(No Model.)

F. G. SUSEMIHL.

COAL CHUTE.

No. 455,585. Patented July 7, 1891.

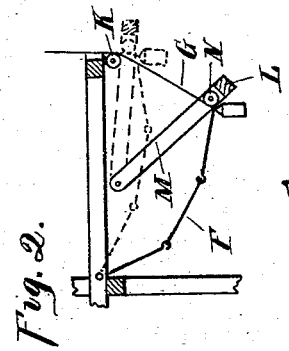

Fig. 2.

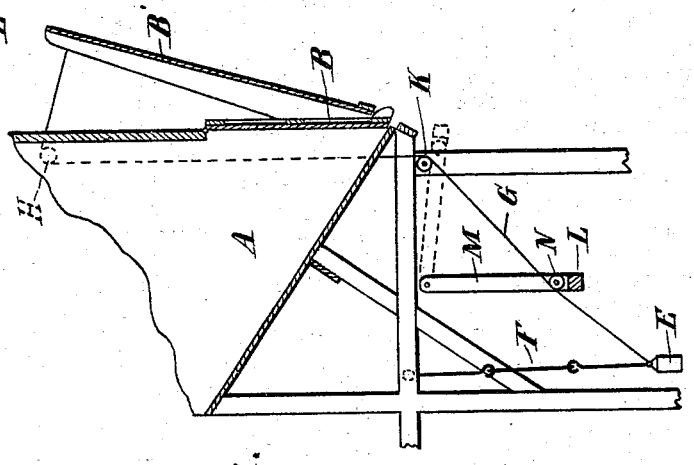

Fig. 1.

Witnesses:
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UNITED STATES PATENT OFFICE.

FRANCIS G. SUSEMIHL, OF DETROIT, MICHIGAN, ASSIGNOR OF TWO-THIRDS TO ASA G. DAILEY AND JAMES D. HAWKS, OF SAME PLACE.

COAL-CHUTE.

SPECIFICATION forming part of Letters Patent No. 455,585, dated July 7, 1891.

Application filed August 14, 1890. Serial No. 362,028. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS G. SUSEMIHL, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Coal-Chutes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in means for operating and closing spouts for chutes or bins; and my invention consists in the novel construction and operation of means for balancing the weight of heavy spouts—such as used, for instance, on coal-chutes for delivering coal into the tender of locomotives or on board vessels. These spouts are hinged and counterbalanced and spout the material from the bin or chute when drawn down to the necessary incline, and upon being released are drawn up by the counter-weight into a perpendicular position, or nearly so, so as to be out of the way and close the mouth of the bin or chute.

The object of my invention is to so arrange the counter-balance that it will only require a minimum of strength to pull the spout down from its closing position, and, further, to prevent it from flying back to its closed position all as more fully described, and shown in the accompanying drawings, in which—

Figure 1 is a section showing a chute. Fig. 2 is a similar section to Fig. 1, showing the location of the parts when the chute is being lowered.

A is the bin or pocket in which the coal is contained, and which has a suitably-inclined bottom to permit the material to spout out by gravity.

B B′ are hinged doors closing the front side of the bin and adapted to open outward, the latter forming a spout and the former being provided with any suitable device for opening or closing it, being substantially of the construction shown in my patent, No. 416,018, granted November 26, 1889.

Heretofore in opening such chutes a great deal of power has been required, for the reason that the counterbalance-weights have been entirely suspended from the upper part of the door B and the full weight had to be lifted by the operator in starting the door from its vertical position, whereas the full force of the counter-weight is only needed when the door is in its lowered position or approaching its lowered position. In order to bring the counter-weight into action proportionate to the amount of weight to be sustained, I have devised the following construction:

E is the counter-weight secured to the lower end of a link F, which at its upper end is secured to the frame at the rear side of the bin A, so as to make a pendulous weight. This weight is normally suspended by the link, or nearly so, and is adapted to be moved from its vertical position to a horizontal position as the spout is lowered.

G is the chain or rope connecting the weight with the upper end of the spout B′, passing over the sheave H.

It is evident that the parts being in the position shown the weight E will be sustained almost entirely by the link F, sufficient power, however, being brought to bear through the chain G to hold the door B′ in its closed position. As soon as the operator takes hold to pull down the door B′, the first part of the movement is but little resisted, as the weight is largely supported by its link; but as the door assumes a horizontal position and its weight is moved from off its pivot-pin the weight E is correspondingly moved toward a horizontal position to offset the weight of the door, and when the door is in its lowered position the full force of the weight is brought against the weight of the door to counterbalance it. In this way the door may be opened with very slight power, making it easy of operation for the operator, and the same is true of closing it.

F is the link corresponding to the link previously described, and it is preferably composed of several sections.

E is the counter-weight.

G is a chain connecting the upper part of the spout with the counter-weight. This chain, however, passes beneath a pulley K as well as over the sheave H. In these large chutes, which are usually made of iron, the chain which supports them is very heavy, and as it pays out the additional weight of

this chain is added to the weight of the spout. In order to offset this accumulation of weight as the chute opens, I have arranged an auxiliary weight L, suspended from a frame M immediately in front of the link F, and the chain G passes over a sheave N on this frame. As the chute opens, the weight E acts in the manner previously described, and as this weight moves toward its horizontal position it engages with the weight L and swings the frame upon its pivot toward the horizontal position, as shown in dotted lines. The additional counterbalancing effect of the weight L is thus brought gradually into play and offsets the accumulated weight of the chain, which is being paid out as the chute descends. As the chute is returned to its normal position, the effectiveness of the weight L decreases as the chain is withdrawn.

Thus it will be seen that I have provided means for counterbalancing the spout at all points proportionate to the amount of weight to be balanced without making the hinges of the spout support the counter-balance, as in the construction in which the spout is balanced on the hinges, and wherein the hinges are therefore called upon to support double the weight and in which the spout is always liable to warp and twist, while the hinges soon give out. This I have accomplished by substituting for the ordinary suspension balance-weight a pendulous counterbalance-weight, to which the suspension cable or chain of the spout is secured, and whereby the weight is caused to move in the arc of a circle, or nearly so, when the spout is raised and lowered; and, further, my invention consists in combining two such pendulous counterbalance-weights with the suspension cable or chain.

What I claim as my invention is—

The combination, with a chute having a hinged door B′, of the counterbalance-weight E, the link F, connecting said weight with a fixed point of suspension, the suspension rope or cable G, connecting the free end of the door with said weight, the pulley H, over which said rope or cable passes, and the pendulous frame M, having the weight L and pulley N, the parts being arranged to operate substantially as described.

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

FRANCIS G. SUSEMIHL.

Witnesses:
M. B. O'DOGHERTY,
P. M. HULBERT.