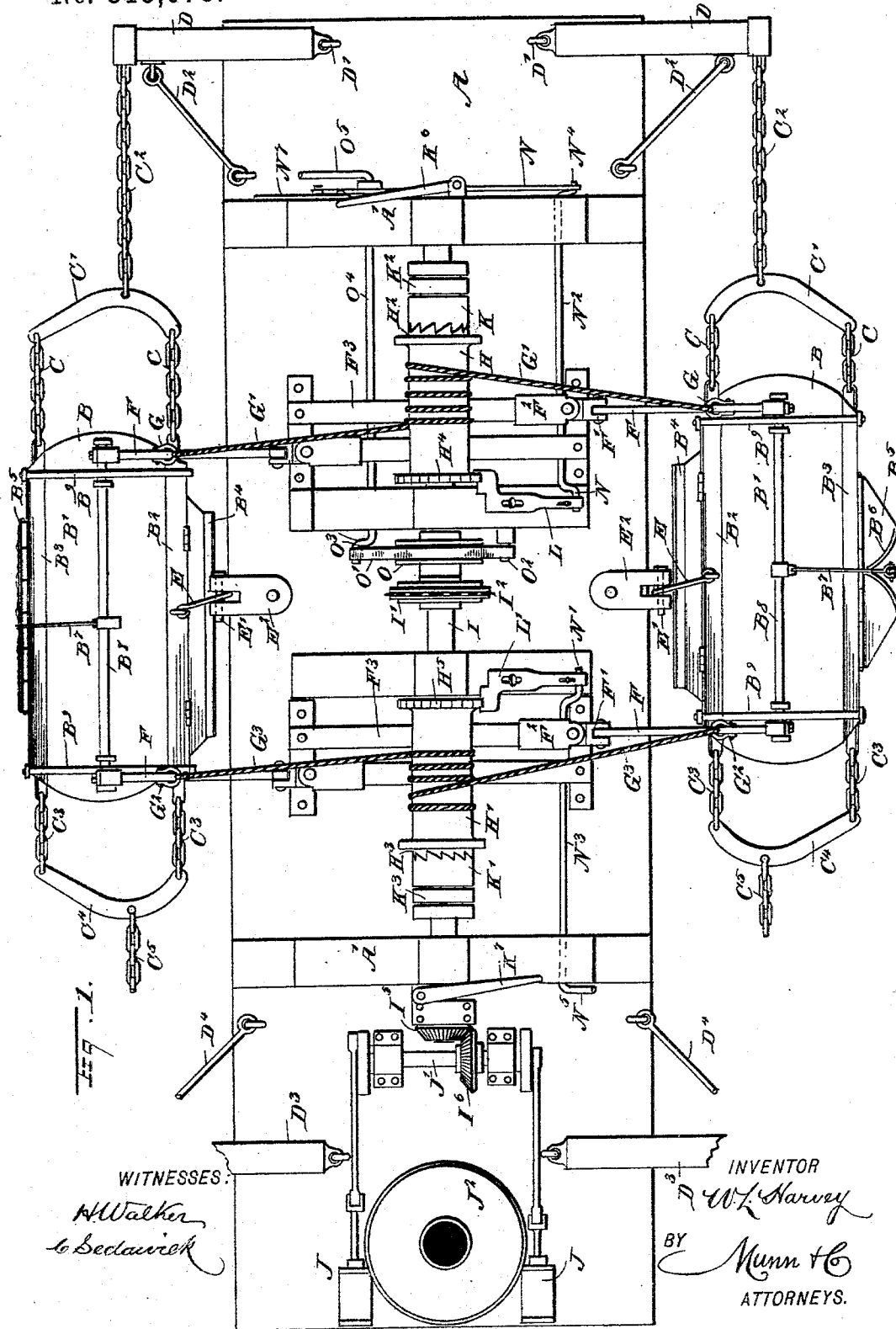


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No. 515,678.

Patented Feb. 27, 1894.



(No Model.)

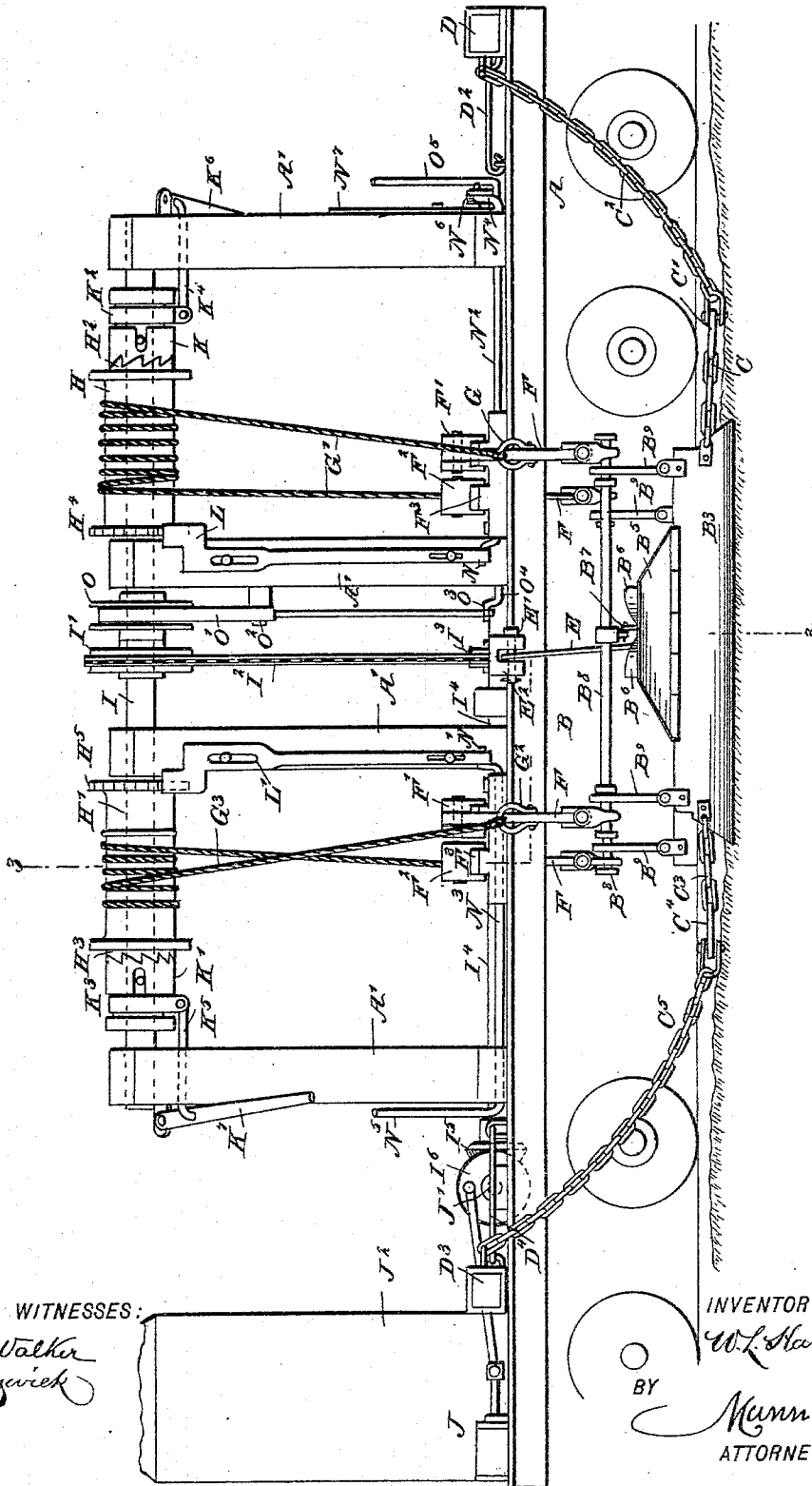
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W. L. HARVEY.
DITCHING MACHINE.

No. 515,678.

Patented Feb. 27, 1894.

Fig. 2.



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BY

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ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

W. L. HARVEY.
DITCHING MACHINE.

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Patented Feb. 27, 1894.

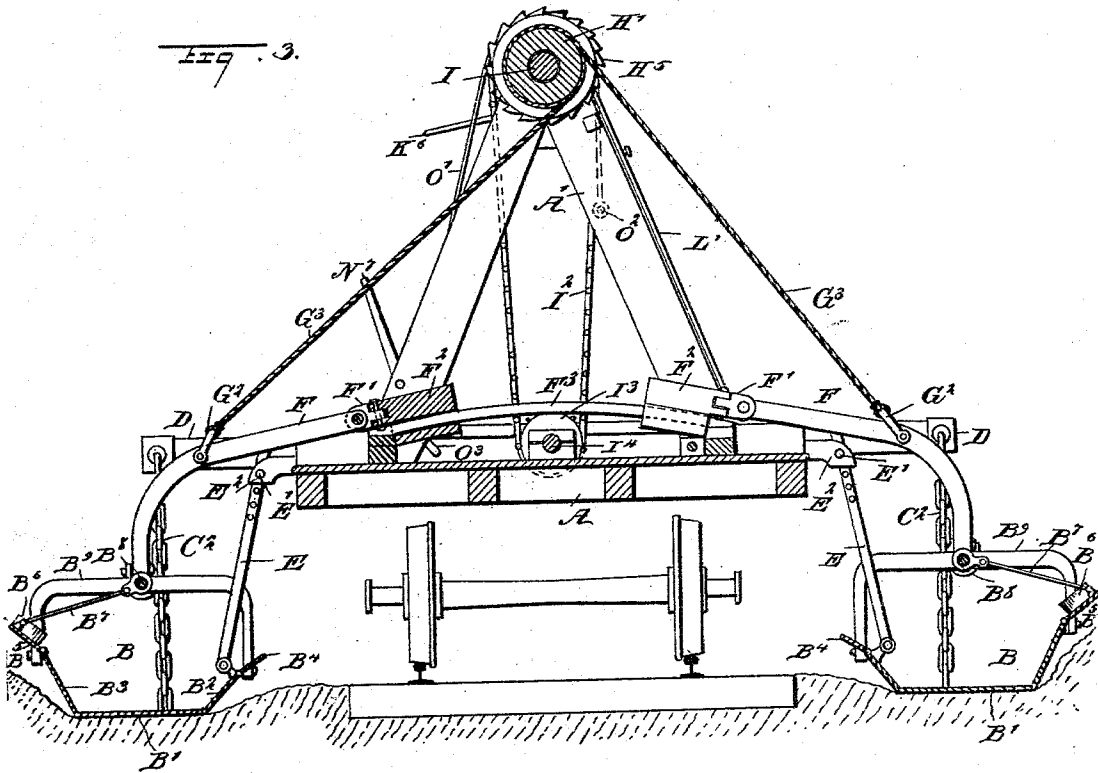


Fig. 5.

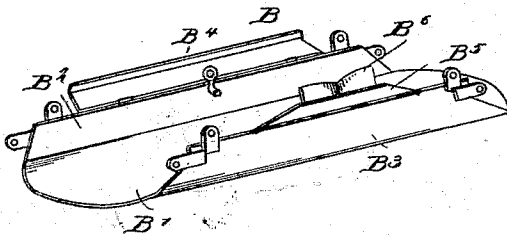
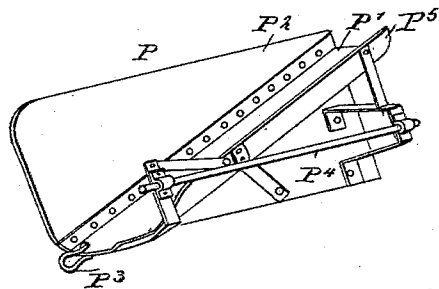


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM LESTER HARVEY, OF STANBERRY, MISSOURI.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 515,678, dated February 27, 1894.

Application filed May 22, 1893. Serial No. 475,020. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LESTER HARVEY, of Stanberry, in the county of Gentry and State of Missouri, have invented a new and Improved Ditching-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved ditching machine, which is simple and durable in construction, very effective in operation, and more especially designed for use on railroads to form a ditch on one or both sides of the road bed.

The invention consists principally of a scraper arranged on the side of the platform car and connected at its ends with draft beams held on the car, transverse levers pivotally-connected with the scraper and with transverse sliding blocks on the car, and a hoisting device connected with the said levers and located on the car, as hereinafter described and claimed.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

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

Figure 1 is a plan view of the improvement. Fig. 2 is a side elevation of the same. Fig. 3 is a cross section of the same on the line 3—3 of Fig. 2. Fig. 4 is a perspective view of the scraper; and Fig. 5 is a like view of the spreader.

The improved ditching machine is mounted on a platform car A, of any approved construction, and on the sides of which are arranged the scrapers B alike in construction, each provided with a bottom B', and the two outwardly-flaring sides B² and B³, as plainly shown in the drawings.

The front ends of the sides B² and B³ of each of the scrapers B are connected by the chains C with a draft bar C' connected by a chain C² with a draft beam D pivoted at D' on top of the platform car A, and held in place by a brace D² also pivoted on the car, to permit of swinging the said draft beam inward when not in use. The rear ends of the

sides B² and B³ of each of the scrapers B are connected by the chains C³ with a draft bar C⁴, connected by a chain C⁵ with the rear draft beam D³, similar in construction to the beam D and pivoted on the platform car and held in place by a pivoted brace D⁴ as plainly shown in the drawings.

The inner side B² of each of the scrapers B is provided at its upper edge with a pivoted wing B⁴, so as to prevent the accumulating dirt from falling onto the railroad track. This side B² of each scraper is pivotally-connected with a link E formed at its upper end with a row of apertures one of which is adapted to be engaged by a pin E', held in an arm E² pivoted on top of the platform car near the middle thereof, as plainly shown in the drawings. The link E serves to guide the scraper and also assists in regulating the depth the scraper is to go down into the ditch. The outer side B³ is provided at its upper edge with a pivoted wing B⁵ adapted to give slope to the side of the ditch to be formed, the said wing B⁵ being provided with curved guide arms B⁶ extending inwardly toward the middle of the wing so as to guide incoming dirt down into the scraper B. This wing B⁵ is pivotally-connected by a link B⁷ with a shaft B⁸ arranged longitudinally and held in pivoted U-shaped arms B⁹ secured to the sides of the scraper B near the ends thereof, as plainly shown in the drawings.

The shaft B⁸ of each of the scrapers is connected with levers F pivoted on swivel blocks F' pivoted on transversely-sliding blocks F² fitted to slide on guideways F³, arranged transversely on top of the platform car A. The front lever F of each scraper B is provided with a clevis G on which is secured one end of a rope G' extending upwardly and inwardly to wind upon a drum H, mounted to rotate loosely on a longitudinally-extending shaft I, journaled in suitable bearings in the upper ends of the standards A' erected on the platform car A.

The rear levers F of the scrapers B are provided with clevises G² on which are secured the ends of a rope G³ also extending upwardly and inwardly to wind on a drum H' mounted to rotate loosely on the longitudinal shaft I, previously mentioned. This shaft I carries a

sprocket wheel I', over which passes a sprocket chain I², also passing over a sprocket wheel I³ secured on a shaft I⁴ extending longitudinally, and mounted to turn in suitable bearings secured to the top of the platform car A. The outer end of this shaft I⁴ carries a bevel gear wheel I⁵, in mesh with a bevel gear wheel I⁶, secured on a transversely-extending main driving shaft J', of a pair of engines J of any approved construction and deriving their supply of steam from a boiler J² located between the engines on the rear end of the platform car A. If desired the boiler J² may be dispensed with, and the engines supplied with steam from the locomotive used for hauling the car over the railroad track.

On the drums H and H' are formed clutch teeth H² and H³ respectively, adapted to be engaged by the clutches K and K' respectively, mounted to slide on and to turn with the shaft I, so that when the said clutches are in mesh with the clutch teeth on said drums, the latter are rotated on rotating the shaft I from the main driving shaft J', of the pair of engines. The clutches K and K' are adapted to be shifted longitudinally on the shaft I, and for this purpose the said clutches are engaged by clutch bands K² and K³ respectively, connected by links K⁴ and K⁵ respectively, with hand levers K⁶ and K⁷ respectively, fulcrumed on the front and rear standards A' and under the control of the operator. By this arrangement each of the drums H and H' can be independently controlled by the operator shifting the corresponding lever K⁶ or K⁷, to cause the respective drum to rotate or not, as desired.

On the inner ends of the drums H and H' are secured the ratchet wheels H⁴ and H⁵ respectively, adapted to be engaged by sliding pawls L and L' respectively, mounted to slide on the innermost standards A', as plainly shown in Figs. 1 and 2. The lower ends of the sliding pawls L and L' are connected with the crank arms N and N' respectively, formed on the ends of longitudinally-extending shafts N² and N³ respectively, of which the former is provided at its outer end with a second crank arm N⁴, and the other shaft N³ is provided at its outer end with a hand lever N⁵ under the control of the operator. The crank arm N⁴ of the shaft N² is connected by a link N⁶ with a hand lever N⁷ fulcrumed on one of the standards A', and under the control of the operator.

On the hub of the sprocket wheel I' is secured or formed a brake wheel O engaged by a brake band O' secured at one end at O², to a stud projecting from one of the innermost standards A'. The other end of the brake band O' is connected with a crank arm O³ held on the inner end of a longitudinally-extending shaft O⁴ journaled in suitable bearings on the top of the platform car A, the outer end of the said shaft being provided with a handle O⁵ under the control of the operator.

The operation is as follows: When the several parts are in the position as shown in Figs. 1, 2 and 3, and the platform car A is pushed forward by a locomotive, then the scrapers B on the sides of the platform car A pass into the ground with their front ends, thus taking up the dirt which fills onto the top of the scrapers. Usually the platform car A is pushed forward a distance corresponding to about the length of the scrapers, so that the latter are filled with a considerable amount of dirt. When this has been done, the operator sets the engines J in motion, and connects the hoisting drums H and H' with the shaft I, so that the rotary motion of the latter rotates the said drums to wind up the ropes G' and G³, whereby an upward swinging motion is given to the levers F, which thus raise the scrapers B off the ground; the car is then drawn by the locomotive to the place of dumping, and then one of the drums H or H' is released from its respective clutch, and at the same time the corresponding pawl L or L' is withdrawn, to permit a free revolving of the drum to unwind the corresponding rope thereon. By this arrangement the levers connecting with the unwinding rope swing downward, while the other levers remain in an uppermost position, so that the scrapers B assume an inclined position, and thus automatically discharge the dirt on the said scrapers. When this has been accomplished, the lowered end of the scraper is again raised by connecting the corresponding clutch with the drum, so that the rotary motion given to the shaft I winds up the rope to bring the scraper back to its normal position, it being understood that during this second revolving of the shaft I the other drum is disconnected from its respective clutch and held in a locked position, by the corresponding sliding pawl L or L'. The car is then returned to the ditch, the scrapers are lowered into the former place, and then the car pushed forward, and the above described operation is repeated.

It will be seen that by the arrangement described, the scrapers B can be raised after being loaded and moved inwardly and rested on the top of the car on opposite sides of the main shaft, so as to permit of pushing the car through narrow places, bridges and the like, without danger of the scrapers striking walls of bridges and similar structures. It is further understood that when the levers F commence to swing upward, the bars E guide the upward movement of the scrapers, and the blocks F² connected with the levers do not commence to slide inward until after the bars E have passed a vertical position.

As illustrated in Fig. 5, a spreader P may be attached to the levers F for the purpose of spreading the dirt on the place of dumping, it being understood that this spreader then takes the place of the scrapers. Each of the spreaders is provided with an inclined side wall P', and a bottom P², as shown in Fig. 5. The inner end of the inclined side wall P' is

provided with a clevis P^3 for connection with the draft beam. The upper portion of the side wall P' is curved outward, as shown at P^5 , so as to form a kind of pocket and prevent the dirt from falling inward over the upper edge of the wall P' . On the top of the said inclined wall P' is journaled a shaft P^4 for connection with the levers F in a manner similar to the connection of the scrapers with the said levers. When this spreader is passed over the fill, the inclined wall P' pushes the accumulated dirt outward, so as to even the same.

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

1. A ditching machine comprising a scraper arranged on the side of a platform car and connected at its ends with draft beams secured on the platform car, transverse levers pivotally-connected with the scraper, blocks capable of a free transverse movement on bearings on the car, and connected with the said levers so as to form a fulcrum that will slide on the said bearings when the levers are swung up or down and a hoisting device connected with the said levers, substantially as shown and described.

2. A ditching machine provided with a scraper having a bottom and two outwardly-flaring sides, and wings pivoted on the said sides and extending upwardly and outwardly, substantially as shown and described.

3. A ditching machine provided with a scraper, comprising a bottom, outwardly-flaring sides, a wing pivoted to the outermost side and extending upwardly and outwardly at an angle to the said side, and arms secured on the said wing for guiding the material into the said scraper, substantially as shown and described.

4. A ditching machine provided with a spreader, comprising a bottom, an inclined side wall secured on the said bottom, and curved outwardly at its upper edge and means, substantially as described, for drawing the said spreader forward, as set forth.

5. A ditching machine, comprising a platform car, scrapers arranged on the said car, draft beams held on the said car and connected with the ends of the said scrapers, levers pivotally-connected with the said scrapers, lugs having a free transverse sliding movement and connected with the said levers so as to form a fulcrum that will slide transversely when the levers are swung up or down transverse bearings fixed on the said car and engaged by the said blocks, and a hoisting device, substantially as described and connected by its hoisting ropes with the said levers, as set forth.

6. A ditching machine, comprising a platform car, scrapers arranged on the said car, draft beams held on the said car and connected with the ends of the said scrapers, levers pivotally-connected with the end of said scrapers, lugs mounted to slide transversely

and connected with the said levers, transverse bearings fixed on the said car and engaged by the said blocks, a hoisting device, substantially as described, and connected by independent hoisting ropes with each of the said levers, at opposite ends of the scrapers and means, substantially as described, for imparting a rotary motion to the said hoisting device, as set forth.

7. A ditching machine provided with a scraper and a shaft from which the same is suspended, a wing pivoted to one of the sides of the scraper, and a connection between the shaft and the wing to keep the latter in position, as set forth.

8. The combination, with the scraper, the U-shaped arms connected with the sides thereof, and the shaft or rod serving to suspend the scraper and passing through the said arms, of a wing pivoted to one of the sides of the scraper, and a link connected with the said wing and the said shaft, as set forth.

9. A ditching machine, comprising a platform car, scrapers arranged on the sides thereof, connections between the car and the ends of the scrapers to hold the latter in an operative position, levers pivotally connected with the scrapers, blocks having a double pivotal connection with the levers after the fashion of a universal joint, whereby the levers with the scrapers are made capable of a swinging movement both in a horizontal and in a vertical plane, and a hoisting device connected with the said levers, as set forth.

10. A ditching machine, comprising a platform car, scrapers arranged thereon, draft beams held on the car and connected with the ends of the scrapers, levers pivotally connected with the scrapers, swivel blocks having a pivotal connection with the said levers to allow the latter to move in a vertical plane, sliding blocks pivotally connected with the said swivel blocks to allow the latter to move in an essentially horizontal plane, transverse bearings fixed on the car and engaged by the said sliding blocks, and a hoisting device connected by its hoisting ropes with the said levers, as set forth.

11. A ditching machine provided with a hoisting device for the side scrapers, comprising a shaft mounted to revolve, drums mounted to rotate loosely on the said shaft, a rope wound on each of the said drums and extending with its ends to the lifting device of the said scrapers, a ratchet wheel held on each of the said drums, posts located adjacent to the ratchet wheels, pawls having a guided movement along the said posts to and from the ratchet wheels, and independent operating means for each of the pawls, substantially as shown and described.

12. In a ditching machine, the combination, with a scraper arranged on the side of a platform car, and means for holding the scraper in an operative position, of a bar pivotally connected with the inner side of the scraper and having an adjustable fulcrum on the

platform car, and levers pivotally connected with the scrapers to raise and lower the latter, substantially as shown and described.

13. In a ditching machine, the combination
5 of a scraper arranged on the side of a platform car, draft beams connected with the ends of the said scraper and also secured on the platform car, a bar pivotally-connected with the inner side of the said scraper and
10 fulcrumed on the platform car, and levers pivotally-connected with the said scraper to raise and lower the latter, substantially as shown and described.

14. In a ditching machine, the combination
15 of a scraper arranged on the side of a platform car, draft beams connected with the ends

of the said scraper and also secured on the platform car, a bar pivotally-connected with the inner side of the said scraper and fulcrumed on the platform car, levers pivotally- 20 connected with the said scraper to raise and lower the latter, means, substantially as described, for imparting a swinging motion to the said levers, and sliding blocks mounted to slide transversely on the platform car and 25 pivotally-connected with the said levers, substantially as shown and described.

WILLIAM LESTER HARVEY.

Witnesses:

JAS. T. DUNN,
GEORGE WALKER.