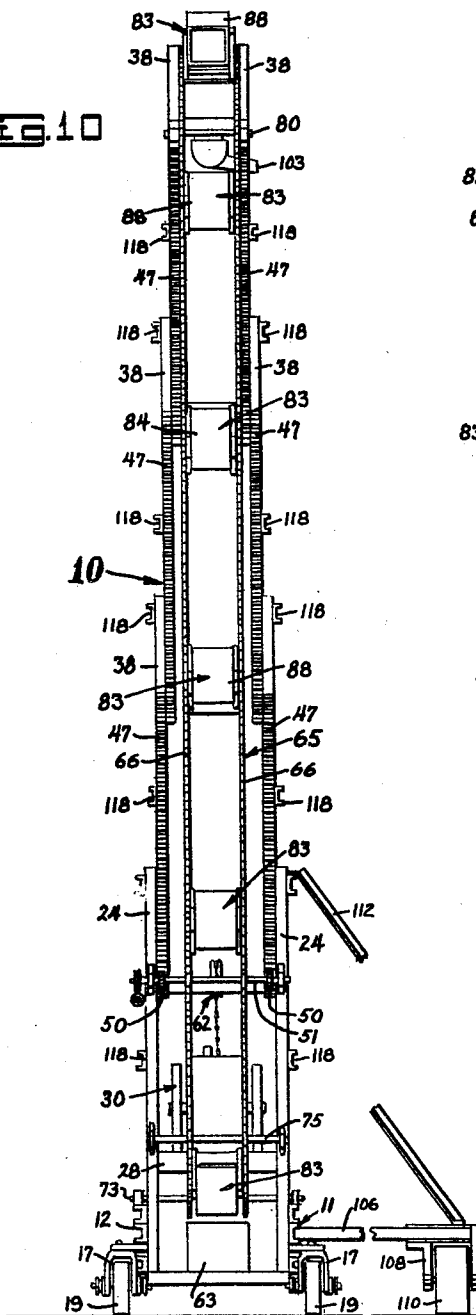
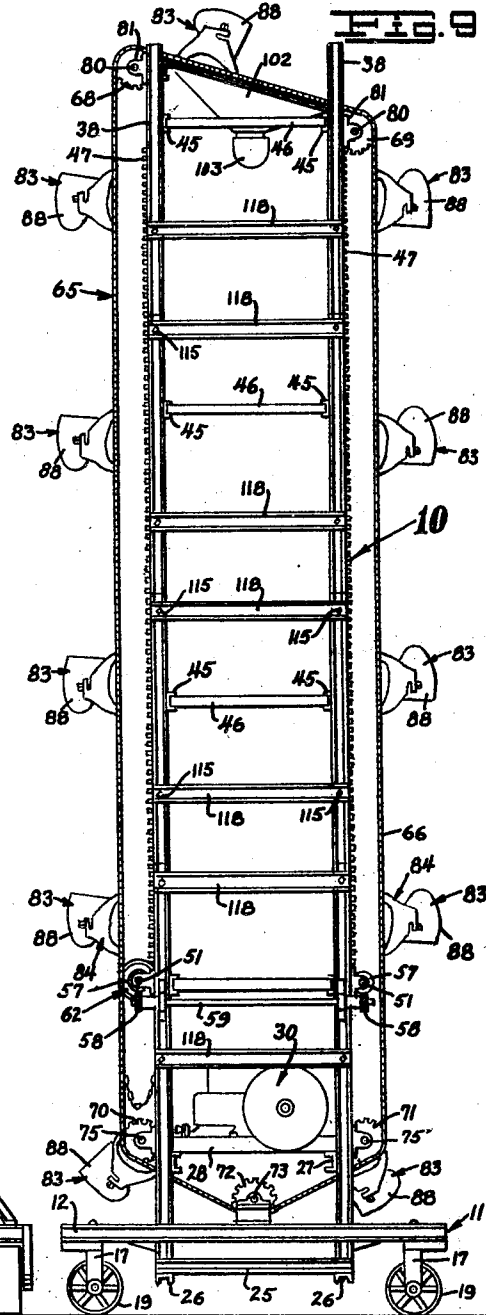


FIG. 9



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## UNITED STATES PATENT OFFICE

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## ELEVATING CONVEYER

Application filed October 23, 1929. Serial No. 401,685.

This invention relates to improvements in elevating conveyers.

The general object of this invention is to provide an improved elevating conveyer.

Another object of the invention is to provide an improved elevating conveyer which is portable.

A further object of the invention is to provide a device of the class described wherein the working height may be adjusted.

Another object of the invention is to provide a portable elevating device including a conveyer mounted on a telescoping tower.

An additional object of my invention is to provide an elevating conveyer wherein a novel drive means is employed.

Other objects and advantages of this invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a side elevation of my improved device showing the elevating tower in a lowered position.

Fig. 2 is a rear end view of Fig. 1 showing the auxiliary supporting frame in position.

Fig. 3 is a top plan view of my device.

Fig. 4 is an enlarged fragmentary side view of the main frame showing one of the supporting wheels.

Fig. 5 is an end view of the parts shown in Fig. 4.

Fig. 6 is a section taken on line 6-6 of Fig. 5.

Fig. 7 is an enlarged top plan section taken through one of the columns of the elevating tower.

Fig. 8 is an enlarged section through one of the elevating gears.

Fig. 9 is a view similar to Fig. 1 on a reduced scale showing the elevating tower in an extended position, and

Fig. 10 is a view similar to Fig. 2 on a reduced scale showing the elevating tower in an extended position.

Referring to the drawings by reference characters I have indicated my improved device generally at 10. As shown the device 10 comprises a supporting frame 11 which includes side members 12 having pivotally secured thereto, adjacent each end as indi-

cated at 13, an arm 14 which includes an angular extension 15. Pivotally secured to the extension 15 as indicated at 16 I provide a forked bearing 17 in which a shaft 18 of a wheel 19 is adapted to be rotatably supported (see Figs. 4, 5 and 6). The extension arms 16 are adapted to be swung from one side of the members 12 to the other and are adapted to be retained in a desired position by a bolt 20 positioned in apertures 21 (Fig. 4) in the members 12 and in another position by positioning the bolts 20 in apertures 22 provided in the members 12. Thus the width of the tread of the device may be altered to suit various conditions.

Secured intermediate the length of each of the members 11 I provide spaced upright members 24, each pair of which are secured together adjacent their lower ends by a connecting member 25 and the members 25 are in turn secured together by transverse members 26 which engage the lower ends of the uprights 24 and are secured thereto as by welding. The uprights 24 are further connected by transverse members 27 secured thereto and on which is mounted a platform 28 adapted to support an engine 30. The uprights 24 are also connected by transverse members 31 having longitudinal members 32 secured thereto.

As clearly shown in Fig. 7 each of the uprights 24 has a slide 34 secured thereto by rivets 35. The slide 34 includes opposite bearing surfaces 36 on each of which is provided a bead 37.

Besides the upright members 24 which are stationary relative to the frame the elevating tower includes a plurality of sets of movable members 38, shown with three of the members in each set and with the sets four in number, but more or less may be used depending on the height to which it is desired to have the tower rise. The members 38 are preferably channel shaped and each one except the one furthest removed from the member 24 has a slide 40 secured thereto by rivets 41 similar to the slide 34. These slides 40 each include bearing surfaces 42 on each of which is provided a bead 43 which together with the bead 37 are each positioned in a

groove 44 provided in the adjacent surfaces of the members 38.

For steadying the members 38 when they are raised I provide transverse braces 45 adjacent the top of each set. These braces are connected by longitudinal braces 46.

For raising the movable members 38 I provide a gear toothed rack 47 on the outer end of each member. These racks 47 are shown as secured in place by rivets 48. For elevating each set of these racks 47 I provide a gear 50, one of which is shown in detail in Fig. 8. The pair of gears 50 at each end of the machine are each mounted on a shaft 51. The shafts 51 are supported in bearings 52 secured to the stationary upright members 24 as clearly shown in Fig. 2.

The gears 50 are slidably mounted on the shafts 51 and are each provided with a key 53 which is positioned in a keyway 54 of the associated shaft whereby rotation of the shaft will be imparted to the gear. For retaining the gears 50 in correct position adjacent their associated racks 47 I provide on each of the gears a spring pressed plunger 55 which is adapted to be positioned consecutively in a plurality of recesses 56 in the shaft 51 on which it is mounted.

Secured to one end of each of the shafts 51 I provide mitre gears 57 which are adapted to mesh with mitre pinions 58 secured to a shaft 59 which is mounted in bearings 60 secured to two of the stationary uprights 24.

Positioned on one of the shafts 51 I provide a chain hoist which is indicated generally at 62 and may be of any desired type. Thus it will be seen that when the chain hoist 62 is operated both of the shafts 51 will be operated in unison through the medium of the shaft 59 and the gears 57 and pinions 58.

Removably positioned on the frame 11 I provide a tank or trough 63, in which the material to be elevated is deposited in any suitable manner.

For elevating material from the tank 63 I provide a conveyer indicated generally at 65. As shown the conveyer includes a pair of spaced chains 66 which are supported on upper pairs of sprockets 68 and 69, intermediate pairs of sprockets 70 and 71 and lower pairs of sprockets 72. The lower sprockets 72 are mounted on a shaft 73 positioned in bearings 74 secured to the frame side members 12 and the intermediate pairs of sprockets 70 and 71 are mounted on shafts 75 and 75' respectively which are positioned in bearings 76 adjustably secured to the stationary upright members 24 by bolts 77 positioned in elongated apertures 78 in the bearings (see Fig. 2). The upper pairs of sprockets 68 and 69 are mounted on shafts 80 positioned in bearings 81 which are secured to the innermost members 38 as clearly shown in Fig. 2.

Secured to the chains 66 at spaced intervals I provide a plurality of bucket elements

which are indicated generally at 83. As shown, each of the bucket elements 83 includes a bracket 84 which includes side members 85 each of which is secured to the adjacent chain 66 at two points as indicated at 86. The members 85 are connected together by a transverse flange 87 as clearly shown in Fig. 3. Each of the brackets 84 is adapted to support a bucket 88 on the sides of which are provided stud shafts 89 which are adapted to be positioned in slots 90 provided in the bracket 84. The stud shafts 89 are adapted to be retained in position in the slots 90 by bolts 91 and the movement of the bucket relative to the bracket is adapted to be limited by stops 92 and 93 which are adapted to engage portions of the associated bracket.

The engine 30 which may be of any desired type is adapted to drive the conveyer mechanism 65 and as shown this is accomplished through the medium of a clutch 95 and a gear train which includes gears 96, 97, 98, and 99, the latter meshing with a gear 100 on the shaft 75. Thus when the engine 30 is in operation and the clutch 95 put in engagement the conveyer mechanism will be operated in the direction of the arrows in Fig. 1 and the buckets will be moved downward into the trough 63 where they will be filled with the material therein, which may be concrete, as they pass through the trough. The buckets then move upward and over the sprockets 68 whence they will be tilted and may empty their contents into a hopper 102 removably supported on the innermost movable members 38.

The hopper 102 is shown as provided with a swinging spout 103 through which the material emptied into the hopper passes, to be deposited into a suitable trough (not shown) for conveyance to the desired position.

The machine 10 shown in the accompanying drawings is intended for use in the construction of concrete dwellings and the height thereof when the elevating tower is in the lowered position as shown in Fig. 1 is such that the machine may be moved under an ordinary door arch and the width of the machine when the wheels 19 are in an inward position as shown in Figs. 2 and 3 is such that the machine may be used in hallways and pass through door openings.

When there is sufficient space the wheels 19 are preferably moved to an outer position as previously described, to provide a wider bearing surface for the machine and when there is a still greater amount of space I preferably employ an auxiliary supporting member indicated generally at 105. As shown the supporting member 105 includes a V-shaped base 106 the spaced ends of which are removably secured to the frame side members 12 by bolts 107. At the apex of the base 106 I provide bearings 108 in which is positioned a shaft 109 having a wheel 110 thereon.

From adjacent the apex of the base 106 I provide braces 112 which are inclined upwardly and are removably secured to adjacent stationary upright members 24 by bolts 113.

When it is desired to raise the elevating tower the chains 66 are disconnected and a sufficient amount of additional links of chain including additional bucket elements is inserted therein to make up for the height to which it is desired to raise the device. The gears 50 are then positioned so that they mesh with the gear toothed racks 47 on the innermost movable upright members 38 and then the operator raises the four innermost upright members 38 by operating the chain lift 62. If it is desired to raise the elevating tower higher the gears 50 are positioned so that they mesh with the gear toothed racks 47 on the center movable upright members 38 which will then be raised when the chain hoist is operated, and if it is desired to raise the elevating tower the entire height the gears 50 are then positioned so that they mesh with the gear toothed racks 47 on the outer movable members 38, whereupon on actuation of the chain hoist 62 they will be raised and all the movable members 38 will be in the position shown in Figs. 9 and 10.

As each set of the movable uprights 38 are raised they are secured to the adjacent upright member by bolts 115 and nuts 116. The bolts 115 are positioned in apertures 117 provided in the members 24 and 38 and are also adapted to secure braces 118 to the upright members. These braces 118 act to strengthen the tower when it is in a raised position as shown in Figs. 9 and 10. The braces 118 may also be used as a ladder by which an operator may conveniently reach the top or intermediate points of the machine when necessary.

At times it will be necessary to clean out the trough 63 and to facilitate the cleaning thereof I preferably construct my device so that the trough may be removed longitudinally from between the side members 12. By reference to Fig. 3 it will be noted that the parts are so arranged and proportioned that the wheels 19 will not interfere with the removal of the trough and by reference to Fig. 1 it will be noted that the bucket elements 83 are so spaced that they do not interfere with the removal of the trough when they are positioned as shown in Fig. 1.

From the foregoing description it will be apparent that I have provided a novel elevating conveyer which is simple in construction and efficient in use.

Having thus described my invention, I claim:

1. In a device of the class described, a base, a tower, means to raise and lower said tower, a conveyer mechanism associated with said tower, said conveyer mechanism including spaced endless chains having vertical reaches and including a plurality of buckets, a trough

mounted on said base, a hopper mounted on said tower, said trough and hopper being disposed between the planes passing through the vertical reaches of said chains and means whereby said buckets convey material from said trough to said hopper and deposit it therein.

2. In a device of the class described, a base, an elevating tower, means to raise and lower said tower, a conveyer mechanism supported by said tower, said conveyer mechanism including spaced chains, a bucket mounted on said chains, a trough, a hopper mounted directly above said trough, said hopper and said trough being arranged between said chains and means whereby said buckets convey material from said trough to said hopper and deposit it therein.

3. In a device of the class described, a base, a plurality of wheels supporting said base, a telescopic elevating tower mounted on said base, means to raise and lower said tower, a conveyer mechanism supported by said tower, said conveyer mechanism including a pair of spaced chains, a plurality of lower sprockets and a plurality of upper sprockets supporting said chains, a plurality of buckets mounted on said chains, a trough mounted on said base between said lower sprockets, a hopper mounted on said tower directly above said trough, means whereby said buckets convey material from said trough and discharge it in said hopper and means to drive said conveyer mechanism.

4. In a device of the class described, a base, said base including spaced side members, a plurality of wheels adapted to support said base, said wheels being positioned inward of the outer edges of said side members, an elevating tower positioned on said base, said tower including a plurality of stationary members secured to said side members and a plurality of movable members, said stationary members being positioned inward of said side members and said movable members being positioned inward of said stationary members, a conveyer mechanism, said conveyer mechanism being supported by said tower, a platform supported by said tower, a power device, said device being mounted on said platform and confined within the limits of said side members, means to drive said conveyer from said device, said drive means being confined within the limits of said side members.

5. In a device of the class described, a base, said base including spaced side members, a plurality of wheels adapted to support said base, said wheels being positioned inward of said side members, an elevating tower on said base, said tower being positioned within the limits of said side members, an endless conveyer mechanism supported by said tower, said conveyer mechanism including a plurality of buckets, a trough, said trough being

supported inward of said side members and below the lower working reach of said conveyer mechanism, said buckets being adapted to travel within said trough, certain of said buckets being spaced so that the two lowermost buckets may each be disposed above the trough whereby said trough may be removed longitudinally either way on a horizontal plane from between said side members without disturbing said buckets, and said wheels being positioned below said trough so that they form no hindrance to the removal of said trough.

6. In a device of the class described, a base, an elevating tower mounted on said base, said tower including a plurality of stationary members and a plurality of movable members, a conveyer mechanism supported by said tower, said conveyer mechanism including a pair of spaced chains, said chains adjacent the lower portion of said conveyer being positioned on a plurality of sprockets supported by said stationary members, and said chains adjacent the upper portion of said conveyer being positioned on a plurality of sprockets supported by some of said movable members, means to elevate said movable members and means to retain said movable members in a raised position, said conveyer mechanism including a plurality of bucket elements, each of said elements including a section of said chain, a pair of spaced frames secured to each of said sections, means connecting each pair of said frames, a bucket removably secured to each pair of said frames, said chains being adapted to be disconnected and the required number of additional sections inserted therein to allow said tower to be raised and said conveyer mechanism to operate.

7. In a device of the class described, a base, a plurality of wheels supporting said base, an elevating tower, said elevating tower including a plurality of stationary upright members secured to said base, a plurality of movable upright members adjacent said stationary members, some of said movable members being in sliding engagement with said stationary members and other of said movable members being in sliding engagement with each other, means to raise and lower said movable members, said means including gear toothed racks on said movable members, a plurality of gears mounted on said stationary members and adapted to engage said racks, means to actuate all of said gears simultaneously, a conveyer mechanism supported by said tower, said conveyer mechanism including a plurality of buckets, a trough mounted on said base, a hopper mounted on certain of said movable members, said buckets being adapted to convey material from said trough to said hopper and deposit it therein, a platform supported by said stationary members above said trough, an engine

mounted on said platform and means connecting said engine and said conveyer mechanism on said platform and means connecting said engine and said conveyer mechanism whereby said engine drives said conveyer mechanism.

8. In a device of the class described, a base, an elevating tower, said elevating tower including a plurality of stationary, upright members secured to said base, a plurality of movable members adjacent said stationary members, certain of said movable members being in sliding engagement with said stationary members and other of said movable members being in sliding engagement with each other, means to raise and lower said movable members, said means including gear toothed racks on said movable members and a plurality of gears mounted on said stationary members and adapted to engage said racks and means to actuate all of said gears simultaneously, a conveyer mechanism supported by said tower, said conveyer mechanism including a pair of spaced chains, a plurality of lower sprockets and a plurality of upper sprockets supporting said chains, said lower sprockets being mounted on said stationary members and said upper sprockets being mounted on some of said movable members, a plurality of buckets mounted on said chains, a trough mounted on said base, a hopper mounted on some of said movable members, said buckets being adapted to convey material from said trough to said hopper and deposit it therein and means to drive said conveyer mechanism.

9. In a device of the class described, a base, a plurality of wheels supporting said base, an elevating tower, said elevating tower including a plurality of stationary upright members secured to said base, a plurality of movable upright members adjacent said stationary members, some of said movable members being in sliding engagement with said stationary members, means to raise and lower said movable members, said means including gear toothed racks on said movable members and a plurality of gears mounted on said stationary members and adapted to engage said racks and means to actuate all of said gears simultaneously, means to secure adjacent movable members together when in a raised position, a conveyer mechanism supported by said tower, said conveyer mechanism including a pair of spaced chains, said lower sprockets being mounted on said stationary members and said upper sprockets being mounted on some of said movable members, a plurality of buckets mounted on said chains, a trough mounted on said base, a hopper mounted on some of said movable members, said buckets being adapted to convey material from said trough to said hopper and deposit it therein, a platform supported by said stationary members above said trough,



an engine mounted on said platform and means connecting said engine and said conveyer mechanism whereby said engine drives said conveyer mechanism, said connecting  
5 means including a clutch mechanism.

In testimony whereof, I hereunto affix my signature.

IRA J. KUERT.

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