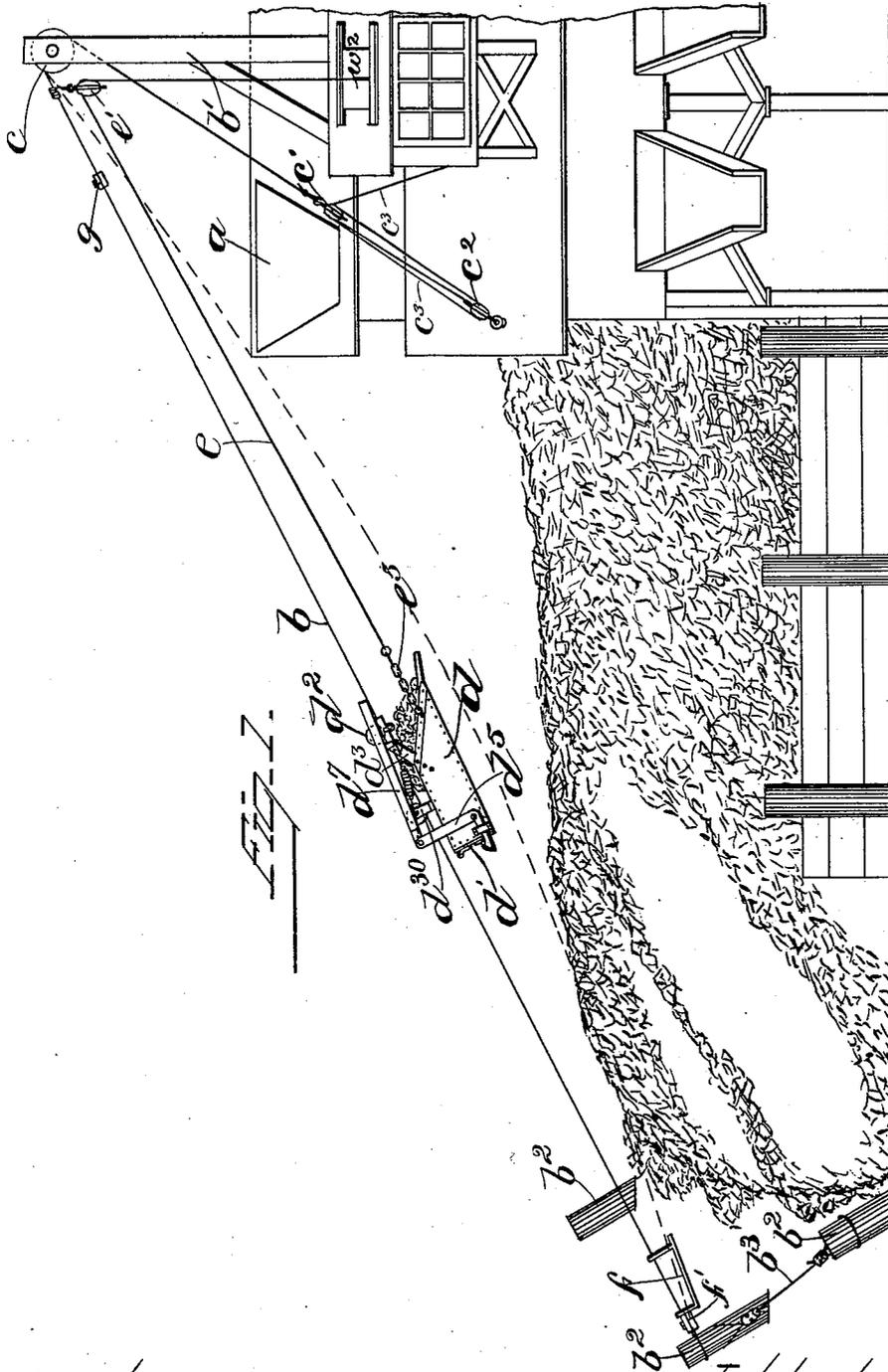


F. H. SYMONS.  
APPARATUS FOR RELOADING COAL.

No. 546,790.

Patented Sept. 24, 1895.



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 Frank H. Symons.  
 by C. J. Hayes esq. atty.



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Fig. 4.

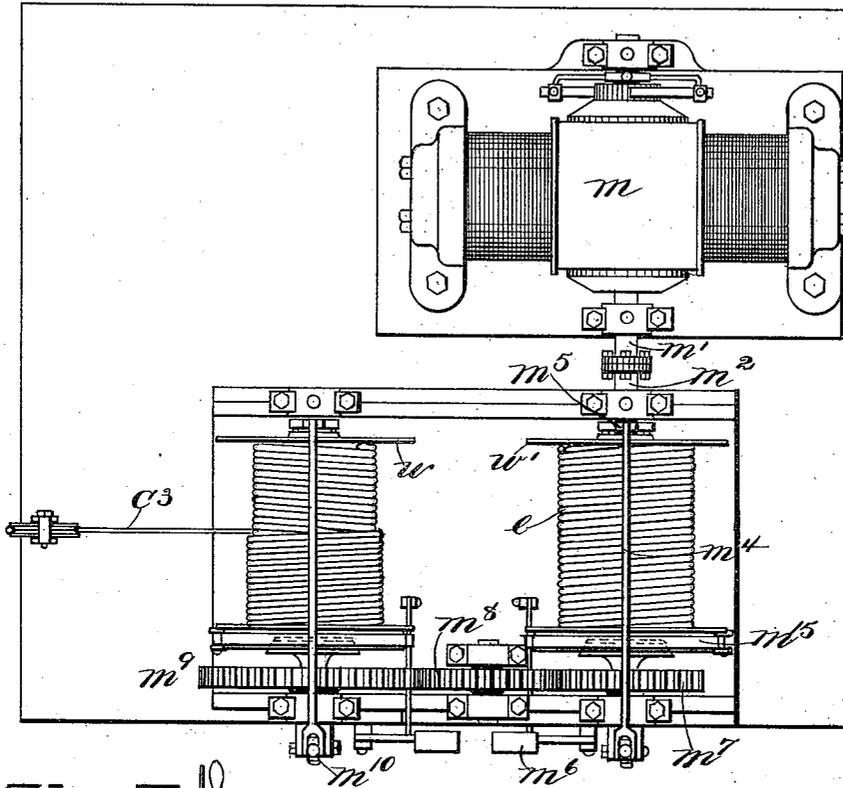
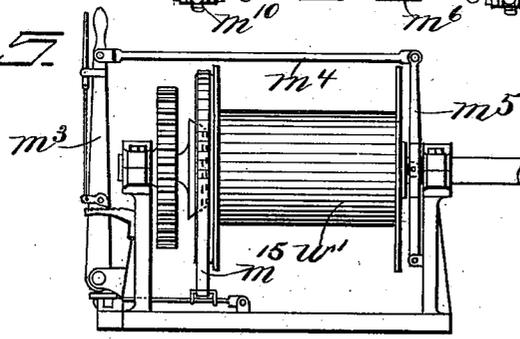


Fig. 5.



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# UNITED STATES PATENT OFFICE.

FRANK HENRY SYMONS, OF BOSTON, MASSACHUSETTS.

## APPARATUS FOR RELOADING COAL.

SPECIFICATION forming part of Letters Patent No. 546,790, dated September 24, 1895.

Application filed December 10, 1894. Serial No. 531,318. (No model.)

### *To all whom it may concern:*

Be it known that I, FRANK HENRY SYMONS, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Apparatus for Reloading Coal, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention has for its object to construct an apparatus especially designed for hoisting or reloading coal—that is, conveying it from one place to another—as, for instance, from a large bin to a small bin or “pocket,”  
15 as it is sometimes called, from which latter receptacle the coal is “let” into the carts, cars, &c.

The invention comprehends an inclined runway or cable connected at its upper end in any desirable way to a point adjacent the bin, pocket, or chute to which the coal is to be delivered and connected at its lower end to a post or other point of attachment located at the side of the pile of coal. There may be  
25 several such posts located at different points around the pile of coal, so that the lower end of the runway or cable may be detached from one post, when the coal near it has been removed, and connected with another post, so  
30 that the entire pile of coal may be removed. The coal tub or carrier by means of which the coal is conveyed is suspended from and adapted to run along the runway or cable, it being constructed and arranged to scoop up  
35 the coal in its passage up the runway and to discharge it as it reaches or approaches the upper end. The runway is adapted to be slackened while the coal-tub is filling, and, as soon as filled, to be tightened to prevent hauling the filled tub along through the coal, and also to enable the tub to clear the upper bin or hopper, and said runway is also held taut while the tub descends that it may clear the coal in its passage.

45 Figure 1 shows in side elevation an apparatus for hoisting or reloading coal embodying this invention; Fig. 2, a perspective view of the coal-tub; Fig. 3, a front elevation of the winding-drums; Fig. 4, a plan view of the winding-drums, and Fig. 5 an end view showing one of the drums.

The invention is herein shown in connection with a pile of coal dumped beside an elevated bin or pocket *a*. An inclined runway or cable *b* is supported at its upper end by a  
55 post or other support *b'*, located adjacent the bin or pocket, passing over a sheave or pulley *c*, journaled in said post, and thence down to a suitable tackle-block *c'*, around which, together with tackle-block *c''*, a cord *c<sup>3</sup>* passes,  
60 which is led to and around a suitable winding-drum *w*. (See Figs. 3 and 4.) The winding-drum is adapted to be operated to slacken and tighten the runway *b* at any time during the ascent and descent of the tub or bucket,  
65 which operation is carried out by paying out or winding up the cord *c<sup>3</sup>*; but my intention is to slacken the runway while the bucket is filling and to hold it taut the remaining time. The lower end of said runway or cable *b* is  
70 connected to a post or other suitable support *b<sup>2</sup>* or point of attachment rising from the floor of the bin containing the coal to be hoisted, and close to the pile of coal. There may be several such posts or points of attachment  
75 for the lower end of the runway located around or about the pile of coal, and the runway may be connected to any one of them, or two posts, for instance, might be connected by a short cable, as *b<sup>3</sup>*, and the lower end of the  
80 runway *b* connected to said cable.

The coal-tub consists, essentially, of a scoop *d*, having an opening at the front end with a forwardly-extended lip, and having an end  
85 piece *d'* or door at the rear end, pivoted at its upper end to the scoop. The scoop-like structure *d* is provided with rollers *d<sup>2</sup>*, which are adapted to follow along the runway or cable  
90 *b*, said rollers being mounted in yokes or frames *d<sup>3</sup>* *d<sup>30</sup>*, secured to and rising from the top of the tub. The pivoted door or rear end piece *d'* has at each side a projection *d<sup>4</sup>*, which is herein represented as formed by securing  
95 to the outer side of the door a cross-bar made longer than the width of the door. Two bell-crank levers *d<sup>5</sup>* are pivoted to the sides of the scoop *d*, the horizontal arms of which are provided at their outer ends with hook-shaped  
100 latches, which by engaging the projection *d'* on the door keep it closed. The vertical arms of said bell-crank levers are connected by a yoke or frame *d<sup>7</sup>*, which projects forward in

advance of the scoop and has an eye or slot at its forward end which receives the cable  $b$ . The upper ends of the vertical arms of the bell-crank levers are connected by a cross-bar  $d^6$ , to which is attached or connected a spiral spring  $d^{10}$ , the opposite end of said spring being connected with the fixed roller-carrying yoke or frame  $d^8$ , the action of the spring being to hold the bell-crank levers  $d^5$  with their hook-shaped latches in elevated position to lock the door. A cord or chain  $e$  is connected by a chain  $e^5$  with the front end of the scoop  $d$  in any suitable way, which passes up alongside the cable  $b$  and over a pulley or sheave  $e'$ , attached to the cable  $b$  near the post  $b'$ , and thence down and onto or around the drum  $w'$  of a motor—as, for instance, it may be an electric motor. (See Figs. 3, 4, and 5.) It will be seen that the said cable  $e$  is passed to the drum  $w'$  through a scuttle  $w^2$ , which is set on the roof of the house in which the winding-drums are located, as partly shown in Fig. 1.

The means employed for slackening and tightening the cable  $b$  and for drawing up the tub are represented in Figs. 3, 4, and 5 as a combined apparatus, consisting, essentially, of an electric motor  $m$ , to the shaft  $m'$  of which is attached the shaft  $m^2$  of the winding-drum  $w'$ , upon which the cord  $e$  is wound to draw up the tub. The drum  $w'$  is mounted loosely upon its shaft and adapted to be connected therewith by a friction-clutch, herein represented as an ordinary friction-cone clutch. A pivoted hand-lever  $m^3$  is connected by a link  $m^4$  with a lever  $m^5$ , which is employed as a means of moving the drum on its shaft to clutch or unclutch it. A suitable brake-band  $m^{15}$  is connected with and operated by a foot-lever  $m^6$ . A toothed wheel  $m^7$  is secured to the drum-shaft, which engages a pinion  $m^8$ , which in turn engages a toothed wheel  $m^9$  on the shaft of the winding-drum  $w$ . The drum  $w$  is constructed and operated, the same as the drum  $w'$ , by a hand-lever  $m^{10}$ .

In operation the lower end of the runway or cable  $b$  is attached to one of the posts  $b^2$  and the coal-tub is permitted to descend to the lower end or thereabout by releasing the brake of the unclutched drum  $w'$ , the runway during such time being held taut or sufficiently so to enable the tub to clear the coal as it descends, and just as it arrives at said lower end the rear end of the scoop—as, for instance, the pivoted door  $d'$ —strikes a stop  $f$ , mounted upon and at the lower end of the runway, and is thereby closed and latched. The runway  $b$  is then slackened by releasing the brake of the unclutched drum  $w'$  and the coal-tub drawn up by clutching the drum  $w'$  to its shaft, scooping up the coal in its passage, and as soon as it has filled the runway  $b$  is again tightened by clutching the drum  $w'$  to its shaft in order that the tub may be drawn up freely without dragging through the coal, and also that the tub may clear the bin or hopper, and as soon as the operating

lever or yoke  $d'$  of the bell-crank levers  $d^5$  strikes a stop  $g$ , secured to the runway at or near its upper end, said levers  $d^5$  are operated to unlatch the door and the coal contained in the scoop immediately escapes. To prevent the door opening too wide it may be provided with side chains  $n$ . As soon as the door  $d'$  is opened the escaping coal enters the pocket or shute, the coal-tub again descends to the lower end of the runway, and the door is automatically closed or latched, as above described. It will thus be seen that the winding-drum  $w$  is held by the brake most of the time, being operated by the motor but for very short intervals.

As the coal-tub is repeatedly dragged up the runway, the runway or cable is each time slackened more and more, so that the coal-tub may sink deeper into the pile.

To work upon another part of the pile the lower end of the runway or cable will be connected with another post, and so on until the entire pile is disposed of.

The stop  $f$  is adjustable on the runway by means of a clamp  $f'$ .

The apparatus herein described may be used for moving any other material besides coal.

The motor shown in Figs. 3, 4, and 5 has two winding-drums connected to it, the drums being clutched to the motor by suitable operating-levers, when desired; but my invention comprehends no particular construction of motor.

I claim—

1. In a conveying apparatus, an inclined runway, a coal tub running thereon, means for slackening the runway while the tub is filling and for thereafter tightening it, substantially as described.

2. In a conveying apparatus, an inclined runway, a coal tub thereon, means for drawing it up the runway, and for permitting it to descend, and means for slackening the runway for a short time while the tub is being drawn up, that it may scoop up the coal, and for thereafter tightening it, substantially as described.

3. In a conveying apparatus, an inclined runway, a coal tub thereon, means for drawing it up the runway, and for permitting it to descend, a winding drum for one end of the runway whereby it may be slackened while the tub is filling, and for thereafter tightening it, and a suitable point of attachment for the lower end of the runway, substantially as described.

4. In a conveying apparatus, a runway, a conveying tub, consisting of a scoop having rollers which follow along said runway, a pivoted door at the rear end having at each side a projection  $d^4$ , bell crank levers  $d^5$ , pivoted to each side of the scoop, and having latches which engage said projections  $d^4$ , the forwardly projecting yoke or frame  $d^7$  connected with said bell crank levers, spring  $d^{10}$  nor-

mally holding the bell crank levers in engagement with the projections  $d^4$ , a stop at the upper end of the runway against which the yoke  $d^7$  strikes to operate the bell crank levers, and  
5 thereby release the door, and a stop at the lower end of the runway against which the door strikes to close it.

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

FRANK HENRY SYMONS.

Witnesses:

B. J. NOYES,

FLORENCE H. DAVIS.