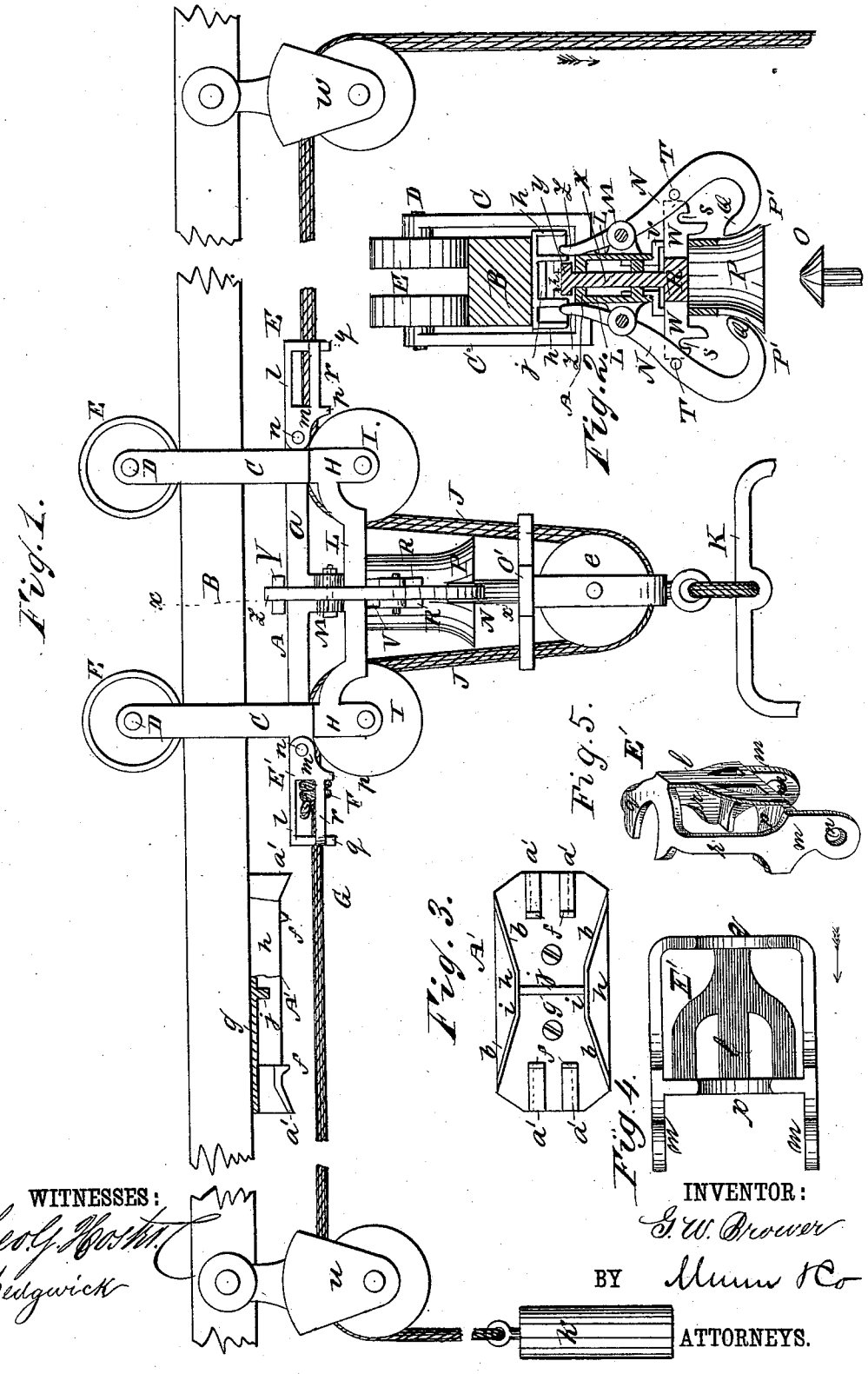
(No Model.)

G. W. BROWER.

HAY ELEVATOR AND CARRIER.

No. 273,455. Patented Mar. 6, 1883.



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HAY ELEVATOR AND CARRIER.

SPECIFICATION forming part of Letters Patent No. 273,455, dated March 6, 1883.

Application filed May 4, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BROWER, of Crawfordsville, in the county of Montgomery and State of Indiana, have invented a new and Improved Elevator and Carrier, of which the following is a full, clear, and exact description.

My invention relates to elevating and carrying apparatus such as is employed to unload hay by a fork let down from above upon a wagon-load, raised therefrom, with its load carried over the mow and discharged, and then returned over and let down, as before, on the wagon-load, the contrivances being automatic except the power for handling the hoisting-ropes.

The nature of the invention consists in the several combinations and arrangements of parts, substantially as hereinafter more fully set forth 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 improved hoisting and carrying apparatus, with a part of the frog in section. Fig. 2 is a transverse section of the carrier, taken on line *x x* of Fig. 1. Fig. 3 is a plan view of the frog inverted. Fig. 4 is an inverted plan view of one of the knot-cribs of the weighted rope, and Fig. 5 is a perspective view thereof.

A represents the carrier, consisting of a horizontal plate or bar, *a*, of suitable length, suspended below the beam B by hangers C, which are supported upon the axles D of rollers E, traveling on said beam.

To each end of the carrier A there is attached a knot-crib, E′, for the control of the knot F of the weighted rope G and the hoisting-rope J, and from under said carrier, near each end, it has hanger-brackets H, in which sheave-pulleys I are pivoted, for the hoisting-rope J, by which the fork K is raised and lowered and the carrier is drawn along the beam B to the place of discharging the fork. Said carrier also has side bars, L, extending from one to the other of the brackets H, and also ears M, in which the grapple-hooks N are pivoted, that engage and hold the fork K by the conical head O of the fork-sheave frame O′ for holding said fork while being carried from the place where the fork is hoisted to the place of delivery and back again. By the conical form of the head O it engages all the same with the grapple-hooks when the bight of the hoisting-rope twists as when it does not. Between these grapple-hooks the carrier has the bell-mouthed guide P suspended from it, to receive and guide the head O between the points Q of the hooks to insure the connection, said guide being slotted at P′ for the hooks to work in and out of it.

Over the bell-guide is a latch-bar, R, with notches S, to lock the grapple-hooks together when holding head O by the engagement of the pins T of said hooks in said notches S, the said latch-bar being fitted to rise and fall, so as to drop on and rise off from said pins to lock and unlock the grapple-hooks. The bar R is arranged in the slot V of the bell-guide, and it is slotted at W to straddle the grapple-hooks, and from the center it has a stem, X, extending up through the top of the carrier and terminating in a T-head, Y. The grapple-hooks have an arm, Z, extending up each side of the carrier A a little above it, and about as high as the top of T-head Y when latch R is in its lowest position. The head Y is elongated in the lengthwise direction of the carrier, and is to lift the latch off of pins T, to let the grapple-hooks open when the fork K is required to descend. It is so lifted by being forced up the incline *a′* of the frog A′ when the carrier is pulled back to the frog after discharging its load for descending and for hoisting another load, the said carriers being pulled back by the weighted return-cord G. As soon as the latch has been so lifted to release the grapple-hooks the arms Z of the said grapple-hooks pass along the incline *b* of the frog, and thereby the hooks N are opened, the head O of the fork let free, and the fork let fall to get its load, the hoisting-rope J being then slack and running through the sheaves to let the bight down in which the fork hangs by its sleeve *e*. When the grapples open, the latch R drops between pins T. The head Y of said latch, having passed the inclines *a*, falls behind shoulders *f* of said inclines, and thereby holds the carrier against the pull of the hoisting-cord J while the fork is being hoisted again with its load. The latch R then holds the grapple-hooks N open, if not

held open by inclines *b*, said inclines being shorter than as herein represented as they are sometimes made. When fork K comes up the head O enters bell-mouthed guide P, and is thereby brought into its proper relations with the grapple-hooks. Said head strikes the latch R and lifts head Y up from behind shoulders *f*, thereby releasing the carrier, so that hoisting-rope J immediately starts the carrier forward on beam B. The arms Z of the grapple-hooks then escape from inclines *b*, the grapple-hooks close under head O, and the latch falls on pins T, locking the grapple-hooks, and thus the fork is automatically connected to the carrier for being carried out to discharge its load and back again to the place for getting another.

It will be noticed that the frog is constructed with duplicate inclines *a'* for the latch, and also with duplicate inclines *b* for the grapple-hooks on the respective ends of the base-plate *g*, the said duplicate inclines being respectively arranged for working the devices of the carrier from opposite directions, the object being to enable the carrier to be run either way from over the load to be discharged, as for delivering hay to a hay-mow either side of the wagon-floor. For this purpose the frog is constructed with bevel-flanges *h* to form the inclines *b*, and said flanges have straight edges *i*, forming continuous ways from the inclines *b* of one end of the frog to those of the other end for the grapple-hooks arms Z to pass along from one end to the other of the frog, and said frog is also constructed with free passage between said flanges for allowing the T-head Y to shift over from end to end in like manner; but midway between the ends of the frog there is a cross-bar, *j*, projecting as far from the base-plate as it may without obstructing the shifting of the T-head, the object of which is to arrest the T-head, and thereby stop the carrier, if at any time it should fail to stop and the latch should fail to drop, as may happen in case of the carrier being jerked back too rapidly or for any other cause. The carrier is to be stopped on its return to the frog by the weight *k* falling upon a rest, so that positive stops on the frog or beam B may be dispensed with in order that the carrier may be readily shifted on the frog when required without having to detach any parts, as such stops would have to be detached if used. In order to shift the carrier from side to side in this way conveniently, it is desirable to have the rope contrived for shifting more readily than it can be done by taking the hoisting-rope out and reversing it, or taking the carrier from the track and turning it about. For this purpose the knot-cribs E' are used, said knot-cribs consisting of bar *l*, having ears *m*, pivoted to carrier A at *n*, also having flange *p*, with hole through it for the rope, also notched flange *q*, in which the rope may work and also drop out or in, the said flanges being connected together by side bars, *r*.

The returning-rope G is knotted to the hoisting-rope J, at F, in the crib E', on the same side of the carrier that the returning-rope is on, and when the change is to be made the horse end of the hoisting-rope and the weight end of the returning-rope are tied together. The knot is then pulled down out of the crib, and the continuous rope is pulled until the knot passes around through sheaves *u* and *w*, made for passing the knot to the other side of the carrier to be lodged in the crib of that side. The ropes are then untied and connected to the horse and the weight, respectively. It is mainly for this purpose that the carrier is provided with more than one pulley I; otherwise the weight-rope might be hitched directly to the carrier, and the hoisting-rope would work over one only of said pulleys.

It will be seen that the bell-mouthed guide P and round-headed fork-top O insure successful operation so far as they are concerned; also, that the latch affords substantial and certain means for locking and unlocking the grapple-hooks, also for locking and unlocking the carrier with the frog, and also for arresting the carrier when overrunning the frog; and it will also be seen that the frog and rope-connecting devices afford simple and easy means of shifting the carrier from side to side of the frog and working it either way therefrom.

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

1. The carrier A for elevating and carrying apparatus, having hangers C, hanger-brackets H, connecting-bars L, and the grapple-hook ear-studs M, and being suspended on rollers E, and provided with hoisting-rope sheaves I, in combination with grapple-hooks M and hoisting-rope J, substantially as and for the purpose set forth.

2. The carrier A for elevating and carrying apparatus, having hangers C, hanger-brackets H, connecting-bars L, and the grapple-hook ear-studs M, and being suspended on rollers E, and provided with hoisting-rope sheaves I, in combination with grapple-hooks N, hoisting-rope J, and knotted and weighted rope G, substantially as and for the purpose set forth.

3. The combination of the conical fork-head O, having the base of its cone projecting beyond its shank or body, with the bell-mouth guide P and the grapple-hooks N of the carrier, substantially as and for the purpose set forth.

4. The combination of the conical fork-head O, having the base of its cone projecting beyond its shank or body, with the latch R, grapple-hooks N, and the slotted bell mouth guide P of the carrier A, substantially as and for the purpose specified.

5. The grapple-hooks N, having pins T, in combination with latch R, having notches S, and said hooks and latch being arranged with bell-mouth fork-head guide P, substantially as described.

6. The combination of the conical fork-head

O with latch R and grapple-hooks N on the carrier A, said latch having notches S and said hooks having pins T, substantially as described.

7. The combination of latch R with bell-mouth fork-head guide P, grapple-hooks N, and carrier A, said latch being arranged in the slot V of the guide P, and adapted to rise and fall in said slot, substantially as described.

8. The combination of latch R with bell-mouth fork-head guide P and grapple-hook N, said latch having stem X and T-head Y, relatively arranged with respect to carrier A substantially as described.

9. The combination of frog A′, having inclines *a′* and *b*, with carrier A, latch R, and grapple-hooks N, substantially as described.

10. The inclines *a′* on frog A′, in combination with latch R on carrier A, substantially as described.

11. The inclines *b* on frog A′, in combination with grapple-hooks N on carrier A, substantially as described.

12. The frog A′, having inclines *b*, in combination with grapple-hooks N, substantially as described.

13. The frog A′, having inclines *b*, in combination with latch R, bell-mouth guide P, fork-head O, and grapple-hooks N, substantially as described.

14. The frog A′, having inclines *a′*, in combination with latch R, bell-mouth guide P, fork-head O, and grapple-hooks N, substantially as described.

15. The combination of frog A′, having inclines *a′* and *b*, with carrier A, having latch R, grapple-hooks N, and bell-mouth guide P, and also with fork-head O, substantially as described.

16. The combination of frog A′, having inclines *a′* and *b* and shoulders *f*, with carrier A, having latch R, and grapple-hooks N, substantially as described.

17. The combination of frog A′, having duplicate and reversely-arranged inclines *a′* and *b*, and also bar *j*, with carrier A, having latch R, and grapple-hooks N, substantially as described.

18. In a frog for hoisting and carrying apparatus, having duplicate and reversely-arranged inclines *a′* and *b*, the guide-edges *i* of flanges *h*, connecting the reverse inclines *b*, substantially as described.

19. In a frog for hoisting and carrying apparatus, having duplicate and reversely-arranged inclines *a′* and *b*, the said frog constructed with free passage between flanges *h* for the traverse of head Y of latch R from end to end of said frog, substantially as described.

20. The combination of knot-cribs E′, substantially as herein described, with carrier A and ropes G J of a hoisting and carrying apparatus, substantially as described.

21. The improved knot-crib E′, consisting of pivot-ears *m*, bar *l*, perforated flange *p*, notched flange *q*, and connecting-bars *r*, and being pivoted to carrier A, substantially as described.

22. The combination, in a knot-crib, E′, of perforated flange *p* and notched flange *q*, adapted to receive the knot F of the ropes between them, to draw in either direction and to drop said knot from between said flanges, substantially as described.

23. The combination, in hoisting and carrying apparatus, of carrier A, hoisting-rope J, returning-rope G, and a knot-crib, E′, the said hoisting and returning ropes being knotted together in said knot-crib, substantially as described.

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Witnesses:
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