(No Model.)

A. H. McGREW.

RAILROAD DITCHING MACHINE.

No. 345,855. Patented July 20, 1886.

Fig. 1.

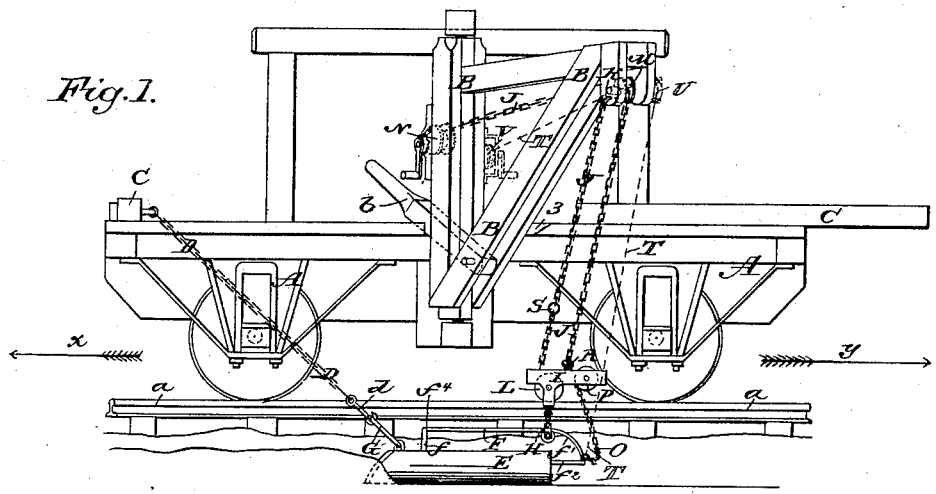


Fig. 2.

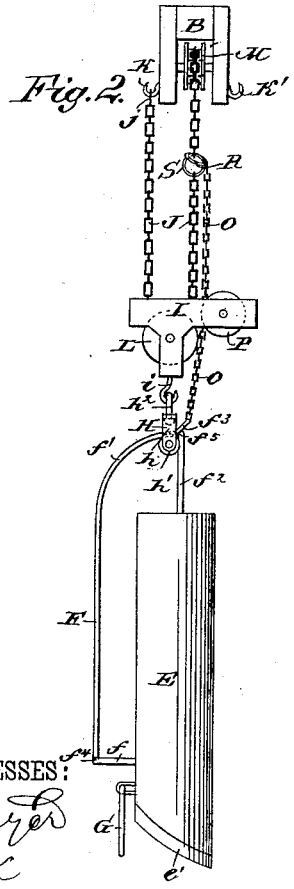


Fig. 4.

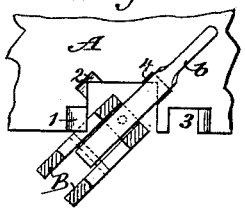
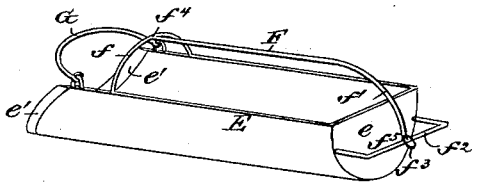


Fig. 3.



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ALONZO HENRY McGREW, OF HURLEY, DAKOTA TERRITORY.

RALROAD DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,855, dated July 20, 1886.

Application filed October 21, 1885. Serial No. 180,520. (No model.)

To all whom it may concern:

Be it known that I, ALONZO HENRY McGREW, of Hurley, in the county of Turner and Territory of Dakota, have invented a new and Improved Railroad Ditching-Machine, of which the following is a full, clear, and exact description.

My invention relates to machines especially adapted to open or trim drainage-ditches at the side of railway-tracks, but applicable for use in other excavating operations.

The present invention is an improvement on the ditching-machine for which Letters Patent No. 318,643 were issued to me May 26, 1885, and has for its object to facilitate and make more easy and certain the dumping of the contents of the scoop than was possible with the prior patented construction of the scoop and mode of supporting it from the derrick of the moving platform or car.

The invention consists in certain novel features of construction and combination of parts of the ditching-machine, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the ditching-machine, showing it at work. Fig. 2 is a side elevation of the improved ditching-scoop and devices for dumping the contents of the scoop, which is shown suspended, nose downward, from the derrick. Fig. 3 is a perspective view of the improved scoop; and Fig. 4 is a detail plan view of part of the car next the derrick, which latter is shown partly in horizontal section.

The letter A indicates the ditcher-car or movable platform, adapted to run on the railroad-track *a*, and B is the derrick, which is mounted on the car to swing horizontally, and has a pivoted lever, *b*, which may be set into any one of a series of notches, 1 2 4 3, made in the edge of the car-platform, to lock the derrick in various positions, and the car is fitted with pivoted beams C, to which connect the scoop draw-chains D.

All the above-named parts are substantially similar in construction and operation to parts for like purposes shown in my aforesaid Patent No. 318,643, and need no detailed description here.

The letter E indicates the ditching-scoop, across which, near its forward end, is fixed the bowed part *f* of the bail, to the center of which part *f* is connected the main part F of the scoop-bail, which part F, instead of connecting with a bowed bar crossing the scoop above the back end, *e*, of the scoop, as shown in my aforesaid Patent No. 318,643, extends beyond the back end of the scoop, and preferably in a downward curve, as at *f'*, so as to connect with a cross-bar, f^2, which is fixed at the back end of the scoop and about at its center, so as to allow the scoop to hang vertically, nose downward, as shown in Fig. 2, and as hereinafter more fully explained.

At or near its forward end the scoop is provided with the pivoted bail G, to which a hook, *d*, on the draft-chain D, is to be connected, and I provide the forward extremity of the scoop with the knife or cutter *e'*, to facilitate the operation of the scoop in hard, tough soils, and through roots, weeds, &c.

To the main part F of the scoop-bail is held the traveler H, which consists, preferably, of a suitable bent metal frame or head, *h*, in which is journaled a roller or sheave, *h'*, which is beneath the bail F, and on which traveler the rear end of the scoop is supported from the arm or jib of the derrick, preferably by means of a hook or eye, h^2, swiveled in the head *h* of the traveler, and connected by a hook, *i*, to the frame I, which in turn is supported or slung in the bight of a chain, J, one end, *j*, of which is hooked in one of the hooks K K', fixed to the derrick-arm, and thence passes downward and beneath a sheave or chain-wheel, L, journaled in the frame I, and thence upward to and over a sheave, M, journaled in the end of the derrick-arm, whence the chain J passes to and around the drum of a ratchet-windlass, N, on the derrick or car, and so that by operating said windlass the back end of the scoop may not only be raised or lowered slightly, to govern the depth of cut of the scoop, but may also be raised considerably for dumping the contents of the scoop, as presently described.

At O is shown a chain, which is fixed at one end in any approved way to the extreme

back end of the bail-bar F, or to the cross-bar f^2, where it joins said bar F—say by means of a ring, f^3, fixed to the scoop-bail—and said chain O passes upward beneath an anti-friction and guide roller or sheave, P, which is journaled in the frame I, and at its upper end the chain carries a ring, R, through which the scoop-hoisting chain J will run freely.

In and to the chain J—say at a distance about from three to five feet from its end *j*, which is fast to the hook K—is connected a ring, S, which will run freely under the sheave L, but will not pass through the ring R, and hence will carry said ring R upward with it and draw on the chain O and lift the back end of the filled scoop.

The operation is as follows: When the ditcher-car is drawn forward in direction of the arrow *x* in Fig. 1, and the scoop E is at work in the ditch, the derrick B will be swung back and held by the engagement of its lever *b* with the car-platform notch 2, and the traveler H will stand about over the back end, *e*, of the scoop. When the scoop is filled, the derrick-lever will be lifted from notch 2, and will be used to turn the derrick forward, so that the lever can be set into the car-platform notch 4, as in Fig. 4, and by thus swinging the derrick the traveler H will be caused to run forward on the scoop-bail to the point of junction at f^4 of the bail-bars *f* F, or to a position forward of the center of the loaded scoop. The windlass N now will be operated to lift the scoop from the ditch, the scoop then hanging, nose upward, at suitable incline to retain its load, and when the scoop has been lifted high enough to allow its contents to be dumped at any appointed place to which the car may be run, or at the outside of the ditch just formed, the chain-ring S will have passed through or around the sheave L, and will be in position to draw on the ring R to lift the back end of the scoop. The chain J now will be wound up a little farther on the windlass, and the chain O is thereby drawn upon by the ring R until the back end of the scoop is lifted above its forward end, so that the scoop will overbalance forward on the sheave *h'*, and will run along this sheave on its bail-bar F from the forward end, f^4, of said bar to its extreme back end, at f^5, where it joins with the back cross-bar, f^2, of the scoop-bail, and as clearly shown in Fig. 2. It is obvious that as the scoop at once assumes a vertical position, nose downward, when upset, the entire contents of the scoop will be dumped at once, the striking of the end bail-bar f^5, by the traveler H causing sufficient shock to jar from the scoop any material which would have a tendency to stick to the scoop. It will also be noticed that by forming the bail-bar F on a curve at *f'* at its back end, the strain on the derrick-arm is very much less, as the scoop pitches or swings nose downward, than it would be if the back end of the bail-bar between a point over the end *e* of the scoop and the bail-joint at f^5 were made straight, or nearly so. After the contents of the scoop have been dumped, the scoop will be lowered by paying out chain J, and the derrick will be swung back to the position shown in Fig. 1, when the car may be run forward, to again fill the scoop in continuing the work of forming or trimming the ditch at the side of the railway-track.

The scoop may be worked in the opposite direction, as indicated by the arrow *y*, by connecting the chain J with the hook K' on the derrick-arm, and connecting the draft-chain D with the draw-beam at the other end of the car.

The swivel-connection of the scoop-holding traveler H with the sheave-frame I facilitates the ready reversal of the scoop to work either way, and also facilitates the easy handling of the scoop in dumping its load.

The arrangement shown and above described of the chains J O and rings S R is preferred, as by it the scoop may be dumped automatically by hauling or drawing in the same chain, J, by which the scoop is lifted from the ditch; but, if desired, other means may be employed for tilting the lifted scoop forward to dump its contents—as, for instance, a chain or rope, T, may be attached to the ring f^3 or the bail-bar f^2 at the back end of the scoop, and may be passed thence to and over a sheave, U, on the derrick-arm, and thence to a separate windlass, V, supported on the derrick or car, and as will be understood from the dotted lines in Fig. 1.

It is evident that the car A may have a derrick, B, and draw-beams C C at each side, so as to operate two ditching-scoops at once, one at each side of the railroad-track.

The scoop or scoops employed with the car when out of use or on the road will be swung up onto the car-platform, and the draft-beams C will be folded in onto the platform, and the derrick or derricks will be swung around into notches 3 in the edge of the car-platform, and will be locked therein by placing the derrick-levers into slots 1, all substantially as described in my Patent No. 318,643, above referred to.

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

1. In ditching-machines, the combination, with a moving platform or car, as at A, and its horizontally-swinging derrick B, of a scoop, E, having a longitudinally-ranging bar extending to a point forward of the center of gravity of the scoop, draft-connections, substantially as described, from the forward end of the scoop to the car, a traveler-support for the scoop placed on its bail-bar, and a swivel-connection between the traveler and a hoisting-chain suspending the scoop from the derrick, substantially as herein set forth.

2. In ditching-machines, the combination, with a moving platform or car, A, and its horizontally-swinging derrick B, of a scoop, E, having a bail-bar, F, ranging longitudinally from a point forward of its center of gravity,

as at f^4, to a point, as at f^5, behind the back end of the scoop, a traveler-support for the scoop placed on the bail-bar, and means for supporting the scoop from the derrick by the traveler, substantially as herein set forth.

3. In ditching-machines, the combination, with the moving platform or car A and its horizontally-swinging derrick B, provided with hooks, as at K K′, of a scoop, E, having a longitudinally-ranging bail-bar, a traveler placed on the bail-bar, a frame, I, having a sheave, L, and connected to the traveler, and a chain, J, adapted to be connected to one of the hooks K or K′, and passing under sheave L, and adapted to be hauled in and paid out to raise and lower the scoop, substantially as herein set forth.

4. In ditching-machines, the combination, with the moving platform or car A and its horizontally-swinging derrick B, of a scoop, E, having a longitudinally-ranging bail-bar extending to a point forward of its center of gravity, a traveler on the bail-bar, a frame, I, having a sheave, L, a chain, J, supporting the sheave-frame and traveler by its bight around the sheave, and adapted to be hauled in and paid out to raise and lower the scoop, a chain, O, connected to the back end of the scoop and provided with a ring, R, through which chain J runs freely, and a ring or stop, S, connected in chain J and adapted to pass around sheave L and to carry the ring R and chain O with it, for tilting the raised scoop to dump it, substantially as herein set forth.

5. In ditching-machines, the combination, with the scoop E, the traveler H, the frame I, sheave L, and chains J O, having rings S R, substantially as specified, of the guide-sheave P for chain O, substantially as herein set forth.

6. In ditching-machines, the ditching-scoop constructed with means for connecting a draft chain or rope to its forward end, and with a longitudinally-ranging bail-bar, F, extending from a point forward of the center of gravity of the scoop, as at f^4, to a point behind the back end of the scoop, as at f^5, substantially as herein set forth.

7. In ditching-machines, the ditching-scoop constructed with means for connecting a draft chain or rope to its forward end, and with a longitudinally-ranging bail-bar, F, extending from a point forward of the center of gravity of the scoop, as at f^4, to a point behind the back end of the scoop, as at f^5, and the back end of the bail-bar being curved, as at f', substantially as herein set forth.

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