J. A. WOODWARD.

GRAIN-ELEVATOR.

No. 192,611. Patented July 3, 1877.

Fig. 1.

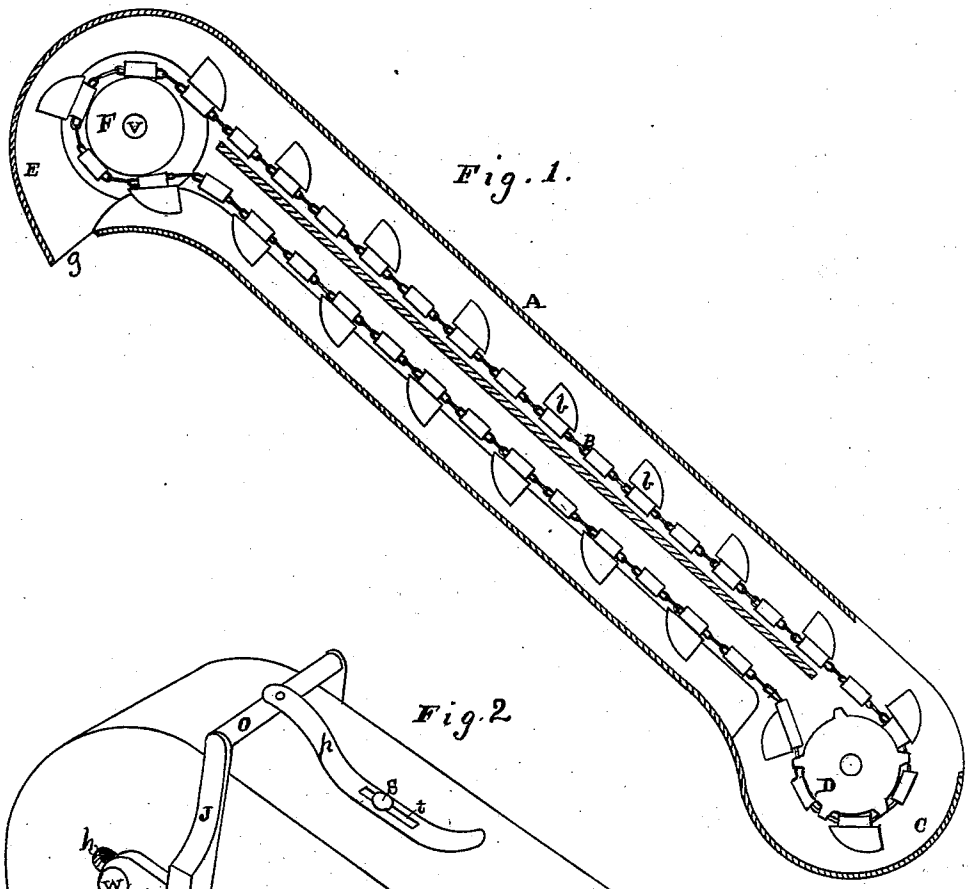
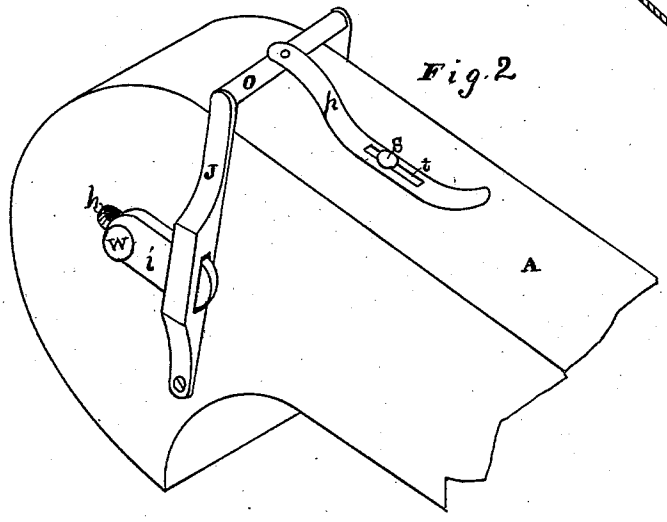
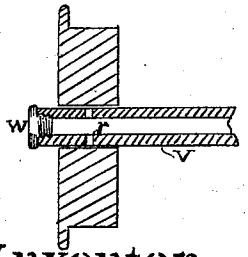



Fig. 2.




Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN A. WOODWARD, OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN GRAIN-ELEVATORS.

Specification forming part of Letters Patent No. 192,611, dated July 3, 1877; application filed May 8, 1877.

*To all whom it may concern:*

Be it known that I, JOHN A. WOODWARD, of the city and county of San Francisco and State of California, have invented an Improved Portable Grain-Elevator; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

The object of my invention is to provide a simple, compact, and portable endless-chain elevator for elevating and storing grain, and for transferring grain and like substances from one means of transportation to another.

My endless-chain elevator is mounted so that it will travel in both directions inside of a single trunk, and the ends of this trunk are so constructed that the buckets on the endless chain will automatically fill and discharge themselves as they pass over the end pulleys, all as hereinafter more fully described, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal section of my elevator. Fig. 2 shows the upper part of the case.

Let A represent the body or main length of the trunk or case, inside of which the endless chain B, with its attached buckets *b b*, traverses. It will be noticed that the ends C E of this trunk or case are made larger than the intermediate portion A, and that one side of the case is straight, while the opposite side is concave. The lower end C is made circular in form, and somewhat larger across than the main length A of the trunk, so that a portion of this circular end projects on one side, so as to form the enlargement above referred to. This projecting circular side is closed tightly, while the opposite or straight side is open almost to the lower end of the case.

The drum D, around which the endless chain passes at the lower end of the case, is mounted in the center of this circular portion. The upper end E of the case is made semicircular in form, as represented, so that a portion of it will project to the same side of the case that the enlargement of the lower end projects, and the upper drum F is mounted at the center of the circle. A discharge-opening, *g*, is made on the under side of the projecting portion of this upper part, through which the buckets discharge their loads.

It will now be evident that the endless chain B will pass in a straight line from the drum D to the drum F on the straight side of the trunk or case; but that the opposite side will be drawn in toward the straight side of the trunk by the conformation of the opposite side.

In operation, the lower end of the trunk is placed where the grain can enter the open or straight side and fill the buckets as they pass around the lower drum D. The buckets are then raised by the straight side of the chain until they pass over the upper drum. As they pass over this upper drum they discharge their loads through the opening *g*, and are immediately drawn inward by the contraction of the trunk, so that they pass down inside of a straight line drawn from the peripheries of the drums C E, thus allowing the bucket behind the one that has just been emptied to discharge its load without interfering with or striking the one in advance of it, while the bottom enlargement gives the buckets a larger sweep around the drum, and causes them to fill more completely.

This arrangement is quite simple and convenient. The entire chain moves in a single leg or trunk, so that the machine is compact and easily handled and moved about.

In order to provide for tightening the chain, when necessary, I make a vertical slot, *h*, in each side of the upper end C of the trunk, so that the ends of the fixed shaft V, on which is the upper drum E, will project through them. Each projecting journal is then fitted in the upper end of a short upright bar, *i*, on each side of the case. The lower end of each bar is then attached to a lever, J, between its fulcrum and handle, which extends out beyond the case on one side, where they are connected by a cross-bar, O. A plate, *p*, has one end attached to this cross-bar, and extends down against the side of the trunk or case, where it is fastened by a screw, S, which passes through a slot, *t*, in the plate, and into the wood of the case, so that the friction of the plate between the screw-head and case will hold the levers and journals at whatever position it is adjusted to.

The shaft V, as above mentioned, is fixed, and the drum E rotates upon it. In order to provide for lubricating the bearings of this

drum without disturbing it, I make the shaft V hollow, and plug each end with a screw, W. I then make a small pin-hole, *r*, in the shaft opposite each bearing, so that by removing one of the screw-plugs W the interior of the shaft can be filled with oil, thus supplying a constant flow of oil to the bearings through the pin-holes.

I thus provide a very convenient apparatus for elevating grain, that can be moved from place to place, and set in operation with little trouble.

Having thus described my invention, what I claim. and desire to secure by Letters Patent, is—

1. The case or trunk A, provided with the enlarged semicircular ends C E, which project upon one side of the trunk, and in which the drums D E are mounted, in combination with the endless-belt elevator B, substantially as and for the purpose described.

2. The connected levers J, pivoted as described, and having the shaft-supporting bars *i* and cross-bar O, in combination with the adjusting-plate *p*, with its slot *t* and screw *s*, substantially as and for the purpose described.

In witness whereof I have hereunto set my hand and seal.

JOHN A. WOODWARD. [L. S.]

Witnesses:

OLWYN T. STACY,

FRANK A. BROOKS.