

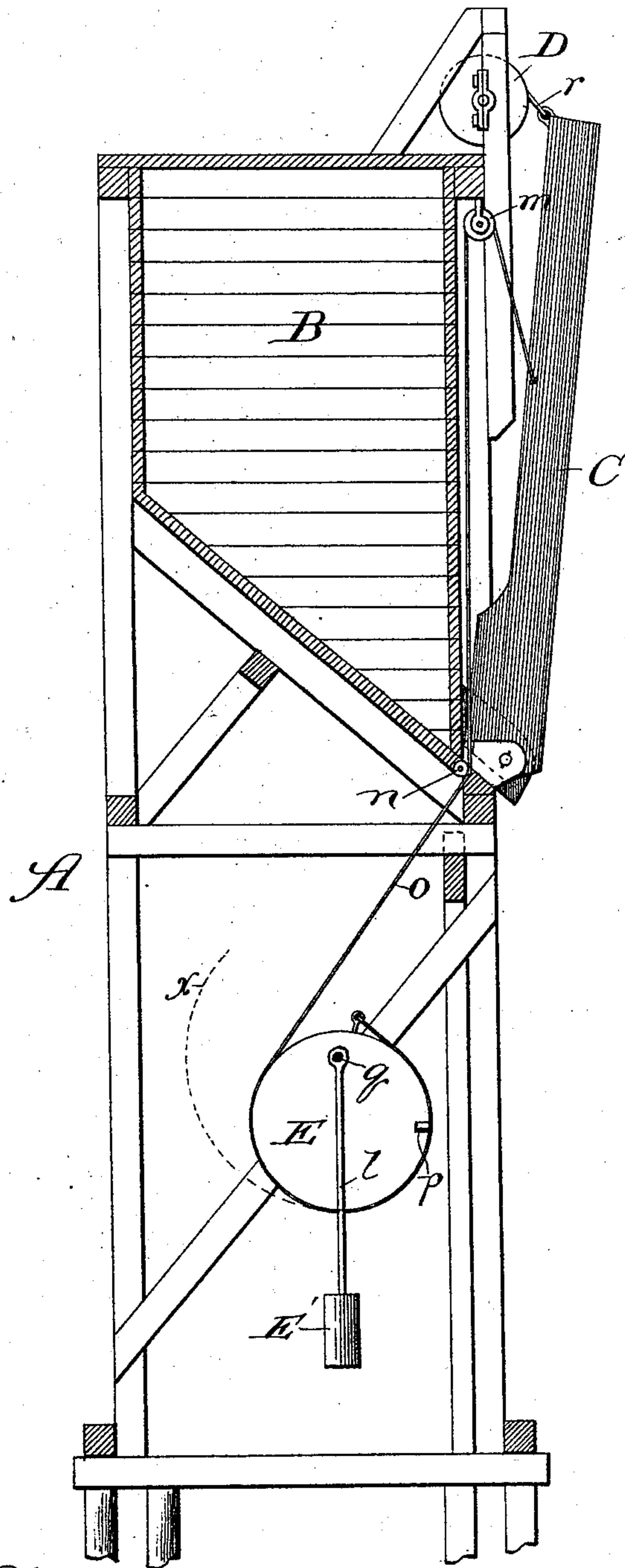
(No Model.)

J. V. ERICSON.

DISCHARGE APPARATUS FOR COAL OR ORE BINS.

No. 412,375.

Patented Oct. 8, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

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DISCHARGE APPARATUS FOR COAL OR ORE BINS.

SPECIFICATION forming part of Letters Patent No. 412,375, dated October 8, 1889.

Application filed May 21, 1889. Serial No. 311,608. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. ERICSON, a citizen of the United States, residing at Escanaba, in the county of Delta and State of Michigan, have invented a new and useful Improvement in Discharge Apparatus for Coal or Ore Bins, of which the following is a specification.

My invention relates to an improvement in the class of apparatus in use particularly on docks for the transfer from the latter to vessels of coal, ore, &c., and it relates more especially to an improvement in that form of the apparatus in which the heavy pivotal chute for directing the discharge from the bin is raised out of the way when not in use and lowered to its operative position by suitable mechanism for the purpose, but without resistance from the weight of the chute, the latter being counterbalanced in all positions it assumes in being raised and lowered by means increasing and decreasing in resistance with the increase and decrease in the resistance of the chute.

The object of my improvement is to provide for the chute a simply-constructed, effective, and reliably-operative counterbalancing medium.

My invention consists in the general construction of my improvement; and it also consists in details of construction and combinations of parts.

The accompanying drawing represents a cross-section of an ore-dock having the bin it supports provided with a counterbalanced discharge apparatus of my improved construction.

A is the dock supporting the bin B, provided at its discharge-opening with a pivotal chute C, raised and lowered by turning a drum D, supported on the bin, to wind and unwind a cable or chain *r*, connecting the chute with the drum.

E is a pulley of desired weight (and which should be grooved around its periphery) suspended from a stationary object—such as the dock—on a pivot *q*, provided eccentrically or near the periphery of the pulley, on one side of which is a lug *p*. A cable or chain

o is secured at one end to the periphery of the pulley and passes thence around it, over guide-pulleys *n* and *m*, to the chute, to which it is fastened at its opposite end.

Obviously the eccentrically-suspended pulley E offers the least resistance to the chute in the vertical position in which it is illustrated. As the chute is lowered toward its operative position, increasing in resistance as it descends, it turns the pulley on its eccentric pivot through the arc indicated by the dotted line *x*, thereby causing its resistance to be increased as that of the chute increases, and if the pulley be sufficiently large and heavy it alone will afford the counter-balance for the chute. It is preferred instead, however, to employ, in addition, a weight E', suspended by a rod *l* from a pivot *q*, and which, when the pulley is turned sufficiently far in lowering the chute, is engaged by the lug *p*, thereby causing it to be raised on its pivot and increasing the resistance of the counter-balance in the desired degree.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a discharge apparatus for coal and ore bins, the combination, with the pivotal chute and means for operating it, of a counter-balance having an eccentrically-pivoted pulley E connected with the chute and raised and lowered on its pivot through an arc by the lowering and raising of the chute, substantially as and for the purpose set forth.

2. In a discharge apparatus for coal and ore bins, the combination, with the pivotal chute and means for operating it, of a counter-balance comprising a pulley E, eccentrically pivoted to a stationary support and provided with a lug *p* on its side, a cable or chain *o* connecting the pulley with the chute, and a weight E', suspended from a pivotal support and having its suspending medium in the path of the lug *p*, substantially as and for the purpose set forth.

JOHN V. ERICSON.

In presence of—

J. W. DYRENFORTH,
M. J. BOWERS.