2 Sheets--Sheet 1.

C. B. BALLARD, G. E. BURT & E. A. & S. B. HILDRETH.

Fuel-Loaders for Engine-Tenders.

No. 147,591. Patented Feb. 17, 1874.

Fig. 1.

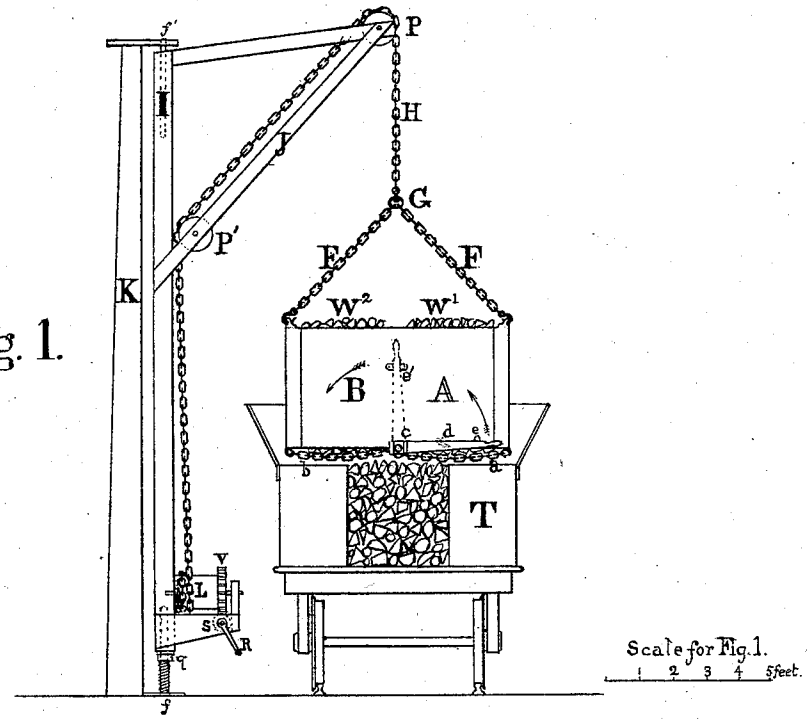


Fig. 2.

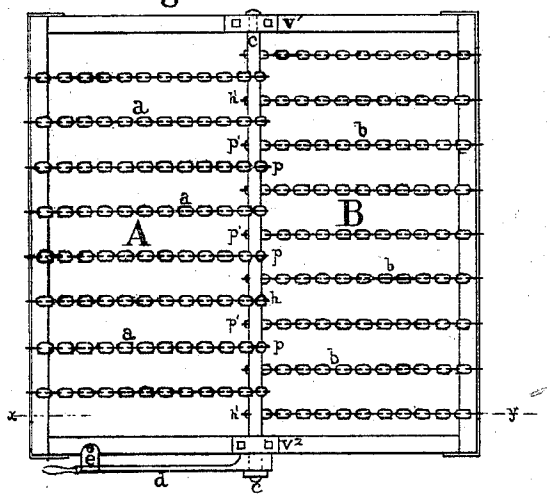


Fig. 3.

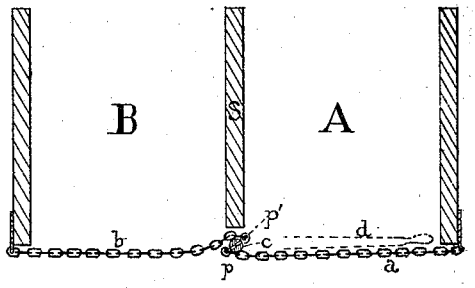


Fig. 4.

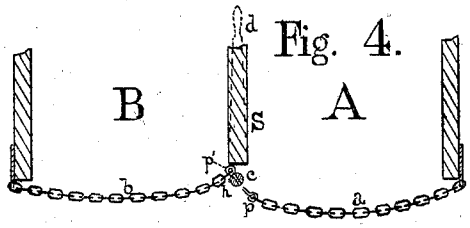
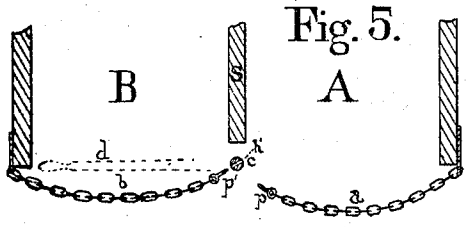


Fig. 5.



Witnesses, { E. E. Burt. A. C. Burt.

Inventors,
Charles B. Ballard.
George E. Burt.
Edwin A. Hildreth.
Stanley B. Hildreth

2 Sheets--Sheet 2.

C. B. BALLARD, G. E. BURT & E. A. & S. B. HILDRETH.

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Fig. 6.

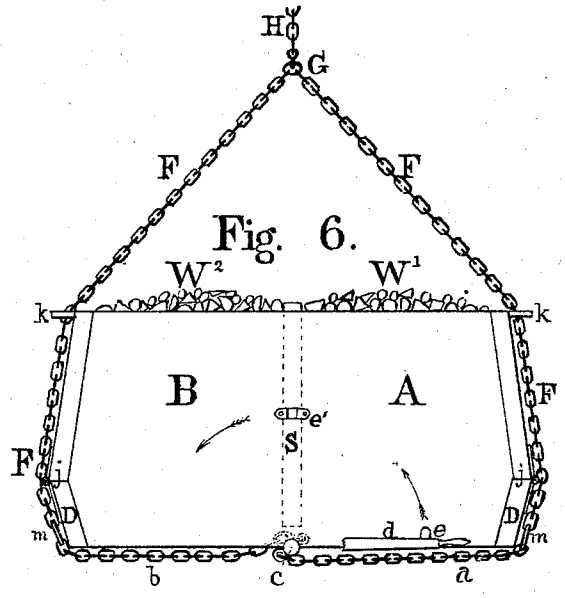
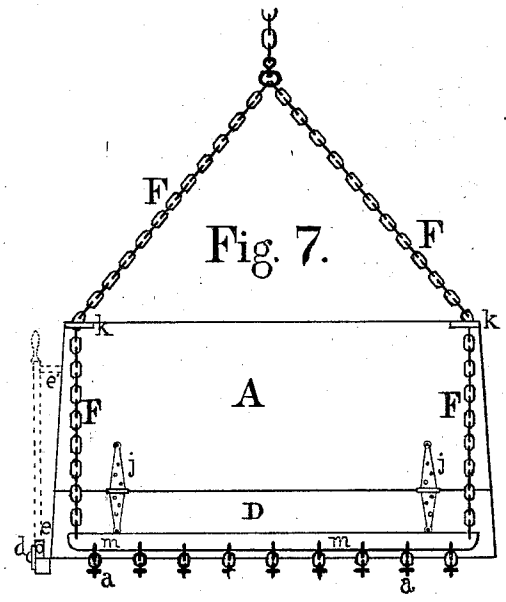


Fig. 7.



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Stanley B. Hildreth

UNITED STATES PATENT OFFICE

CHARLES B. BALLARD, OF HARTFORD, VT., AND GEORGE E. BURT, EDWIN A. HILDRETH, AND STANLEY B. HILDRETH, OF HARVARD, MASS.

IMPROVEMENT IN FUEL-LOADERS FOR ENGINE-TENDERS.

Specification forming part of Letters Patent No. **147,591**, dated February 17, 1874; application filed November 29, 1873.

To all whom it may concern:

Be it known that we, CHARLES B. BALLARD, of Hartford, in the county of Windsor and State of Vermont, and GEORGE E. BURT, EDWIN A. HILDRETH, and STANLEY B. HILDRETH, of Harvard, in the county of Worcester and State of Massachusetts, have invented an Improved Fuel-Loader for Engine-Tenders, of which the following is a specification:

It is well known by all travelers on railroads that there is considerable time taken in wooding-up the tender. It requires several hands to perform this labor, delaying the train, and causing loss of time to all the passengers.

The nature of this invention consists in constructing and arranging a fuel-loader for locomotive-engine tenders, so as to enable the engineer and fireman to take fuel onto the tender by a very easy and quick method, without any liability of injury to the tender, and without disarranging the wood or fuel in loading it onto the tender, thus saving much of the time that has heretofore been taken in wooding-up, thus giving the engineer more running time between the stations, thus lessening the liability of collision with other trains, or preventing the engineer from losing the right of road.

Figure 1 is an end view of a locomotive-tender, with the fuel-loader held by a derrick in position to discharge the fuel into the tender. Fig. 2 is a view of the bottom of the wood-loader, which is turned bottom upward, showing the chain bottom and the discharging-bar *c*. The scale in this figure is twice the regular scale. Fig. 3 is a vertical section of the wood-loader, taken through the line *x y* in Fig. 2, and showing the chains *a b*, discharging-bar *c*, and lever *d* in position to hold the wood in the box. Fig. 4 is a view of the same parts as shown in Fig. 3, showing the chains *a b*, and discharging-bar *c*, and lever *d* in position to discharge the wood from one-half of the fuel-loader. Fig. 5 is a view of the same parts as Fig. 3, showing the chains *a b* and discharging-lever *d* in position to discharge the wood from both sides of the wood-loader. Fig. 6 is an end view of the fuel-loading car, constructed and arranged to fit closely into the engine-tender. The lower part of the sides is arranged to swing out as the load is discharged, and the chains are so attached and arranged that they may be drawn out from under the wood by the derrick before the frame of the car or loader is lifted. By this arrangement the wood may be loaded high on the tender, if properly piled in the loading-car, dispensing with side-boards on the tender. Fig. 7 is a side view of the car, with the same arrangement of parts as shown in Fig. 6.

T is the locomotive-tender, which is represented in Fig. 1 as partly filled with wood. A B is the wood-loader car, which is a strong frame or box, made of wood or other suitable material, having a partition in the middle, dividing it into two parts, which can be made to hold half a cord each if it is desired to measure the wood, or larger size can be used. The bottom of the car or wood-loader, when designed for wood, is constructed with two sets of chains, *a a* and *b b*, one set being attached strongly on one side, and the other set attached on the other side of the wood-loader. Through the middle of the wood-loader is a shaft, *c*, turning in bearings *v v'*, and protected from the wood by the partition *s*, as shown in Figs. 3, 4, and 5. This shaft *c* is provided with holes or seats *h h'*, to receive the pins *p p'* on the loose ends of the chains *a a* and *b b*. *d* is a handle to operate the discharging-shaft *c*. *e* and *e'* are stop-catches to hold the handle *d* and shaft *c* in position. K is a derrick-post, which supports the swinging derrick I, with its brace J and pulleys P P', over which the chain H is operated by the drum L, gear V, and screw S, which is operated by the crank R. The wood-loader box is supported by chains F F at the corners, and can turn on the chain H by means of the swivel G. W^1 and W^2 represent the wood as packed in the two portions A and B of the wood-loader, on the side shown in Figs. 1 and 6.

In Figs. 6 and 7, H is the derrick-chain. F F are the lifter-chains. *a a* and *b b* are the flexible bottom chains. G is the swivel. *k k* are corner guides and ears. A B is a fuel box or car, constructed to receive the wood piled substantially as it is designed to be left on the tender. *j j* are hinges, which allow the part D to swing out as the main frame is raised. *m*

m are connecting-bars, that hold and operate the flexible bottom or chains *a a* and *b b*. The other parts in Figs. 6 and 7 are substantially the same as in the frame shown in Fig. 1.

The operation of this loader is as follows: The car A B is first filled with wood from the shed. The wood can be packed closely together in regular piles in the carrying-car, whenever it is desired to deliver the wood already packed onto the tender; or the wood can be thrown in promiscuously, if it is preferred so to do. When the car A B is loaded, it is raised by means of the derrick, (shown in Fig. 1,) which is placed at suitable distance from the track. When the car A B is raised high enough to swing over the tender of an engine, the load is ready for delivery.

Whenever an engine comes up for wood, the car A B is swung around over the tender, and is lowered by the derrick gradually onto the tender, and the wood is quickly discharged by throwing open the bottom portion of the car; then, raising the car from its position around the wood, the car can be swung off by the derrick, and the train can then be ready to go on, having been delayed not much longer than is necessary for passengers to get off and onto the train.

This method is essentially different from dumping the fuel onto the tender from above, as dumping the fuel disarranges the position of the wood, if packed in the loader, and also disarranges the portion of the fuel already on the tender; and dumping fuel also unnecessarily strains the axles and other parts of the tender by the concussion.

We are aware that coal is now loaded by dumping it onto the tender; yet it is evident that it would be a great improvement to have it loaded in more gently. If coal is designed to be swung out and lowered into the tender by this fuel-loader, a bottom sufficiently close to hold the coal must be used.

Before the wood-loader is filled with wood, the lever *d* is placed in a position a little to the left of the catch *e'* in Fig. 1, thus bringing the holes or recesses *h' h'* in the discharging-shaft *c* into such a position that the pins *p' p'* can be put into these holes or seats *h' h'*, as shown in Fig. 4. The lever *d* is then turned to a position just to the right of the catch *e'*, and the pins *p p* may then be put into their seats *h h* in the shaft *c*. The lever *d* is then turned down to the catch *e*, which holds the lever *d*, shaft *c*, and chains *a a* and *b b* in position to support and hold the wood, as shown in Figs. 1, 2, and 3. The wood is then packed into the car, when it is desired to put in as much as possible, and to deliver it, all packed, onto the tender. Nearly one-third more wood can be packed into the carrying-car than the car will hold if the wood is thrown in promiscuously. There is plenty of time at the sheds for packing the wood in these loading-cars without keeping any trains waiting, as a number of these loading-cars can be kept loaded by common laborers at each station where wood is taken for the engines. The loader may be brought on small cars running on a track through the shed to the derrick K I, if the wood is stored at any considerable distance from the derrick. The chains F F are hooked into the corners of the car A B, and, by turning the crank R, by means of the screw-gear *s v*, the drum L is turned, winding up the chain H; and, by means of the pulleys P' P, the loader A B, with the fuel, is raised to the requisite height to swing over the tender. By turning the crank R in the opposite direction, the loader can be lowered into the tender of the engine after being swung out over the tender to be loaded. If the entire contents of the loader A B is needed, the lever *d* is swung half round from the catch *e* to the other side of the loader. The tension of the chains under the wood will then disengage the pins or hooks *p p'*, with the chains attached thereto. Then, if the loader is raised by the derrick, the chains *a a* and *b b* will gradually be withdrawn from under the wood without displacing it. If the wood in only one division of the loader is required, the lever *d* is carried around to the catch *e'*, as shown in Fig. 1, thus relieving only one set of chains. When it is wished to pile the wood high on the tender without having high side-boards, we propose to use a loader made substantially in the manner shown in Figs. 6 and 7. In this loader the sides are brought in or contracted toward the top, to give the wood a firmer shape when loaded onto the tender. The wood is piled with the ends toward the outer walls of the loader, to keep it more firmly in position after being transferred to the tender. The sides D are contracted at the bottom for a short distance, to fit closely into the flaring top of the tender; but the contracted sides are hung with hinges, to allow them to swing out to discharge the wood as the loader is raised. The chains *a a* and *b b*, in Figs. 6 and 7, are attached to side bars *m m*, which are in turn attached to the corner-chains F F. When the chains in the bottom of the loader *a a* and *b b* are released to discharge a load, the crank R is turned, winding up the main chain H. This, by means of the corner-chains F F, raises the bars *m m*, and withdraws all the chains from under the load before the main frame of the box is moved from its position around the wood. As soon as the chains are withdrawn from under the load, the bars *m m* strike against the stops or guides *k k*, and the main frame is then raised, and can be swung to one side out of the way. It is intended, in the car shown in Figs. 6 and 7, to pile the wood substantially as it should be piled upon the tenders of engines, and to transfer it in such a pile onto the tender. The derrick can be placed at the end of the wood-shed, where there will be plenty of room to swing the loading-car; or the derrick can be placed between the wood-shed and the main track. Most of the wood-sheds on the railroads are constructed too low to swing the derrick-arm and loader into them. To overcome this

difficulty, we construct our derrick so that the main swinging arm can be lowered, by means of the slides *f f'*, so that the swinging arm and the loader can be swung into the shed. After the loader is filled and swung out of the shed, the derrick-arm can again be elevated by the nut *g*, or some equivalent device.

Having thus described our invention, we claim—

1. In combination with the derrick I J, the vertically-adjustable car A B and flexible bottom, permitting it to be drawn from under the fuel after being deposited in a locomotive-tender, substantially in the manner set forth.

2. In combination with the derrick and vertically-adjustable fuel-car, a bottom formed in sections, which, after the car is lowered into the tender, can be freed and drawn out on each side, substantially in the manner set forth.

3. The combination of the lever *d*, the rolling bar *c*, the recesses *h h'*, the pins *p p'*, and the chains *a b*, substantially as set forth.

4. The vertically-adjustable car, constructed to conform with the general shape of the engine-tender, in combination with mechanism for freeing the wood, so that the car can be withdrawn, leaving the tender filled with wood, and without disturbing its arrangement, substantially as set forth.

5. The carrying-car A B, divided into two compartments, in combination with the independent dropping mechanism, by means of which each or both may be discharged, substantially as set forth.

CHARLES B. BALLARD.
GEORGE E. BURT.
EDWIN A. HILDRETH.
STANLEY B. HILDRETH.

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E. E. BURT,
A. C. BURT.