

C. W. MILLS.
Grain-Elevator.

No. 166,023.

Patented July 27, 1875.

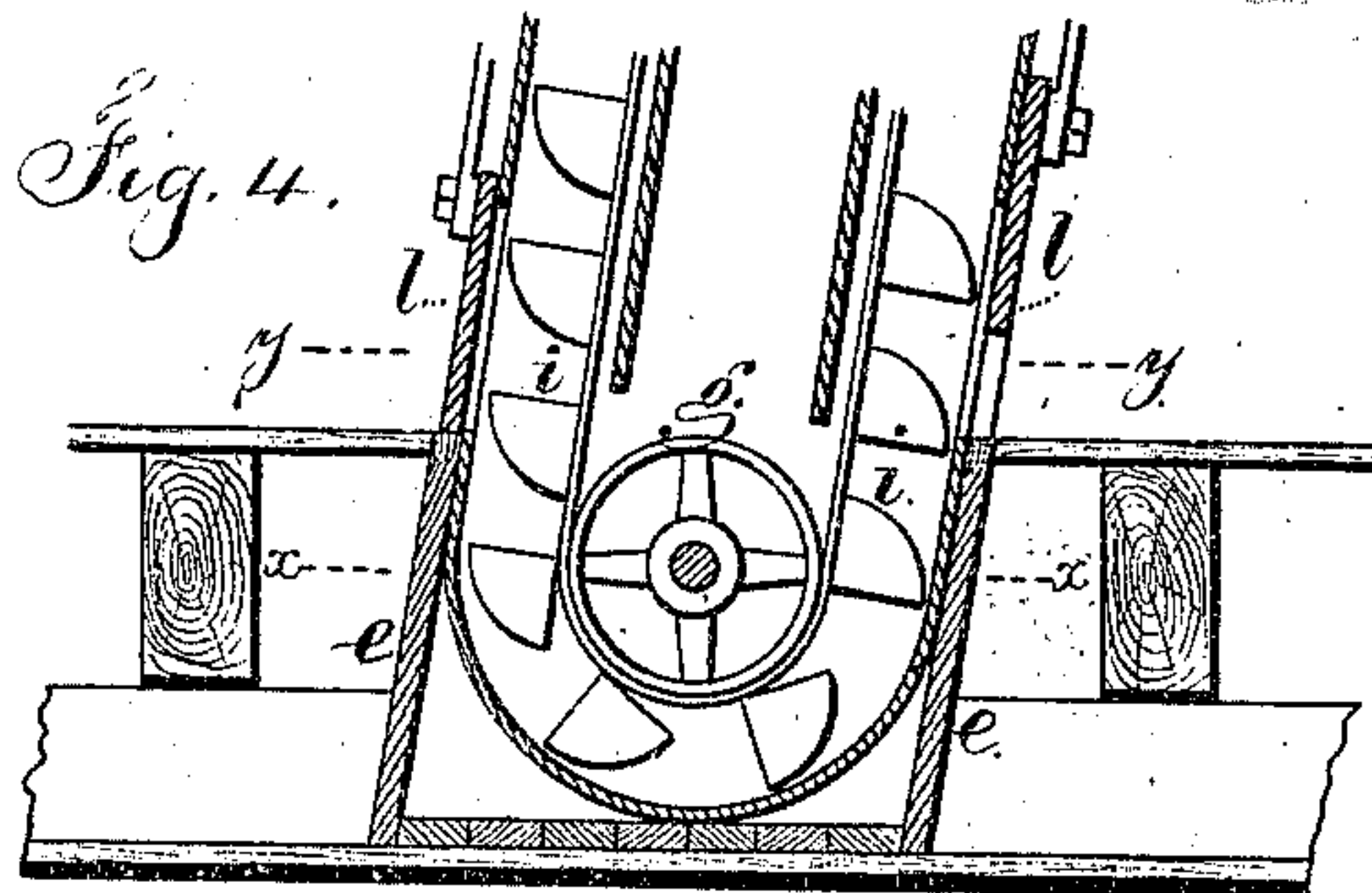
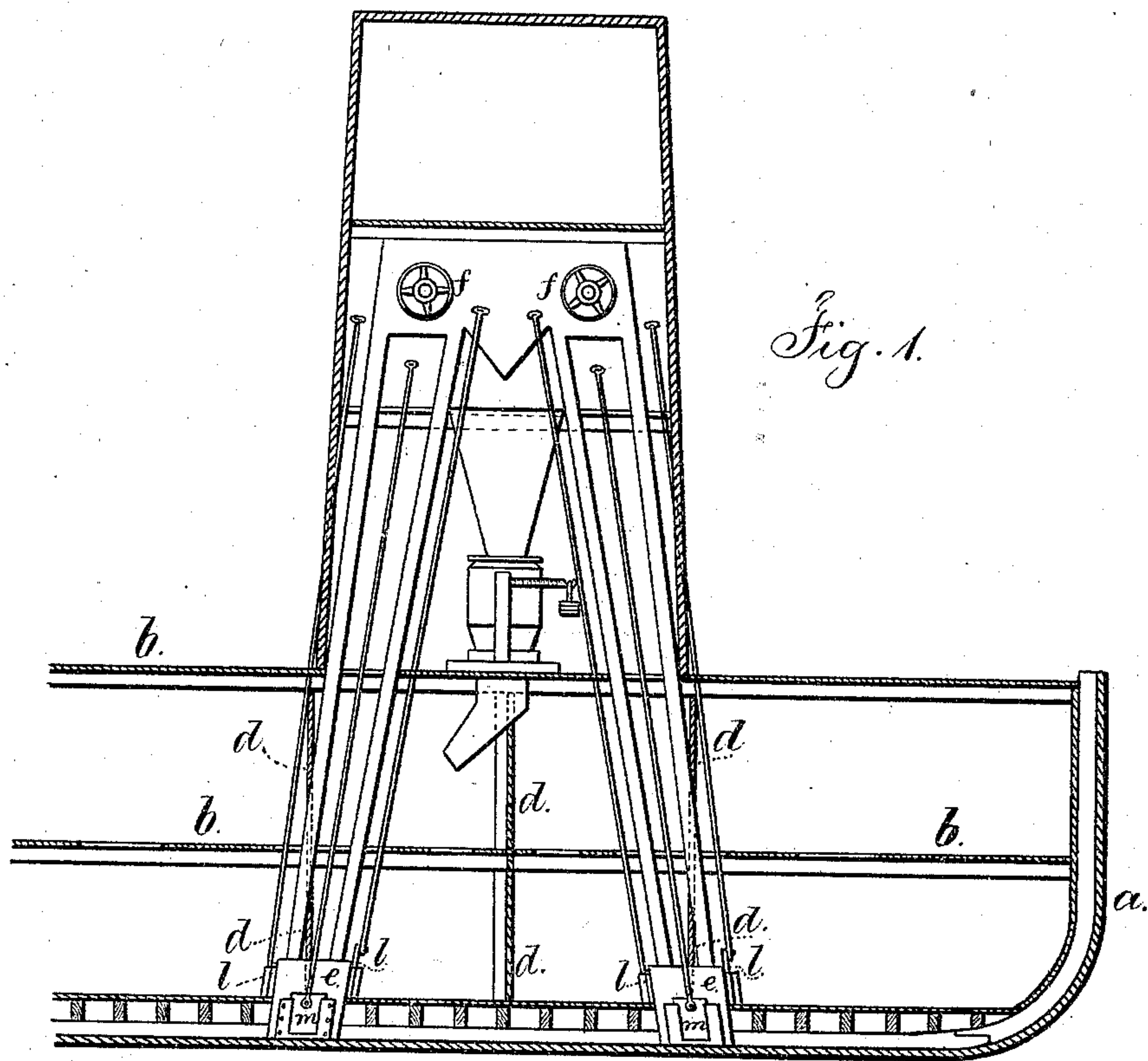
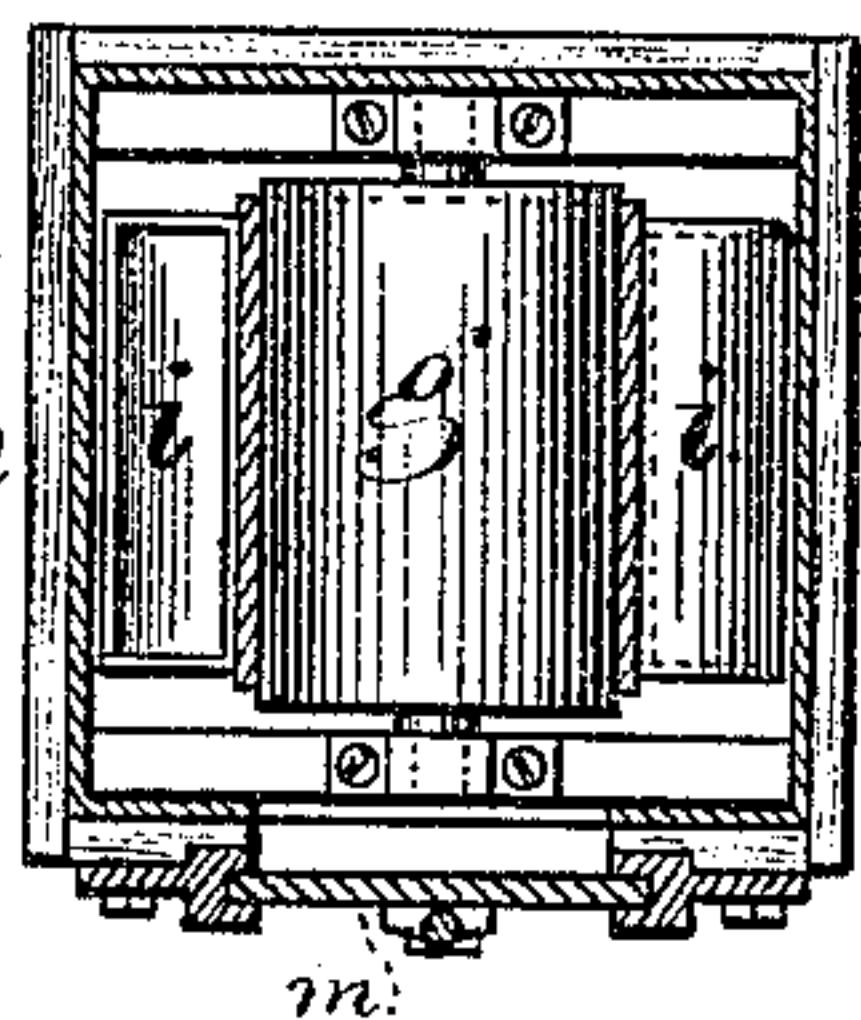
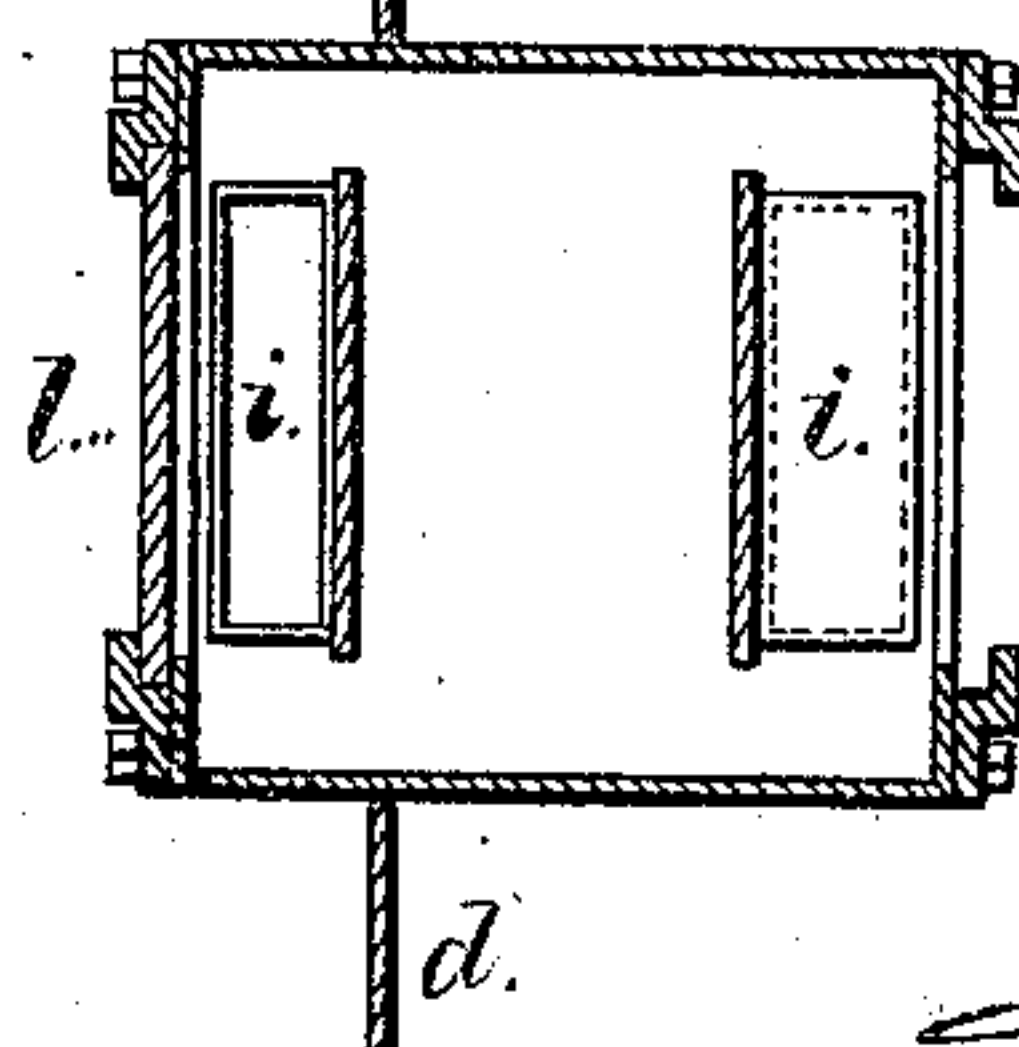


Fig. 2.



Witnesses,
Chas. Smith
H. C. Smith

Fig. 3.



Inventor

Clark W. Mills

per L. H. Ferrell

att'y

UNITED STATES PATENT OFFICE.

CLARK W. MILLS, OF MONT CLAIR, NEW JERSEY.

IMPROVEMENT IN GRAIN-ELEVATORS.

Specification forming part of Letters Patent No. 166,023, dated July 27, 1875; application filed January 19, 1875.

To all whom it may concern:

Be it known that I, CLARK W. MILLS, of Mont Clair, in the county of Essex and State of New Jersey, have invented an Improvement in Grain-Elevating Apparatus fitted permanently into vessels, for rendering them self-discharging; and the following is declared to be a correct description of the same.

Grain-elevators have been placed upon barges or boats so as to be employed in removing grain from canal-boats and transferring the same to steamships and vessels. This process of loading can be carried on very rapidly, but in unloading ships and steam-vessels great difficulty is experienced because the portable grain-elevator is not adapted to being placed into the vessel through the hatchways, and, in cases where this has been attempted, considerable grain remains at the bottoms of the bins that cannot be reached or elevated except by hand-labor.

My invention is made for facilitating the removal of grain and similar material, in bulk, from the bins in vessels containing the same, and, also, providing for removing water in case of leakage or accident to the vessel, or for preventing too great accumulation of water, if water is admitted to extinguish fire.

A water-tight well is made in the vessel; it passes through the bins, or at the division between or junction of two or more bins, and it passes below the bottoms of the bins so as to receive the lower pulley of the chain or belt-elevator, and the upper portion of this well rises above the bins in the form of two trunks for the endless belt or chain of buckets, and these trunks pass to the upper pulley and delivery-spout. The well is provided with openings and slides, preferably water-tight, like a stop-cock, and there is one of these slides to each bin, so that the grain can be admitted from either one bin or the other, and there is a third opening and slide below the floors of the bins, and these slides are actuated by rods passing up to the deck. By this construction the grain can be removed from one or more bins, and it will run into the well freely, and either the bottoms of the bins may be inclined or a man be employed in the bin to push the grain toward the opening, so as to discharge the entire contents of the bins.

In cases where the vessel springs a leak, or becomes injured, the slides to the grain-bins, remaining tight, exclude water, but the lower slide being drawn, the water will pass freely from below the grain-bins into the well from which it is raised by the elevator-chain or belt, and is discharged with great rapidity, so that this apparatus, fitted upon vessels, becomes a great protection in case of accident, as well as a means for rapidly discharging cargo.

In the drawing, Figure 1 is an elevation of the apparatus as fitted into a vessel, a portion of said vessel only being shown. Fig. 2 is a sectional plan at the line $x x'$, and Fig. 3 is a similar view at the line $y y$. Fig. 4 is a sectional elevation of the said improvement in elevators; Figs. 2, 3, and 4 are shown in larger size than Fig. 1.

My elevating apparatus may be fitted into any vessel. A portion of the hull is shown at a , and portions of the decks at b .

The decks may form the bottoms of the grain-bins, or special floors may be constructed. $d d$ are the divisions that separate the vessel into compartments or bins.

The well e is preferably made of planking laid together so as to be water-tight; it may extend all the way down, from the upper deck to the bottom of the vessel, and into this well the elevating apparatus is placed. It is generally best to make this well complete, as aforesaid, so that access will be given from above to all parts of the elevating-apparatus, but separate trunks for the elevator-chains might be used.

The endless chain or belt i , provided with buckets, passes over the drum or pulley at f and is guided at the bottom by the pulley g , and the power employed to drive the chain of buckets is connected with the drum at f and may be of any suitable character. The drum f is to be at such a height that the grain will be discharged by a spout or trough over the side of the vessel into the receptacle provided therefor.

The divisions d will usually extend from the elevator-well or trunks so that the elevator is between two bins, or it may be at the angle between four bins, and there are openings into the well, one for each bin, and to each opening there is a sliding gate, l , that

is preferably made water-tight and fitted with a rod extending up to the deck, so that grain can be admitted from either bin into the well and discharged.

The opening into the well is to be at the level of the floor, so that most of the contents of the bin will run by gravity, and the floor may be inclined to aid this operation, but where the floor of the bin is level, the grain that will not run into the elevator is to be pushed or drawn to the opening by hand with a suitable scraper.

Where one bin is above another it is preferable to discharge the bottom one first, and then allow the contents of the upper bin to run through a spout to the opening at the lower bin, and, when the grain-bins extend lengthwise of the vessel, two or more short elevators may be used to raise the grain from the end bins and deliver the same to chutes that convey it to the main elevator, by which it is raised sufficiently to discharge it by a spout from the vessel into lighters or into warehouses.

Below the floor of the lowest bin is an opening and slide, or gate *m*, operated by a rod extending above, so that the grain-elevator can be used for removing water in case of

leakage or accident, and the well and gates being made water-tight the grain will be protected from the water that is carried up by the elevator.

This improvement is to be distinguished from elevators that are movable and changed from place to place in removing grain from bins or canal-boats carrying such grain in bulk; and it will be apparent that my improved elevators, fitted permanently into steam-vessels and provided with separate engines, are always in position to be run, even by the steam that may remain in the boilers after the vessel reaches port.

I claim as my invention—

The water-tight well fitted into a vessel and extending below the floor of the grain-bins, in combination with the elevating-buckets and two slides, one to admit grain from the bin and the other to admit water below the bin, substantially as set forth.

Signed by me this 15th day of January, A. D. 1875.

CLARK W. MILLS.

Witnesses:

CHAS. H. SMITH,
HAROLD SERRELL.