

Dec. 25, 1923.

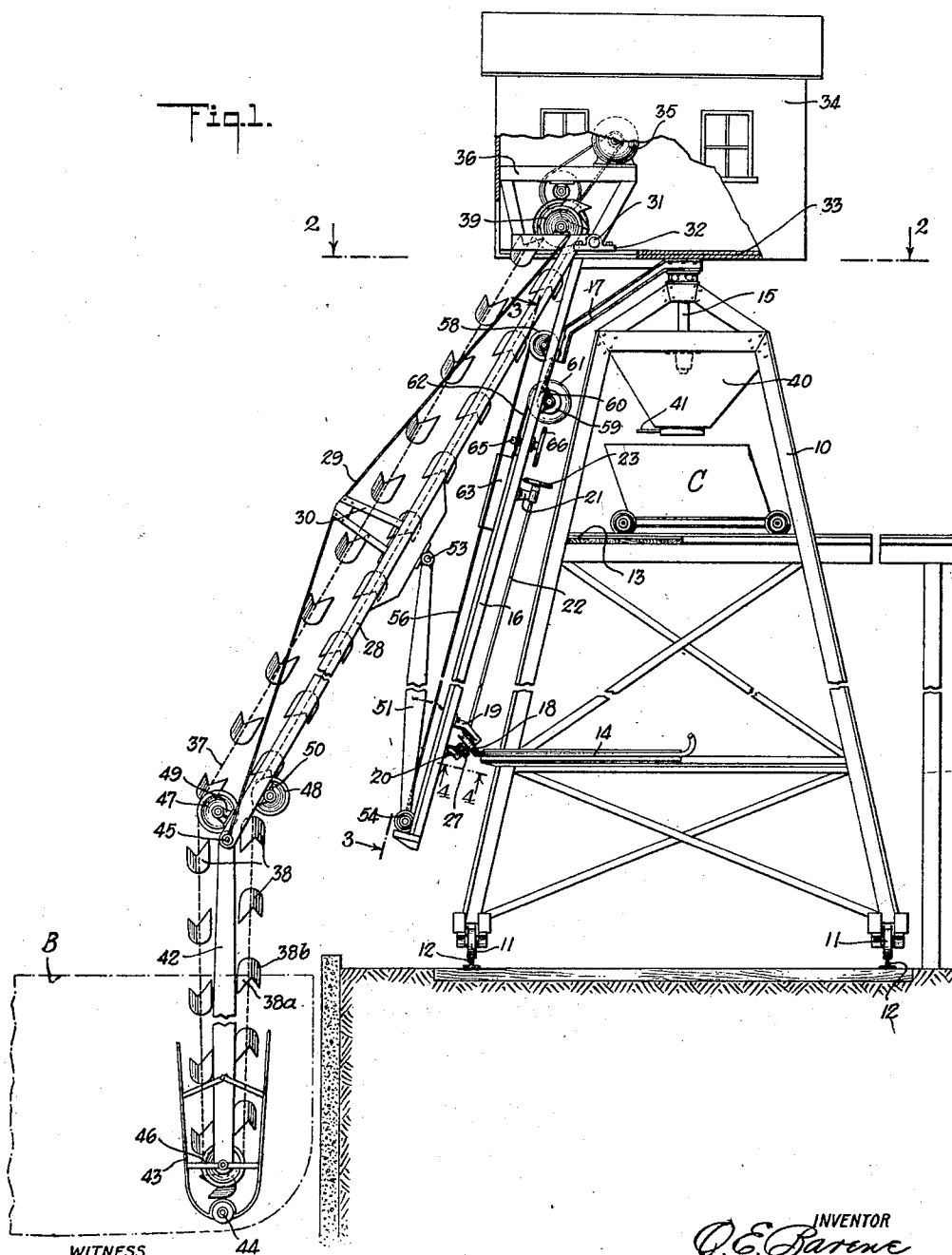
O. E. BARENE

1,478,812

COAL CONVEYER

Filed Oct. 11, 1920

2 Sheets-Sheet 1



Dec. 25, 1923.

1,478,812

O. E. BARENE

COAL CONVEYER

Filed Oct. 11, 1920

2 Sheets-Sheet 2

Fig. 2.

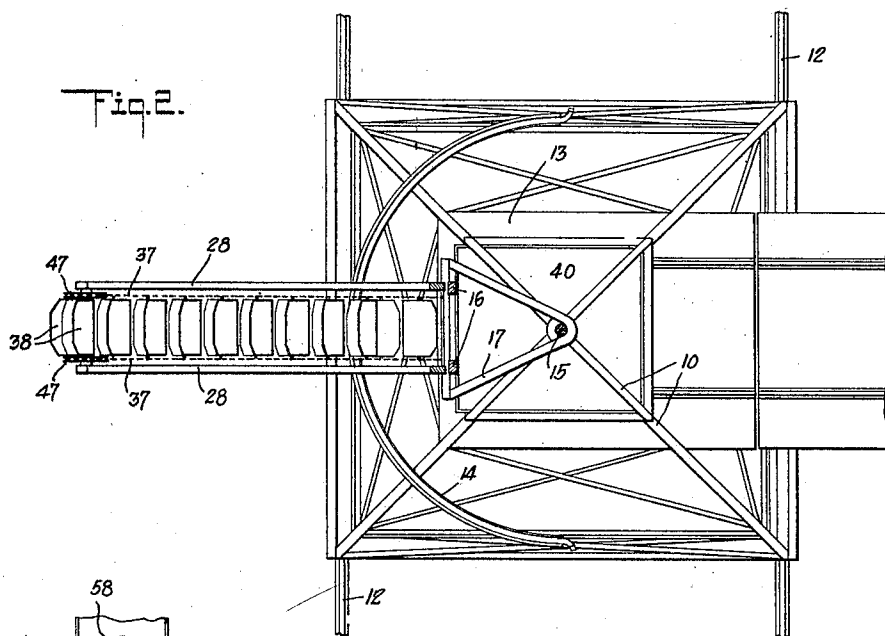


Fig. 3.

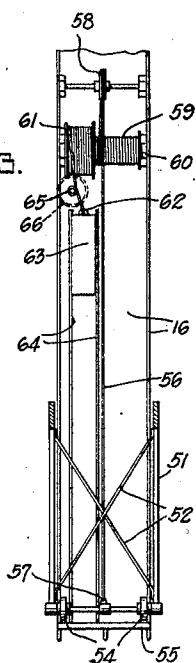


Fig. 4.

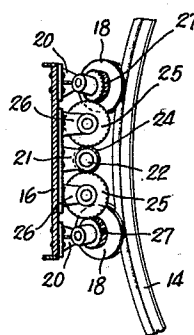
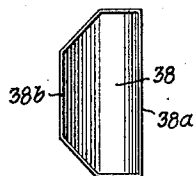


Fig. 5.



WITNESS

Frederick Kuhl.

INVENTOR
O. E. Barene
BY
Geo. H. Beeler
ATTORNEY

UNITED STATES PATENT OFFICE.

OTTO E. BARENE, OF BROOKLYN, NEW YORK.

COAL CONVEYER.

Application filed October 11, 1920. Serial No. 416,268.

To all whom it may concern:

Be it known that I, OTTO E. BARENE, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Coal Conveyers, of which the following is a specification.

This invention relates to conveyers, and has particular reference to conveyers or elevators of the adjustable leg type intended for the elevation or transfer of commodities in bulk, such as coal, sand, grain, crushed stone, or the like.

Among the objects of the invention, distinguishing it from all prior machines that have been brought to my attention, are the following: to provide improved means for elevating or adjusting the boom and leg with respect to the main supporting means; to provide improved means for so supporting the boom upon the main support as to enable the operator to easily shift or adjust the same laterally to any desired extent around the main support; to enable a single operator to have easy command and control of the operation of the conveyer, the vertical adjustments of the leg and boom, the lateral adjustments of the same, and the delivery of the material from the conveyer, while standing at about the same place, and finally to generally improve this type of machines with respect to economy of construction and operation, durability, and efficiency.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings, in which like reference characters designate the same parts in the several views, and in which—

Figure 1 is a side elevation, somewhat diagrammatic, of my improved conveyer.

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

Fig. 3 is a vertical section on the line 3—3 of Fig. 1.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 1, looking upward toward the lateral shifting means.

Fig. 5 is a plan view of one of the conveyer buckets.

In the construction of this machine I wish it to be understood that while I illustrate the main support for the conveyer as a tower 10 supported upon wheels or rollers 11 movable upon tracks or rails 12, said tower may be of an immovable nature, and moreover the term tower as used herein is intended to be given an interpretation broad enough to cover any frame work, building, or other upright structure, adapted to support the conveyer as herein shown or upon a scow or car.

The tower 10 includes a platform 13 upon which the operator is positioned and from which he has direct and easy control of practically all of the operations of the machine for the elevation and delivery of coal or the like. Between the platform and the base, at any desired elevation, of the tower or adjacent thereto is arranged a track 14 shown in the form of an arc of a circle extending around the front of the tower in a horizontal plane and supported upon the tower. At the top of the tower is a vertical pivot pin 15 the axis of which is concentric with the arc-shaped track 14. The pin 15 is fixed or journaled in the upper end of the tower and constitutes a vertical axis around which the conveyer may be adjusted in connection with the track 14, or which in connection with the track constitutes a support for the conveyer in any desired vertical plane radiating from said axis.

16 indicates a frame for the conveyer, and to the upper end of this frame is connected a yoke 17 extending around the pin 15 if the pin is stationary or fixed to the pin if the pin is rotatable in the tower top. By this means the frame 16 is held from lateral movement bodily in any direction, with respect to the tower. At any desired distance from the lower end of the frame are arranged traction wheels 18 each of which is journaled in brackets 19 and 20 secured to the rear surface of the frame 16. The axis of each wheel 18 is inclined from the hori-

zontal at about 45 degrees, so that the plane of the wheel, at right-angles to its axis, will intersect the track 14 at a similar inclination. Thus the resultant between the two forces, the one downward and the other horizontal, representing the weight of the conveyer and its frame, will be borne mainly by the track 14, the pivot pin 15 acting primarily as a centering or steadying device.

10 Journaled in suitable bearings or brackets 21 at the back of the frame 16 is a shaft 22 to the upper end of which is secured a hand wheel 23 or its equivalent through which the operator on the platform 13 may rotate the shaft 22 in either direction. To the lower end of the shaft 22 is fixed a pinion 24 meshing with a pair of similar spiral gears 25 on opposite sides of the pinion 24 and each journaled in a bracket 26 fixed to the back of the frame 16. These gears 26 mesh in turn with pinions 27 fixed to the axles of the traction wheels 18. Hence with the rotation of the shaft 22 in either direction the wheels 18 will be rotated in a similar direction, and the friction or traction between the wheels 18 and the track 14 will cause a movement of the entire frame and parts supported thereon in a direction corresponding to the direction of movement of the hand wheel 23.

20 Any suitable gearing, with respect to the number, size, or type of wheels, may be employed for transmitting this rotary movement of the hand wheel 23 for the purpose of propelling the frame laterally. The movement of the frame, with respect to the tower or the operator's platform is relatively slow, and hence the movement of the hand wheel along with the frame does not interfere with the operator's actuation thereof. This lateral adjustment of the conveyer may be effected whether or not the conveyer is in operation, but ordinarily the conveyer will not be adjusted laterally when in operation.

28 indicates a boom which may be of any suitable length, width, or construction, but is indicated as including truss rods 29 extending over standards 30 projecting outward or upward from the middle portion of the boom. The boom 28 is provided at any desired location, as at its upper end, with a transverse horizontal pivot 31 journaled in bearings 32 in or adjacent to the floor 33 of an overhead shelter 34, covering the motor 35 and other parts of the construction. Said motor is secured upon a frame 36 rigid with the conveyer boom 28 and hence tiltable therewith around the axis of the pivot 31.

The conveyer is of the endless bucket type and comprises one or more endless members 37, such as chains, cables, or the like, and to which are secured by any suitable means a series of buckets 38. The means for securing the buckets to the endless connections 27 is preferably such as to prevent the swinging or tilting of the buckets with respect to the endless connections. Hence when the connections turn over the head wheel or drum 39 the contents of the buckets will be dumped in succession automatically or without special dumping means, said contents passing thence directly into any suitable receptacle such as a hopper 40 at the top of the tower. If the coal is to be delivered from the tower in cars, the filling thereof may be controlled by the operator on the platform through a cutoff 41, and hence the operation of the conveyer may be continuous for while a loaded car is being run out and an empty one run into its place beneath the hopper, the capacity of the hopper will take care of any accumulation of coal therein. Any suitable size, design, or construction of bucket may be used, but I prefer a bucket of the type indicated in the drawings each involving a longer carrying side 38^a and a shorter digging or filling side 38^b. The digging side of the bucket is the outer side, and in order to facilitate its entrance into or through the bulk material it is preferably only about one half as wide as the carrying side 38^a. These two sides of the bucket may be related to each other in any suitable manner, but as shown they are straight and both parallel to the direction of movement of the bucket. The carrying side of the bucket is not only long enough to insure the retaining of the coal while carrying in a horizontal or inclined direction, but also serves as a more effective delivery means for the bucket in passing over the head wheel or drum.

To the lower end of the boom is pivoted a suspended leg 42, the frame of which may be made of any suitable length material or design, and has attached to its lower end a cage or boot 43, of an open skeleton structure but having journaled in its bottom one or more anti-friction rollers 44 to facilitate the oscillating or swinging movements thereof around the point of connection 45 with the boom. This boot may extend upward along the leg as far as may be necessary to effect a substantial guard for the buckets, protecting them from the sides of the barge or other carrier from which the coal is being elevated or transferred. The bight of the conveyer is guided over the lower end of the leg by means of one or more wheels 46, and the upper and lower runs of the conveyer are guided over other portions of the conveyer frame by any suitable guide rollers such as shown at 47 and 48, journaled in brackets 49 and 50 respectively on the outer and inner sides of the lower end of the boom. These rollers obviously will be arranged in pairs when a pair of cables or chains 37 are used, but they will be employed singly when but one endless connection for the buckets is used.

As above premised the conveyer frame may be elevated or swung outward and up-

ward around the axis of the pivot or pivots 31 for the purpose of elevating the leg or swinging it outward with respect to the wharf. Any suitable means may be provided to effect this swinging of the conveyer, but I prefer to use a strut 51 which may be a single arm or a device including a pair of arms connected by diagonal braces as indicated at 52. The upper end of the strut is connected by a horizontal pivot 53 to the under inner side of the boom and located at any desired point intermediate of the ends thereof. Journaled upon the lower end of the strut are anti-friction rollers 54 which are adapted to co-operate with a stop member 55 at the lower end of the frame 16 to limit the downward movement thereof, or to roll along the sides of the frame 16 as guides when the lower end of the strut is lifted by any suitable means. As a suitable means to effect the elevation of the strut I provide a cable or chain 56 attached to the lower end of the strut, as for example at the point 57 on the axle of the rollers 54. This cable 56 extends upward parallel with the frame and over a pulley 58 journaled in the upper portion of the frame adjacent to the yoke 17. The cable passes thence downward over the smaller portion 59 of a double drum journaled in bearings 60 on the inner side of the frame. Coiled upon the larger portion 61 of this double drum is a cable 62 whose otherwise free end is attached to a counter-weight 63 slidable, as indicated, along a pair of spaced guides 64 and so confined to the conveyer frame 16. The counter-weight cable 62 is snubbed over a hand power shaft 65 journaled in the frame 16 and to the inner end of which is secured a hand wheel adjacent to the operator. The counter-weight is calculated to counter-balance a large portion of the weight of the conveyer boom and leg, so that the operator through the hand wheel 66 may effect the lifting of the conveyer. Obviously the rotation of the wheel 66 and shaft 65 in the proper direction will cause the unwinding of the cable 62 from the drum 61, and this unwinding will cause the cable 56 to be wound up on the drum 59 with the result that the lower end of the strut will be drawn upwardly along the frame 60 toward a position approximating the perpendicular to the boom. Thereby the boom and leg will be elevated as much as necessary. In designing the drums 59 and 61 account is taken of the probable strength of the operator or any other power means that may be employed to rotate the shaft 65, and the size or weight of the parts to be elevated. Any suitable speed reduction gearing may be employed between the motor 45 and head drum or wheel 39.

The lateral adjustability of the conveyer adapts the machine to be located upon a

dock projecting outward into the water far enough to enable a barge to be located on any one of three sides and yet not interfere with the elevation of coal by the conveyer or the delivery of the coal from the hopper. Another adaptability of my improvement is that a series of docks may be built to project parallel to one another from the same wharf, but so spaced from each other that a barge or other vessel may be unloaded from a position between them. In this adaptability of the machine the track rails 12 may align, remotely, with similar rails on an adjacent dock, so that by applying a temporary bridge between docks, the tower and machinery supported thereon may be transferred from one dock to another along the lines of said rails.

I claim:

1. In a conveyer, the combination of a frame, means to hold the frame from tilting, a conveyer boom connected by horizontal pivots to the upper portion of the frame adapting the boom for movement at its lower end toward and from the frame, and means to cause the tilting of the boom, said means including a strut pivoted at its upper end to the boom intermediate of its ends, the lower end of the strut being movable up and down along the frame.

2. A conveyer as set forth in claim 1 including means connected to the lower end of the strut, tending to elevate the same and cause the outward movement of the boom.

3. A conveyer as set forth in claim 1 including a flexible connection leading from the lower portion of the strut, and a counter-weight acting upon said flexible connection tending to elevate the strut and boom.

4. In a conveyer, the combination of a frame, means to hold the frame from tilting, a conveyer boom pivoted to the upper portion of the frame and movable at its lower end toward and from the frame around the axis of the pivots, a strut pivoted at its upper end to the boom and movable at its lower end along the frame, stop means fixed to the frame to limit the downward movement of the strut, and power means attached to the lower end of the strut to cause the elevation thereof and the boom.

5. A conveyer as set forth in claim 4 in which the power means includes a counter-weight movable along the frame.

6. A conveyer as set forth in claim 4 in which the power means includes a double drum having larger and smaller portions, a flexible connection leading from the lower end of the strut to the smaller portion of the drum, and a counter-weight connected to the larger portion of the drum, said counter-weight tending to lift the strut and boom.

7. A conveyer as set forth in claim 4 in which the power means includes a counter-

weight slidable along the frame, an over head guide pulley in the upper portion of the frame, a double drum journaled in the frame below the pulley and having larger and smaller portions, a flexible connection leading from the lower end of the strut over said pulley to the smaller portion of the drum, a flexible connection leading from the counter-weight to the larger portion of the drum, and power operated means co-operating with the latter mentioned flexible connection to cause up or down movement of the counter-weight. 10

OTTO E. BARENE.