2 Sheets--Sheet 1.

J. W. UPSON.

Coal-Chutes.

No. 155,053. Patented Sept. 15, 1874.

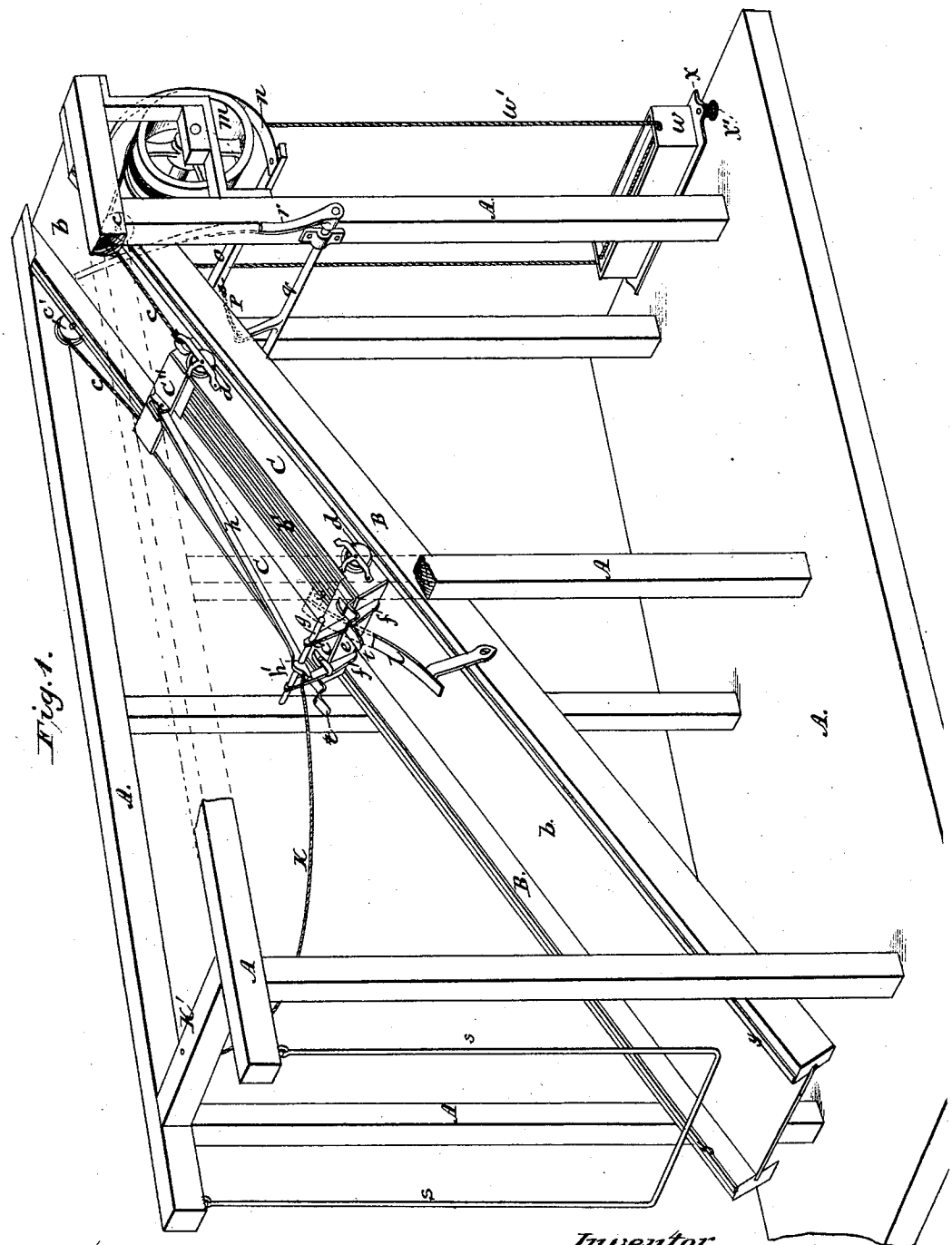

Fig. 1.

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THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

2 Sheets--Sheet 2.

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Fig. 3.

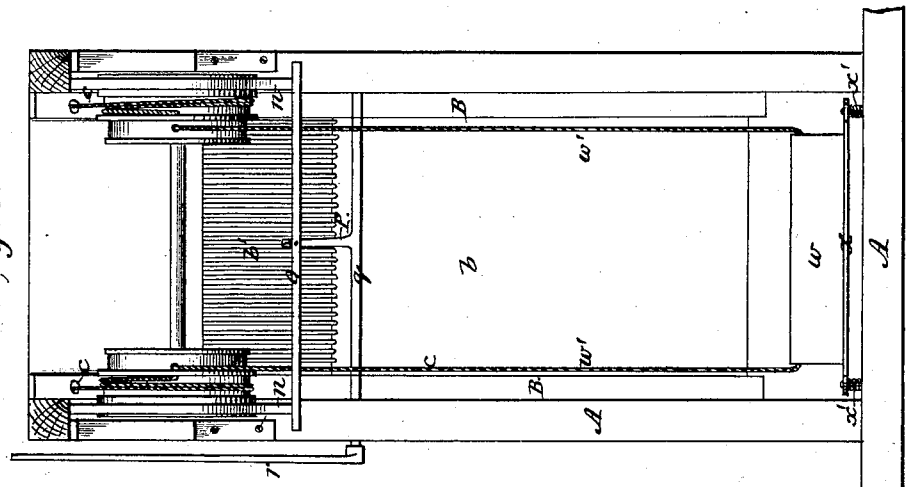
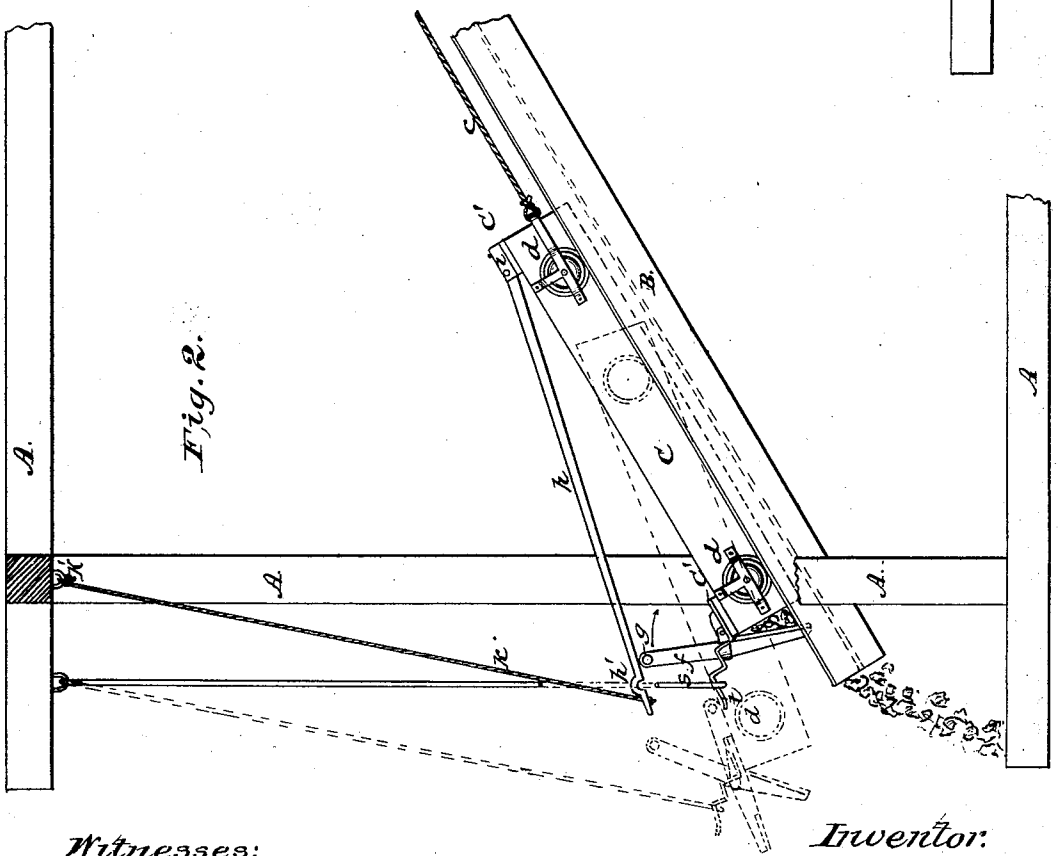


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES W. UPSON, OF TALLMADGE, OHIO.

IMPROVEMENT IN COAL-CHUTES.

Specification forming part of Letters Patent No. **155,053**, dated September 15, 1874; application filed March 11, 1874.

To all whom it may concern:

Be it known that I, JAMES W. UPSON, of Tallmadge, Summit county, State of Ohio, have invented certain Improvements in Coal-Chutes, of which the following is a specification:

This invention relates to that class of chutes which are used in passing coal from a higher to a lower plane, as in loading railway coal-cars from mining-cars, vessels from railway coal-cars, &c. Its special purpose is to prevent the crushing or breaking of coal lumps in handling; and its peculiar adaptation is to the handling of bituminous or soft coal. It consists in a chute provided with a traveling gate and gate-carrier, which controls the descent of the coal; in the devices which accomplish the automatic opening of the gate to discharge the coal, and the automatic closing of the gate after discharging, the automatic return or ascent of the gate, and the various auxiliary devices, hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of this invention. Fig. 2 is a partial side elevation of the same with part of the frame broken away, showing the gate in the act of discharging; and Fig. 3 is an end rear view.

The same letters of reference indicate corresponding parts in the different figures.

A represents the supporting-frame of the chute, consisting of base, uprights, cross-pieces, &c. B B are the sides of the chute; *b*, the bottom, and *b'* a screen in the bottom. The sides B B, on their upper edges, are provided each with a rail, *y*. C C C' C'' represent the frame of the traveling gate-carrier, to which the gate and its auxiliaries are attached. Each side is provided with two flanged wheels, *d d*, hung in brackets, and adapted to run upon the rails *y y* upon the sides of the chute. The sides C C are so supported that they fall just below the line of the upper edge of the sides of the chute, extend above, and form an addition to said sides. To the lower cross-piece C' the gate *e* is hinged. It extends entirely across said frame, and closes the opening between the sides. It is secured to two or more uprights, *f f*, which are pivoted to said cross-piece by a common bolt-rod. The uprights *f* are extended above the gate, and a heavy rod, *g*, is secured to their ends, which, on one side, extends beyond the gate and over the side of the chute. To the other cross-piece C'', and about midway of it, one end of a long bar, *h*, is hinged. The other end of the bar extends over the bar *g*, and when the gate is closed a notch, *h'*, in said bar catches upon said rod and holds the gate to its closed position. A rope, *k*, is secured to the free end of the bar *h*, and reaches thence to an upper cross-piece of frame A, where it is secured. This rope is of such length that when the gate and carrier descend to the lower mouth of the chute, the bar *h* will be held up from the rod *g*, and allow the gate to open. The other and open end of the carrier-frame C C is secured by means of ropes *c c*, which pass over pulleys *c' c'* to a windlass, *m*. This windlass consists of a double wheel on each end of its shaft, upon one of which the rope *c* is wound, and upon the other, and in a reverse direction, a rope, *w'*, which is attached to a weight, *w*. This weight is more than sufficient to counterbalance the gravity of the gate and carrier; and its rope being wound upon the windlass in a direction the reverse of rope *c*, when the carrier descends the weight will be elevated, and when the carrier is allowed to ascend it will be carried up by the descent of the weight. To ease the weight in its descent, and prevent the jar which otherwise would be consequent upon its sudden stopping, a spring-platform, *x*, is arranged to receive and support it, *x' x'* being coiled springs at either end of the platform. The lever-handle *r* controls the brake *q p o*, which operates upon the windlass by means of the strap-rubbers *n n*, and by its use the turning of the windlass can be controlled, and the descent or ascent of the gate and carrier regulated. *s* is a swing hung to the outer ends of top beams of frame A, just over the discharging-mouth of the chute, the object of which, as shown in dotted lines in Fig. 2, is to catch the projecting arms *t t* of the carrier, check the impetus which it has gained in its descent, and give it an ascending start.

An incline, *l*, is attached to the side of the chute, the object of which is to present a sur-

face against which the elongated end of rod *g* will strike in the ascent of the gate, and cause it to close. The position the gate assumes after being thrown open is shown in dotted lines in Fig. 2.

The operation is as follows: The gate with its attachments and the carrier being in the position shown in Fig. 1, and the operator standing so as to manage the brake-lever, coal is dumped into the chute at its upper end. The angle of inclination of the chute is such as to cause the coal to slide down until it reaches and is stopped by the gate, and in so doing it is screened by the screen *b'*, and the fine coal passes through to such additional screens below as may be necessary. When a sufficient quantity has been added to more than counterbalance the weight *w*, the gate will descend unless the brake is used, and allow the coal to pass off; but, being controlled by the brake in the hands of the operator, it is held to its position until the proper or desired load is received, when it is allowed to descend. Its rapidity of motion in making the descent is to a great extent modified by the ropes, windlass, and weight unassisted, but is entirely controlled by the brake. When it reaches the point indicated in Fig. 2 the rope *k* will hold up the end of lever *h*, and, as soon as it becomes disengaged from its hold upon rod *g*, the coal, of its own gravity, will force the gate to swing open, and will pass out beneath it from the chute to the car or vessel which stands ready to receive it. When the gate is forced open the weight of rod *g* will carry it to the final position shown in dotted lines in Fig. 2. To counteract the effect of the impetus which may have been imparted to the gate and carrier in its descent, and prevent it from carrying it too far after being discharged of its contents, the arms *t t* catch in the swing *s*, and the carrier will, at one end, swing slightly from the track until its downward progress is checked, when it will be carried back by the weight to its first position to receive another load. In passing up, the elongated end of rod *g* strikes against the incline *l*, closes the gate, and the notch in bar *h* catches upon the rod *g* and latches the gate to its closed position.

The shock of the descent of the weight is relieved by a spring-platform, *x*; but, instead thereof, spring-bumpers to receive and stop the car could be substituted, or other elastic yielding device be used for the purpose. Proper handling of the brake will obviate all necessity of this elastic bumper.

I claim as my invention—

1. A traveling gate and gate-carrier, in combination with a coal-chute, for the purpose specified.

2. A swing, *s*, secured to the frame of the chute, to receive the carrier at the lower mouth of the chute and check the impetus gained in the descent.

3. The combination of the gate *e*, rod *g*, bar *h*, and rope *k*, substantially as and for the purpose set forth.

4. The combination of the gate *e* and rod *g* with the incline *l*, substantially as and for the purpose set forth.

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Witnesses:
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