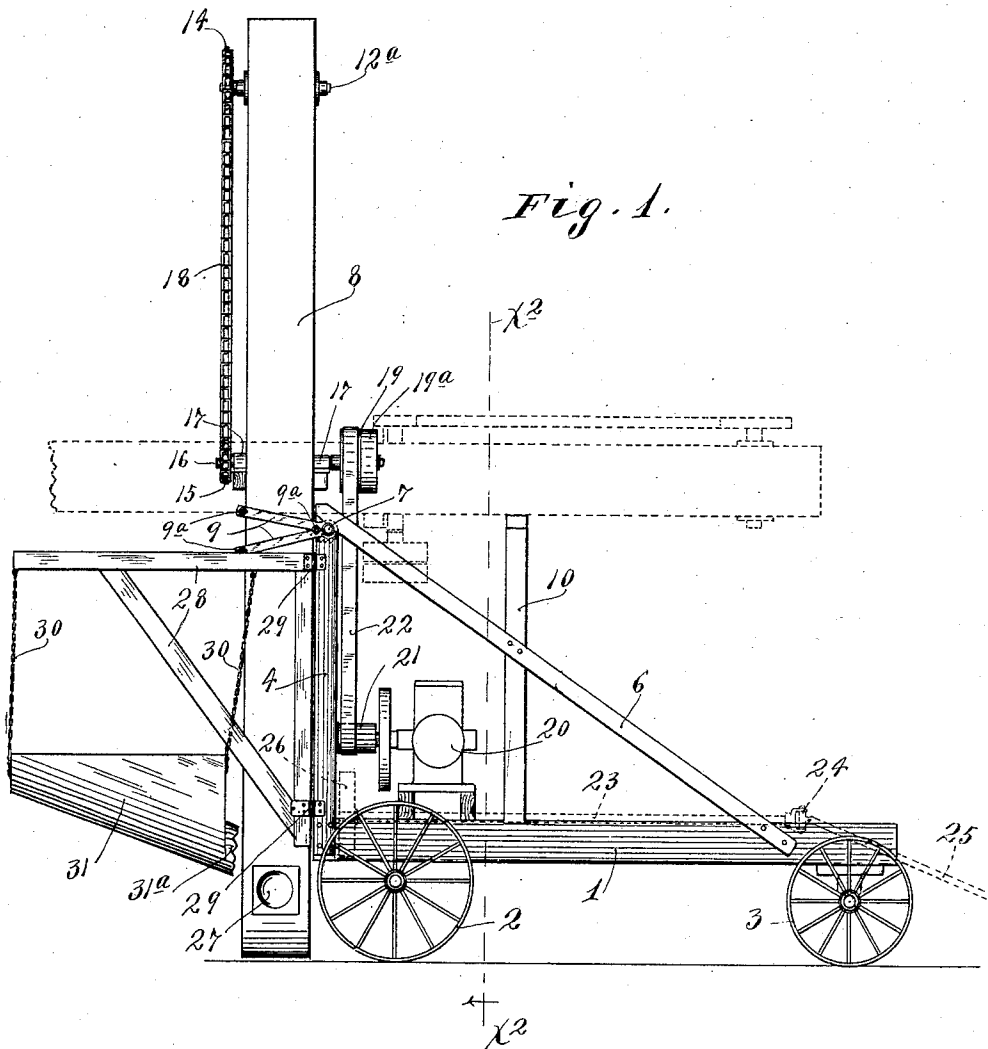


No. 866,619.

PATENTED SEPT. 24, 1907.

J. B. BUSHNELL.
PORTABLE ELEVATOR.
APPLICATION FILED MAR. 18, 1907.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

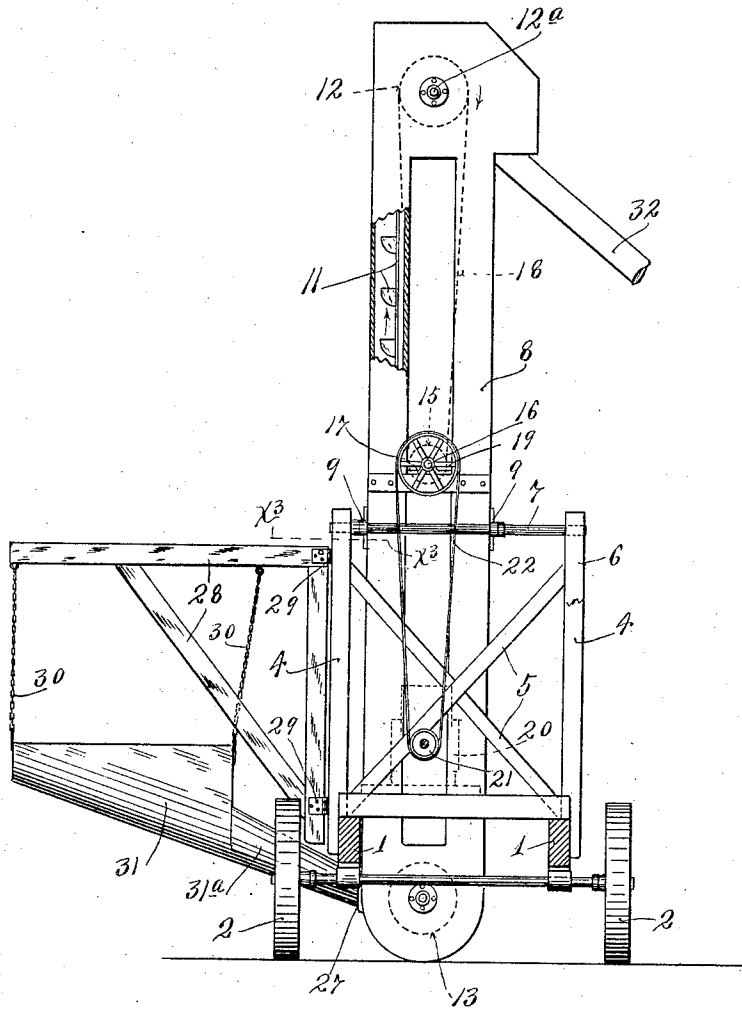
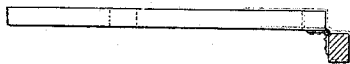


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN B. BUSHNELL, OF MINNEAPOLIS, MINNESOTA.

PORTABLE ELEVATOR.

No. 866,619.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed March 18, 1907. Serial No. 362,920.

To all whom it may concern:

Be it known that I, JOHN B. BUSHNELL, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Portable Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates particularly to portable elevators for the convenient and economical handling of grain, and has for its object to simplify and generally improve the construction and operation of mechanism of this class, which mechanism is, nevertheless, capable of general use for elevating materials in bulk.

The improved elevator is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in side elevation, with some parts broken away, and with some parts indicated by dotted lines, showing my improved elevator. Fig. 2 is a transverse vertical section taken on the line $x^2 x^3$ of Fig. 1; and Fig. 3 is a detail in horizontal section, taken on the line $x^2 x^3$ of Fig. 2.

All parts of the improved machine are supported, directly or indirectly, from a suitable truck comprising a frame 1, rear wheels 2 and front wheels 3, of any suitable construction. To the rear end of the truck frame 1, laterally spaced supporting brackets or pedestals 4 are rigidly secured, and these, as shown, are rigidly tied together by crossed truss bars 5. Also as shown, the upper portions of said pedestals 4 are tied to the forward portion of the truck frame 1, by inclined brace bars 6. A transverse pivot shaft 7 is secured at its end to the upper ends of the pedestals 4. A long bifurcated elevator leg 8 is intermediately pivoted on the shaft 7 for movements from a vertical position, shown by full lines in Figs. 1 and 2, into a horizontal position shown by dotted lines in Fig. 1. This pivotal connection is preferably made by brackets 9 secured to the sides of said leg 8 and pivoted on said shaft 7. The leg 8 is so nearly counterpoised on the said shaft 7, that a movement thereof from the one position to another may be easily accomplished. However, the said pivot shaft 7 is entirely at one side of the said leg 8, when the latter is turned into an upright position, so that the said leg will be gravity held in its upright or operative position. Furthermore, that portion of the leg and parts carried thereby which are above the said shaft 7 when the leg is upright, are somewhat heavier than those parts which are below the said shaft, from which it follows that the said elevator leg will be gravity held in its horizontal position, when turned into that position. The numeral 10 indicates a stop bracket shown as secured to the truck frame 1 and to the brace bars 6, and standing in position to support the forwardly turned end of the elevator leg when

the latter is turned into its horizontal or inoperative position.

An endless bucket-equipped conveyer belt 11 works within the leg 8 and is mounted to run over wheels or pulleys 12 and 13 mounted, respectively, on the upper and lower portions of said leg. The shaft 12^a of the upper wheel or pulley 12 projects at one end and is provided with a sprocket 14 that alines with a sprocket 15 carried by one end of a countershaft 16 journaled in suitable bearings 17 on the leg 8 and extending between the laterally spaced spouts thereof. A sprocket chain 18 runs over the said sprockets 14 and 15. At its forward end, the countershaft 16 is shown as provided with a fixed pulley 19 and a loose pulley 19^a.

The elevator belt is adapted to be driven either by an engine or motor carried by the truck of the machine, or by a suitable horse power mechanism. The numeral 20 indicates an explosive engine mounted on the truck frame 1, and the crank shaft of which, at its rearwardly projecting end carries a wide faced driving pulley 21 that alines with the two overlying pulleys 19 and 19^a. For the purpose of transmitting power from this engine to the bucket-equipped elevator belt, a driving belt 22 is run over the pulleys 19 and 21. When the belt 22 is run onto the idle pulley 19^a, the elevator belt will, of course, be stopped even though the engine 20 is permitted to run.

In Fig. 1, parts of a horse power transmission mechanism are indicated by dotted lines, and of the said parts the numeral 23 indicates a shaft that is mounted in suitable bearings in the truck frame and extends longitudinally thereof, is connected by a knuckle joint 24 to an extended transmission shaft 25 and is provided at its rear end with a driving pulley 26 that alines with the pulley 19 of the counter shaft 16. When the driving belt 22 is provided with a suitable interposed extension section, it may be applied to the pulleys 19 and 26 so as to transmit motion from the horse power mechanism to the bucket-equipped elevator belt. At its lower portion, and on that side wherein the bucket-equipped elevator belt 11 moves upward, the elevator leg 8 is provided with an inlet passage 27. To that pedestal 4 which is adjacent to the inlet passage 27 of the elevator leg 8, a crane or laterally swinging hopper supporting bracket 28 is pivotally attached, as shown, by hinges 29. A pair of chains or other suitable flexible connections or laterally yielding supports 30 support a feed hopper 31 from the transversely extended portion of the crane 28. This feed hopper 31 is inclined and is provided with an extended inclined delivery spout 31^a. Preferably, the said hopper is constructed of sheet iron, and the lower ends of the chains 30 are attached to the opposite ends thereof. When the crane 28 is turned outward or at a right angle or approximately so, to the longitudinal direction of the truck frame, the hopper 31 will be so supported by the chains 30 that it

will tend to swing toward the elevator leg 8, and the delivery end of the spout 31^a is then adapted to be inserted into the inlet passage 27 of said leg 8 and to be held in such position by gravity. When the hopper is thus supported, any material, such as wheat or other grain, delivered in to the hopper 31 will run, under the action of gravity, into the elevator leg 8 and will be carried upward by the bucket-equipped elevator belt 11 and delivered into a discharge spout 32 that inclines downward from the upper portion of the said elevator leg 8. In practice, this spout 32 will usually be an articulated or flexible metallic spout, capable of being variously positioned within a car or other receptacle into which the grain is being loaded; but this feature has nothing to do with my present invention.

In the use of the device, the crane with the hopper 31 will be turned inward and to the rear of the elevator truck, so as to permit the loaded wagon of grain to be driven alongside the elevator. Then, when the crane and hopper are again turned outward as shown in Fig. 2, the hopper will stand at the rear of the wagon box in position to receive the grain therefrom.

When the elevator leg 8 is turned into its inoperative horizontal position, shown by dotted lines in Fig. 1, and the crane and hopper are turned inward and rearward, the elevator rig may be driven through gateways, doorways, bridges and other passages of the usual width and height. A movement of the elevator leg from its upright operative position into its horizontal inoperative position simply throws off the driving belt 22, but leaves the sprocket and chain drive connected up in operative condition. When the elevator leg is turned from its inoperative position to its upright operative position, all that is required to render the same operative is to apply the driving belt 22 to the cooperating driving and driven pulleys, and this, as is obvious, may be very easily and quickly done because the upper or driven pulley is not located at a very great height above the platform of the elevator truck.

The brackets 9 are preferably adjustable longitudinally of the elevator leg 8, and to this end nutted clamping bolts 9^a are passed through the laterally spaced brackets outward of the elevator leg, thereby rigidly but adjustably clamping the said brackets onto the said leg. This adjustment makes it possible to vary the position of the extreme lower end of the elevator leg when the leg is in an upright or operative position. As is evident, if the leg be set so that its lower end projects below the level of the ground, a slight depression in the ground will be required therefor, but by this lower adjustment of the leg an increased drop or inclination of the feed hopper is made possible with the outer portion of the hopper at a predetermined elevation. The level of the outer portion of the hopper is usually limited by the height of the wagon box from which the grain is unloaded into the hopper. Of course, by adjustments of the chains 30, the altitude and inclination of the inclined feed hopper 31 may be varied.

In practice, any suitable lock or hook may be provided for positively locking the lower portion of the elevator leg to the truck frame when the said leg is turned into an operative or upright position. It will, of course, be understood that a belt and pulleys may be substituted for the chain 18 and sprockets 14 and 15. It is also evident that sprockets and chains may be substituted for the driving belt 22 and pulleys 21 and 17, all within the scope of my invention.

The machine described, as is evident, is of simple construction and, consequently, of comparatively small cost. In actual practice the said machine has been found highly efficient for the purposes had in view.

What I claim is:

1. In a machine of the kind described, the combination with a frame having upright supports, of an elevator leg intermediately connected to said upright supports by a pivot extending transversely of said frame, an endless conveyer working within said elevator leg, and a drive for said conveyer, comprising a counter-shaft mounted on the intermediate portion of said elevator leg and extending in the plane of the said leg's pivotal movement, a pulley on said counter-shaft, a pulley mounted on said frame, and a belt arranged to run over said two pulleys, the said two pulleys having approximately parallel axes when the elevator leg is in an upright or operative position, whereby the said belt will be given slack when said elevator leg is turned pivotally into a horizontal or inoperative position, substantially as described.
2. In a machine of the kind described, the combination with an elevator leg, an endless conveyer working therein and means for driving said conveyer, of an inclined feed hopper supported with freedom for endwise movements and provided with a discharge spout loosely fitting an inlet passage in the lower edge of said elevator leg and arranged to be gravity held engaged therewith, substantially as described.
3. In a machine of the kind described, the combination with a truck, of an elevator leg pivotally supported on said truck, an endless conveyer belt working within said leg, means for driving said conveyer belt, a crane supported by said truck with freedom for lateral swinging movements, and an inclined feed hopper suspended from said crane and provided with a discharge spout detachably engageable with the inlet passage in the lower portion of said elevator leg, and which hopper is adapted to feed material into said leg under the action of gravity, substantially as described.
4. In a machine of the kind described, the combination with a truck, of an elevator leg pivotally supported thereon, an endless conveyer belt working within said leg, means for driving said conveyer belt, a crane supported by said truck with freedom for lateral swinging movements, an inclined hopper provided with an inclined discharge spout detachably engageable with an inlet passage in the lower portion of said leg, and connections loosely suspending said hopper from said crane, with freedom for endwise swinging movements and so arranged that said discharge spout will be held in engagement with the inlet passage of said leg, under the action of gravity, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. BUSHNELL.

Witnesses:

MALIB HOEL,
F. D. MERCHANT.