

(No Model.)

2 Sheets—Sheet 1.

F. F. LANDIS.
CENTRIFUGAL GRAIN SEPARATOR.

No. 551,494.

Patented Dec. 17, 1895.

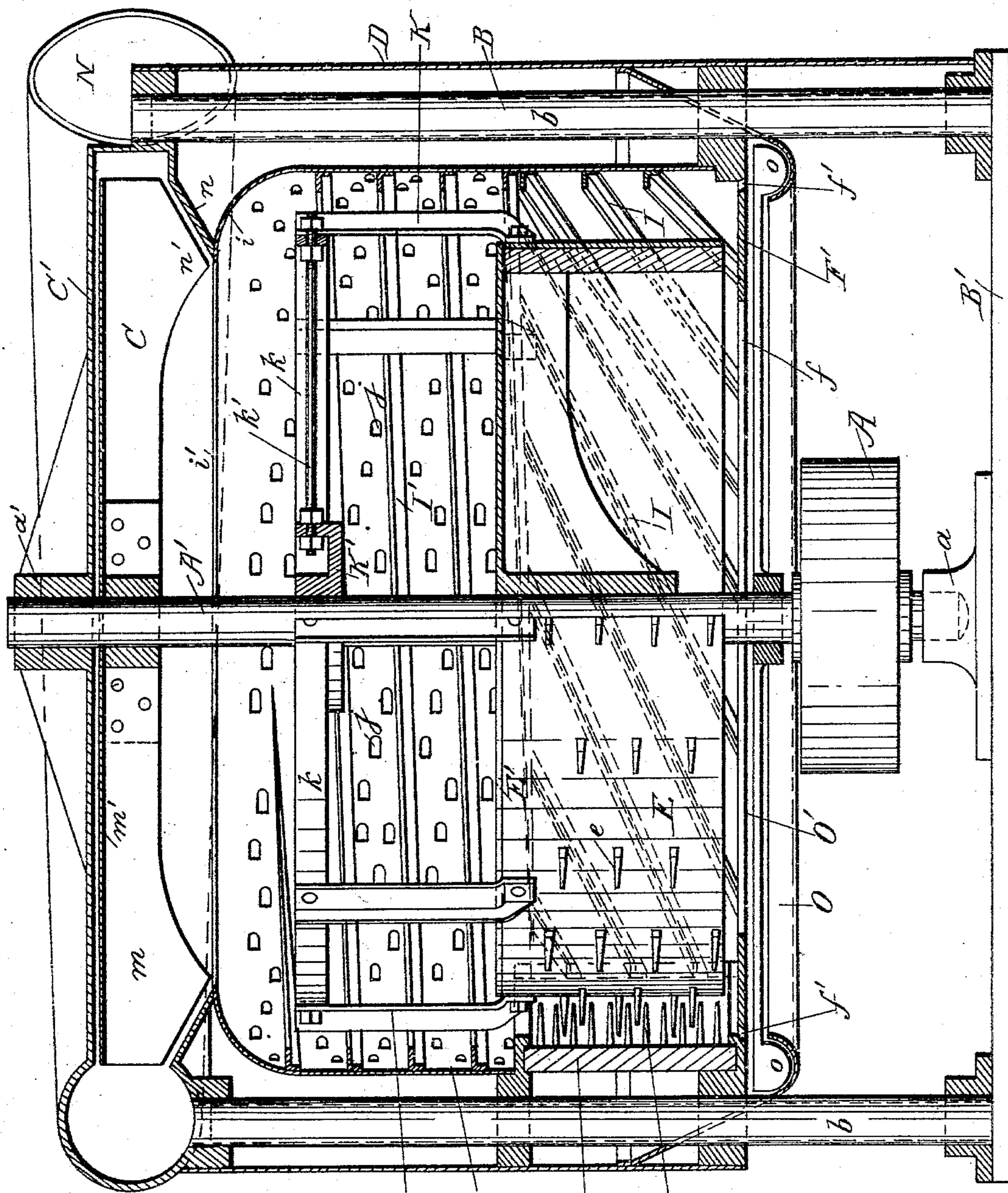


FIG. 1.

Witnesses

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Frank F. Landis

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FIG. 3.

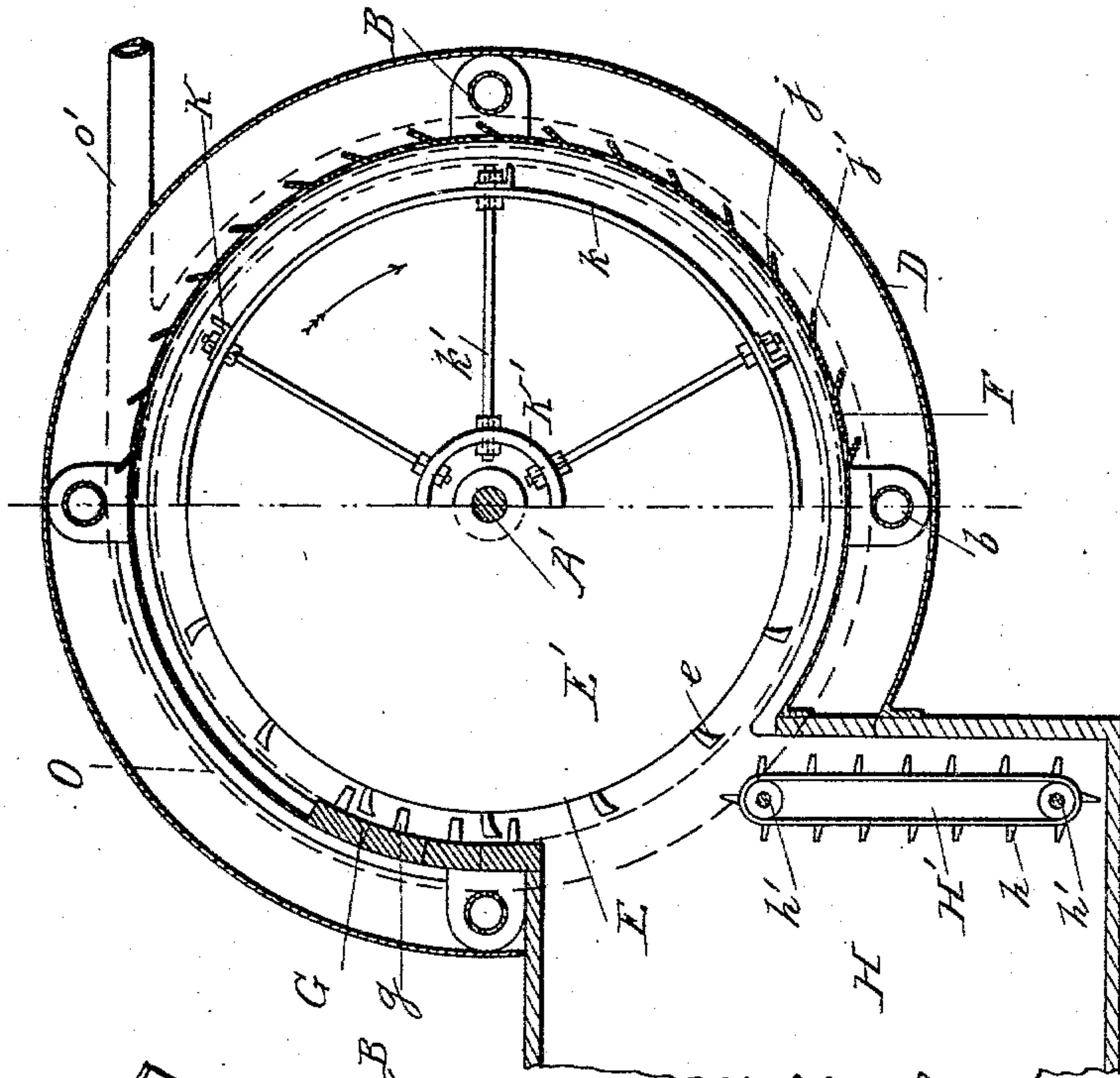
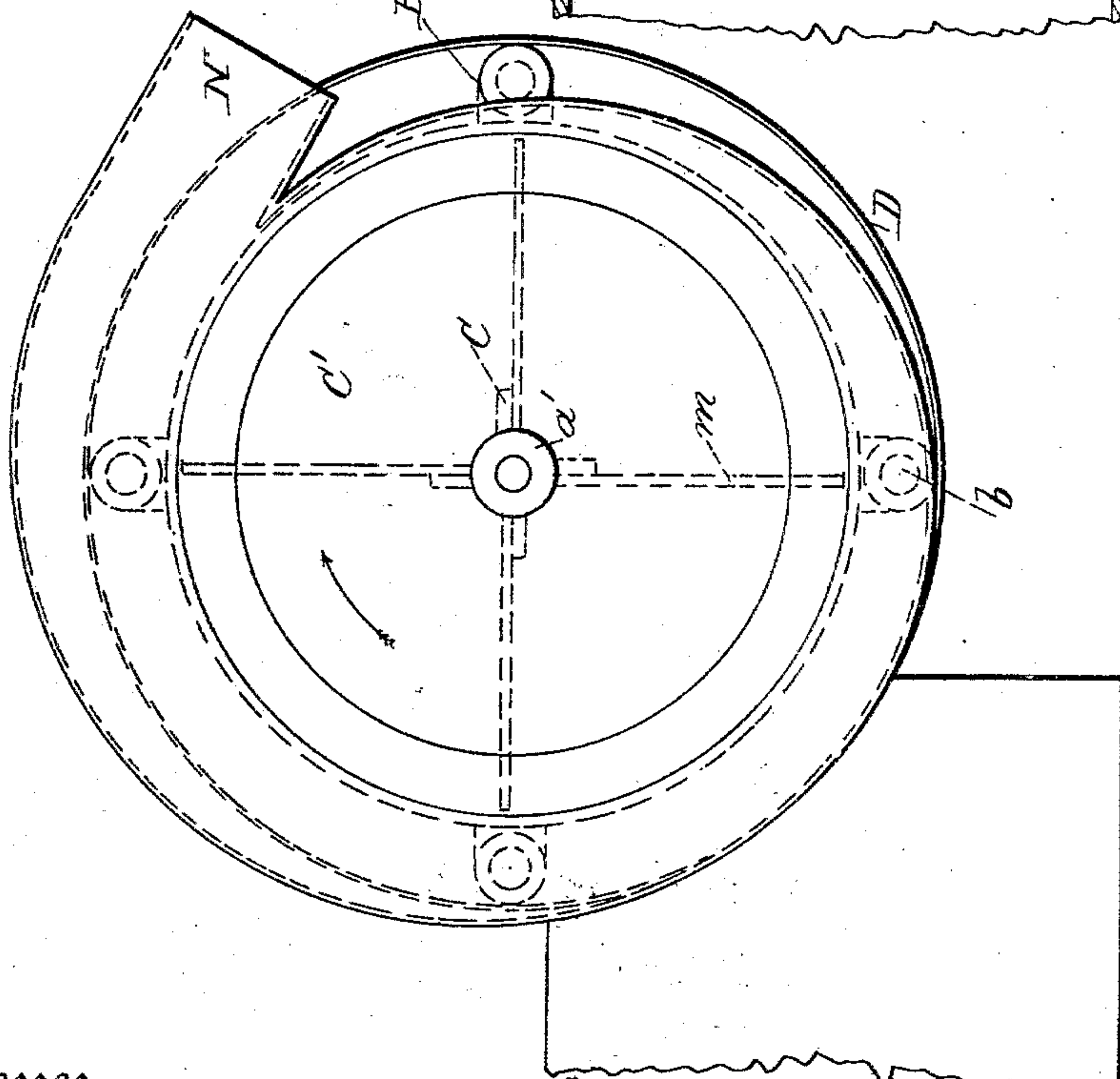


FIG. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK F. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

CENTRIFUGAL GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 551,494, dated December 17, 1895.

Application filed August 8, 1895. Serial No. 558,642. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. LANDIS, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Centrifugal Grain-Separators; and I do hereby 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.

This invention relates to centrifugal grain-separators; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a vertical section through the machine. Fig. 2 is a plan view. Fig. 3 is a sectional plan view.

A is the driving-pulley of the machine, journaled in the step *a* and in the bearing *a'*.

B is the frame of the machine, which is preferably provided with tubular uprights *b* secured to the base *B'* which also supports the step *a*. The upper part of the frame consists of the casing *C'* of the discharger *C*, which will be more fully described hereinafter. The bearing *a'* is formed integral with, or is otherwise secured to, the casing *C'*. The outer casing *D* of the machine is cylindrical and may be of sheet metal. This casing *D* is secured to the uprights *b*.

E is a thrashing-cylinder secured upon the shaft *A'* and provided with teeth *e*. The upper end of the cylinder *E* is provided with a plate *E'*; but otherwise the cylinder may be of any approved construction, excepting that it is much larger in diameter than the thrashing-cylinders ordinarily used in thrashing-machines.

F is a separating-chamber, cylindrical in form, and encircling the thrashing-cylinder. The lower end of this chamber is provided with a head *F'* having a central opening *f* smaller in diameter than the cylinder, and holes *f'* near the periphery of the chamber.

G is a concave of approved construction, provided with teeth *g*, and let into the side of the chamber *F*.

H is a table or hopper for receiving the unthrashed grain. This table is level with the head *F* and is arranged in front of the concave.

H' is a feeding device consisting of an endless conveyer provided with horizontally-pro-

jecting teeth *h*. This conveyer is arranged at a tangent to the thrashing-cylinder and is driven by vertical shafts and driving-wheels *h'*. The power for driving the feeding device may be obtained from the shaft *A'* and transmitted to the feeding device therefrom by any approved driving mechanism, (not shown in the drawings,) or the feeding device may be driven separately, or it may be dispensed with altogether, if desired.

I are spirally-arranged ribs or projections secured to the periphery of the chamber *F* around the thrashing-cylinder, and having considerable pitch or inclination in an upward direction.

I' are spirally-arranged ribs or projections secured to the periphery of the chamber *F* above the thrashing-cylinder, and having a less pitch or inclination than the ribs *I*. The chamber is provided at its upper end with an inwardly-curved portion *i*, and a central outlet-opening *i'* which is preferably smaller in diameter than the thrashing-cylinder. Passages or holes *j* are formed in the periphery of the chamber *F* between the ribs *I'*, and are provided with inclined outwardly-projecting lips *j'*.

K are bars secured to the thrashing-cylinder and projecting upwardly in the chamber *F* in close proximity to the ribs *I'*. The upper ends of the bars *K* are secured to a ring *k* which is carried by the arms *k'* secured to a hub *K'* on the shaft *A'*.

The discharger *C* is provided with radial arms *m* and has a flat disk *m'* on its upper side. The discharger is secured on the shaft *A'*. The discharger-casing *C'* is provided with a conical throat-piece *n* which fits close onto the top of the chamber *F*, and the discharger-arms preferably have projections *n'* on their lower sides which project within the said throat-piece. The casing *C'* has its periphery formed of a volute curve, and its cross-section increases in area and is greatest where it joins onto the straw-delivery pipe *N*.

O is a circular trough secured to the casing *D* and arranged below the holes *f'* in the head *F'* of the separating-chamber.

O' are arms secured to the shaft *A'* and provided with ends *o* which revolve in the bottom portion of the trough *O* which communicates with a grain-delivery pipe *o'*.

The operation of the machine is as follows: The unthrashed grain is laid upon the table

and is pressed against the feeding device with the heads pointing toward the concave. The motion of the feeding device and the thrashing-cylinder feeds the grain between the cylinder and concave where the grains are thrashed out and most of them fall on the head F' . The grains pass through the holes f' and are discharged up the pipe o' by the arms O' . The straw is guided into the upper part of the chamber F by the ribs I , and is whirled around therein by the bars K . The grains are driven out of the straw by centrifugal force and pass through the passages j , falling into the trough O . Any grains which fall on the plate E' of the thrashing-cylinder are driven off it by centrifugal force, and also fall into the trough O . The straw is guided upwardly in the upper part of the chamber F by the ribs I' , and is deflected at the top of the chamber by its curved portion i , so that it is brought into a very loose condition before it passes into the discharger-casing. The discharger draws a current of air through the machine and through the passages j and assists the straw in passing upwardly through the chamber F . The discharger draws the straw through the opening i' , and its arms fling the straw against the conical throat-piece n in which it is engaged by the projections n' and whirled around. The straw slides freely up the conical throat-piece and does not catch upon and accumulate around the opening i' . The discharger draws all the straw and chaff out of the chamber F , and forces them up the straw-delivery pipe.

I do not confine myself to the use of the thrashing mechanism hereinbefore described, as other approved means for thrashing the grain before it passes into the separating-chamber may be used.

What I claim is—

1. The combination, with a vertical shaft, and a toothed thrashing cylinder secured thereon; of a chamber encircling the said cylinder and provided with spiral ribs on its periphery, and a concave arranged at one part of the periphery of the said chamber and provided with projecting teeth arranged to pass between the teeth of the said cylinder, substantially as set forth.

2. The combination, with a vertical shaft, and a thrashing cylinder secured thereon; of a chamber encircling the said cylinder and provided with spiral ribs on its periphery, a concave arranged at one part of the periphery of the said chamber, a circular trough provided with a delivery pipe and arranged under the said chamber, and arms secured on the said shaft and provided with ends revolving in the said trough and operating to force the grains up the said pipe, substantially as set forth.

3. The combination, with a vertical shaft, and a thrashing cylinder secured thereon; of a chamber encircling the said cylinder, a concave at one part of the periphery of the said chamber, a grain table at the bottom of the

said chamber, and a mechanical grain feeding device arranged crosswise of the said table, substantially as set forth.

4. The combination, with a thrashing cylinder, and bars projecting longitudinally beyond one end of the cylinder; of a separating chamber provided with spiral ribs on and passages in its periphery, and encircling the said cylinder and arms, substantially as set forth.

5. The combination, with a thrashing cylinder, and bars projecting from one end of the cylinder; of a separating chamber provided with spiral ribs I and I' encircling the said cylinder and bars respectively, the ribs I having a greater inclination than the ribs I' , and passages between the ribs I' , substantially as set forth.

6. The combination, with a thrashing cylinder, and bars projecting longitudinally beyond one end of the cylinder; of a separating chamber provided with passages in its periphery and encircling the said cylinder and bars, and means for moving the straw in the said chamber in a direction parallel with the axis of the cylinder, substantially as set forth.

7. The combination, with a separating chamber having continuous and spirally-arranged ribs on its periphery and passages between the said ribs, of a central shaft, and bars supported by the said shaft and operating to whirl around the straw in the said chamber, substantially as set forth.

8. The combination, with a separating chamber having passages in its periphery and an inwardly curved portion at one end, of a central shaft, a discharger secured on the said shaft beyond the said curved portion and operating to draw the straw out of the chamber, and bars supported on the said shaft under the said curved portion and operating to whirl around the straw in the said chamber, substantially as set forth.

9. The combination, with a separating chamber provided with an opening at its top, and means for whirling around the straw in the said chamber; of a discharger casing provided with a conical throat piece secured over the said opening, and a revoluble discharger provided with arms having downwardly projecting portions revolving in the said throat piece, substantially as set forth.

10. The combination, with a thrashing cylinder, its shaft, and bars projecting longitudinally beyond one end of the cylinder; of a separating chamber provided with spiral ribs, passages between the ribs, and an inwardly-curved portion over the upper ends of the said bars; and a centrifugal straw discharger secured on the said shaft above the said chamber, substantially as set forth.

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

FRANK F. LANDIS.

Witnesses:

ALF. N. RUSSELL,
GEO. H. RUSSELL.