

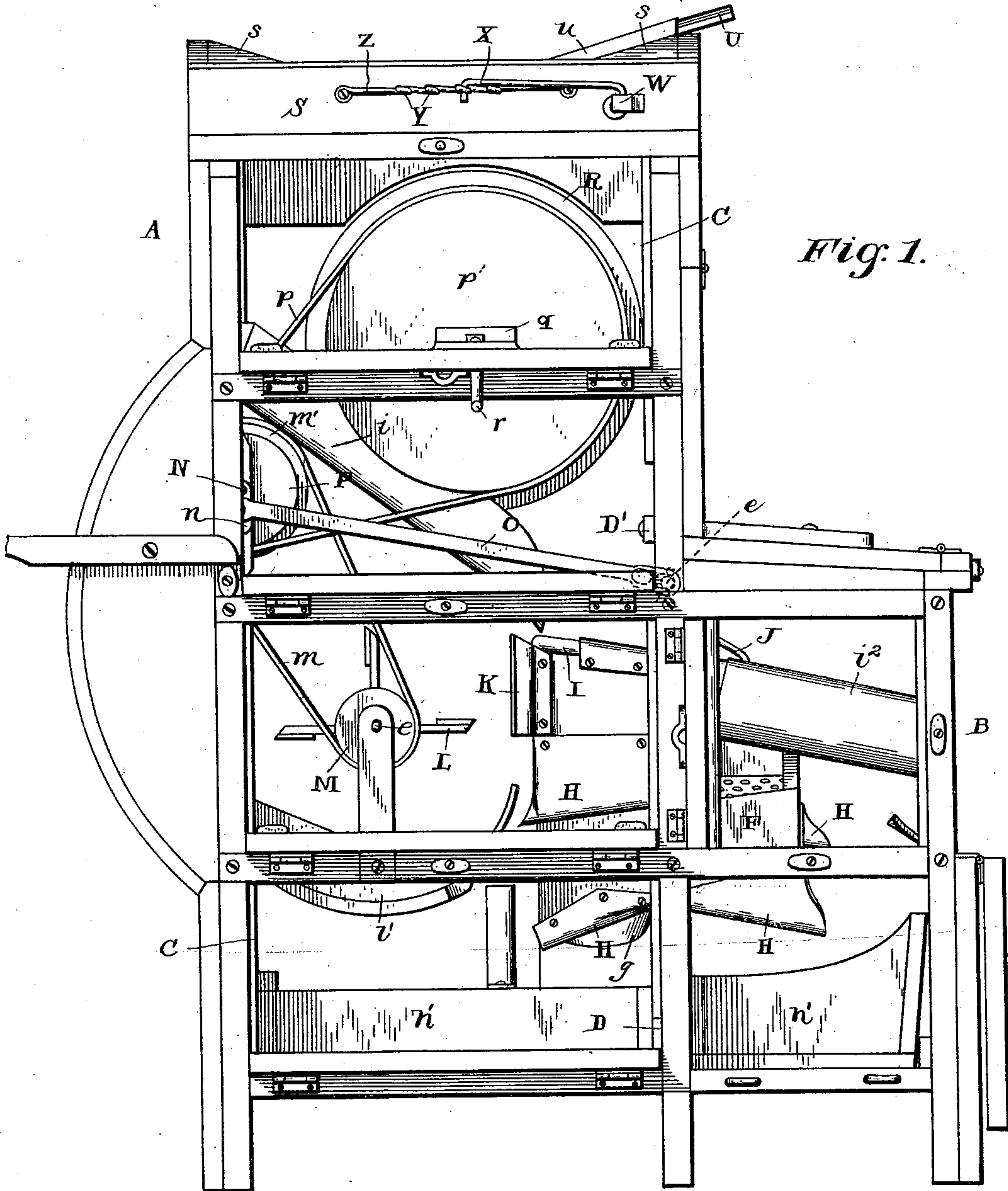
(No Model.)

3 Sheets—Sheet 1.

L. STALEY.
FANNING MILL.

No. 512,405.

Patented Jan. 9, 1894.



Witnesses

C. A. Ford.

D. P. McKeen.

Inventor

Levi Staley,

By his Attorneys,

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(No Model.)

3 Sheets—Sheet 2.

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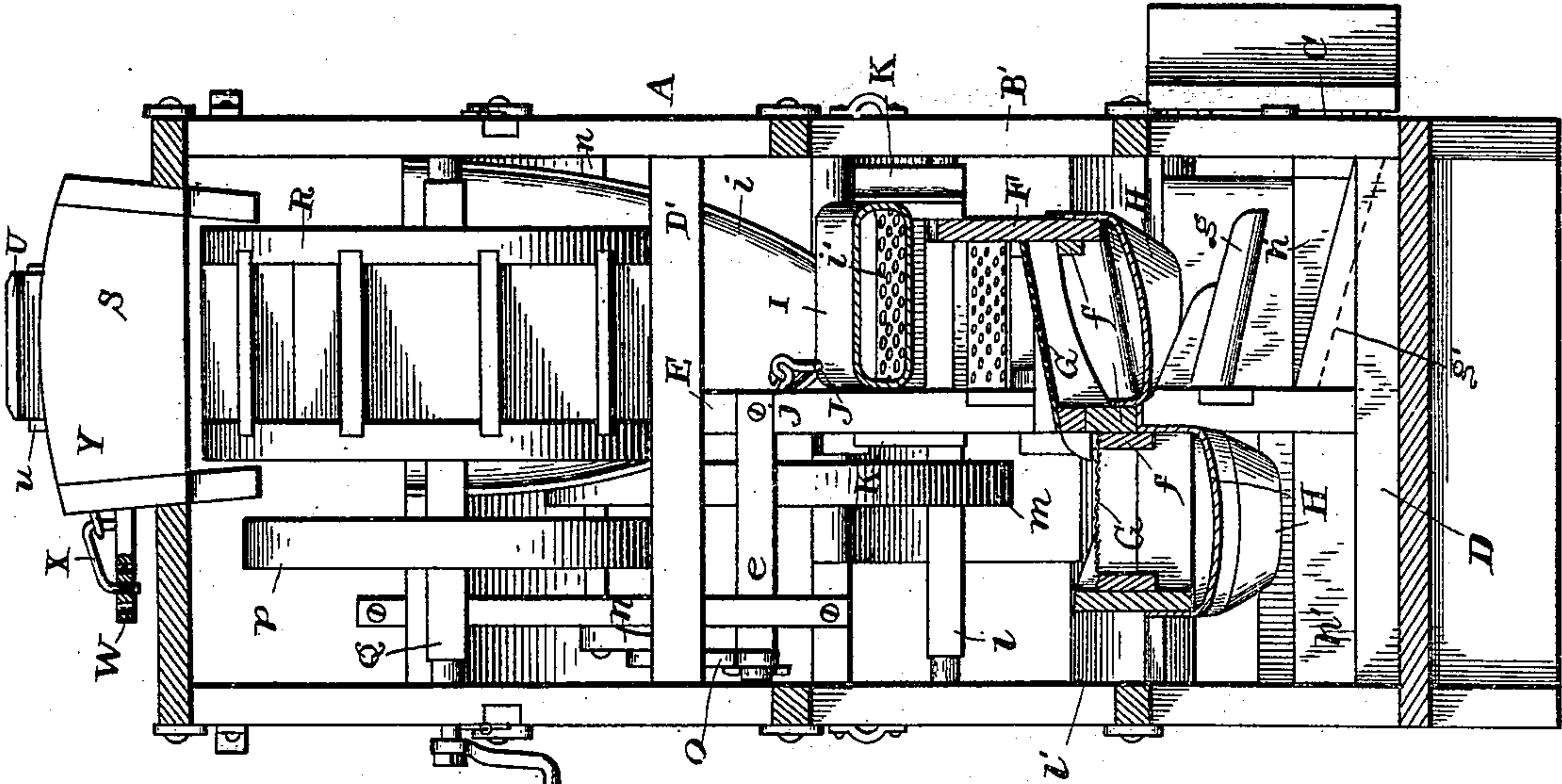


Fig. 3.

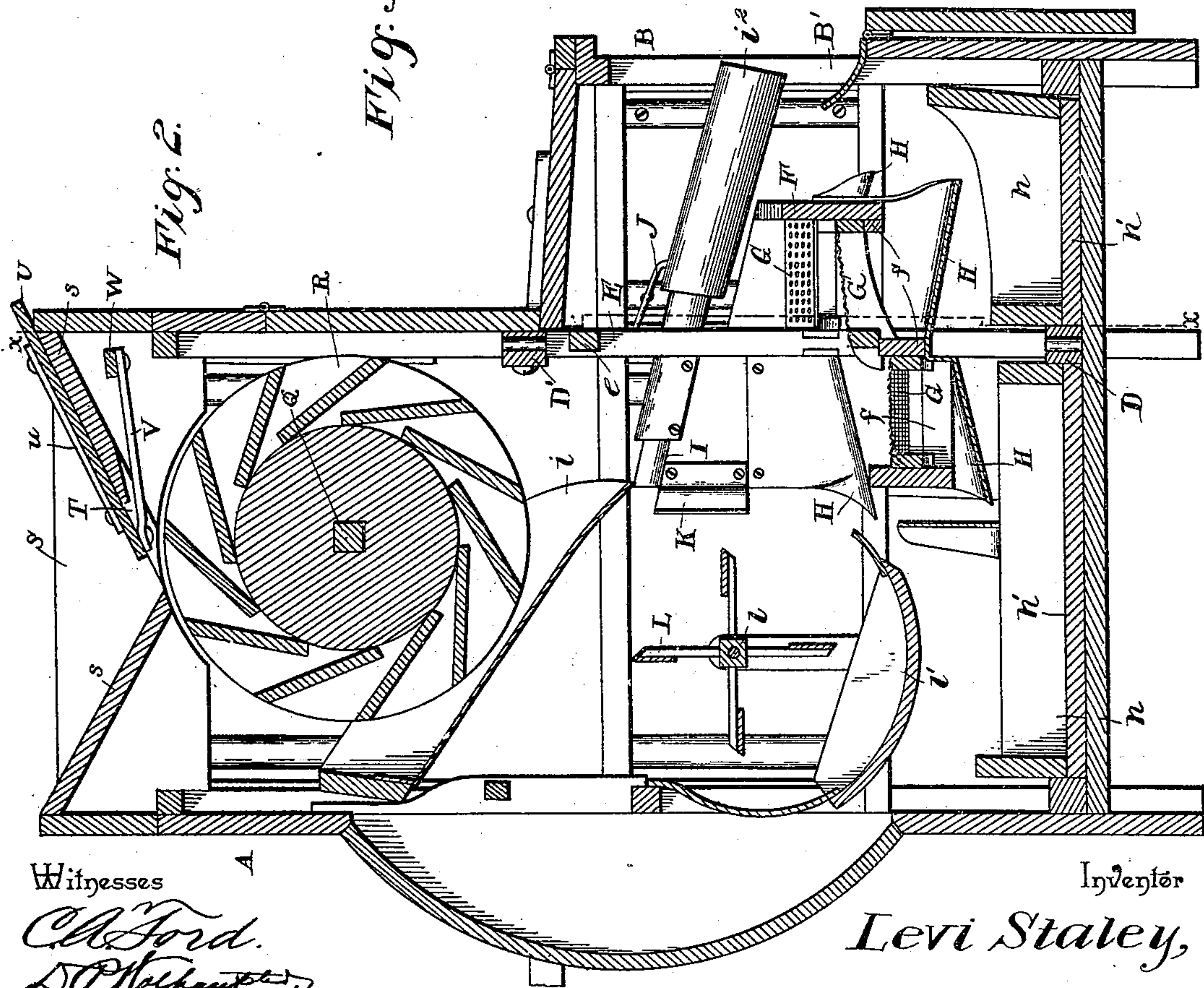


Fig. 2.

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Patented Jan. 9, 1394.

Fig. 5.

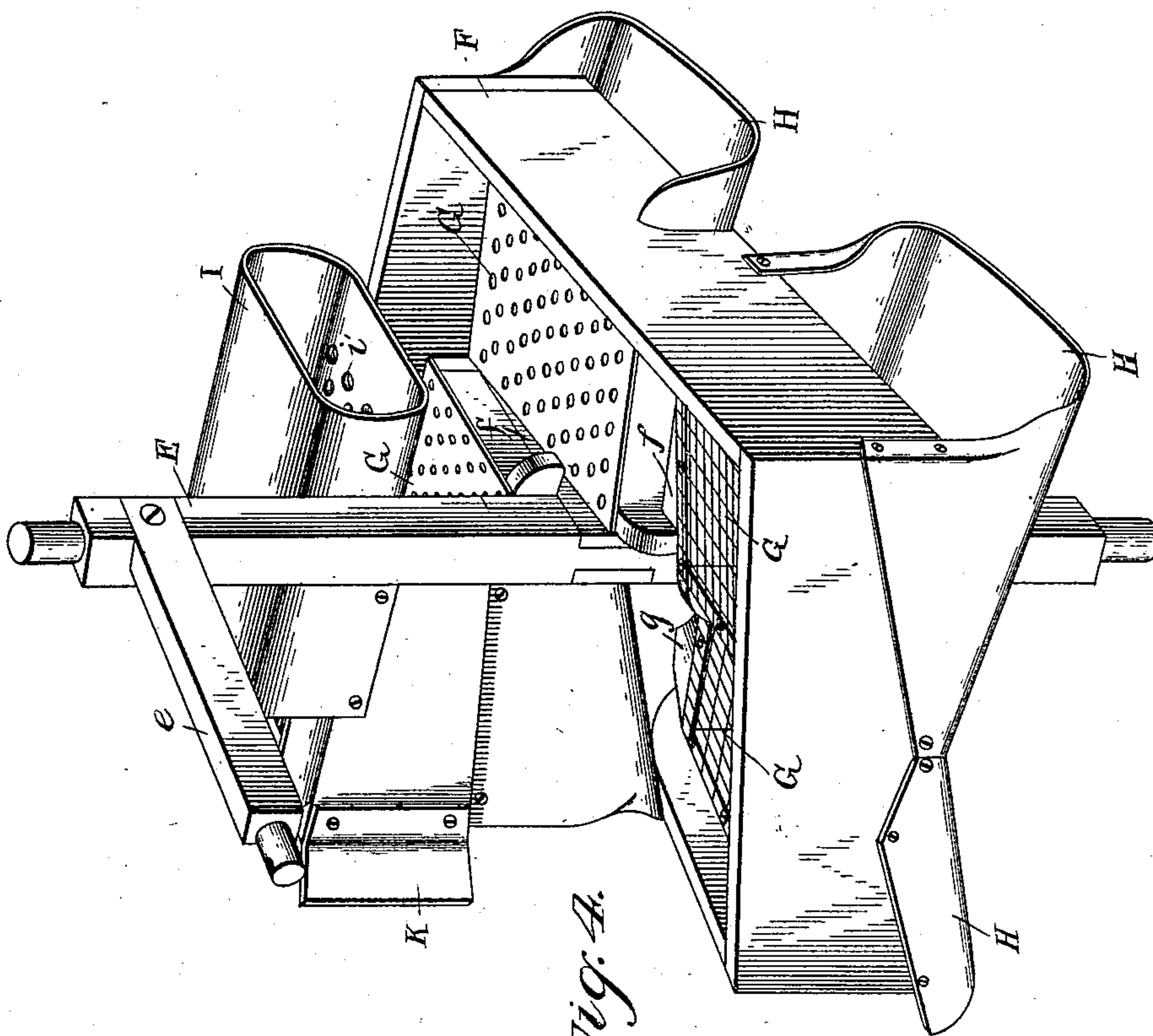
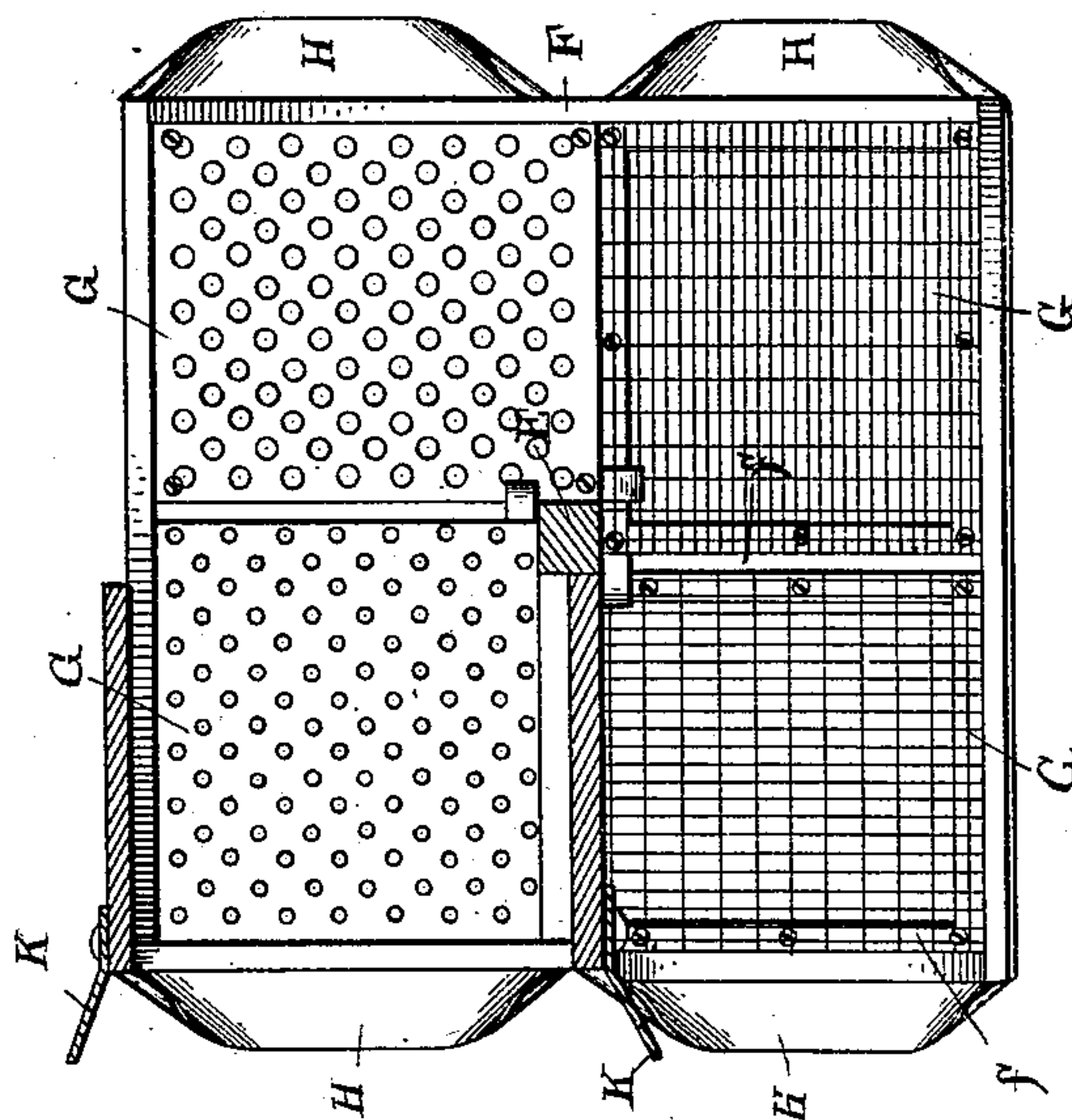


Fig. 4.

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UNITED STATES PATENT OFFICE.

LEVI STALEY, OF ALCONY, OHIO.

FANNING-MILL.

SPECIFICATION forming part of Letters Patent No. 512,405, dated January 9, 1894.

Application filed May 9, 1893. Serial No. 473,564. (No model.)

To all whom it may concern:

Be it known that I, LEVI STALEY, a citizen of the United States, residing at Alcony, in the county of Miami and State of Ohio, have
5 invented a new and useful Fanning-Mill, of which the following is a specification.

This invention relates to fanning mills; and it has for its object to provide certain improvements in mills of this character which
15 are employed for separating and cleaning grain.

To this end the main and primary object of the present invention is to provide an automatic or semi-automatic fanning mill which
20 shall be so constructed as to provide efficient means for the thorough cleaning of all grades of grain, as well as the perfect separation of grain into several different grades, each of which grades is deposited in separate receptacles or boxes.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination
25 and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of a fanning mill constructed in accordance with this invention,
30 showing all of the side doors thrown open to expose the interior working parts of the machine. Fig. 2 is a central vertical longitudinal sectional view of the mill. Fig. 3 is a vertical sectional view on the line $x-x$ of Fig. 2. Fig. 4 is a detail perspective view of the oscillating or vibrating spiral screen box on its vertical shaft. Fig. 5 is a detail top view of the same below the separator trough.

Referring to the accompanying drawings,
40 A represents the main mill casing having a forward extension B, and provided at both sides and in the front with a series of openings C, which are inclosed by suitable doors, in order to not only inclose the entire casing,
45 but at the same time provide means whereby ready access can be gained to each and every part of the mill. The front opening in the front of the forward extension B, may be designated as B', and during the operation
50 of the mill is open in order to allow for the proper fan draft, and the discharge of the chaff and lighter impurities from the grain,

which is undergoing the processes of separation and cleaning.

At an intermediate point within the mill casing A, is arranged the bottom bearing bar D, and the upper transverse bearing bar D', arranged in a line with the lower bearing bar at a point between the top and bottom of the mill casing, and together with such bottom
60 bearing bar forms a bearing for the vertical oscillating or vibrating screen shaft E. The vertical screen shaft E, is provided with upper and lower journal ends working in the bearings therefor, and has extended from its
65 upper end the off-standing operating arm e , to which is connected the devices, to be hereinafter described, for oscillating or vibrating said shaft during the operation of the mill.

Fixedly attached to the vertical screen shaft E, and leading from a point near its upper extremity to its lower extremity, is the side inclosed screen box F. The side inclosed screen box F, is arranged spirally
75 around the vertical shaft E, in order to impart to the grain a travel spirally or circuitously around the shaft, so as to effect the thorough separation thereof into several grades.

The spirally disposed and side inclosed screen box F, is illustrated as being of a rectangular spiral disposition as distinguished from a circular spiral, and at each of the corners thereof, beginning at its upper terminal
85 and ending at its lower terminal, is provided with the separated transverse screen supports or bars f , which removably support in position the grading screens G, which screens have rectangular frames registering in the
90 corners of the screen box, and adapted to rest on top of said transverse supports whereby the same may be readily removed and replaced in cleaning.

The grading screens G, vary in mesh from
95 the uppermost to the lowermost, in order to secure the proper and desired grading of the grain, and by reason of having the several screens arranged removably in each of the corners of the spiral screen box F, a stair-step
100 disposition of the screens around the vertical shaft E, is secured, so that, as the said shaft oscillates, the grain falls from one screen onto the next lower screen, and so on around the

screen shaft to the lowest and last screen of the series, from which the unseparated matter falls onto the lower discharge pan *g*, attached to the lower terminal of the screen box F, and working directly over the inclined chute block *g'*, removably arranged on the bottom of the mill casing, and adapted to discharge the unseparated matter through one of the side openings of the mill casing outside of the same and into any suitable receptacle designed to receive such matter.

As before referred to, the several removable screens, ranging in stair-step order around the screen shaft inside of the screen box F, may vary in mesh, and are easily removed and replaced, and the open spaces or bottom portions of the screen box F, at the corners thereof directly under each of the screens, are inclosed by the inclined screen chutes H, which receive the separations from each screen, and direct such separations or gradings into separate and independent compartments *h*. These separate and independent compartments *h* are formed in separate grain boxes *h'*, removably fitted in the main bottom portion of the casing and the forward extension B, so as to be arranged on opposite sides of the vertical shaft E, it being shown that the screen box F, carries two screens on each side of the dividing point between the main part of the mill casing and the forward extension. These grain boxes *h'*, can be easily removed from the casing through the side openings thereof.

Arranged directly over the uppermost screen, at the upper receiving end of the screen box F, is the tubular grain receiving separator trough I. The tubular separator trough I, is arranged at an incline and attached to the separator box so as to receive the grain from the feeding chute *i*, attached at an incline to one end wall of the casing under the feed devices to be presently described, and said separator trough I, is provided with a perforated bottom *i'*, through which falls the body of the grain, to be separated, onto the first receiving screen of the series, while the chaff and other lighter impurities are at this point eliminated from the body of the grain and blown out through the removable chaff spout *i''*. The chaff spout *i''*, is tubular, and is removably fitted over the lower tubular end of the separator trough and held in such position by means of the connecting link J, removably attached to the attaching hook *j*, secured to one side of the shaft E, above the separator trough. Directly below the perforated bottom of the separator trough and at the receiving end thereof are arranged the flared blast plates K, which serve to direct the blast from the fan L, through the falling grain, so as to assist in the separation thereof, and to blow out the chaff and other light impurities through the chaff spout and out through the front opening B', of the casing, before referred to.

The fan L, is carried by the fan shaft *l*, jour-

naled in suitable journals in rear of the oscillating screen devices, and such fan is inclosed at the bottom by the partial casing *l'*, which serves as a deflector for the blast to direct it into the screen or grading devices. The fan shaft *l*, carries a belt pulley M, over which passes the belt *m*, which receives motion from a belt wheel or pulley *m'*, carried by the transverse gear shaft N. The transverse gear shaft N, is journaled in suitable bearings above and in rear of the fan shaft, and is provided at one end with the crank *n*, to which is pivotally attached one end of the connecting arm or pitman O, the other end of which is adjustably connected to the operating arm *e*, of the shaft E, so as to impart motion thereto. The gear shaft N, is further provided alongside of the belt wheel or pulley *m'*, with the drive pulley P over which passes the drive belt *p*, receiving motion from the large belt pulley *p'*, mounted on the power shaft Q. The power shaft Q, is journaled in suitable bearings *q*, at opposite sides of the casing near its upper end, and carries the bucket power and feed drum or wheel R. The bucket drum or wheel R, is arranged to work over the inclined feed chute *i*, and is adapted to receive the grain from the hopper S, removably fitted in the top of the mill casing.

As the grain is fed into the bucket drum or wheel, the weight will be sufficient to operate the entire mill, particularly when heavy grain is being treated, but when found necessary the operation may be assisted by means of the hand crank *r*, removably attached to one outer end of the shaft Q.

The removable top hopper S, is provided with the inclined converging bottom boards *s*, in one of which is formed the feed opening T, over which is adapted to be adjusted the feed slide U. The feed slide U, is arranged to move between the guides *u*, attached to one of said bottom boards *s*, and has attached to the lower end thereof the operating arm V. The operating arm V, is arranged under one of the bottom boards of the hopper, and has attached to the free end thereof the pivoted adjusting arm W, which forms with the arm V, a bell crank, and which projects through one side of the hopper and has adjustably connected therewith one end of the adjusting hook X. The other end of the adjusting hook X, is adapted to adjustably engage any one of the series of eyes Y formed in the wire eye strip Z, attached to one side of the hopper. Now by engaging the hook X, in said eyes, the feed slide U, can be so adjusted as to regulate the quantity of grain fed to the bucket wheel or to entirely cut off the supply.

Now from the foregoing it is thought that the construction, operation and many advantages of the herein-described fanning mill will be readily apparent to those skilled in the art, and I will have it understood that changes in the form, proportion and the minor details of constructions, as embraced within the scope

of the appended claims, may be resorted to without departing from the principles or sacrificing any of the advantages of this invention.

5 Having thus described the invention, what is claimed and, desired to be secured by Letters Patent, is—

1. In a fanning mill, the combination with the inclosed casing and the fan therein; of a vertical oscillating screen shaft mounted within the casing, a rectangular side-inclosed screen box mounted on said vertical shaft and disposed spirally there-around, separated transverse screen supports arranged in each corner of the screen box, a descending step series of different-mesh grading screens each having rectangular frames registering in the corners of the screen box and adapted to removably rest on top of said transverse screen supports, said grading screens each slightly overlapping the next lower screen, inclosed chutes attached to the screen box under each screen, and separate receptacles or compartments located under each chute, substantially as set forth.

2. In a fanning mill, the combination of the inclosed casing having door inclosed side openings, compartment grain boxes removably located in the bottom of the casing, an inclined chute block removably arranged in the bottom of the casing next to one of the grain boxes, an oscillating screen grading device mounted within the casing and having a lower discharge pan working over said in-

clined block and a number of separate screen chutes working over said compartment grain boxes, said oscillating screen grading device being further provided at the receiving end with flared blast plates, a partial bottom fan casing arranged within the main casing at one side of the grading device, the fan arranged over the partial casing, the feed chute, the bucket power wheel arranged over the feed chute and geared with the fan, and the feed hopper, substantially as set forth.

3. A feed hopper having opposite inclined converging bottom boards one of which is provided with a feed opening, guides attached to one of said bottom boards, an adjustable slide mounted to move in said guides and work over said feed opening, a bell crank connection with said feed slide, one of the arms of which projects beyond one side of the hopper, a wire eye strip attached to one side of the hopper, and provided with a series of eyes and an adjusting hook adjustably attached at one end to the bell crank connection and adapted to engage at its other end the said eyes in said eye strip, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

LEVI STALEY.

Witnesses:

M. B. BEMETT,
ALF. MASON.