

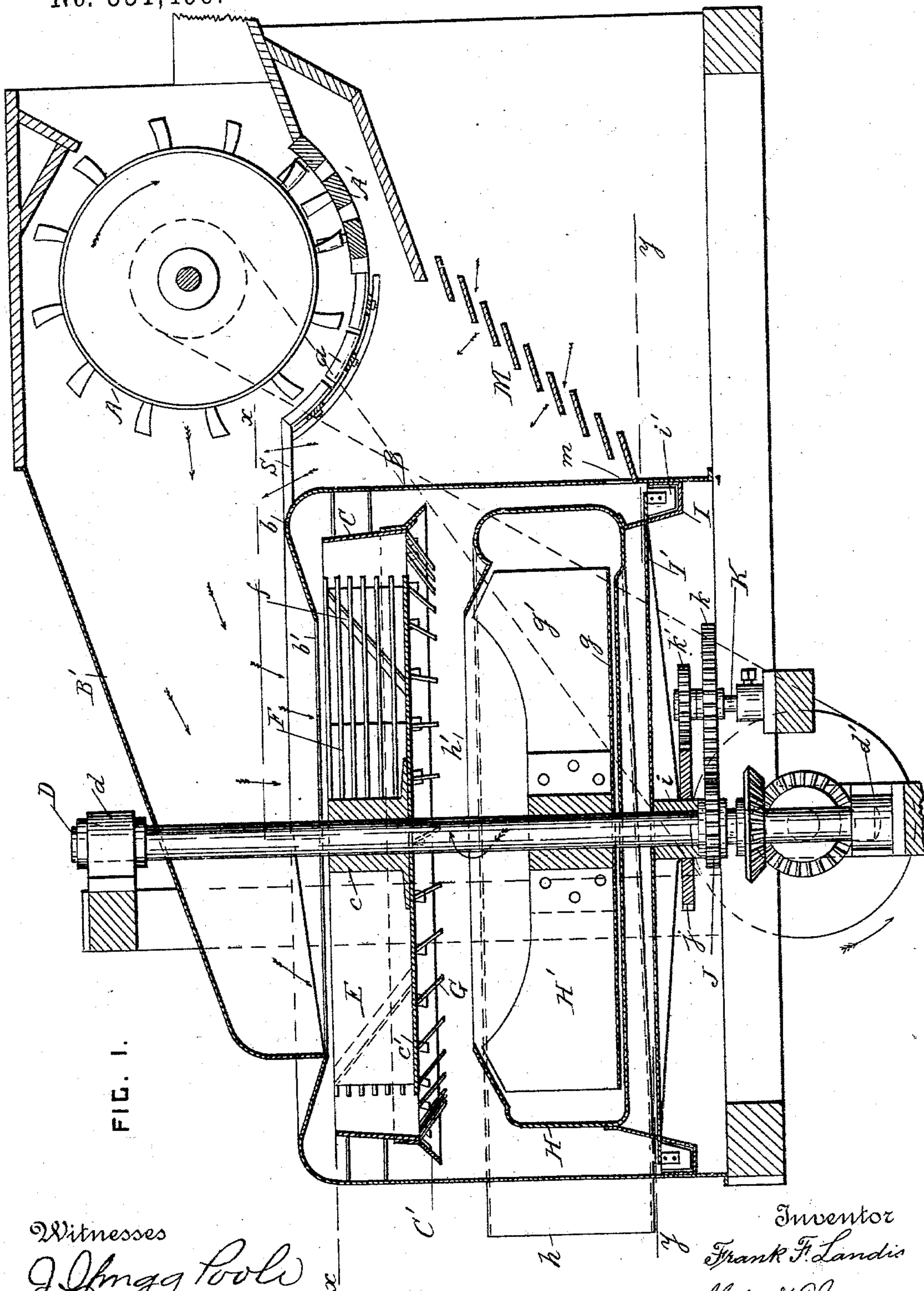
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3 Sheets—Sheet 1.

F. F. LANDIS.
CENTRIFUGAL GRAIN SEPARATOR.

No. 551,499.

Patented Dec. 17, 1895.



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Witnesses

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Inventor

Frank F. Landis

By Attorney *Herbert W. Jenner.*

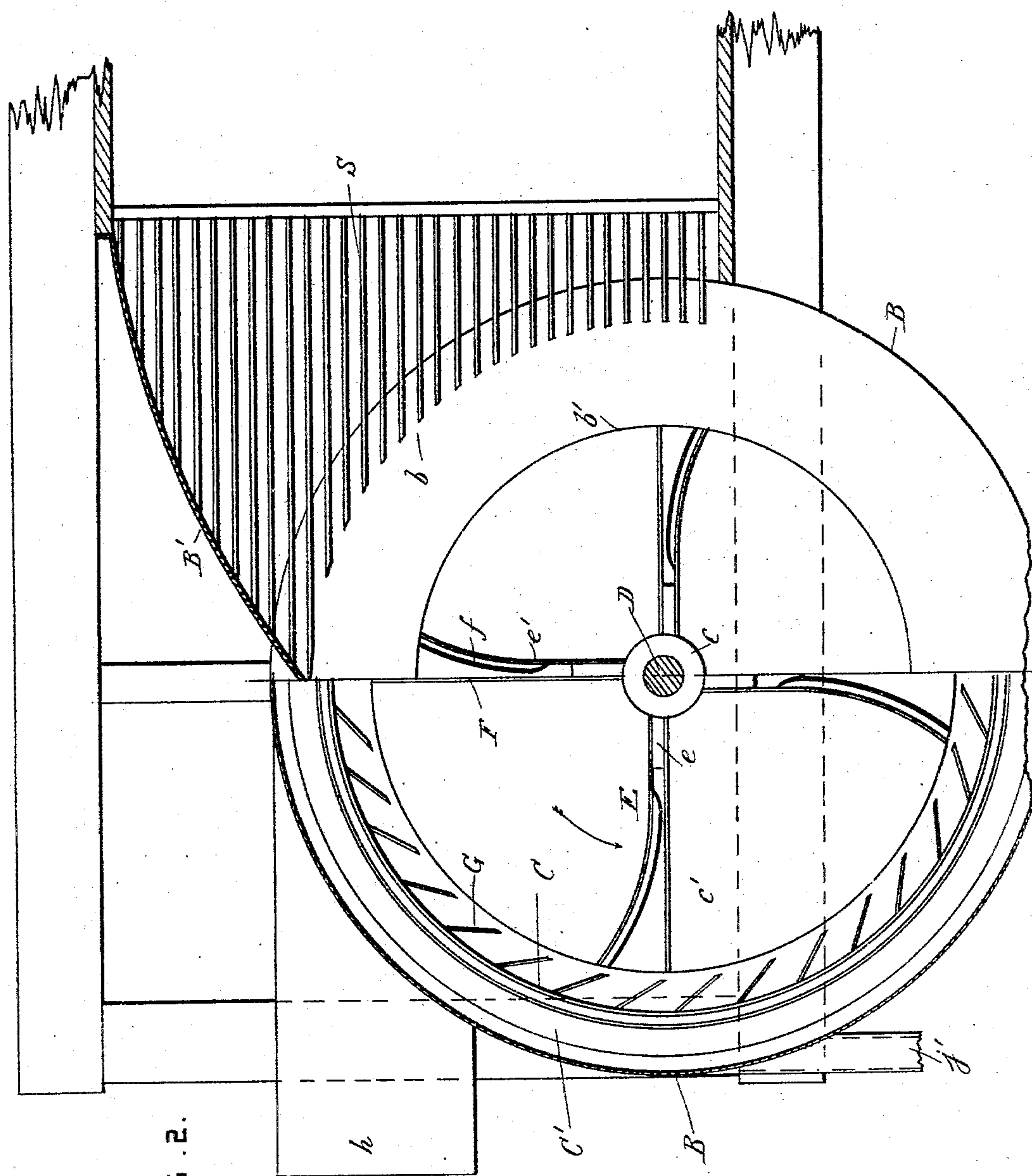
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3 Sheets—Sheet 3.

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FIG. 3.

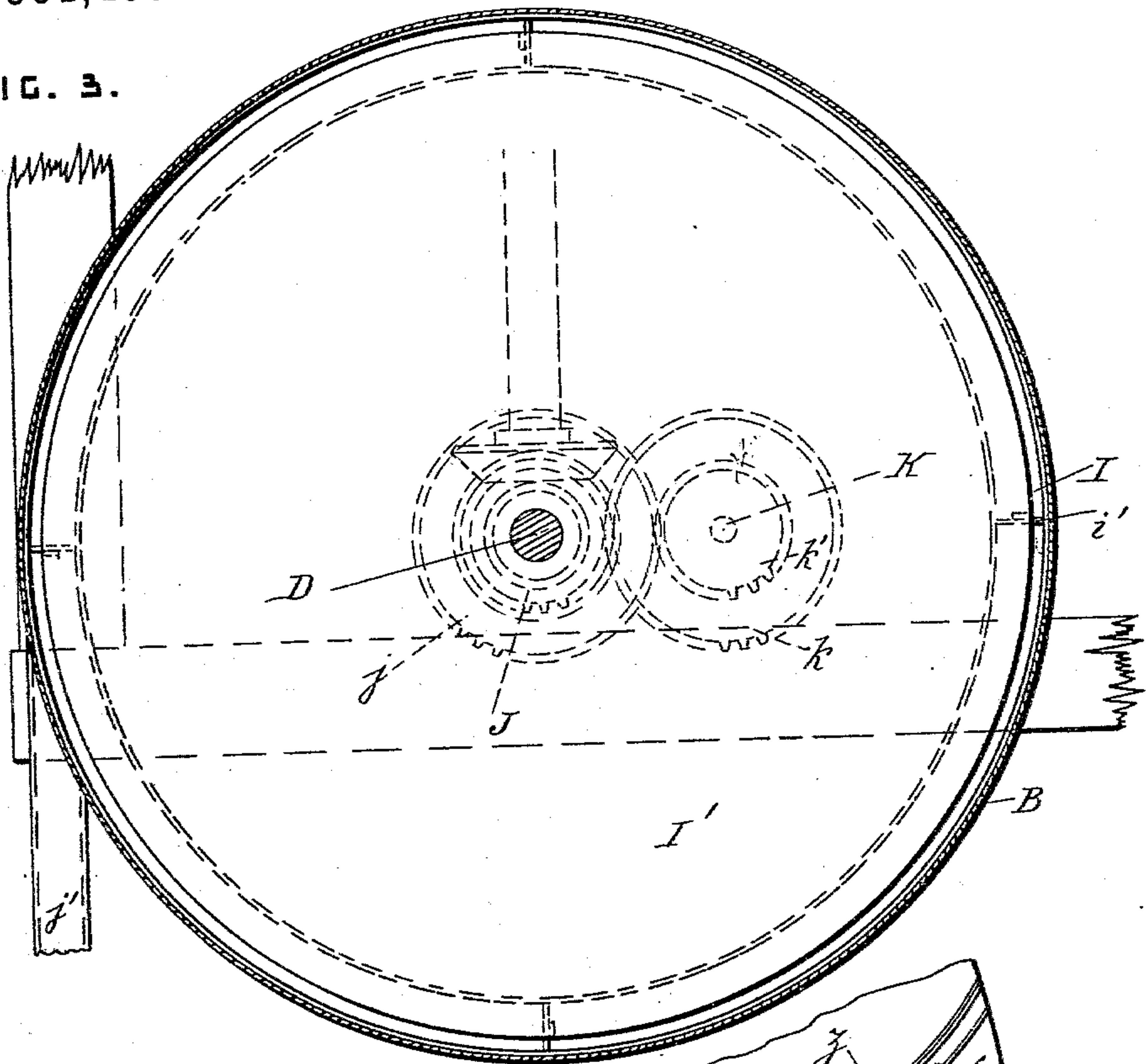


FIG. 4.

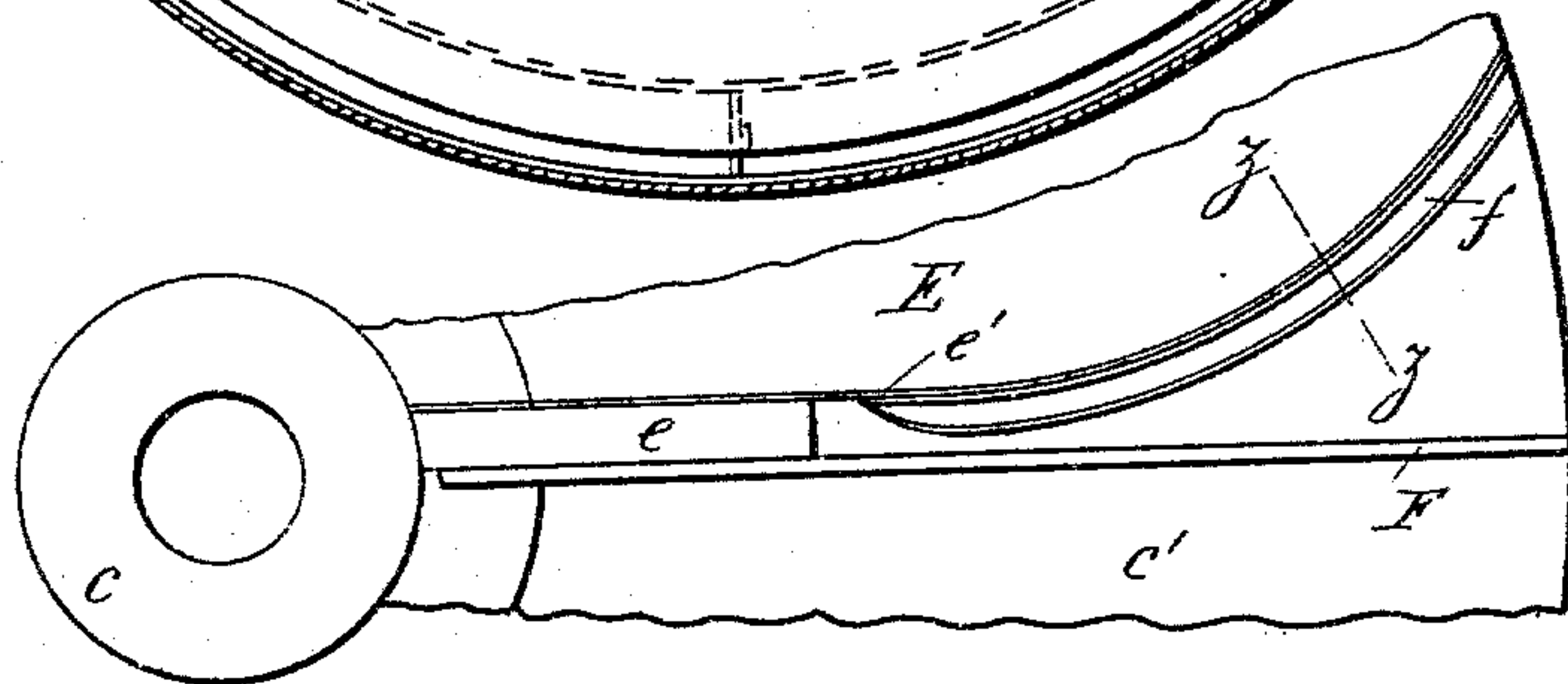
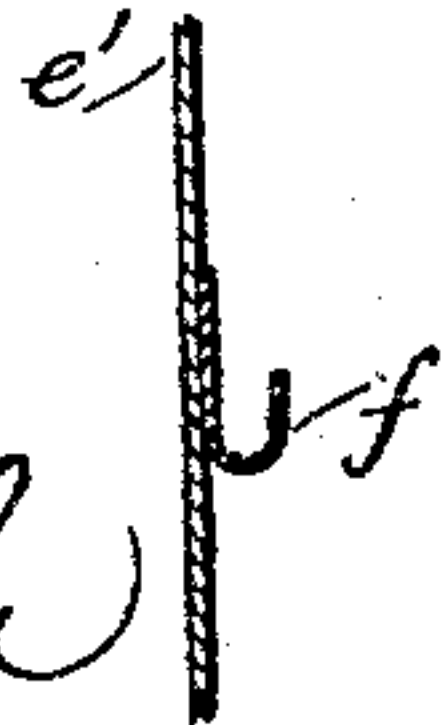


FIG. 5.



FIG. 6.



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UNITED STATES PATENT OFFICE.

FRANK F. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

CENTRIFUGAL GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 551,499, dated December 17, 1895.

Application filed August 27, 1895. Serial No. 560,642. (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 a centrifugal grain-separator constructed according to this invention. Fig. 2 is a sectional plan view taken on the line *xx* in Fig. 1. Fig. 3 is a sectional plan view taken on the line *yy* in Fig. 1. Fig. 4 is a detail plan view of a part of the separating-reel drawn to a larger scale. Fig. 5 is a front view of the same. Fig. 6 is a cross-section taken on the line *zz* in Fig. 4.

A is a thrashing-cylinder. A' is its concave, and *a* is a zigzag curved grate behind the concave. These parts are of any approved construction.

B is a cylindrical case having a concave portion *b* at its top, and a downwardly-inclined mouthpiece *b'*.

B' is a cover extending over the top of the case, and S is a grate arranged horizontally between the top of the grate *a* and the top of the case B.

C is a circular separating-chamber supported in the upper part of the case B. This chamber is preferably conical, and its larger end is at the bottom.

C' is a downwardly-inclined conical deflector secured to the bottom of the chamber C and projecting outward at an angle of about forty-five degrees.

D is a vertical shaft journaled in the bearing *d* and step *d'*, centrally of the separating-chamber. Rotary motion is preferably imparted to this shaft from the shaft of the thrashing-cylinder by intermediate driving mechanism of any approved construction.

E is the separating-reel provided with a hub *c* secured on the shaft D, and having a

horizontal disk *c'* at about the bottom of the separating-chamber. The hub *c* is provided with vertical flanges *e*, and *e'* are rearwardly-curved arms secured to the said flanges. F are radial bars secured to the said flanges *e* in front of the arms *e'* and at a little distance from them. The bars F are arranged in series, and at such a distance apart that the straw will not readily pass between them. Each arm *e'* is provided with a curved trough *f* extending from its lower edge near the flange *e*, upward at an angle of about forty-five degrees, to its upper corner, which is substantially level with the top of the separating-chamber. The trough is secured to the face of the arm between it and the bars F in front of it.

G are guide-fingers secured at the lower edge of the separating-chamber. These guide-fingers project downwardly and inwardly, and are also inclined, in the direction of the rotation of the reel, at an angle of about forty-five degrees.

H is the casing for the discharger H', supported in the case B below the separating-chamber, and provided with a delivery-pipe *h* at its periphery and a circular inlet-opening *h'* at its top. The discharger H' consists of a hub, a disk *g* at its lower part, and radial arms *g'* secured on the shaft D inside the discharger-casing.

I is an annular trough in the lower part of the case B at its periphery.

I' is a disk or its equivalent, such as radial arms. This disk is journaled on the shaft D, and has wings *i'* depending from it within the trough I. The disk I' is revolved at a lesser speed than the discharger.

J is a toothed pinion secured on the shaft D, and *j* is a toothed wheel secured on the hub *i*.

K is a vertical shaft secured parallel with the shaft D. A toothed wheel *k* and a toothed pinion *k'* are secured together and are journaled on the shaft K. The pinion J gears into the wheel *k*, and the pinion *k'* gears into the wheel *j*. A spout *j'* is provided at one point of the periphery of the trough I.

M is an inclined grate consisting of inclined plates arranged one above the other in the form of steps. This grate extends from the concave to the trough I, and *m* is an opening

in the case B, above the trough I and at the bottom of the grate M.

The operation of the machine is as follows: The unthrashed grain is fed between the cylinder and the concave in the usual manner. Most of the grains leave the straw and fall through the concave and the grate *a*. The discharger draws a strong current of air through the machine in the direction of the arrows in the drawings. The grains slide down the grate M and fall into the trough I, and the chaff and rubbish are drawn upward toward the separating-chamber. The straw, which still has some grains mixed with it, passes over the grate S and is drawn downward through the mouthpiece of the case B. The straw is caught by the radial bars F and is whirled around in the separating-chamber. The grains are separated from the straw by centrifugal force and are deflected downward by the periphery of the chamber C and the deflector C'. Some of the small straw, chaff and grains pass between the bars F, and the grains are caught by the troughs on the arms of the reel. The grains which drop into the troughs *f* are carried up by them and are discharged over the top of the separating-chamber. The grains from the separating-chamber fall into the trough I, passing between the discharger-casing and the periphery of the case B, and are discharged from the said trough out of the spout *j'* by the winged disk I'. The straw and chaff from the separating-chamber are guided into the inlet-opening *h'* of the discharger by the guide-fingers G. The straw is whirled around by the discharger and is forced out of the delivery-pipe of its casing.

What I claim is—

1. The combination, with a thrashing cylinder, its concave, and a curved grate behind the concave; of a centrifugal separator having a trough for the grains at its lower part, a horizontal grate arranged between the said curved grate and the entrance to the said separator, and an inclined grate consisting of plates arranged in the form of steps, extending under the said concave and grates and communicating with the said trough, substantially as set forth.

2. The combination, with a cylindrical case having a trough for the grains at the lower part of its periphery, of a vertical shaft arranged centrally of the said case, centrifugal grain separating devices supported in the upper part of the said case and driven from the said shaft, a centrifugal straw discharger supported in the said case between the said trough and separating devices and driven by the said shaft, and to discharge the straw, and a disk driven from the said shaft and provided with wings running in the said trough and operating to discharge the grains, substantially as set forth.

3. The combination, with a cylindrical case having a trough for the grains at the lower part of its periphery, of a vertical shaft arranged centrally of the said case, centrifugal grain separating devices supported in the upper part of the said case and driven from the said shaft, a centrifugal straw discharger supported in the said case between the said trough and separating devices and driven by the said shaft, and to discharge the straw, a disk journaled on the said shaft and provided with wings running in the said trough, and intermediate driving mechanism operating to revolve the said disk from the said shaft and at a lesser speed, substantially as set forth.

4. The combination, with a circular separating chamber, of a revoluble reel provided with arms having upwardly inclined discharge spouts on their faces, and series of horizontal bars arranged radially at a little distance in front of their faces, substantially as set forth.

5. The combination, with a circular separating chamber, of a revoluble reel provided with rearwardly curved arms having curved and upwardly inclined discharge spouts on their faces, and series of radial bars arranged at a little distance in front of their faces, substantially as set forth.

6. The combination, with a conical separating chamber, larger at the bottom, and inwardly and downwardly inclined guide fingers at the bottom of the said chamber; of means for whirling around the straw in the said chamber, substantially as set forth.

7. The combination, with a conical separating chamber, larger at the bottom, and inwardly inclined straw guide fingers and an outwardly inclined deflector secured at the bottom of the said chamber; of a revoluble reel provided with arms, and having a disk arranged below the said arms at the bottom of the said chamber, substantially as set forth.

8. The combination, with a cylindrical case having a central opening and a concave portion at its top, of a circular separating chamber open at the top and bottom and supported under the said concave portion, inwardly and downwardly inclined guide fingers secured to the bottom edge of the said chamber, means for whirling around the straw in the said chamber, and a centrifugal straw discharger and its casing supported in the said case below the said chamber, a passage for the grains being formed between the said discharger casing and the periphery of the said case, substantially as set forth.

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

FRANK F. LANDIS.

Witnesses:

T. S. CUNNINGHAM,
M. F. NEWMAN.