

(No Model.)

2 Sheets—Sheet 1.

H. P. DENNIS.
ELEVATOR.

No. 580,777.

Patented Apr. 13, 1897.

Fig. 7.

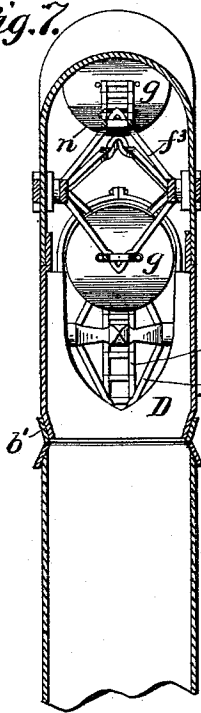


Fig. 1.

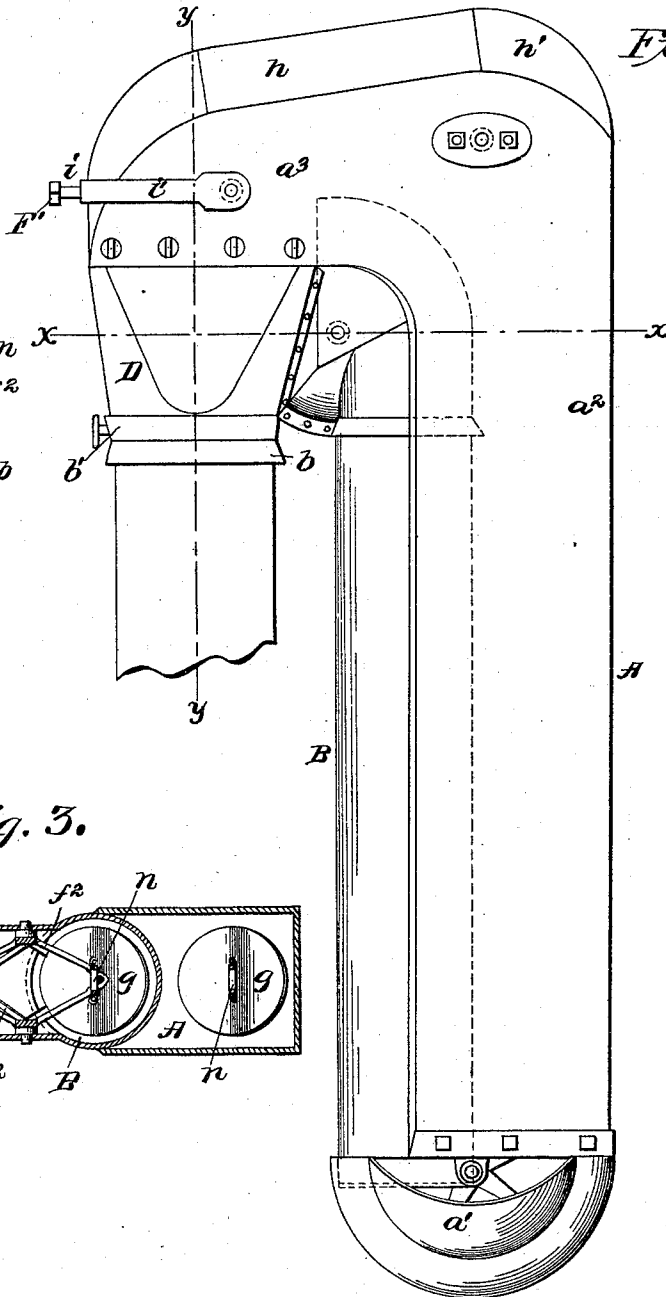
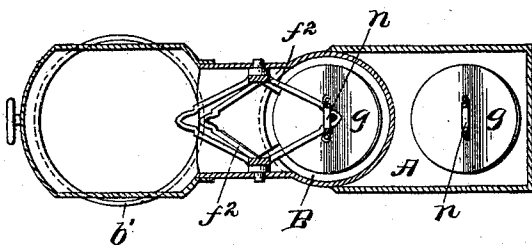


Fig. 3.



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Att'y.

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Fig. 2.

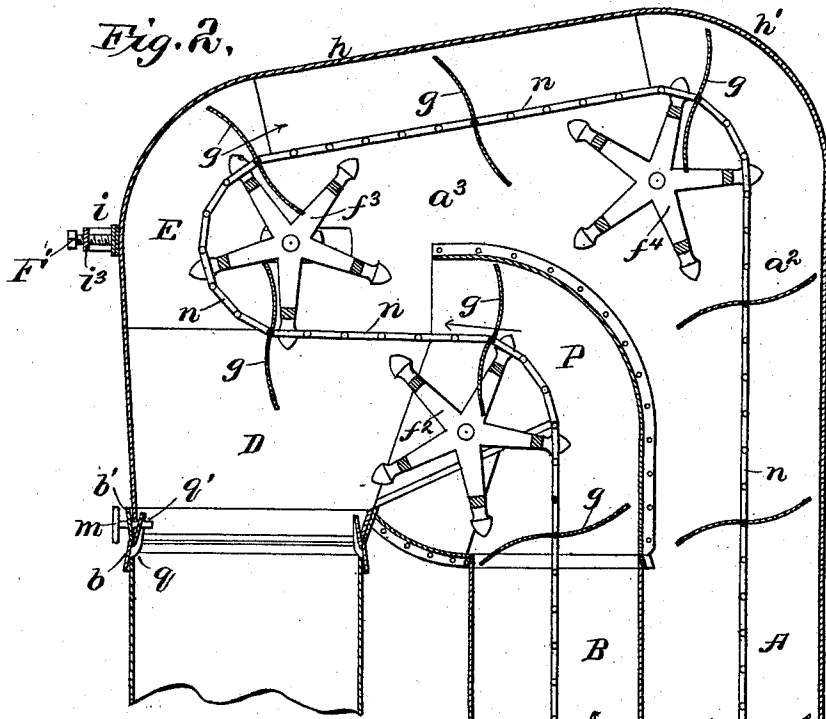


Fig. 4.

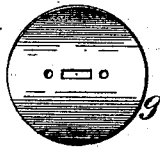


Fig. 5.

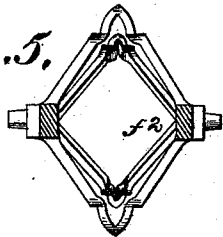


Fig. 8.

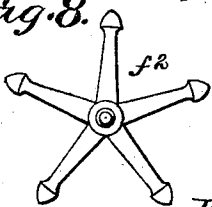
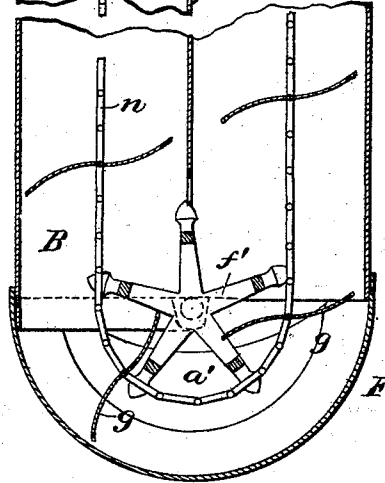
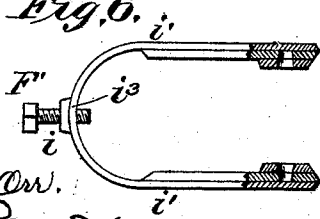


Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY P. DENNIS, OF PEORIA, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO
JOHN H. ELLIS AND ALBERTUS D. POTTER, OF SAME PLACE.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 580,777, dated April 13, 1897.

Application filed July 6, 1896. Serial No. 598,222. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. DENNIS, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Elevators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of parts embodying my invention, being a sufficient portion of an elevator adapted to take the grain from threshing mechanism to a weigher or other receiving device. Fig. 2 is a vertical section. Fig. 3 is a cross-section on the line $x x$, Fig. 2. Figs. 4, 5, and 6 show details.

In the drawings a casing is illustrated of a sort which I at present prefer. The main vertical body thereof comprises the part A and the part B, that at A being in a cross horizontal section, the three sides of a box at substantially right angles to each other, and that at B being a cylindrical tube or duct substantially parallel to part A, situated partly within the latter. At the lower end of this vertical portion is placed the boot or receiving-box F.

f' indicates a sprocket-wheel mounted to rotate at the lower end of the elevator-box. The walls $a a$ of the boot are concentric with the wheel f' , so that the flights attached to the elevator-chain can pass in close proximity thereto as they go around the wheel. At the sides of the boot there are outwardly-flaring mouthpieces a' , with relatively large openings above them through which grain can be readily introduced from either side.

At the upper end of the mechanism the casing is expanded toward one side, the side walls a^2 of the trunk A being extended, as at a^3 . The space between these side expansions a^3 is inclosed by a curved top, as at $h h'$. The part h is of the nature of a door which can be removed or opened to permit access for any purpose to the elevator.

The parts last referred to inclose the sides and tops of a chamber, (indicated by E.) Be-

low this there is placed a hopper or receiving-funnel, (indicated by D.)

At the upper end of the cylindrical duct or elevator-tube B there is a curved chamber (indicated by P) communicating with the chamber E and also with the hopper or funnel D through an opening in the inner side of the latter. f^2 is a sprocket-wheel mounted centrally in this curved-chamber or elbow extension of the duct B.

f^3 is a guiding idler's sprocket-wheel mounted in the chamber E and directly over the delivery-hopper D.

f^4 is a similar idler sprocket-wheel at the upper end of the trunk A and preferably somewhat higher than the wheel f^3 .

The wheels $f' f^2 f^3 f^4$ are of a peculiar shape, as will be seen upon an examination of the drawings, and this being intended for a purpose to be described. By reference to the drawings it will be seen that the said sprocket-wheels are formed by a series of forked spokes, each spoke having its members spaced or separated at the center of the wheel. By this construction I am enabled to provide a wheel which shall be light and strong and which being open at the center will offer no obstruction to the passage of the flights. It will also be noticed that the spokes of each sprocket are or may be formed integral with the hub or connecting portion, which is provided with laterally-projecting trunnions.

n indicates the chain, which is fitted to the side wheels and travels thereon in the direction of the arrows. This chain is provided with peculiarly-shaped flights $g g$. Each flight when observed in plan view has the outline of a circular disk, but when looked at in edge view or in central diametric section it is seen to be curved on both sides of the center, the curve on one side being the reverse of that on the other. That is to say, when looked at on lines parallel to the axis of rotation of the wheel it is concavo-convex on one side of the chain and also concavo-convex on the other side, the concave faces of the two sides being opposite to each other vertically. When constructed and arranged in this way, the flights are each provided with a carrying-cavity on one side of the chain

and a guide or deflector on the other side, whereby a proper delivery of the grain is effected at the time of discharge.

The chain, the flights, and the wheels are constructed and related to each other in the way shown so that the flights can pass around the wheels without interference. As they in turn reach the wheel f^2 , they begin to pass away from the vertical lines of travel and are tipped in such a way as to throw the grain outward toward the hopper D, and by the time they reach the wheel f^3 they have been thrown and carried in such positions that they are completely emptied. From the latter wheel they pass with the chain to the wheel f^4 , and thence down to the front to be again loaded in the boot f . The wheel f^3 is mounted in an adjustable support, (indicated by i ,) it consisting of a frame having arms i' with suitable boxes at their ends and the adjusting-screw F' , engaging with the cross-piece i^3 . By means of these devices the wheel can be moved out or in to vary the tension of the chain, as may be required.

b b' indicate collars or the two parts of a single collar. The upper is firmly secured to the hopper D, and the lower one is adapted to be detachably connected to the upper. q q are hooks on the part b , and q' q' are lugs on the part b' . The lower collar b can be engaged by the hooks with the lugs and secured to the bottom of the hopper. m is a thumb-screw which passes through the upper collar and is adapted to lock the two parts together. By these devices a delivery-spout of any suitable sort can be attached, or a weigher, if preferred.

While some of the features of the construction and arrangement herein shown and described can be used in and of several mechanisms, I have devised the present elevator more particularly for use in connection with threshing machines to carry the grain as it is delivered from the thresher to weighing or bagging devices.

These machines often deliver the grain with great rapidity, and it is desirable to withdraw it as fast as it is delivered and to deposit it in and withdraw it from the weighing mechanism with corresponding speed. The elevator or carrier chain n is driven at a high rate of speed and a practically continuous stream of grain is propelled through the duct B. Serious difficulty has been experienced with the elevators as heretofore constructed for this purpose because of the fact that the flights or carrier-sections could not be properly emptied or freed of their load. By having the wheel f^2 in the throat of the duct B and the wheel f^3 somewhat higher and related to the other in a way shown and to revolve in opposite direction thereto, so that the chain passes first over the wheel f^2 and then up and over the wheel f^3 , I cause a perfect and rapid discharge of the grain, and it will be noticed that I arrange the hopper for receiving grain

from the flights adjacent to the rising or ascending leg of the elevator, instead of adjacent to the descending leg, as has been heretofore the common plan. By my arrangement I avoid the necessity of providing a trough or support across the top of the elevator, connecting the sprocket-wheels at the upper ends of the rising and descending legs, and am enabled to use flights of the form shown instead of buckets for moving the grain.

What I claim as my invention is—

1. In an elevator, the combination of the duct, B, the sprocket-wheel, f^2 , adjacent to the upper end of said duct, the hopper at the side of the duct, the sprocket-wheel, f^3 , above said hopper and beyond the side line of the duct, B, the boot at the lower end of the duct, the sprocket-wheel, f' , adjacent to said boot, the chain engaging with all of said sprockets, and the flights on said chain and situated centrally relatively to the sprocket-wheels, substantially as set forth.

2. In a grain-elevator, the combination of the vertical trunk, A, the vertical elevator-duct, B, the inclosed chamber E communicating with the vertical elevator-duct, the delivery-hopper below the chamber E, the boot F, the sprocket-wheel in the boot, the sprocket-wheel at the upper end of the elevator-duct, the sprocket-wheel above the hopper D and beyond the side of the elevator-duct, the sprocket-wheel at the upper end of the trunk A, the chain connecting all of said sprockets, and the flights on the chain, substantially as set forth.

3. In an elevator, the combination with the lower sprocket-wheel and the upper sprocket wheel or wheels, of the chain and the disk or flight having two concave parts on opposite sides of the chain, the concave faces being opposite vertically to each other, substantially as set forth.

4. In a grain-elevator, the combination with an endless belt or chain carrying a series of flights, of a duct for the rising leg of said endless conveyer, and a delivery-hopper at the side of said duct to receive material from the rising leg of the conveyer, substantially as set forth.

5. The combination with the upwardly-moving elevator-chain, the flights thereon, the sprocket-wheel, f^2 , around which the chain is deflected from the vertical as it moves upward, the sprocket-wheel, f^3 , above the wheel f^2 , and revolving oppositely thereto and adapted to receive the chain from the wheel f^2 and guide it over the top, the sprockets f' f^4 , arranged above and below said sprocket-wheels and at one side thereof, and the receiving chute or hopper below the wheel f^3 , substantially as set forth.

6. The combination with the elevator or conveyer chain, and the flights thereon, of a sprocket-wheel, having each of its spokes formed of two members inclined oppositely and connected to separated hubs at their in-

ner ends to provide the sprocket with an open center whereby interference with the flights is prevented substantially as set forth.

5 7. The combination with the elevator or conveyer chain, and the flights attached thereto, of the sprocket-wheel having forked spokes, the legs of each spoke being separated at the center of the wheel, substantially as set forth.

10 8. In a grain-elevator the combination of an endless chain arranged to have its rising and descending legs close together, a hopper supported adjacent to the rising leg of said elevator, and means at the upper end of said
15 rising leg for deflecting the chain from a vertical line to pass horizontally over said hopper, substantially as set forth.

9. In a grain-elevator the combination of an endless chain having a descending leg with

flights, and an ascending leg carrying flights 20 close to those on said descending leg, a trunk or casing inclosing said descending leg, a duct inclosing said rising or ascending leg, a sprocket-wheel f^4 at the upper end of the descending leg, a sprocket f^1 , at the lower end 25 of the elevator, a sprocket, f^2 , at the upper end of the rising leg rotating in the opposite direction to the sprocket f^4 aforesaid, and a sprocket f^3 , above the discharge-duct rotating oppositely to the sprocket, f^2 , substantially as set forth. 30

In testimony whereof I affix my signature in presence of two witnesses.

HENRY P. DENNIS.

Witnesses:

F. E. PACKER,
J. A. WELSH.