

Dec. 23, 1941.

H. J. DEETZ ET AL

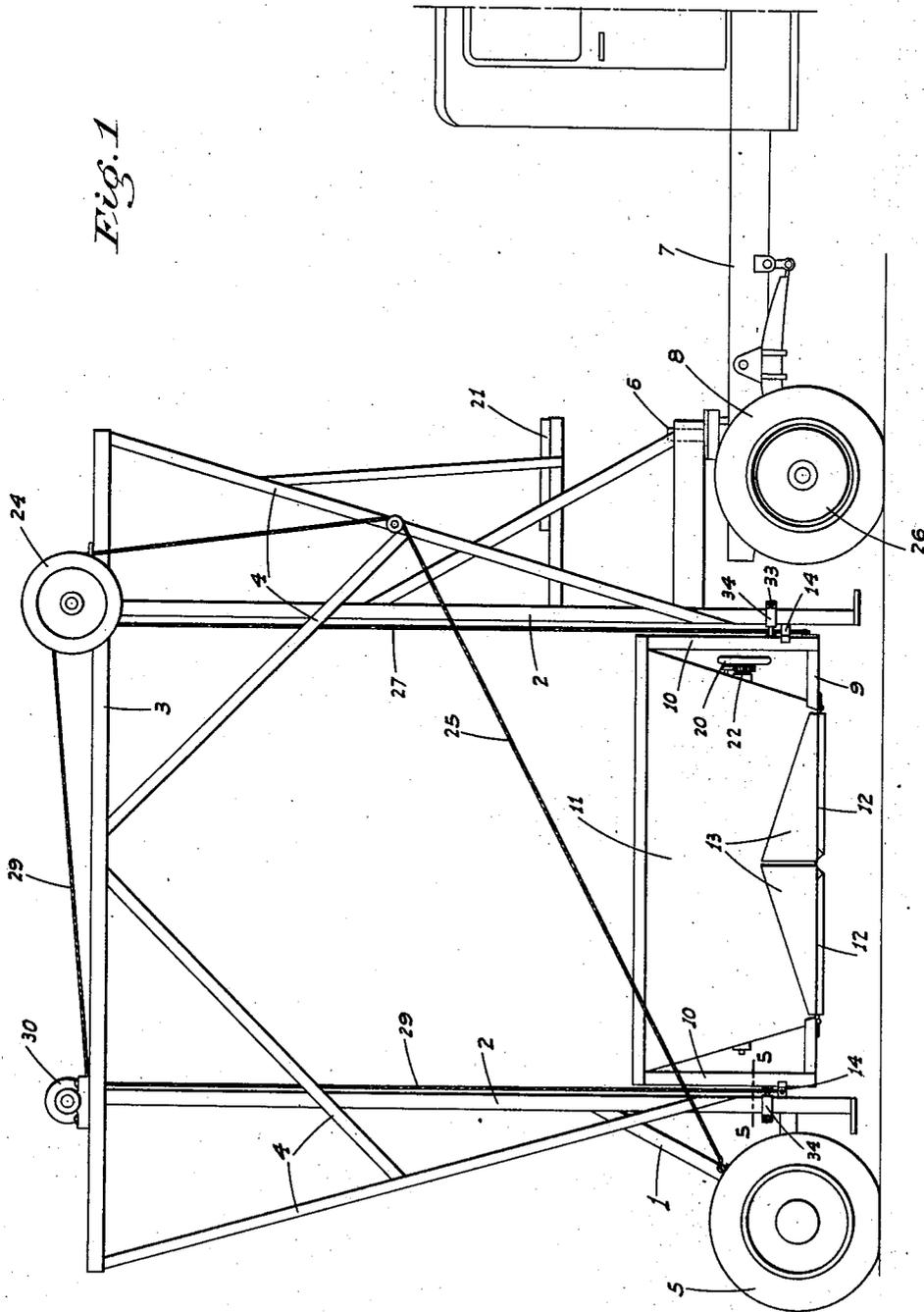
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PORTABLE ELEVATOR

Filed March 8, 1940

3 Sheets-Sheet 1

Fig. 1



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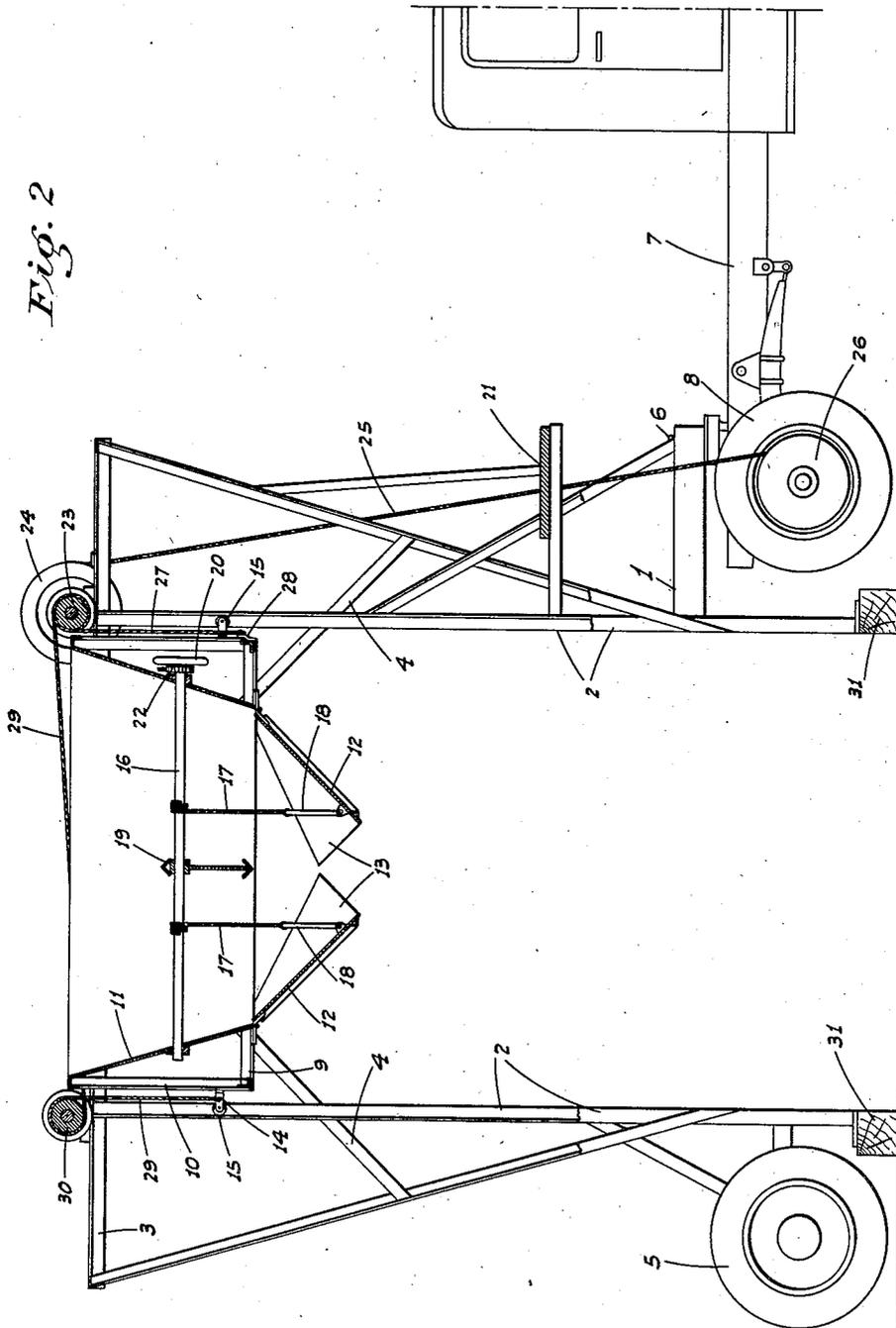
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Filed March 8, 1940

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Fig. 2



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2,267,270

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Fig. 3

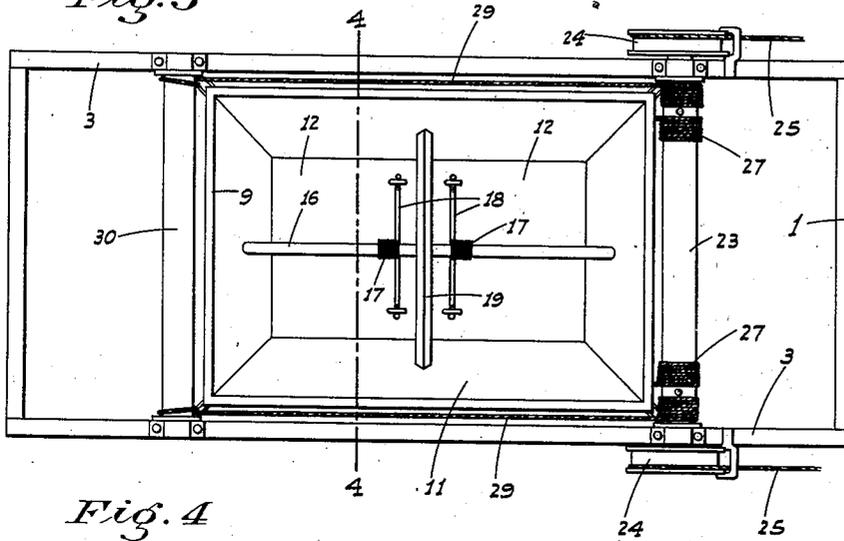


Fig. 4

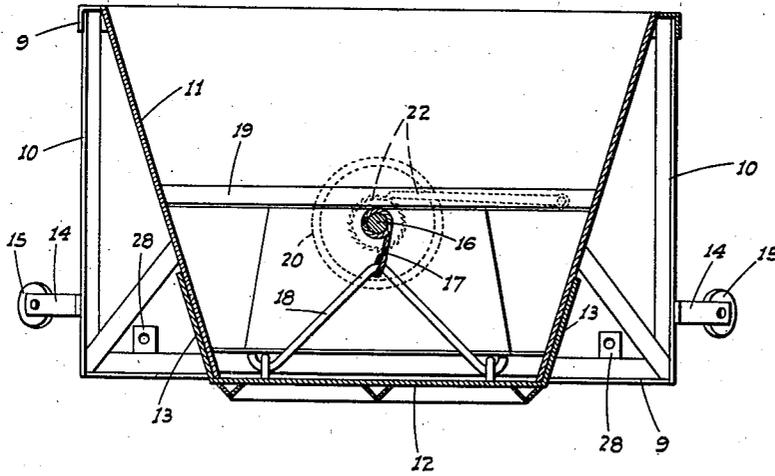
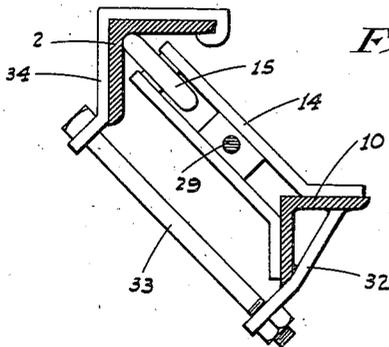


Fig. 5



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2,267,270

PORTABLE ELEVATOR

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per cent to Sherwood S. Green, Madera, Calif.

Application March 8, 1940, Serial No. 322,922

9 Claims. (Cl. 214—117)

This invention relates in general to construction equipment, and in particular the invention is directed to a portable elevator especially designed for use in connection with a concrete mixer.

At present it is a common practice to employ combination mixers and transport vehicles, one type of which is known as a "Transit-mix," to convey a batch of concrete from a central supply plant to a job; the ingredients being introduced at such plant into the power mixer on the vehicle, and being then mixed as the vehicle proceeds to the job.

This procedure is quite satisfactory where there is a relatively short haul from the supply plant to the job, but on long hauls the time lapse is such that combination mixer and transport vehicles cannot be used. It has therefore been necessary for a contractor to transport an independent power mixer to the location of the job, and to then truck the dry ingredients from the source of supply to the mixer. This causes considerable loss of time and additional expense, especially on small jobs, as the independent power mixer is usually heavy and cumbersome to move from one place to another.

It is therefore the principal object of our invention to provide a unique portable elevator which can be easily transported from place to place and used to elevate the dry mix, dumped from a supply truck, and to discharge such mix into the power mixer of a combination power mixer and vehicle which can likewise be driven to the job with ease.

Thus, on those jobs where long hauls make impossible the use of the combination power mixer and vehicle in the usual manner, such vehicle is driven to the job and there used as the mixer; the dry and proportioned mix being transported by truck to the job and raised by means of the elevator to a height from which it can be fed by gravity into the power mixer of the vehicle.

Another object of the invention is to provide a portable elevator, for the purpose described, which is so constructed that the combination power mixer and vehicle can drive under the elevated bucket from either side of the elevator to receive the batch of material in the bucket.

A further object of the invention is to provide a portable elevator having a vertically movable bucket arranged so that when in lowered position it is in a low enough plane to receive material discharged from a dump truck, and when in raised position is in a high enough plane to dis-

charge by gravity into the mixing chamber of a combination power mixer and vehicle.

It is also an object to provide a portable elevator with a vertically movable bucket; the bucket being arranged to be locked with and thus strengthen the frame during movement of the elevator from one location to another.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects we accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a side elevation of the structure showing the bucket lowered and locked, as in transporting position.

Figure 2 is a similar view, mainly in section, showing the bucket in raised and dumping position.

Figure 3 is a top plan of the upper portion of the elevator frame, showing the bucket hung therein and in elevated position.

Figure 4 is a transverse section of the bucket on line 4—4 of Fig. 3.

Figure 5 is an enlarged fragmentary section as on line 5—5 of Fig. 1 showing the means to lock the bucket and elevator frame against relative movement.

Referring now more particularly to the characters of reference on the drawings, the elevator comprises a frame indicated generally at 1 and including side uprights 2 of angle form, facing each other and arranged to define a rectangular area. The uprights are connected together at the top by longitudinal beams 3, but are disconnected at the bottom. The frame also includes diagonal braces 4 arranged so as to maintain the uprights in rigid relationship to each other, without closing the transverse opening formed between the uprights and extending from the ground up below beams 3.

At its rear end, and rearwardly of the rear uprights, the frame is supported by wheels 5, while at its front end and ahead of the front uprights, the frame is swivelly connected as at 6 to the chassis of a motor truck or similar vehicle 7 and which includes rear driven wheels 8 disposed adjacent the swivel connection. The space or arch between the uprights, both horizontally and vertically, is sufficient to receive a self-propelled vehicle such as a portable concrete mix-

ing vehicle of the type recited in the preamble, when said vehicle is disposed transversely of the elevator.

Disposed for vertical movement in said space or arch is a bucket unit which includes a frame 9 having corner uprights 10 arranged symmetrical to and adjacent uprights 2, and a bucket 11 having sloping sides and provided with downwardly opening discharge doors 12 hinged at their opposite ends on the bucket at the ends thereof. The doors include side wings 13 overlapping the sides of the bucket. Brackets 14 projecting from the uprights 10 near their lower end support rollers 15 which engage in the uprights 2 at their corners.

The bucket doors are manually controlled by means of a windlass device which comprises a horizontal shaft 16 extending lengthwise of the bucket above the doors and journaled in connection with the bucket walls. Cables 17 are secured on and wrapped about the shaft, and depend to connections with swivel yokes 18 mounted on the doors near their free end. A transverse brace unit 19 connects the sides of the bowl centrally of their ends and also provides a central journal for the shaft.

At its forward end, outside the bucket, the shaft 16 is provided with a hand wheel 20 operable, when the bucket is elevated, from a platform 21 on the frame 1 ahead of the front uprights 2. A releasable pawl and ratchet unit 22 prevents rotation of the shaft in a door lowering direction.

The bucket is raised and lowered by the following means: Journaled on the beams 3 in a plane adjacent the forward end of the bucket is a transverse roller 23 forming a cable drum, on the ends of which are larger drums 24. Cables 25 on these larger drums depend to detachable connections with wind-up drums 26 secured on the rear wheels 8 of the truck 7. When the structure is not in use, or is being transported, these cables are detached from the drums 26 and are then preferably tied or otherwise detachably connected to frame 1 adjacent its rear end.

Cables 27 depend from drum 23 to connections with straps 28 mounted on the bucket frame 9 laterally inward of the adjacent roller brackets 14 but at about the same level. Other cables 29 are wrapped about drum 23 laterally outward from cables 27 and extend thence rearwardly and about a direction changing roller 30 journaled on beams 3 adjacent the rear end of the bucket. These cables then depend to connections with the adjacent roller brackets 14. The various cables are arranged so that when cables 25 are being wound onto power drums 26, they are being unwound from drums 24, while at the same time cables 27 and 29 are being wound onto drum 23, and the bucket is being lifted at approximately its four corners.

Also, the cables 27 and 29, and the cooperating rollers 23 and 30, are arranged relative to the bucket so that the latter may be elevated above said rollers without interference to the limit allowed by rollers 15, as may be necessary to clear any transit mixer, and without having to make the framework so high as to be greater than the clearance afforded in underpasses, subways, etc.

When the structure is to be used, the frame 1 and truck are jacked up so as to clear the various wheels from the ground, and the frame is then held in such raised position by timbers 31 or the

like extending transversely of the frame and supporting the uprights 2 at their lower end, as shown in Fig. 2. This of course enables the drums 26 on the drive wheels of the truck to be freely operated as may be required. The bucket is lowered for the reception of materials, and is then elevated, the transit mixer run thereunder, with the mixing drum in position to receive from the bucket, and the doors of the latter are then opened to discharge into the mixer by the operator standing on platform 21.

When the structure is to be transported, the timbers 31 are of course withdrawn, and the bucket is lowered and secured to the frame by the following means: Secured on and projecting diagonally from the corner uprights 10 of the bucket frame are straps 32 adapted to support removable draw or clamping bolts 33 at one end, as shown in Fig. 5. Hangers 34 for the other end of the bolts are slidable on the adjacent uprights 2, the straps and hangers being arranged so that the bolts are parallel to brackets 15 and thus enable the uprights 2 to be tightly pulled against the rollers 14.

The value of this arrangement is that it positively ties the bucket and elevator frames together, avoiding the possibility of the uprights 2 tending to spread at their lower end during transportation, without having to use such heavy bracing to the frame structure as would increase the weight of the same excessively. Also, this arrangement eliminates the annoying rattling of the normally relatively moving parts such as would be otherwise inevitable.

From the foregoing description it will be readily seen that we have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described our invention, what we claim as new and useful and desire to secure by Letters Patent is:

1. A portable elevator comprising a vertical frame structure arranged to provide an arch-like opening extending upwardly from the ground through which to move a vehicle in a direction transversely of the elevator, a bucket mounted in connection with the frame structure to discharge into a vehicle disposed in said opening, wheels supporting the structure beyond one end of the opening, other wheels supporting the structure beyond the other end of the opening, one of said other wheels being adapted to be raised clear of the ground when the elevator is in operation and to be then driven, and a power hoist connected to the bucket to raise and lower the same, said hoist including a cable drum fixed on said driven wheel.

2. A portable elevator comprising a wheel mounted frame structure including side corner uprights disposed together to outline a rectangular area in plan and arranged to provide an arch-like opening extending upwardly from the ground through which to move a vehicle in a direction transversely of the structure, a bucket in said opening having guided engagement with the uprights, means applied to the bucket to raise and lower the same and releasable means to tie the bucket and uprights together when the bucket

is lowered whereby to prevent possible spread of the uprights adjacent their lower end.

3. A portable elevator comprising a wheel mounted frame structure including side corner uprights disposed together to outline a rectangular area in plan and arranged to provide an arch-like opening extending upwardly from the ground through which to move a vehicle in a direction transversely of the vehicle, a bucket in said opening having guided engagement with the uprights, means applied to the bucket to raise and lower the same, a frame rigid with the bucket and including members disposed adjacent the uprights, rigid straps on and projecting from the members and uprights, and draw bolts removably engageable with said straps.

4. An elevator comprising a vertical frame structure which includes side corner uprights disposed to outline a rectangular area and arranged to provide an arch-like opening extending upwardly from the ground and of a size to receive a vehicle disposed transversely of the elevator, a bucket in said opening, means on the bucket having guided engagement with the uprights, means suspending the bucket from the frame structure for controlled vertical movement and including transverse cable mounting members on the frame structure adjacent the ends of the bucket and cables depending from the members and connected to the bucket adjacent all corners thereof.

5. An elevator comprising a vertical frame structure which includes side corner uprights disposed to outline a rectangular area and arranged to provide an arch-like opening extending upwardly from the ground and of a size to receive a vehicle disposed transversely of the elevator, a bucket in said opening, means on the bucket having guided engagement with the uprights, and including upright engaging rollers on the bucket adjacent the bottom thereof, horizontal frame beams at the top of the uprights and forming the top of the frame structure, and hoist means suspending the bucket from the frame structure for controlled vertical movement and including rotary cable mounting members journaled on said beams adjacent but beyond the plane of the ends of the bucket and cables depending from said members and connected to the bucket adjacent the bottom thereof.

6. An elevator comprising a vertical frame structure which includes side corner uprights disposed to outline a rectangular area and arranged to provide an arch-like opening extend-

ing upwardly from the ground and of a size to receive a vehicle disposed transversely of the elevator, a bucket in said opening, means on the bucket having guided engagement with the uprights, a transversely disposed driven cable drum mounted on top of the frame structure adjacent one end of the bucket, cables wrapped about said drum and connected to the adjacent end of the bucket, other cables wrapped about the drum in laterally spaced relation to the first named cables and extending thence in a substantially horizontal direction to the opposite end of the bucket, and a direction changing member mounted on the frame structure adjacent said other end of the bucket and about which said other cables pass and depend for connection with the bucket at said other end thereof.

7. A structure as in claim 6 in which said drum and member are beyond the corresponding ends of the bucket, the horizontal portions of said other cables are disposed laterally outward from the sides of the bucket and the connections of all the cables with the bucket are made adjacent the bottom thereof whereby the bucket may be elevated sufficiently to project above said drum and member.

8. A portable elevator comprising a vertical wheel-mounted frame structure disposed to provide an arch-like opening extending upwardly from the ground through which to move a vehicle, a bucket suspended from the frame structure and movable vertically in said opening, opposed downwardly opening doors on the bottom of the bucket, means pivoting the doors at their opposite ends transversely on the bucket, and means including a hand shaft mounted on the bucket at one end to open and close the doors.

9. A portable elevator comprising a vertical wheel-mounted frame structure disposed to provide an arch-like opening extending upwardly from the ground through which to move a vehicle, a bucket suspended from the frame structure and movable vertically in said opening, opposed downwardly opening doors on the bottom of the bucket, means pivoting the doors at their opposite ends transversely on the bucket, a shaft extending lengthwise in the bucket above the doors, means on the shaft at one end thereof and outside thereof to rotate the shaft and cables wound on the shaft and depending to connections with the doors near their free end.

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