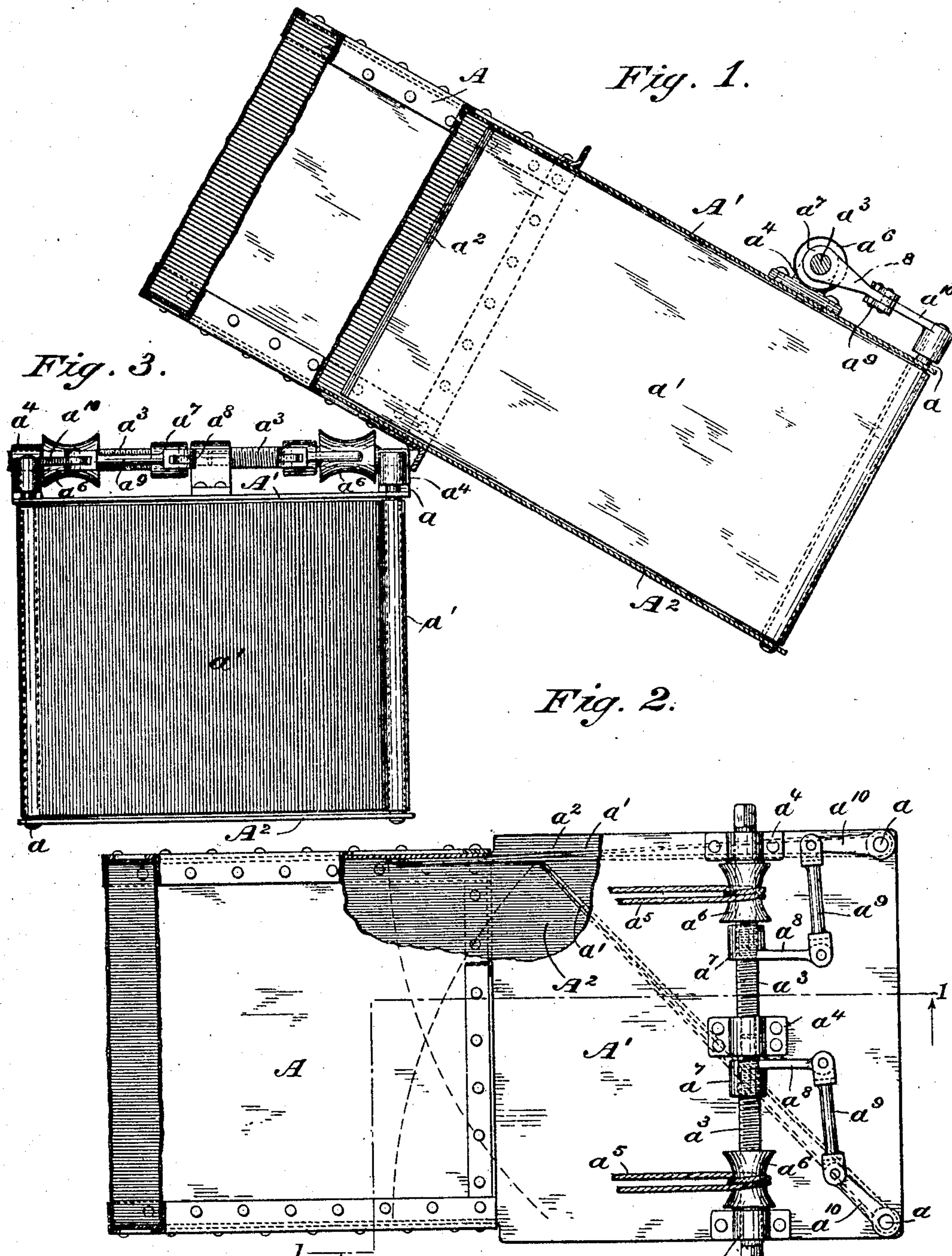


No. 849,478.

PATENTED APR. 9, 1907.

T. IRWIN.  
LOAD TRIMMER.  
APPLICATION FILED JULY 21, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR:  
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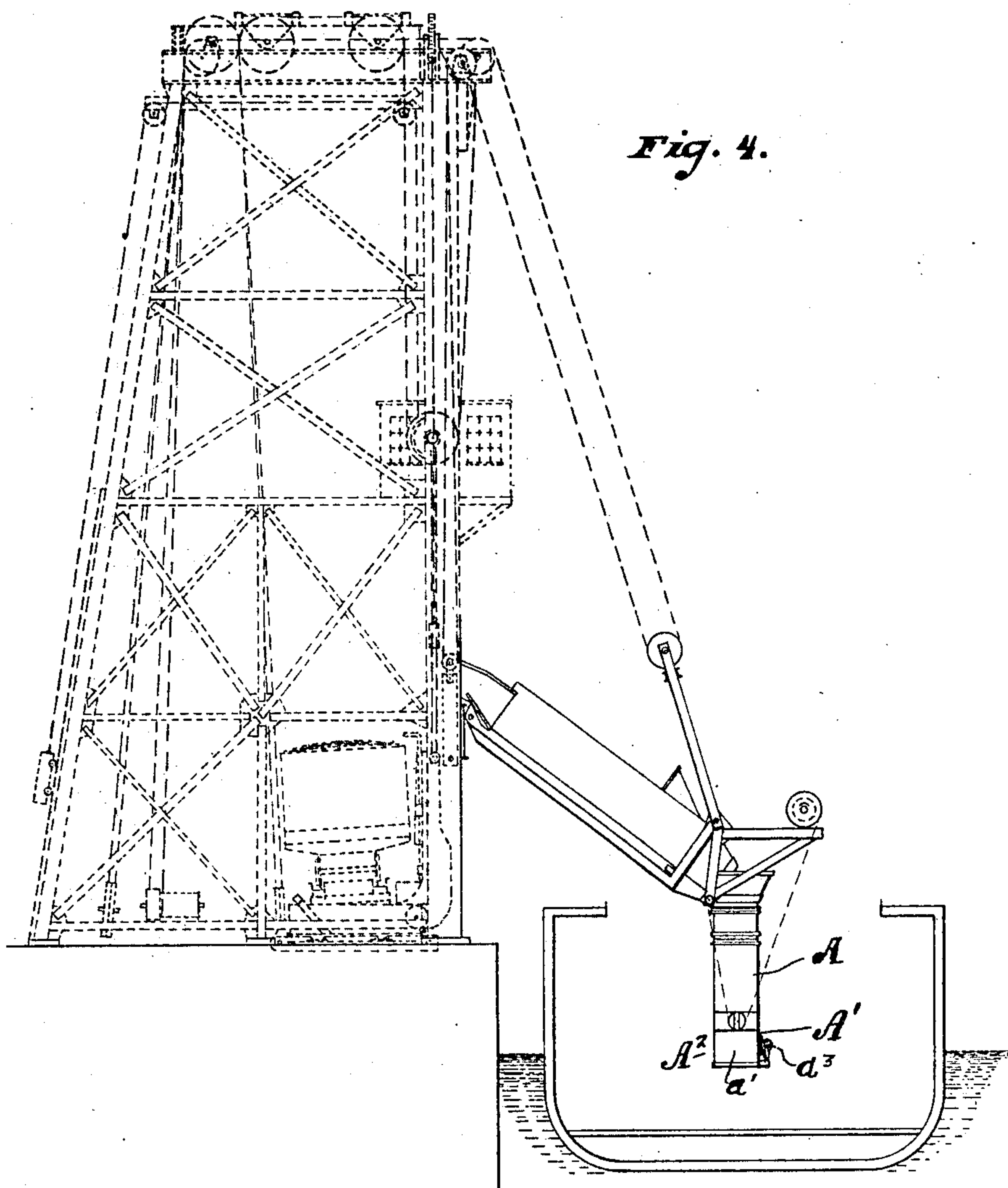
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# UNITED STATES PATENT OFFICE.

THOMAS IRWIN, OF CLEVELAND, OHIO.

## LOAD-TRIMMER.

No. 849,478.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed July 21, 1906. Serial No. 327,123.

*To all whom it may concern:*

Be it known that I, THOMAS IRWIN, a citizen of the United States, a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Load-Trimmers, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to improvements in loading devices, and particularly in devices of the kind that have come into general use in loading coal onto vessels in the ports of the Great Lakes, between which enormous quantities of coal have to be annually transported in a shipping season more or less curtailed by severe and tempestuous winters. In their later and perfected form such loading devices are adapted to bodily elevate a railway-car to a considerable height above the level of the dock adjacent to which the vessel is moored and then tilt such car so as to cause it to discharge its contents into an inclined pan or apron, the lower end of which usually terminates in a straight chute of telescopic construction, whereby the coal or other material is conducted into the hatchway of the vessel. In order to distribute the material in such hatchway from one side to the other of the vessel's hold, the chute just referred to is made oscillatory in a vertical plane at right angles to the axis of the vessel, and in order to fill the space lying beneath the portions of the deck intermediate of the several hatchways, as also the extreme ends of the vessel's hold, such chute is preferably provided with a trimmer for laterally deflecting the descending stream of coal whenever desired. Otherwise the vessel's hold will only be partially filled or else a large amount of manual labor is required to shovel the material over. Such trimmers for mechanically effecting an even distribution of the material beneath the deck have taken various forms, one of which is shown in my pending application, Serial No. 314,914, which was filed May 3, 1906. This my present invention is a modification of the structure therein set forth and is designed to present several advantageous features in addition to those possessed by such trimmer. Said invention then consists of means hereinafter fully described, and specifically set forth in the claims.

The annexed drawings and the following

description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure 1 represents in side elevation the discharge end of a chute such as has been above described with my invention attached, a portion of such chute being broken away on a plane indicated by the line 1 1, Fig. 2, in order to better disclose the trimmer structure. Fig. 2 represents a plan view of the same, the chute being again partly broken away for the same purpose. Fig. 3 is an end elevation of such chute with trimmer in place, while in Fig. 4 is shown in dotted outline an unloading-tower of the kind in connection with which the discharge-chute above described and my invention are adapted to be employed, such tower forming no part whatever of such invention.

The chute A (illustrated in the above-described figures) is made up of steel plates solidly riveted together to form the usual rectangular structure, the length of which depends upon the particular situation for which the loader has been designed. Ordinarily a platform is provided just above the point of the inclined pan, on which an operator may be stationed and where a steam-engine or other motor is provided, together with suitable connections for swinging the chute and raising and lowering the same in the manner previously set forth.

The modification of the usual chute structure required to adapt it for the reception of my trimmer mechanism is but slight. For such purpose opposite sides of the chute—those at right angles to the vertical plane in which the latter swings—are prolonged for equal distances beyond the discharge end of the chute proper, such prolonged portions being designated by A' A'. The extended portion of the chute thus provided is obviously open on three sides. In each of the lower corners thereof, so as to be in substantial alinement with the sides of the chute that are parallel with the plane in which the latter swings, is a shaft *a*, upon which is fixedly mounted a gate or valve *a'*. Each of such gates is preferably made of a steel plate doubled upon itself about the corresponding shaft *a*, to which it is securely riveted or bolted. (See Fig. 2.) The width of the gates is such as to permit them to swing



freely between the extended wall portions A' A<sup>2</sup>. Their length is such as to cause them when in their normal position—that is, parallel with the side walls of the chute—to entirely close the sides of the space included between extended wall portions A' A<sup>2</sup>. This is the position in which the gate to the right as viewed in Fig. 3 is shown in each of the figures. In other words, when both gates are thus positioned the chute as a whole is, in effect, prolonged by a distance equal to the length of such extended wall portions. By turning the respective shafts *a* inwardly the gates *a'* may obviously be alternately swung diagonally across the discharge end of the chute, at the same time leaving the corresponding side of the extended portion of the chute open. This is the position in which the gate to the left as viewed in Fig. 3 is shown in that figure and in Fig. 2. Such gate does not appear at all in Fig. 1, being broken away. Since it is obviously immaterial how far above the discharge end proper of the chute the gates *a'* extend, their length is gaged to cause them to incline at the proper angle when diagonally disposed to best facilitate the discharge of the coal without either unduly contracting the cross-sectional area of the opening through which such discharge must take place or, on the other hand, presenting a face against which the coal can lodge.

In order to still further eliminate danger of clogging, due to lumps of coal catching against the inner ends of the gates when longitudinally disposed, the inner edges of such ends are beveled, as clearly appears at *a*<sup>2</sup> in Figs. 1 and 2. Inasmuch as such inner edges become outer edges when the gates occupy their second diagonally-disposed positions, it seen that this same bevel permits a gate to lie closely against the opposite side of the chute as well.

Rotation of shafts *a* to angularly position gates *a'* may be most simply effected by mounting upon the upper end of each shaft an arm that can be manually operated to swing the gate to occupy the desired position, suitable means, as a pin adapted to engage apertures provided therefor in wall portion A', being supplied to secure the gate in place once it is thus positioned. It is preferable, however, to arrange for the operation of the gates from the same station or platform as that from which the oscillation and telescoping of the chute itself is controlled. To this end I have devised the means appearing in the several figures of the drawings. Such means comprise two short screw-threaded shafts *a*<sup>3</sup> *a*<sup>3</sup>, mounted end to end in suitable bearings *a*<sup>4</sup> therefor, provided upon the top of the chute, or rather the prolongation thereof formed by plate A'. Independent rotation of shafts *a*<sup>3</sup> is effected by means of cables *a*<sup>5</sup>, that pass around pulleys or "nigger-

heads" *a*<sup>6</sup>, respectively rotatively mounted upon each of the shafts near the outer end of the same. These cables may be driven by either hand or motor operated drums at the operating-station, to which reference has just been made. Threaded upon each of shafts *a*<sup>3</sup> is a nut *a*<sup>7</sup>, provided with a lateral projection or arm *a*<sup>8</sup>, that is connected, by means of an intermediate link *a*<sup>9</sup>, with a lever-arm *a*<sup>10</sup>, mounted upon the upper projecting end of the corresponding shaft. Rotation of either of shafts *a*<sup>3</sup> produced in the manner explained will accordingly effect a movement of a nut *a*<sup>7</sup> therealong and a resultant swinging of the corresponding gate.

The operation of my load-trimming device as a whole is as follows: Since the major portion of the quota of coal or other material to be loaded through any particular hatchway is discharged directly through the chute, both plates *a'* will normally be longitudinally disposed. As has been stated, when the gates are in this position the trimmer becomes simply a prolongation of the chute, and by virtue of the beveled inner ends of such gates not even the slightest impediment is offered to the free discharge of the coal. Not only are vexatious delays occasioned by clogging of the chute thus avoided, but, what is of equal importance, especially in handling lump-coal, the coal is not damaged by being broken, with consequent production of slack, that requires to be later screened out and sold at a much lower price. When it does become necessary to divert the stream of coal to one side or the other of the hatchway, one or the other of doors *a'* is swung diagonally across the discharge-opening of the chute, whereby the direct discharge of the coal is prevented and its lateral discharge effected instead. When it becomes necessary to divert the coal to the other side, the gate first swung, as described, is returned to its normal position and the other one thereupon disposed diagonally. The force of the coal as it descends the length of the chute is more than sufficient to carry the material to the extreme sides of the hatchway. Hence not only is the necessity of manually trimming the load obviated, with the large measure of economy thereby effected, but no expenditure of power to operate cumbersome conveying or distributing mechanism is required to detract from this result. The power required to occasionally swing the doors is so inconsiderable as to be quite negligible.

It should be stated in conclusion that while my invention has been here described as applied to a particular situation I am well aware that a number of analogous applications thereof to devices for handling materials other than coal and loading the same on carriers other than vessels might be suggested. It is generally adaptable, in



other words, to trimming loads on railway-cars, as well as on boats, and may be used in distributing material in bins just as effectively.

5 Having thus described my invention in detail, that which I particularly point out and distinctly claim is—

1. In a load-trimmer, the combination with a chute having two opposite wall portions extended beyond its discharge end, of a gate adapted in one position to laterally inclose the space between such extended wall portions and in another position to lie diagonally in front of such discharge end.

15 2. In a load-trimmer, the combination with a chute having two opposite wall portions extended beyond its discharge end, of two gates respectively adapted in one position to close the corresponding side of the space between such extended wall portions and in another position to lie diagonally in front of such discharge end.

3. In a load-trimmer, the combination with a chute having its top and bottom walls extended beyond its discharge end, of a gate pivotally mounted between the extended portions of said walls and adapted in one position to laterally inclose the space between such extended wall portions and in another position to lie diagonally in front of such discharge end.

4. In a load-trimmer, the combination with a chute having its top and bottom walls extended beyond its discharge end, of two gates pivotally mounted between such extended wall portions and respectively adapted in one position to close the corresponding side of the space between such extended wall portions and in another position to lie diagonally in front of such discharge end.

5. In a load-trimmer, the combination with a chute oscillatory in a vertical plane and having its walls on the sides transversely disposed with respect to such plane extended beyond its discharge end, of a gate adapted in one position to laterally inclose the space between such extended wall portions and in another position to lie diagonally in front of such discharge end.

50 6. In a load-trimmer, the combination with a chute oscillatory in a vertical plane and having its walls on the sides transversely disposed with respect to such plane extended beyond its discharge end, of two gates pivotally mounted between such extended wall portions and respectively adapted in one position to close the corresponding side of the space between such extended wall portions and in another position to lie diagonally in front of such discharge end.

7. In a load-trimmer, the combination with a chute of substantially rectangular cross-section having two opposite wall por-

tions extended beyond its discharge end, of two gates pivotally mounted between such extended wall portions, the axes of said gates being located in the respective lower corners of the extended portion of said chute. 65

8. In a load-trimmer, the combination with a chute of substantially rectangular cross-section having its top and bottom walls extended beyond its discharge end, of two gates pivotally mounted between such extended wall portions, the axes of said gates being located in the respective lower corners of the extended portion of such chute. 75

9. In a load-trimmer, the combination with a chute of substantially rectangular cross-section, such chute being oscillatory in a vertical plane and having its walls on the sides transversely disposed with respect to such plane extended beyond its discharge end, of two gates pivotally mounted between such extended wall portions, the axes of said gates being located in the respective lower corners of the extended portion of such chute. 85

10. In a load-trimmer, the combination of a chute having two opposite wall portions extended beyond its discharge end, of two gates pivotally mounted between such extended wall portions, the axes of said gates being located in the respective lower corners of the extended portion of said chute, and means for independently angularly positioning said gates upon such axes. 95

11. In a load-trimmer, the combination of a chute having its top and bottom walls extended beyond its discharge end, two gates pivotally mounted between such extended wall portions, the axes of said gates being located in the respective lower corners of the extended portion of said chute, and means for independently angularly positioning said gates upon said axes. 105

12. In a load-trimmer, the combination of a chute of substantially rectangular cross-section having its top and bottom walls extended beyond its discharge end, two gates pivotally mounted between such extended wall portions, the axes of said gates being located in the respective lower corners of the extended portion of said chute, and means for independently angularly positioning each of said gates, such means comprising a screw rotatably mounted upon said chute, means for rotating said screw, a nut threaded upon the same, an arm rigidly connected with the corresponding gate, and a link connecting said arm with said nut. 115

Signed by me this 5th day of July, 1906.

THOMAS IRWIN.

Attest:

D. T. DAVIES,  
JNO. F. OBERLIN.