

H. I. CHASE, P. F. CHASE & E. D. CHASE.

Elevating, Conveying, Storing. and Shipping Grain.

No. 138,994.

Patented May 20, 1873.

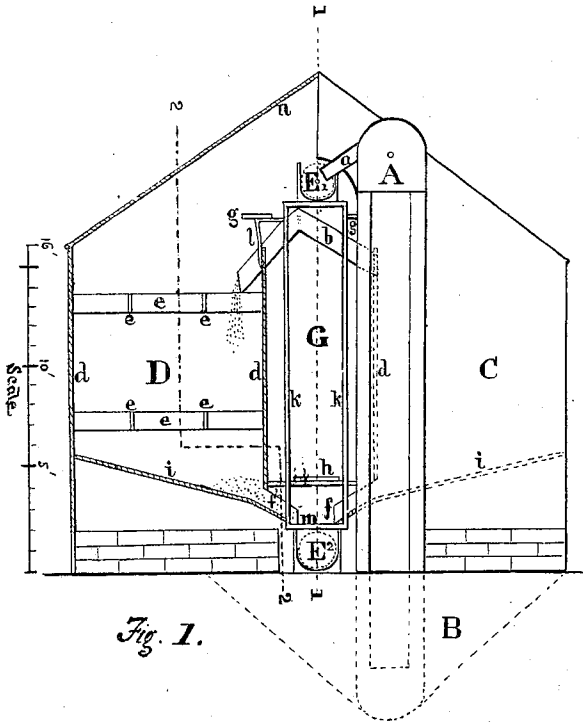


Fig. 1.

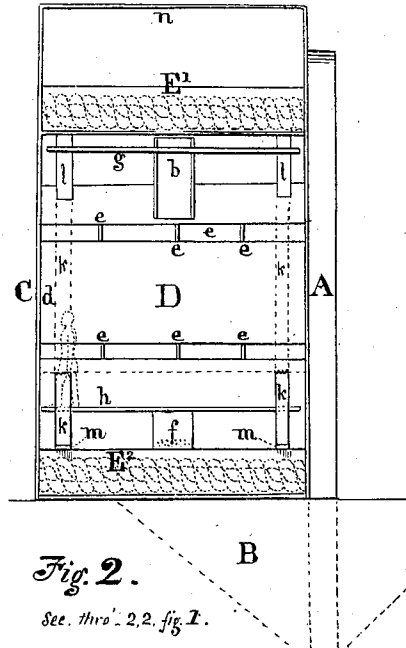


Fig. 2.

Sec. thro' 2, 2, fig. 1.

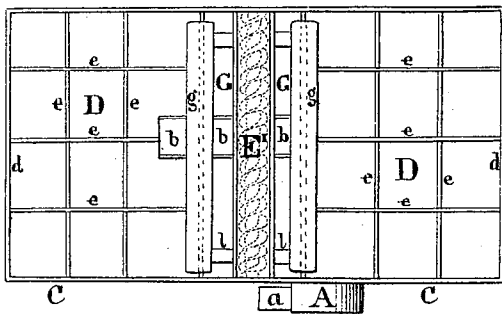
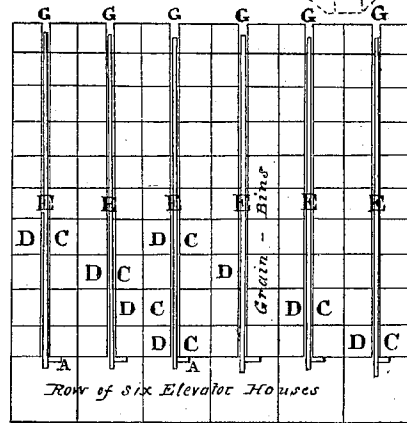


Fig. 3.



Row of six Elevator Houses

R.R. Truck

Fig. 6.

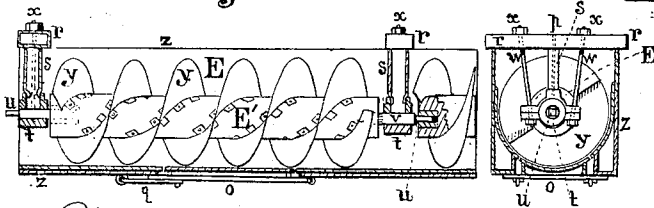


Fig. 4.

Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

HENRY I. CHASE, PHILANDER F. CHASE, AND EDWIN D. CHASE, OF
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IMPROVEMENT IN ELEVATING, CONVEYING, STORING, AND SHIPPING GRAIN.

Specification forming part of Letters Patent No. **138,994**, dated May 20, 1873; application filed
March 5, 1873.

To all whom it may concern:

Be it known that we, HENRY I. CHASE, PHILANDER F. CHASE, and EDWIN D. CHASE, all of the city of Peoria, in the county of Peoria, and in the State of Illinois, have invented an Improved System of Receiving, Conveying, Storing, and Shipping Grain, Corn, &c., and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing, making a part of this specification, in which like letters of reference refer to like parts, and in which—

Figure 1 represents a front elevation of the grain-house, the left half seen in section; Fig. 2, a sectional elevation of same (seen from the left of Fig. 1) along the dotted line 2 2, Fig. 1; Fig. 3, a plan of same; Fig. 4, sectional elevation of conveyer; Fig. 5, end view, showing section of trough, trap-door, &c.

This invention consists, first, in the peculiar arrangement of elevator-houses in connection with proper grain-houses or bins behind them, the latter being about sixteen feet square, and about the same height, arranged in rows running back from the elevator-buildings, and built thus low to obviate the enormous pressure of accumulated grain in houses of many stories, and more freedom from damage by fire; second, in providing an open passage between each double row of grain-bins extending from the ground upward, and in which open passage the conveyers have an independent foundation, and extend from the elevator to the rear of the line of bins to secure said conveyers from derangement from settling any part of the bins; third, in the employment of parallel lines of conveyers for doing the work of the moving of grain, (the elevators being merely used to raise it to the level of the top of the bins.)

The following is the arrangement of elevator-houses and their annexed line of bins, the number of each not being material to the principle. The numbers here used merely indicate proportion between the elevator-buildings and the bins, or store-houses. (See Fig. 6 for a general plan.) Six elevator-buildings built in a line, each forty-five feet high by thirty-six feet square, each having a grain-sink beneath them twelve feet deep, with an

ordinary elevator fifty feet high, operated by an upright shaft and line of shafting in the top and bottom of the houses. These elevator-buildings are shown at Fig. 6 in the drawing, but the elevator proper (A) is shown attached to the outside of one of the bins and rising from a grain-sink, merely to illustrate the connection of the bins, &c., with the same. There are no grain-sinks under the bins. Each elevator-house has a grain-house, or long line of bins, C D, attached to it, consisting of two rows of bins, D D, &c., extending back at a right angle, with an open passage, G, between each double row of bins, in which passage the upper and lower line of conveyers are built, so as to secure for them an independent foundation, as before mentioned. The lower elevator E² is built upon the ground, and the upper conveyer E¹ is supported from the ground or from the lower conveyer by posts k k. A building for grain, &c., on this plan, covering one acre, consists of six double-line bins C D, (sixteen by sixteen feet square,) one hundred and fifty feet in length, holds about forty thousand bushels in secure storage, at a cost of about three cents per bushel; whereas on the old plan of high elevators the storage would cost from thirty to thirty-five cents per bushel. The bins D D, &c., are each sixteen feet square, built of studding, two by eight inches, and fourteen inches apart, covered with one-inch boards, the floor sloping toward the conveyer E². The bins are tied by stock-boards e e e, &c., nailed to the studding, one set horizontally across each way, at the top of each bin, and another set in a similar manner is placed in the middle of each bin; spouts f f discharge grain from the sloping floors of the latter into the conveyer E². The upper conveyer E¹ also discharges by spouts laterally into the bins on either side. A platform, g g, from which to superintend this conveyer is supported partly by the posts k k, and partly by the side of the bins. A similar platform, h, is placed over the lower conveyer. Each conveyer consists of a continuous line of screws, made in sections, united by gudgeons. Each section is a continuous spiral iron screw or flight, Y, eighteen inches in diameter, winding along a

central shaft, E^1 , eight inches in diameter and twelve or more feet in length, coupled to each adjoining section by the usual gudgeons u , &c., supported in journal-boxes $t t$ dependent from iron rods or braces ww , hanging from cross-pieces $r r$, &c., across the top of the trough Z . The gudgeons are stayed by a wooden key, $s s$, secured to the cross-piece r , and passes into the oil-box t on the journal of the gudgeon u . A hole, p , for oil runs down the center of said key s into the oil-box. The conveyer or screw rotates in an iron or metal lined trough, Z , and discharges grain, &c., through a hinged door, o , likewise of iron, or metal-faced, in the bottom, into a spout, b , which can be thrown or adjusted so as to spout the grain into either lateral bin on each side of the passage G or conveyer line. The braces ww are fitted above the cross-piece $r r$, with nuts $x x$, or other adjustments, to level the screw or conveyer within its trough. The flights y are attached to the central axle E^1 by means of lugs or ears projecting from either side of that part of the flight next to the axle, making the flight act as a continuous band or ligature to prevent the splitting of the axle when the latter may be endangered by heavy work.

The operation of this system of hauling and storing grain, &c., is as follows: When corn or grain is to be stored, it is shoveled into a hoppers sink, B , under the elevator, from whence it is raised by elevating to the top of the house, where it is spouted into a weigh-hopper, and thence into the conveyer E^1 , and carried along the Archimedean screw at the rate of fifty or more bushels per minute, whence it passes through the traps in the trough of conveyer into the lateral bins $D D$, &c. In shipping produce, it passes from each bin, by spout f , into the lower conveyer E^2 , and is brought back to the elevator, which discharges it into the weigh-hoppers, and is spouted thence into the cars on the adjoining track.

When the operator desires to change from oats to corn or other grain, he first inserts a bunch of broom-corn into the trough of conveyer, holding the projecting portion of the broom while the screw carries it along, and sweeping itself clean to a single grain.

The advantages of this system are, first, that it is unnecessary to elevate grain any higher than from forty to forty-five feet, and will not strain the buildings when stored in bins but sixteen feet high, and is vastly more secure from damage by fire. Such storage is obtained at one-fifth of the ordinary cost, as the plan above described holds four hundred

thousand bushels and covers one acre, at a cost of twenty thousand dollars, while an ordinary elevator building holding the same amount costs one hundred thousand dollars; second, that a polished conveyer trough and continuous conveyer flights moves grain in a horizontal line with half the power required to lift its dead weight an equal distance. To convey grain on this system at the rate of fifty bushels per minute two pounds of steam is fully sufficient, whereas to elevate the same quantity requires fifty pounds of steam; third, the bins, built sixteen feet only in height, hold grain at a much less risk of damage by fire, by reason of the small amount of material used in their construction, so much so that grain will not be very materially damaged by a fire, but in such case can be all saved in a slightly damaged condition.

What we claim as our invention is—

1. The system described of receiving, conveying, storing, and shipping grain, &c., in rows of bins, $C D$, of one story in height, arranged on either side of an upper and lower line of conveyers, $E^1 E^2$, one line for receiving and distributing grain, the other for discharging the same, whereby danger and damage from fire is greatly lessened, and storage greatly reduced in cost, all substantially as described.

2. The system described of a combination of elevator-houses, $G G$, &c., in one line, of not more than two stories in height, from each of which runs back, at a right angle, a double line of store-bins, having an upper and lower line of conveyers, $E^1 E^2$, built on independent foundations, substantially as described.

3. The construction and arrangement of the bins $C D$, &c., walls $d d$, stays $e e e$, &c., floor i , spouts $f f$, &c., passages $g g$, &c., conveyers $E^1 E^2$, posts $k k$, spout b , platforms $g h$, and elevator A .

4. The construction and arrangement of the metal or metal-lined conveyer-trough Z , cross-pieces $r r$, keys $s s$, rods ww , journal-boxes $t t$, trap-doors o , continuous flight $y y$, so attached to the axle or shaft as to form a continuous band to prevent the splitting of the axle when heavily worked.

In testimony that we claim the foregoing system of receiving, conveying, storing, and shipping grain, corn, &c., we have hereunto set our hands this 26th day of February, A. D. 1873.

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Witnesses:

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