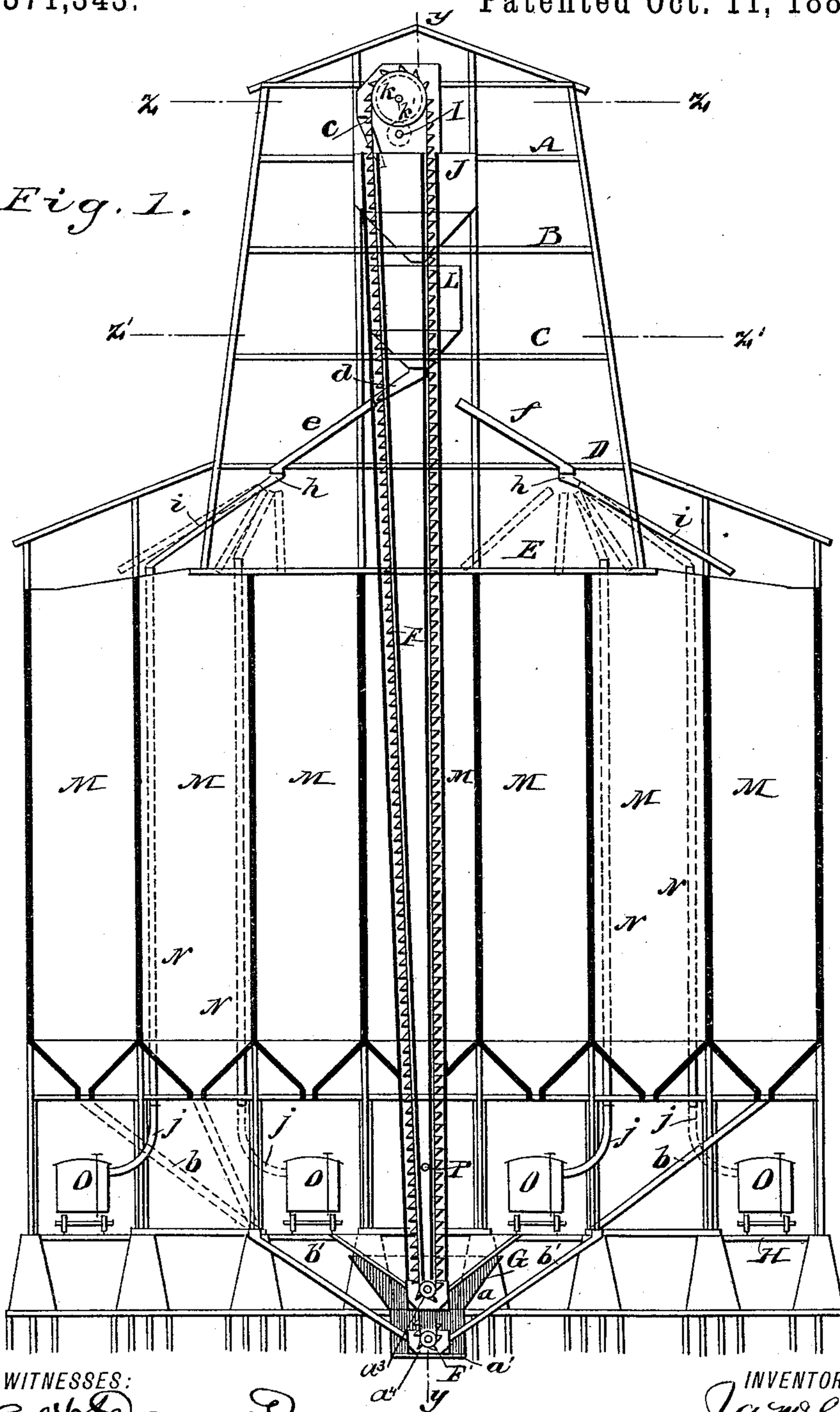
(No Model.) 3 Sheets—Sheet 1.

J. A. McLENNAN.

GRAIN ELEVATOR.

No. 371,343. Patented Oct. 11, 1887.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

J. A. McLENNAN.

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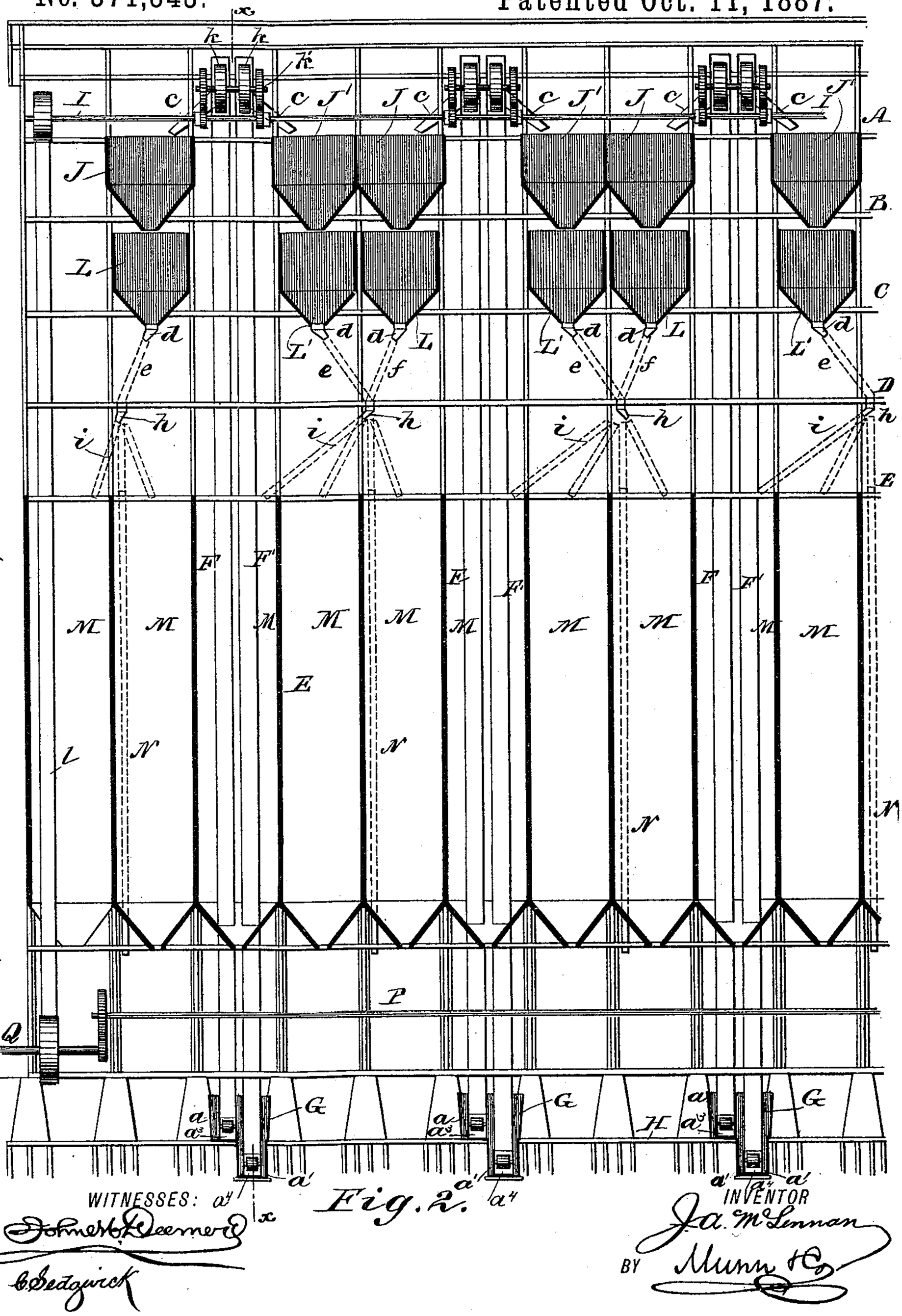

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

J. A. McLENNAN.

GRAIN ELEVATOR.

No. 371,343. Patented Oct. 11, 1887.

Fig. 3.

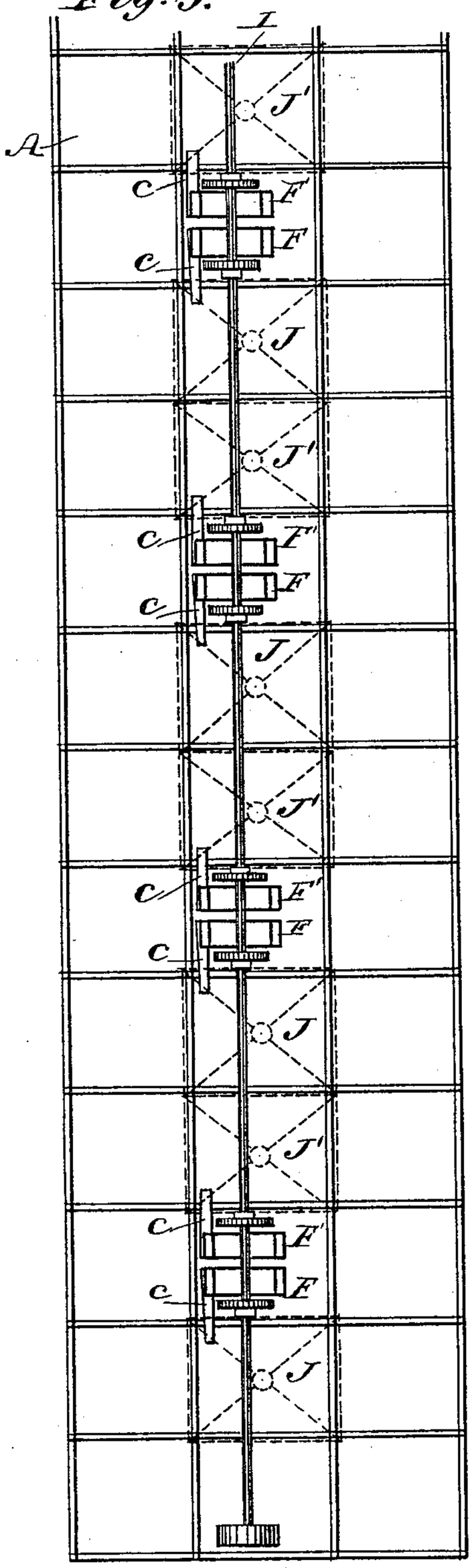
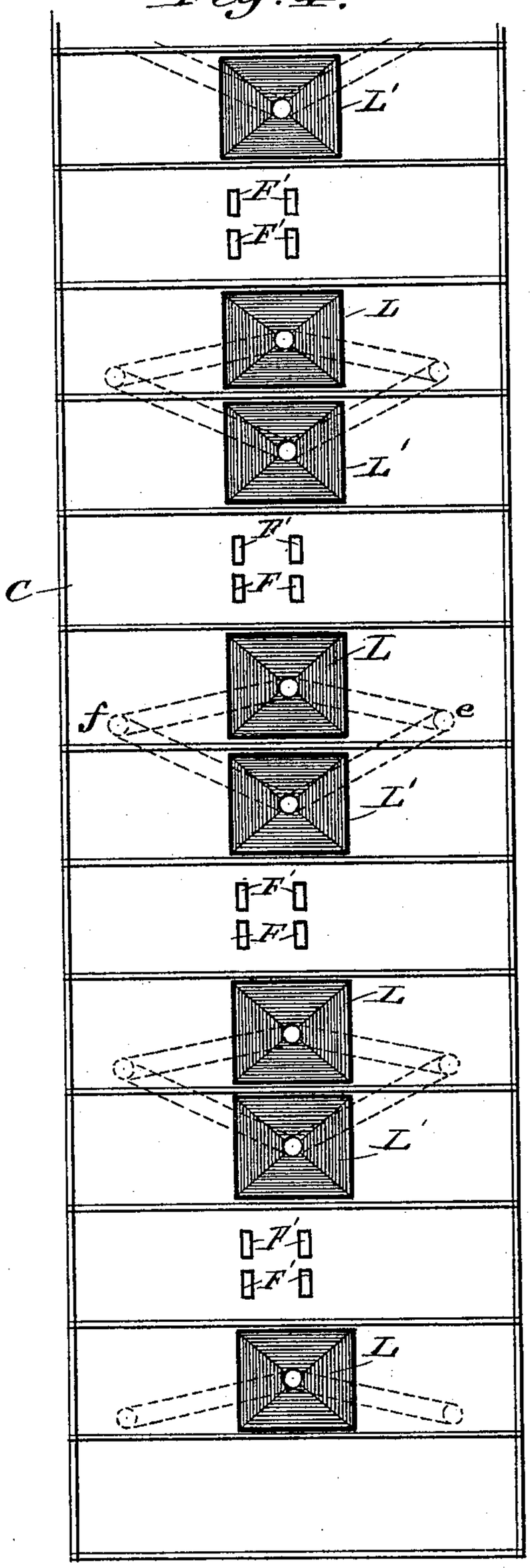


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN A. McLENNAN, OF CHICAGO, ILLINOIS.

GRAIN-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 371,343, dated October 11, 1887.

Application filed September 27, 1886. Serial No. 214,628. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. McLENNAN, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Grain-Elevator, of which the following is a full, clear, and exact description.

My invention relates to certain improvements in the construction and general arrangement of store-houses or elevators for storing, cleaning, or transferring grain and other agricultural products.

Heretofore it has been the practice in constructing large elevator-buildings to place all the receiving-elevators in line, leaving a distance between each elevator nearly the length of a railway-car, and to locate the shipping or transferring elevators in one or more lines parallel to the line of receiving-elevators, but in different tiers of bents of the building. This arrangement necessitates separate lines of shafting on machinery-floor for running the different sets of elevators, causes complications in spouting, and necessitates the employment of different gangs of men if shipping and transferring are done at the same time, and causes much delay and loss of time in the general management of the elevators.

The object of my invention is to overcome these difficulties, to reduce the cost of erecting and equipping such establishments, and to so arrange the elevators that the work of the house may be systematized and facilitated, thus reducing the running expenses.

The invention consists, principally, in locating both the shipping and receiving elevators alternately, with the garners or scales all in one line of bents throughout the building, so that both sets of elevators may be operated from a single line of shafting.

The invention also consists in locating the elevating apparatus in pairs or sets of two lengthwise throughout the building, and in locating the receiving-elevators immediately adjoining and co-operating with the shipping-elevators.

The invention also consists in carrying the lower end of the transfer or shipping elevators to a lower level than the receiving-elevators, and in arranging the receiving boots or hoppers below the railway-tracks at the ground-floor or basement of the house.

The invention finally consists of the construction, arrangement, and combination of parts, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a transverse sectional elevation of the elevator-building, taken on the line *x x* of Fig. 2. Fig. 2 is central longitudinal sectional elevation on the line *y y* of Fig. 1. Fig. 3 is a sectional plan view on line *z z*, Fig. 1, and Fig. 4 is a similar view taken on the line *z' z'* of Fig. 1.

The building has, as shown in the drawings, the outlines of a modern grain-elevator, with a cupola running longitudinally with the body of the building. The cupola is divided into four floors, viz., machinery-floor A, garner-floor B, scale-floor C, and spouting-floor D, which latter is located immediately above the bin-floor E, in the body of the building.

Near the longitudinal center line of the structure are located a series of endless elevators of common construction, placed in pairs of one receiving-elevator, F, and one shipping-elevator, F'. These pairs of elevators each extend below the first or basement floor, H, and are placed, preferably, in the same tank, G, made of suitable material and water-tight. The tanks G are each made of two depths, forming tanks or hoppers *a a'*, for the receiving-elevator F and the shipping-elevator F', and the boots a^3 a^4 thereof, to obtain the proper incline or angle for transferring from the bins through the spout *b b'*. (Shown in Fig. 1.) The pairs of elevators F F' extend to the machinery-floor A, and are all operated from the same shaft, I, and a spout, *c*, is attached to the head of each elevator to discharge the grain into the receiving-garner J or the transfer or shipping-garner J', as the case may be. These garners J and J' each occupy a separate bent in the building, and are placed in pairs, side by side, along the central longitudinal line of the building, and each pair of garners J J' alternate throughout the length of the building with the pairs of elevators F F', so that every third bent contains a pair of elevators, while the two intervening bents are occupied each by a garner in such manner that the shipping-garner J' is

adjoining and below the shipping-elevator F′ and the receiving-garner J adjoining the receiving-elevator F, which system is maintained throughout the cupola.

Below the garners J and J′, respectively, are located on the scale-floor C the receiving-hopper scale L and the shipping-hopper scales L′, which of course are arranged in pairs and in the same relation with the bents of the building and with the elevators F F′ that the garners J J′ bear, and by means of the short revolving spouts *d d* the scales may be registered with either of the stationary spouts *e* or *f*. The spouts *e* and *f* are each provided with a second revolving spout, *h*, which is adapted to connect with a spout, *i*, which may be shifted, as shown in dotted lines in Figs. 1 and 2, for directing grain from the scales to the bins M or connected with any of the pipes N for loading the cars O, as indicated in Fig. 1. The lower ends of the bins M may be connected with the transfer or shipping elevators F′ by the spouts *b b′*, above referred to, while the shipping-spouts N connect with the car-spouts *j* in a common manner. Four lines of cars may receive grain from the spouts N *j*, and the two center lines of cars convey the grain into the elevator, and from which the grain may be transferred by steam-shovels into the boots a^3 of the receiving-elevators F.

The steam-shovels may be operated from a central line of shafting, P. (Shown in Figs. 1 and 2.) The shaft I, which transmits motion to the elevators through the head-pulley *k* on counter-shafts *k′* and by belts or friction-pulleys or chain-wheels or otherwise, is driven from the ground-floor by belt *l*, coming from shaft Q, which transmits motion also to the shaft P. The distance between the pairs of elevators F F′ is governed by the length of the railway-cars in use, as there must be the length of one car between each pair in such manner that all the cars in a line may be unloaded simultaneously.

In operation a line of loaded cars is run into the building and stopped so that each car-opening stands opposite to a receiving-elevator, F. The cars are then opened and the steam-shovels started and the grain shoveled from the cars into hoppers and boots *a* a^3 of the receiving-elevators, which elevators lift the grain to machinery-floor and discharge it into the receiving-garners J, from which it passes to the scales L, weighed, and, by means of the spouts above described, conveyed to the proper bins of the series supplied from that special or particular garner. Meanwhile, the shipping or transferring of grain from another lot of bins may take place through the spouts *b b′*, transferring-elevators F′, garners J′, scales L′, pipes *d h i* and N *j* to any empty cars in the house. In this manner there is no complication of spouting, and both receiving and shipping may be conducted at the same time, and no loss of time or labor in shifting gangs of men, as is unavoidable under the old system, where the receiving-elevators are placed in one line, leaving the distance between each elevator nearly the length of a car, and locating the shipping or transferring elevators in one or more lines parallel to the receiving elevators, but in different lines of bents. The alternate arrangement in the same line of bents of the elevators and the receiving and shipping garners therefore greatly facilitates the management of the house, and besides enables a single line of shafting to be used for the elevators, both receiving and shipping or transferring. Furthermore, by this arrangement both the receiving and shipping elevator boots may be put in the same tank, thereby saving nearly one-half of the present cost of tanks, and the transfer or shipping boot a^4 being on a lower lever, the transfer-spouts *b′* may be passed below the railway-tracks and be stationary and yet out of the way, and the loading of the two elevators together causes only one bent to be obstructed, where by the old system two bents were occupied, and the locality of the elevators in pairs allows them all (both shipping and receiving) to be placed in the center line of the building alternately with the garners and scales, thus enabling the house to be spouted on first floor to the center from both sides to all the "cross-section" bents, while in the old system with two or more lines of elevators, each line only would be reached from the adjoining bents of the house. The shipping and receiving elevators being, as described, arranged in one line and together in pairs, allows one gang of men to attend to the pair of elevators, thus utilizing the time generally lost while one line of cars are being pulled out of the building, which occupies nearly as much time as unloading; and a large saving of time is also accomplished upon the cupola-floors, as the spouting, scale, and weigh men, as well as the machinery men, may do their work in far less time and with considerably less trouble than by the old system, every man attending only to one line of scales or machinery, whereas before he had two or three lines to attend to, and had to effect a passage between them.

It will be understood that although the drawings indicate ordinary bucket belt-elevators, the general system is applicable where any device for elevating the grain is used, and that each of the advantages pointed out may be attained separately by using one part of the system and omitting others.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The grain-elevator comprising two garners, J J′, placed side by side, the pair of elevators F F′, placed together and contiguous to the garner J′, and another pair of elevators F F′, placed together and contiguous to the garner J, the said elevators and garners being all arranged in the same line, substantially as shown and described.

2. The grain-elevator comprising a pair of garners, J J′, and a pair of scales, L L′, ar-

ranged between two pairs of elevators, F F′, substantially as described.

3. The grain-elevator comprising two scales, L L′, placed side by side, the two pairs of elevators F F′, arranged on either side of the scales, the stationary pipe *e*, connected to the scale L′, the pipe *f*, connected to the scale L, and the separate pipes *d h*, substantially as described.

4. The grain-elevator comprising two elevators, F F′, placed side by side and operated by the same line of shafting, the receiving-boot a^3, the shipping-boot a^4, both placed in and surrounded by a single hopper or tank, G, the boot a^4 being on a lower level than the boot a^3, substantially as and for the purposes set forth.

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Witnesses:
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ROBERT JEFFREY.