(No Model.) 2 Sheets—Sheet 1.

S. F. WELCH.

EXCAVATOR.

No. 334,497. Patented Jan. 19, 1886.

Fig. 1.

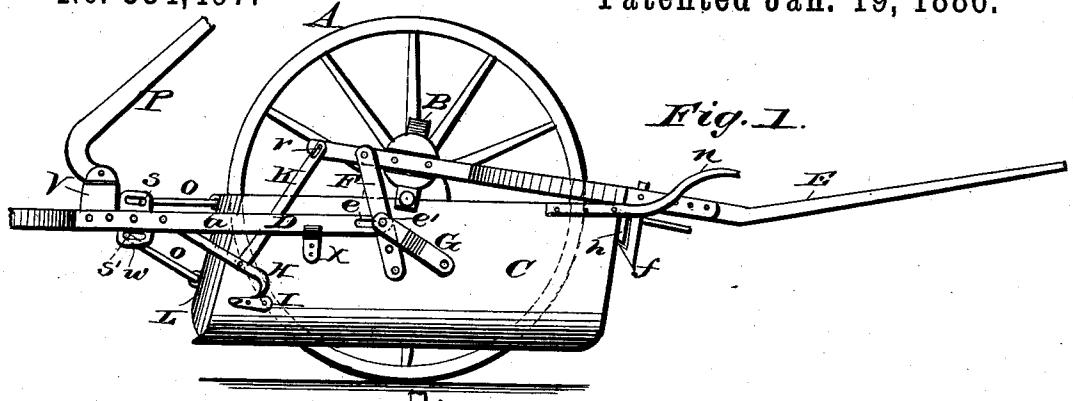


Fig. 2.

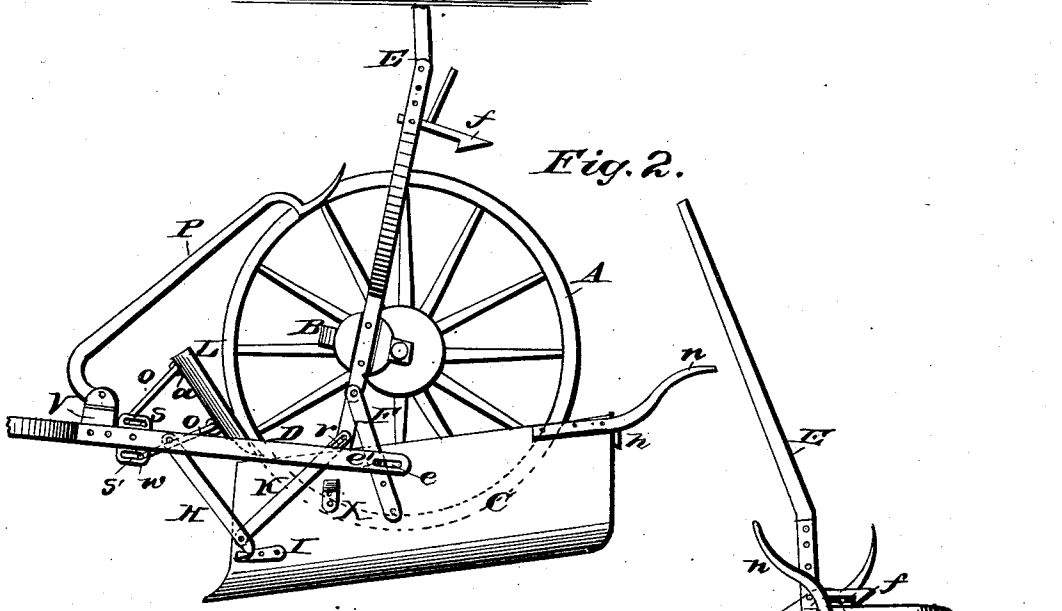
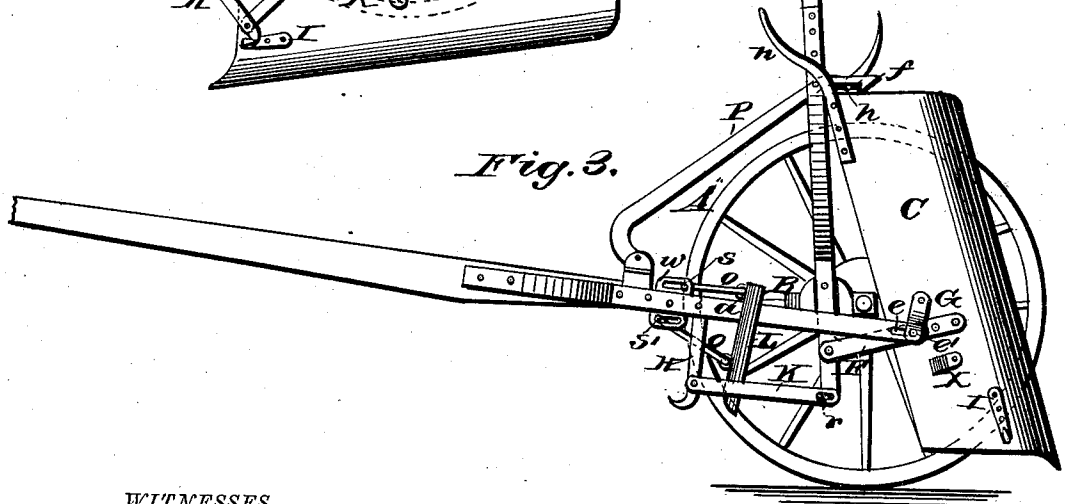


Fig. 3.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

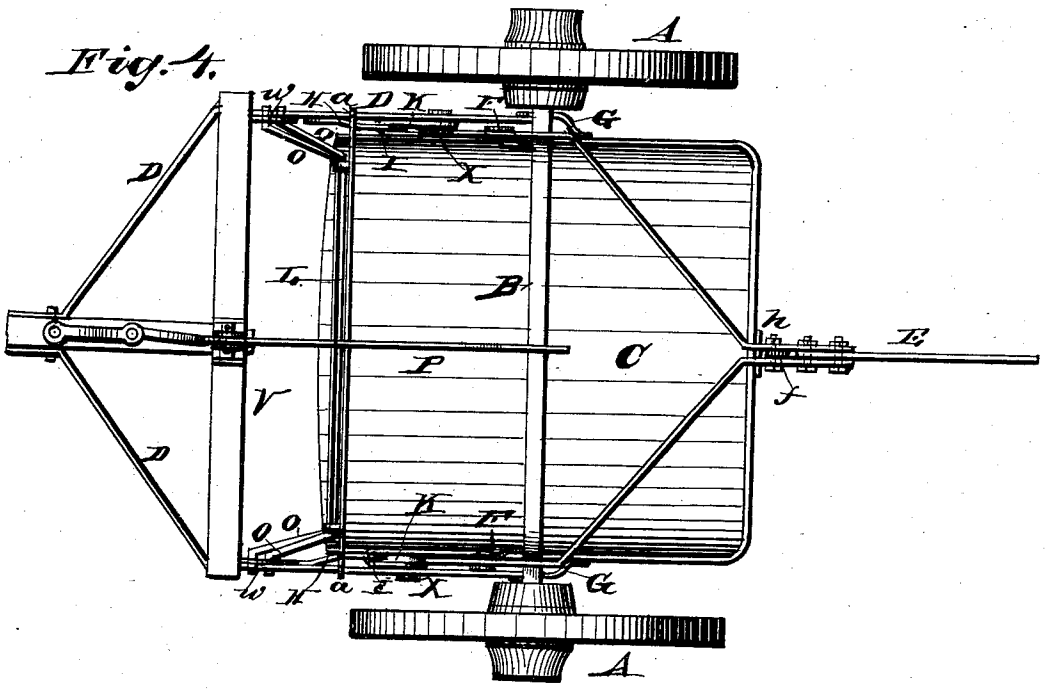
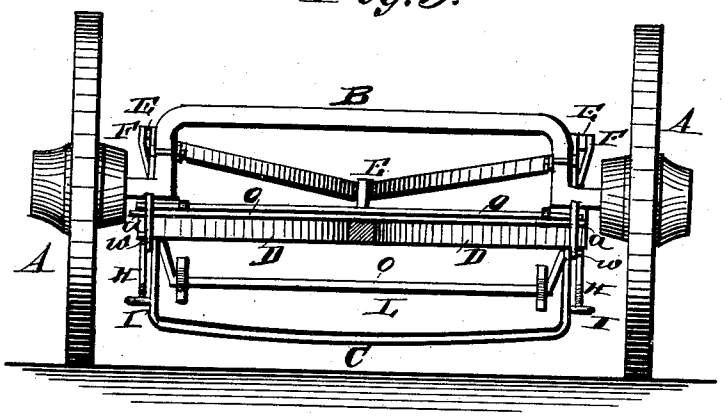


Fig. 5.



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UNITED STATES PATENT OFFICE.

S. FRANK WELCH, OF MOUNT PLEASANT, IOWA.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 334,497, dated January 19, 1886.

Application filed June 18, 1885. Serial No. 169,081. (No model.)

To all whom it may concern:

Be it known that I, S. FRANK WELCH, of Mount Pleasant, in the county of Henry and State of Iowa, have invented certain new and useful Improvements in Wheeled Excavators; 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 to an improvement in wheel-scrapers.

Heretofore chains and metal bars arranged in different forms have been used to couple the forward end of a scoop-scraper to the tongue-bars as a means of securing a draft-connection with the scoop at its forward end during the process of filling, and supplementary draft-bars pivoted to the sides of the scraper-scoop near their forward ends have been provided, the same being arranged to automatically engage and disengage at their forward ends with fixtures on the tongue-bars, for the purpose of securing the draft, as above described; but all of said devices for thus shifting the draft are objectionable, as they are permanently attached to the sides of the scoop, and thereby to a great extent constitute or become additional and separate draft attachments in use at the same time, thereby causing great rigidity in the operation of the scoop, thus making it difficult to properly manipulate it in part of its operations—as, for instance, it becomes necessary to cant the scoop by raising the rear end thereof, in order to cause it to properly start into the dirt for filling, and after the scoop is thus started it is necessary to lower the same to a partially level position during the process of filling, to enable it to cut a smooth and even bottom, and also causing the scoop to fill better than if continued in its canted position.

I am also aware that forward end-gates having automatic action have been provided, in which the gates have been rigidly fastened to the tongue-bars or analogous fixtures of the machine in such manner that the scoop is closed only by raising the scoop to the gate. End-gates have also been provided having pivoted arms to control and guide their action, and permitting of vertical adjustments, the arms having fixed pivots at both ends, causing the gates to describe arcs of circles in their adjustments. All of these constructions are objectionable—the former because a portion of the dirt in the scoop will escape before the scoop reaches its full elevation, so as to properly close its mouth, and the latter because the gate in closing will cut out a portion of the dirt that should remain in the scoop.

The object of my improvement is to secure the draft-connections of scraper-scoop in such manner that at all times it will be best adapted to the workings of the scraper in its necessarily varied positions.

A further object is to provide improved means for attaching the end-gate to a scoop, whereby the same may be automatically opened and closed.

A further object is to provide means of the above character which shall be simple and economical in construction and durable and efficient in use; and with these ends in view my invention consists in pivoting the forward ends of a pair of supplementary draft-bars having hooks at their rear or lower ends to the tongue-bars of the machine, so that the hooks on said bars will when the scoop is lowered engage with other hooks rigidly secured to the scoop at its forward end and become disengaged when the scoop is raised, and a manipulating connecting-bar coupling the lower ends of said supplementary draft-bars with forward extensions of a bifurcated lever used for swinging the scoop, as a means of forcibly controlling the movements of the hook ends of said draft-bars, and thus cause them to automatically engage and disengage with the said fixed hooks.

My invention further consists in providing pivoted bails to the forward end-gate of the scoop, with the outer ends of said bails pivotally secured in horizontal slots, thereby providing for horizontal oscillating movements for the ends of said bails.

My invention further consists in the certain features of construction and combinations of parts, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying my invention in position for carrying a load. Fig. 2 is a similar view of the scoop in position for filling. Fig. 3 represents the scoop in a semi-

inverted position occupied after dumping. Fig. 4 is a plan view of the machine, and Fig. 5 is an end view thereof. In Figs. 1, 2, and 3 one of the wheels is removed for the purpose of clearly showing the mechanism.

A represents the ground-wheels of the machine, and B the rectangular arched axles on which the wheels are journaled.

C represents the scoop, and D the tongue or shaft bars.

E represents a lever, the end of which is bifurcated, forming arms, to which is suspended the scoop C. The lever is also provided with a hand-hook, *f*, the same being adapted to take under a catch, *h*, on the rear of said scoop and support the same. Suitable arms, F, are pivoted to the lever E, the opposite ends thereof being rigidly secured to the scoop.

G are suitable lugs adapted to support and brace the outer ends of the main shafts D. The supplementary draft-rods H are pivotally secured to the shafts D, and are provided on their free ends with hooks for the purpose of engaging the hooks I, which are rigidly secured on the forward end of the scoop, whereby the draft is transferred to its forward end during the process of filling.

K are coupling-bars, having one end thereof secured to the free or lower ends of the rods H, the opposite ends thereof being secured to the bifurcated ends of the lever E, for the purpose of supporting and also for actuating the lower or free ends of the rods H. The lugs X are fastened to the sides of the scoop forward of its swinging pivots or hangers F, in such manner that they will impinge against the bottom of the shafts D when the scoop is elevated, as shown in Fig. 1, thereby preventing the rear end of the scoop from tilting backward when additional weight is brought to bear upon the rear of its pivotal points.

L is a forward end-gate for closing the end of the scoop, the same being secured to the shaft-bars or frame D by means of the rectangular hinged bails *o*, the inner ends of the said bails being pivoted to the gate, and the outer ends thereof being loosely pivoted in the horizontal slots *s s'*, formed in the plate *w*, which is attached to the shafts D, whereby a horizontal oscillation or sliding movement is allowed said bails, whereby the same may be automatically adjusted in said slots when the gate is opposed to frictional contact.

V is a cross-bar serving as a lateral brace, and adapted to support the rear ends of the shafts, and also forming a bearing for the hook P, which is adapted to secure the scoop in a semi-inverted position when traveling empty, as shown in Fig. 3. The handles *n* are secured to the rear end of the scoop in preferred manner, and are for the purpose of conveniently tilting the same.

For the purpose of affording flexibility to the scoop attachments during the process of filling the scoop, the slots *e* are formed in the rear ends of the shafts D, in which the studs or pins *e'*, which project from the sides of the scoop and the hangers F, are adapted to work, whereby the scoop may be conveniently manipulated or adjusted to any desired angle or inclination necessary to accommodate the same to different kinds and conditions of earth, the object being accomplished by means of the studs or pins *e'* sliding forward in the slots *e* when the rear end of the scoop is elevated.

It will be observed that when the scoop is lowered for filling, as shown in Fig. 2, the draft is brought to bear upon the hooks I. The slots *e* also limit the upward or forward movement of the studs or pins *e'*, whereby the scoop is prevented from accidentally dumping by having its cutting-edge strike a hard or solid substance during the filling process. The slots *e*, if preferred, may be made obliquely with said bars, or enlarged round holes may be used instead. The upper ends of the rods K are also provided with slots in their upper ends, in which the pins *r* slide, as a means of accommodating the variable distance between the ends of the lever and the hooks I, caused by the opposite arcs described by the adjacent ends of the lever E and rods K.

Having described the construction of my improvement, I will proceed to describe its operation, which is as follows: Supposing the machine to be in the position shown in Fig. 1, the scoop is lowered for filling by the attendant grasping the lever E and disengaging the hook *f* from the catch *h*, when the scoop by its own gravity will descend to the position shown in Fig. 2, at which time the hooks on the supplementary bars H, being actuated by the lever E and the rod K, will engage the hooks I, at which time the scoop is canted forward and enters into the loose soil. While the scoop is being thus filled, the end-gate L rides over the soil, bearing against it until the scoop is filled to its utmost capacity, and as the soil thus bears against the end-gate the same will be elevated above the scoop, and through the contact with the soil against the end-gate the lower bail *o* will slide backward into the slot *s'*, and by the pressure bearing backward against its lower edge it will be caused to rotate on its pivotal connections with said bails, so as to slide the pivotal ends of the upper bail *o* outward or forward in the slots *s*, whereby the gate is enabled to slide over the loose soil and such clods or lumps as it may encounter, and thus it is elevated as the quantity of soil increases in the scoop until the parts assume the position shown in Fig. 2, at which moment the outward pressure of the dirt bears against the lower edge of the end-gate, thus causing all the parts to reverse their action by sliding the outward ends of the lower bail *o* outward in the slot *s'*, and by the reverse rotation of the gate on the said bail, it serving as a fulcrum or pivot, causes the upper bail *o*

to slide inward or backward in the slots *s*, so that said gate will thereby take nearly a perpendicular position and automatically settle as the scoop is raised, thereby closing the mouth of the scoop. When all of the parts occupy the position shown in Fig. 1, the scoop has been raised by a downward pressure on the outer end of the lever E, and is secured in position by means of the hook *f* taking on the catch *h* on the rear end of the scoop, in which position the load is conveyed to its destination, where it is dumped by raising the outer end of the lever E without disengaging the hook *f*.

I would have it understood that I do not limit myself to the exact construction shown and described, but consider myself at liberty to make such changes and alterations as properly fall within the spirit and scope of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with an axle and arms secured thereto and projecting in front of said axle, and a scoop pivoted to the arms, of rods pivoted to the draft attachments and connected with the handle, and adapted to engage the forward ends of the scoop, substantially as set forth.

2. In a wheel-scraper, the combination, with the draft-frame and a lever secured to the axle thereof and projecting in front of said axle, and a scoop pivoted to the lever, of draft attachments provided with slots at their rear ends, and connecting-rods and manipulating-bars provided with pins or studs adapted to register with said slots and loosely connect the draft attachments with the scoop, substantially as set forth.

3. The combination, with a scoop and draft-frame, of a gate and slotted plates secured to the frame, and pivotal connecting-rods between the plates and the gate, whereby the gate is adapted to automatically open and close the scoop, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

S. FRANK WELCH.

Witnesses:
C. M. SNYDER,
O. P. BECKWITH.