

(No Model.)

2 Sheets—Sheet 1.

J. H. FELMLEE.

DEVICE FOR LOADING AND UNLOADING.

No. 307,107.

Patented Oct. 28, 1884.

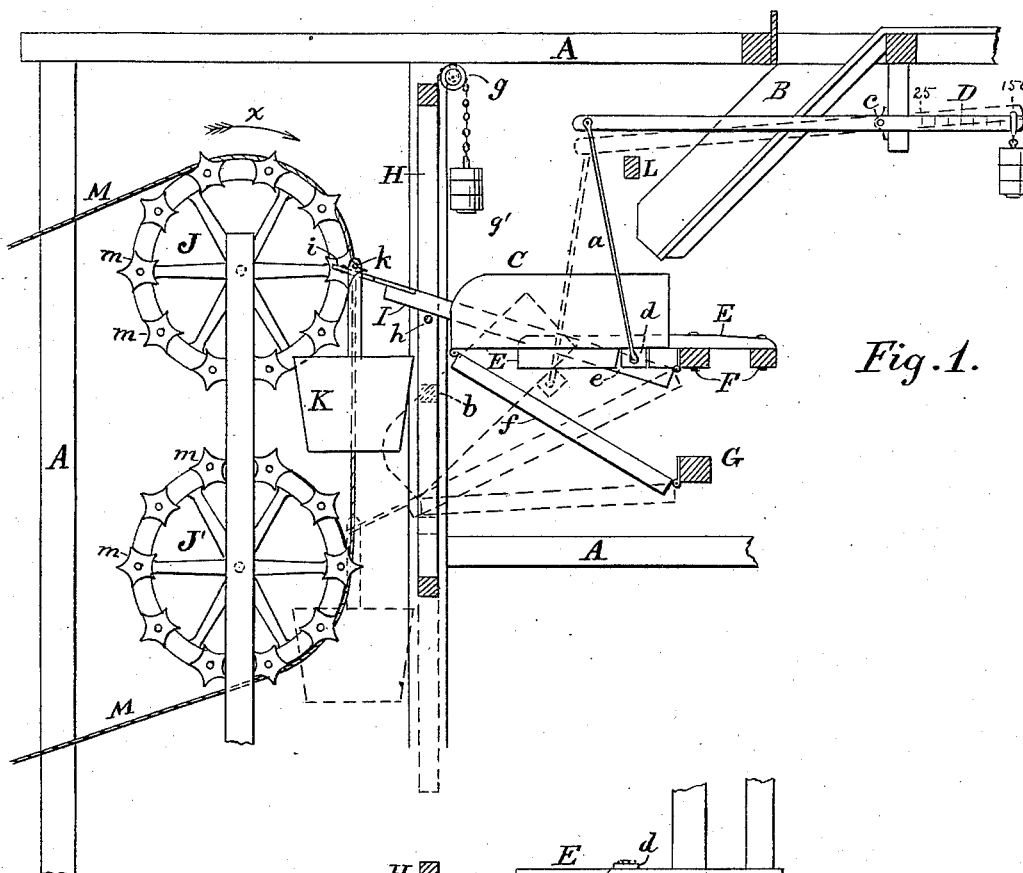


Fig. 1.

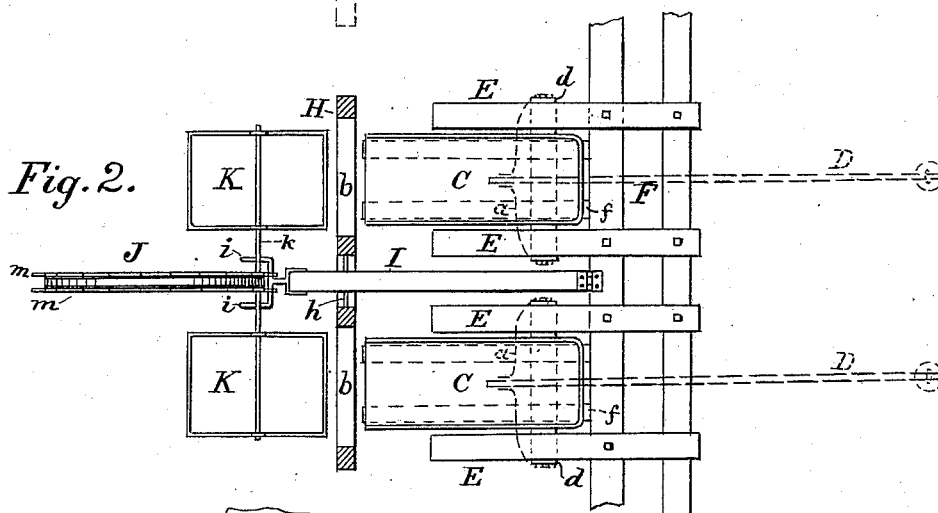


Fig. 2.

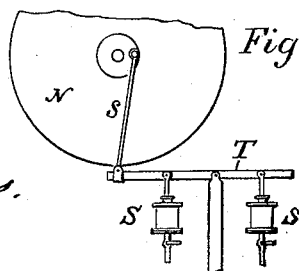


Fig. 8.

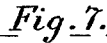
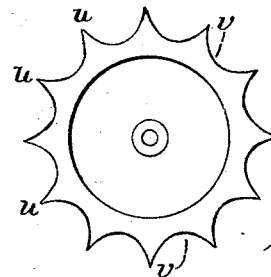
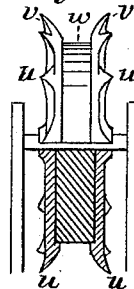
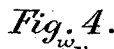
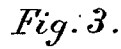
Witnesses:
G. B. Towles.
A. Daniels

Inventor:
John H. Feltmlee
By Walter Cooksey
Attorney

2 Sheets—Sheet 2.

DEVICE FOR LOADING AND UNLOADING.

Patented Oct. 28, 1884.



H. Daniels

John H. Felmlee
By Walter Cookney
Attorney.

UNITED STATES PATENT OFFICE.

JOHN H. FELMLEE, OF DENVER, COLORADO.

DEVICE FOR LOADING AND UNLOADING.

SPECIFICATION forming part of Letters Patent No. 307,107, dated October 28, 1884.

Application filed June 16, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. FELMLEE, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Devices for Loading and Unloading Ore, Coal, and other Articles, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to apparatus for loading and unloading ore, coal, and other articles; and it consists in certain improvements in the construction of such apparatus, as hereinafter described and claimed.

In my construction an endless cable is provided, which passes over wheels of peculiar construction, and has horizontal bars or rods secured centrally to the cable. To each of said bars two carrying-buckets are attached, which are carried forward from the point where they are filled to the terminal or dumping end of the apparatus, and, coming in contact with a dumping device, are emptied, and then returned to be again filled. The coal or article to be loaded is passed down inclined chutes, and falls into receiving-boxes suspended to scale-beams for weighing the contents. When said boxes have received certain quantities in weight they are automatically tilted and discharge their contents into the buckets, and are then returned to their first positions. When the buckets arrive at the terminal or discharge point they are automatically dumped, and then carried back to the receiving-boxes to be again filled. An adjustable shaft is also provided for communicating power to the apparatus, when desired. Provision is also made for governing movement, and also for rendering the cable steady in passage and preventing its slipping. Intermediate supporting devices are also provided.

Referring to the drawings, Figure 1 is a sectional side view illustrating the loading portion of my improved apparatus. Fig. 2 is a partial plan of the same. Fig. 3 is a sectional side view of the unloading or terminal part of the apparatus. Fig. 4 is a front view of a tower supporting the cable intermediately. Fig. 5 is a side view of same. Fig. 6 represents, in side and sectional edge views, one

of the wheels used to support the cable intermediately. Fig. 7 represents, in front and side views, a gripping device for the cable, which is applied to one of the wheels over which the cable passes. Fig. 8 represents a governing device applied to the terminal wheel.

A designates the frame-work which supports the loading devices, and B the inclined chutes, down which the article to be loaded passes to the receiving-boxes C. Each of said boxes is suspended by means of rods *a* to a scale-beam, D, having its pivotal attachment at *c* for weighing the contents of boxes. The rods *a* are connected with the ends of the cleats or cross-pieces *d*, one being fastened to the bottom of each receiving-box near the rear end thereof. Each box C, when in position to receive the ore or coal from a chute, B, is held between two of the fixed horizontal pieces E, fastened to cross-beams F, with the cleats *d* extending into recesses or notches *e* in the lower sides of the fixed pieces E. The front end of each box is left open, and is hinged to the forward ends of the pieces *f*, the rear ends of which are hinged to a cross-beam, G, for the purpose hereinafter stated.

H indicates a vertical frame placed in front of and near the boxes C, and suspended by chains passing over pulleys *g* and provided with weights *g'*.

I indicates a bar, hinged at its rear end to a cross-beam, F, and extending forward between the boxes C and through frame H, the forward part of said bar resting on a cross-rod or pin, *h*, fixed in said frame. The free end of bar I is provided with prongs *i*, for connection with horizontal rods to which the carrying-buckets are hung, as hereinafter stated.

At the loading end of the apparatus the endless cable M, which carries the buckets, passes over a wheel, J, and from thence downward to and about a lower wheel, J', bringing the cable for a short distance on a vertical line, as shown. To the cable M is secured a number of bars or horizontal rods, *k*, the same being secured centrally to the cable at suitable distances from each other, and two carrying-buckets, K, are hung to each of said bars, one being at either side of the cable. To the sides of each of the wheels J and J' are pivotally secured the star-wheels *m*, the same

being constructed substantially as shown, with points and concave edges between them; and said star-wheels are so arranged along the peripheries of the wheels J and J' that the points project beyond the peripheries of said wheels. The star-wheels m are rotated independently by contact with bars k , carrying the buckets. They serve as flanges to the wheels, to which they are pivoted, keeping the cable in place on said wheels, and as the bars k come in contact with them they are partially rotated and allow the bars to bear against the peripheries of wheels J and J' .

The scale-beam having its weights set to weigh a certain quantity—say twenty-five pounds—when that quantity has been poured into box C the box sinks, taking the cleat d from the notches e , and swings forward, its movement being governed by the hinged bars f , to which the front end of the box is hinged. This movement brings the front ends of bars f and the box to rest on a cross-bar, b , of the frame H . The cable M at the same time passing over wheel J in the direction indicated by the arrow x in Fig. 1, and a bar, k , descending with two buckets, the said bar catches the prongs i of hinged bar I , said prongs straddling the cable, and said bar I , and consequently frame H , are pressed downward, the boxes C being thus tilted forward, as indicated in dotted lines in Fig. 1, discharging their contents into the buckets, which have meantime reached the proper position below. When the pronged end of bar I is brought down to a certain point, it slips from bucket-carrying bar k , and the frame H is immediately raised by the weights g , bringing upward bar I and boxes C and returning them to their first positions.

L indicates a fixed cross-piece under and a suitable distance below the scale-beam to form a stop to prevent it from being drawn down too far by the operation of box C .

If, during the passage of the cable, the boxes C are not loaded sufficiently to cause their descent and forward movement, as above described, the bar k , descending, catches the pronged bar I , but only brings it downward a short distance and releases it; when, by the operation of frame H , it is raised to its first position.

At the terminal or discharge end of the apparatus is a terminal wheel, N , the cable M passing about said wheel in the direction indicated by the arrows z in Fig. 3. The wheel N is mounted in a frame, O , which is a sliding frame, and is provided with a weight, v , at the end of a cord passing over a pulley, v' , and attached to the frame, the weight serving to keep the cable extended and tightened.

When the cable is adjusted in position at a suitable inclination, it operates automatically, the weight of the loaded buckets descending being sufficient to return the empty buckets to the loading end, but when it is desired to communicate power to drive the mechanism, this may be done by means of an adjustable shaft, Q , in suitable bearings on the frame,

connection between said shaft and wheel N being readily effected through gearing R . The said shaft Q , being adjustable in length, is usually constructed with a joint, y , one section of the shaft entering a hollow portion of another section, and being secured by one or more fixed pins extending into slots.

The gripping devices illustrated in Fig. 7 may be secured to the terminal wheel N or to a suitable intermediate wheel. Each gripping device has the jaws P , which are pivotally attached to the wheel on opposite sides at n , near the periphery. To the shanks or lower ends are fastened the springs o , which are also severally fastened to the wheel, as indicated by p . The wheel is recessed at q to receive the lower ends when pressed inward by the springs, and is also recessed somewhat at the periphery to allow the jaws to partly sink therein, as seen in Fig. 7. The springs o hold the jaws P open until the cable M , pressing between said jaws, brings them together, thus binding the cable and preventing its slipping, so that its movement is steady and uniform.

A governing device is provided for the mechanism, and is applied to any suitable wheel—usually the terminal wheel—as seen in Fig. 8. Said device has two air-pumps, S , with their piston-rods connected with a pivoted lever, T , which is connected with the wheel by connecting-rod s and a crank-pin, the pistons making alternate strokes as the wheel revolves.

At the discharge end of the apparatus is placed a chute, U , down which the carrying-buckets discharge their contents. To the upper end of the chute is hinged a dump-board, t , which is so constructed and attached that it is held in a vertical position, extending upward beyond the plane of the chute, as indicated in dotted lines in Fig. 3. When a pair of loaded buckets is brought in contact with the dump-board t , the moving cable carrying the bucket, brings them, and also the board t , to inclined positions, the forward end of the board lapping on the chute, as shown in the drawings. The buckets being thus emptied and carried forward, the dump-board resumes its vertical position.

For supporting the cable at one or more points along the same a tower is placed, the same being constructed of frame-work V , and provided with two wheels properly guarded and mounted, one above another, in positions to support the upper and lower parts of the endless cable. Each of said wheels is a triple wheel, being composed of three parts on the same shaft or bolt, each part being independent in movement. (See Fig. 6.) The central part, w , is a plain wheel, on which the cable bears, and the side wheels, v , are indented or provided with points u , extending beyond the periphery of wheel w , serving as flanges for said wheel and retaining the cable in position thereon. When a bar, k , carrying buckets, comes in contact with the indented peripheries of wheels v it is allowed to close against the

periphery of wheel *w*. One of these triple wheels may be placed at any desired point to support the cable, which may be made round, in section, or of any suitable form.

5. Having described my invention, I claim—

1. In an apparatus for loading or unloading, one or more wheels provided with independently-rotary star-wheels having projecting points, in combination with an endless cable provided with cross-bars carrying buckets, substantially as and for the purposes described.

2. In an apparatus for loading or unloading, an endless cable, passing over wheels, in combination with a horizontal bar secured to the cable and carrying buckets attached to said bar, substantially as set forth.

3. In combination with wheels *J* and *J'*, having star-wheels *m*, pivoted thereto, an endless cable, *M*, bars *k*, and buckets *K*, substantially as set forth, for the purposes specified.

4. In a device for loading and unloading, one or more receiving-boxes, *C*, each box being suspended to a pivoted weighted beam between fixed retaining-pieces *E*, and provided with hinged bars *f*, connected with a beam, *G*, in combination with carrying devices, substantially as set forth and described.

5. In combination with pivoted scale-beams *D*, boxes *C*, suspended thereto and provided with cleats *d*, the fixed notched pieces *E*, and the hinged bars *f*, connected with a beam, *G*, substantially as and for the purposes set forth.

6. In combination with a scale-beam, *D*, with boxes *C* suspended thereto and provided with cleats *d*, the notched fixed pieces *E*, hinged bars *f*, vertically-moving frame *H*, hinged bar *I*, adapted to connect with a bar, *k*, attached to a moving cable and carrying devices, substantially as set forth.

7. In combination with an endless cable

with carrying-buckets, a triple supporting-wheel, the central part, *w*, and side parts, *v*, being severally independent in movement and the side parts having indented peripheries extending beyond the central part, substantially as set forth and described.

8. In combination with a moving cable carrying a bar, *k*, with buckets attached, a wheel supporting the cable, the middle part, *w*, of which wheel has a movement independent of the movement of the side parts of the wheel, substantially as set forth.

9. In combination with a moving cable with carrying devices, a hinged dump-board, *t*, and chute *U*, constructed substantially as and for the purposes set forth.

10. In combination with a cable having carrying devices and passing over wheels, a governing device consisting of two air-pumps, the pistons of which are connected by devices, substantially as shown, with the operating mechanism of the cable, substantially as set forth.

11. In combination with an endless cable having carrying devices and passing over wheels, an adjustable shaft, *Q*, provided with gearing, and constructed, substantially as shown, to be connected and disconnected with a wheel supporting the cable, substantially as set forth.

12. The adjustable shaft *Q*, mounted on a fixed frame and provided with connecting-gearing, in combination with a wheel supporting the cable and mounted on a sliding frame provided with a drawing-weight, *r*, substantially as and for the purposes set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHN H. FELMLEE.

Witnesses:

E. W. WAYLEIGHT,
H. D. CASSIDAY.