

No. 645,443.

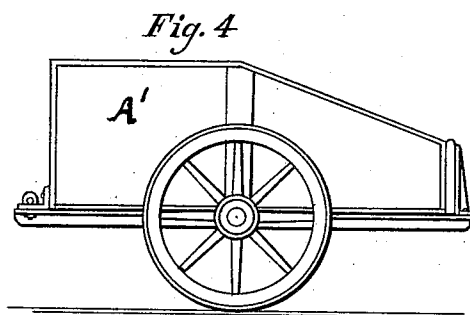
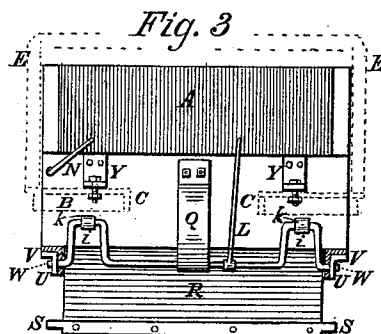
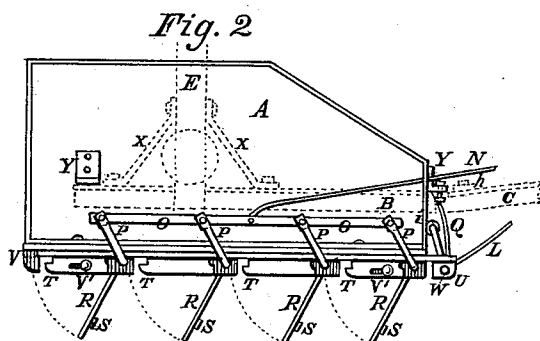
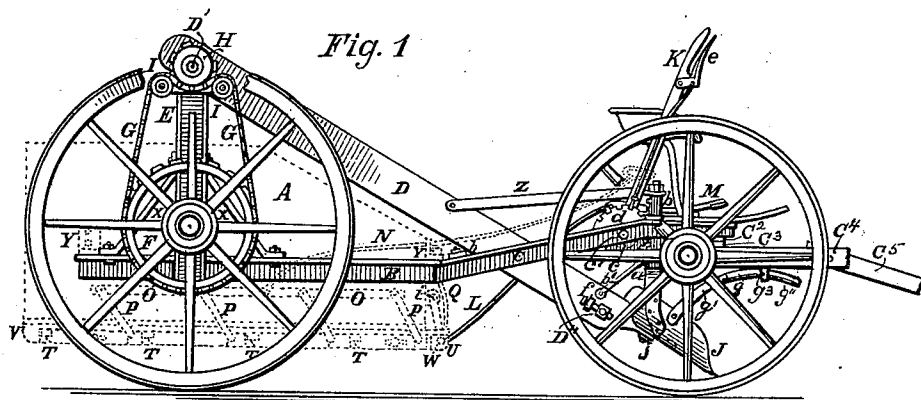
Patented Mar. 13, 1900.

J. W. WEAVER.
SELF LOADING EXCAVATOR.

(Application filed Jan. 3, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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Chas. A. Rowe

INVENTOR:

John W. Weaver
by Robt. B. Wilson
his attorney

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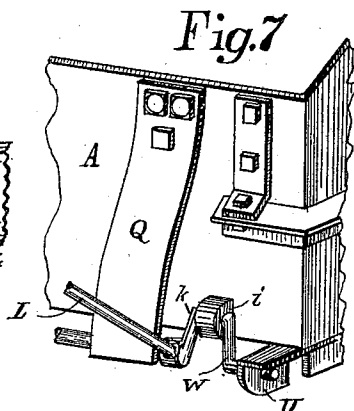
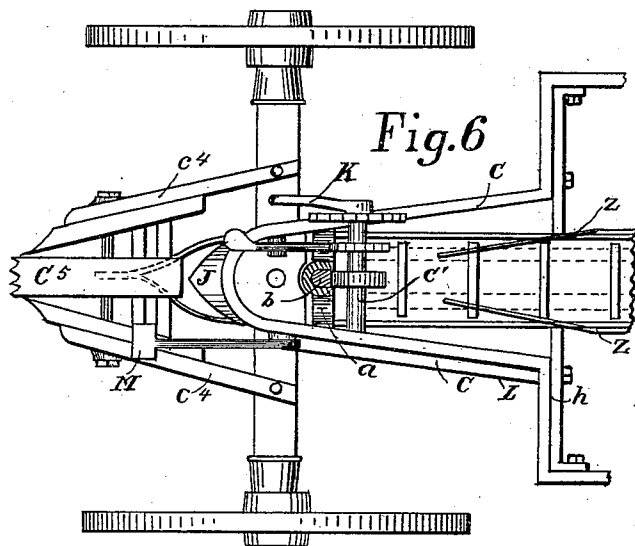
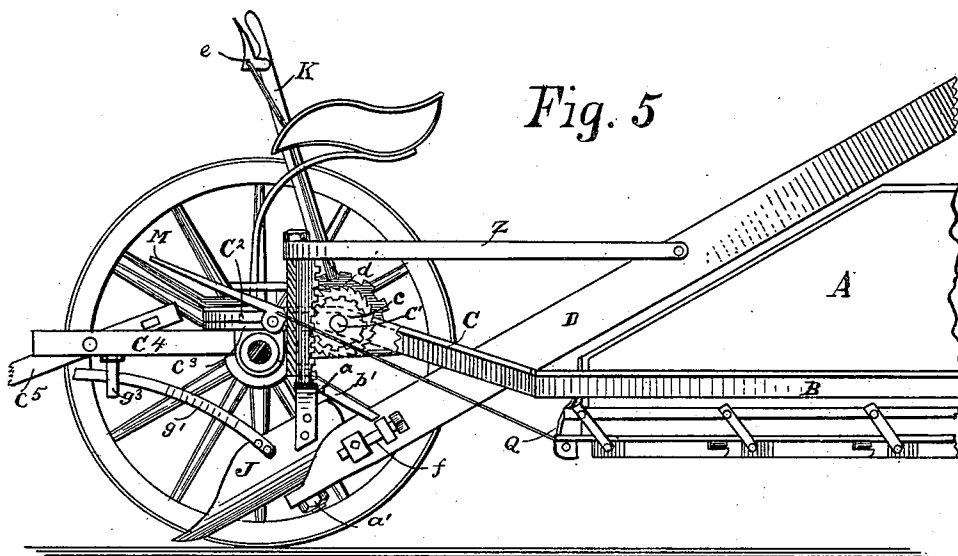
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3 Sheets—Sheet 2.



Witnesses.

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No. 645,443.

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3 Sheets—Sheet 3.

Fig. 8.

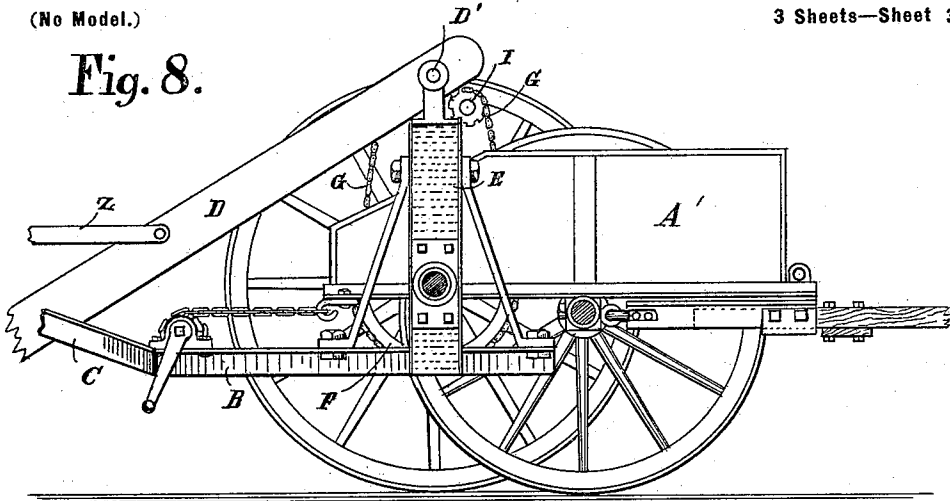
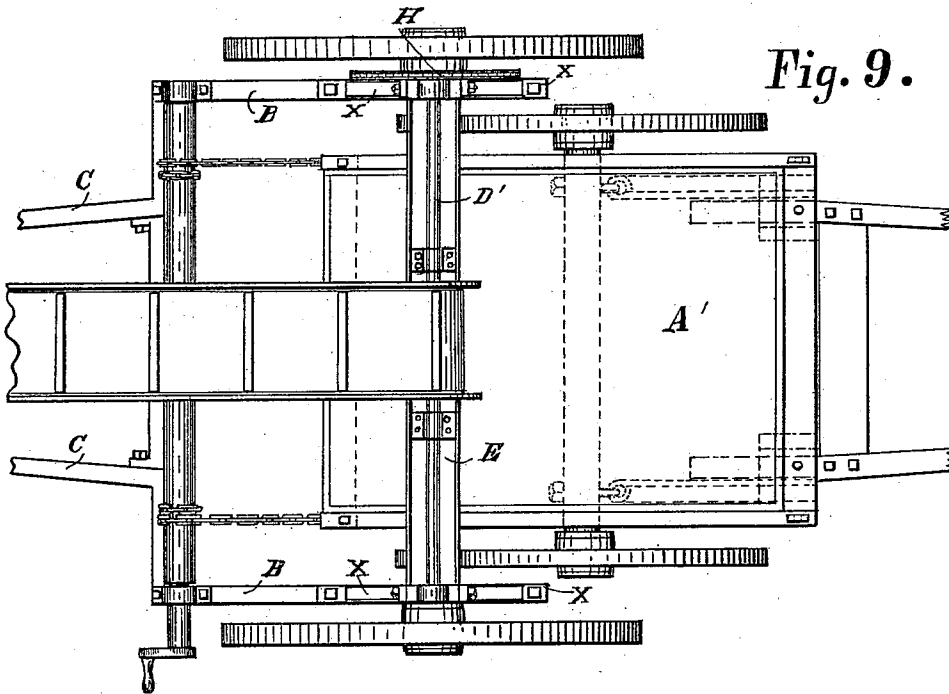


Fig. 9.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN W. WEAVER, OF TOLEDO, OHIO.

SELF-LOADING EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 645,443, dated March 13, 1900.

Application filed January 3, 1899. Serial No. 701,080. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. WEAVER, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have
5 invented certain new and useful Improvements in Self-Loading Excavators, of which the following is a specification.

My invention relates to improvements in self-loading excavators in which a conveyer
10 operates in conjunction with a plow to elevate the dirt as fast as excavated by the plow and deposit it in the bed of the vehicle to which the plow is attached; and the objects of my improvements are, first, to provide a
15 plow and conveyer in coöperative relation that may be readily raised and lowered together independently of the frame of the vehicle to which they are movably attached; second, to provide a plow that will while so
20 operatively attached to a conveyer turn horizontally with the front axle of the vehicle, so that when lowered it will cut the ground centrally to the front axle and in the direction of its forward movement without affecting its operative relation to the conveyer, and,
25 third, to provide simple means for loading, hauling, and dumping the loaded dirt. I attain these objects by the mechanism illustrated in the accompanying drawings, in
30 which—

Figure 1 is a side elevation of the machine, showing the mechanism for raising and lowering the plow and conveyer together and for operating the conveyer. Fig. 2 is a side elevation of the bed of the excavator, showing the mechanism for dumping the dirt therefrom; and Fig. 3 is a front end elevation showing a part of the same mechanism. Fig. 4 shows a side elevation of an auxiliary cart which may
40 be used in place of the bed shown in Figs. 1, 2, and 3 to receive the dirt from the conveyer and be separately hauled to the dumping-place while a similar one is being loaded by the excavator. Fig. 5 is an enlarged side view
45 of the front end of the excavator with one front wheel removed and a portion of the excavator-frame broken away to show mechanism for raising and lowering the plow. Fig. 6 is a top view of the same. Fig. 7 is an enlarged detail view of spring Q and crank-shaft mechanism for dumping. Fig. 8 is a side view of the rear portion of the excavator

with one wheel removed, showing an auxiliary cart in position for loading and having detachable shafts. Fig. 9 is a top view of the same.

Similar letters refer to similar parts throughout the several views.

The bed A, supported by brackets Y, secured to frame B, the frame B, having arch E, provided with braces X X and with axle-bearings for the rear wheels secured to the rear sides thereof, the coupling-bars C C, having cross-brace h and bearing C², the front axle, having bearing C³ pivoted to bearing C²,
65 hounds C⁴, and tongue C⁵ constitute, with the wheels, the vehicle which carries the earth excavated and the mechanism for excavating, loading, and unloading it.

D is a conveyer-frame, which is provided 70 with an endless-sprocket-chain conveyer, having slack-adjuster f, and with shafts D¹ and D², having sprocket gear-wheels attached, adapted to operate the conveyer. Shaft D¹ is also provided with sprocket gear-wheel H, which is
75 connected by sprocket-chain G, having idlers I I, to sprocket gear-wheel F, attached to one of the rear wheels, whereby when the vehicle is moved forward the upper web of the conveyer is moved in the opposite direction. 80 Shaft D², extending horizontally through the sides of conveyer-frame D near its upper end, is also provided with journal-bearings on each side of the frame, securing it to arch E, whereby the conveyer-frame D is pivoted at its upper
85 end to arch E of frame B. From thence, inclining forward and downward, conveyer-frame D, together with braces Z Z, extending horizontally forward from its sides, and rack-post b, shouldered into braces Z at its
90 upper end and having arms b', embracing and attached to the sides of frame D at its lower end, form a standard for plowshare J, having arch a, pivoted centrally to rack-post b, and pivot j, journaled into the end of frame D. 95 Plowshare J is also provided with guiding device g, having arms g', pivoted to the sides of plowshare J, and body portion g'', extending loosely through eyebolt g³, attached to hounds C⁴ in line with tongue C⁵. The cogs of rack-
100 post b mesh into pinion-wheel c, having shaft C', journaled horizontally through coupling-bars C. Lever K, which is pivoted on shaft C', is provided with a ratchet for operating a

ratchet-wheel secured to the same shaft and with a spring-dog *e* to connect it with rack *d* and hold it, and with it the plow, in any desired position, whereby when lever *K* is moved forward the plowshare *J*, together with conveyer-frame *D*, is lowered until the point of share *J* engages with the ground and is driven into it to any desired depth within the limits of the movement of rack *b* as the machine is moved forward, which forward movement also operates to set the conveyer in motion, and the excavated soil forced upward by plowshare *J* falls onto the moving conveyer and is carried backward and upward to the upper end of conveyer-frame *D*, from which it falls into bed *A* of the excavator. It is apparent that as the front axle is turned on its pivoted bearing *C*³ by tongue *C*⁵ guiding device *g* will turn plowshare *J* on its pivots *j* and *a'* and keep the nose of the plow directed central to the front axle and in the direction of its movement and that in any position the plow *J* may be thus made to assume it will in its forward movement deposit the soil it excavates onto the conveyer. In raising and lowering plow *J* guiding device *g*, passing loosely through eye-bolt *g*³, accommodates itself to the movement of the plow up and down without affecting its adaptability to guide the plow in whatever position it may be, while the range of movement of share *J*, with its support, under control of lever *K* enables the operator to adjust the depth of the cut or to remove the plow from the ground to pass obstacles or while the load is being hauled to the dump.

For convenience of dumping the loaded dirt bed *A* is provided with trap-doors *R* in its bottom, adapted to be closed when open by levers *P*, operated simultaneously by connecting-bar *O*, through connecting-rod *N*, extending for convenience within reach of the operator. Trap-doors *R* are hinged to angle-bar supports *V*, secured to the bottom of bed *A*, at each side thereof, by the main body portions of levers *P*, to which they are fixedly attached, and which extend from side to side of bed *A*, and through holes in the perpendicular webs of angle-bar supports *V*, the lever portions being formed by bending the rods of which they are constructed at right angles to their main body portions. Trap-doors *R* have attached to them supporting-bars *S*, the ends of which extend beyond the ends of the doors *R*, and, corresponding to the position thereof when the doors *R* are closed, the perpendicular webs of supports *V* are cut away to allow the doors *R* to close between them without interference from bars *S*. Embraced within the inner angles of supports *V* and conforming thereto are angle-bars *U*, which are movably attached to supports *V* by bearings *V'*. The perpendicular webs of angle-bars *U* are likewise cut away at intervals corresponding with the bearings of levers *P* and to form latches *T*. At their forward ends angle-bars *U* are connected by crank-shaft *W*, having journals *i* and bear-

ings *k*, attached to the front end of bed *A*, the movement of which is limited by bearings *V'* and resisted by spring *Q*, whereby when the crank portion of the shaft is pulled forward by connecting-rod *L*, operated by foot-lever *M*, supports *U* will be moved a short distance forward; and when the pressure is removed from lever *M* spring *Q* will return them to their normal position, in which, the doors being closed, they are supported in such position by latches *T* underneath bars *S*. When it is desired to dump a load from bed *A* by pressing on lever *M*, crank-shaft *W* is drawn forward, moving with it bars *U* and latches *T* from underneath bars *S*, thereby releasing doors *R* simultaneously, which dropping instantly dump the load from bed *A*. The load being dumped, by pulling rod *N* all of the doors *R* are simultaneously moved upward, bars *S* are brought into contact with the rounded ends of latches *T*, whereby the bars *U* are wedged forward against the pressure of spring *Q* until bars *S* have passed latches *T*, when the spring reacts and the doors are held closed by the latches *T*.

Where the haul for dumping is long and the excavator can be more profitably employed in excavating than in hauling, carts *A'* may be substituted for bed *A*, which may be removed for the purpose. Cart *A'*, which is constructed substantially in the form of the ordinary dumping-cart, is provided at its rear end with any suitable and convenient means of draft attachment to frame *B* when backed into the position of bed *A* in frame *B* (shown in dotted lines in Fig. 1) and at its front end with ready means of attaching and detaching shafts while a horse is hitched therein and adapted when so attached to sustain the overbalance of weight of the load in the front end of the cart. Thus provided, a cart *A'*, having the shafts detached, may be backed into and attached to frame *B* and the excavator moved forward until the cart is loaded. When loaded, a horse may be detached from an empty cart by detaching the shafts, and the shafts being then attached to the loaded cart and the draft attachments to frame *B* released the loaded cart may be hauled away to the dump while the empty cart, similarly attached to the excavator, is being loaded.

I am aware that prior to my invention self-loading excavators have been made with conveyers operating in conjunction with a plow that turns with the front axle and cuts the ground centrally to it in the direction of its movement. I therefore do not claim such a combination broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a self-loading excavator, a body-frame mounted on front and rear wheels, adapting it to be moved over the ground like a wagon, comprising side beams rigidly connected by a plurality of connections, the rear connection being an arched beam having

axle-journals secured to its vertical sides upon which the rear wheels are journaled, and forming an arched opening in the frame between the rear portions of the side beams for receiving a dumping-cart or other receptacle for excavated soil, having means of attachment to the frame, in combination with a conveyer-frame pivotally attached at its rear end to the arch-beam of the body-frame and inclined forward and downward therefrom, and having its front end free and adapted to be raised or lowered independently of the body-frame and provided with a plow, means to raise or lower the front end of the conveyer-frame and therewith the plow, a conveyer attached to the conveyer-frame, and means to operate the conveyer by the movement of the rear wheels, substantially as and for the purpose described.

2. In a self-loading excavator, a body-frame mounted on front and rear wheels, the front wheels being journaled on an axle centrally pivoted to the front end of the frame and provided with a tongue, adapting the frame to be moved over the ground like a wagon, comprising side beams rigidly connected by a plurality of connections, the rear connection being an arched beam having axle-journals secured to its vertical sides upon which the rear wheels are journaled, and forming an arched opening in the frame between the rear portions of the side beams for receiving a dumping-cart or other receptacle for excavated soil, having means of attachment to the frame, in combination with a conveyer-frame pivotally attached at its rear end to the arch-beam of the body-frame and inclined forward and downward therefrom and having its front end free and adapted to be raised or lowered independently of the body-frame, and provided with a plow pivotally secured thereto and adapted to a limited horizontal rotation independently of the conveyer-frame, means to raise or lower the front end of the conveyer-frame and therewith the plow, means to turn the

plow horizontally with and as the front axle turns independently of the conveyer-frame, a conveyer attached to the conveyer-frame, and means to operate the conveyer by the movement of the rear wheels, substantially as and for the purpose described.

3. In a self-loading excavator, the combination of the frame B, having the arch E, coupling-bars C, C, and bearings C² and C³, and provided with wheels adapting it to be moved over the ground, with conveyer-frame D, provided with an endless-sprocket-chain conveyer, pivoted at its upper end to arch E of frame B, and having its lower end free and provided with braces Z, Z, and rack-post b, plow J, pivoted to frame D and its rack-post b, and having guide g provided with eyebolt g³, means to raise and lower the free end of frame D and with it plow J, and means to operate the conveyer to carry the excavated soil away from the plow by the forward movement of frame B on its wheels, substantially as and for the purpose set forth.

4. The combination of an excavator-frame, mounted on front and rear wheels adapting it to be moved over the ground like a wagon, comprising side beams having a plurality of rigid connections, the rear connection being an arched beam having axle-journals secured to its vertical sides upon which the rear wheels are journaled and forming an arched opening in the frame between the rear portions of the side beams, a dumping-cart adapted to enter the arched opening between the sides of the frame, provided with means for attaching it to the frame and with detachable shafts and means carried by the frame to excavate soil and load it into the cart by the forward movement of the excavator-frame on its wheels, substantially as and for the purpose set forth.

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Witnesses:

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