

No. 674,350.

Patented May 14, 1901.

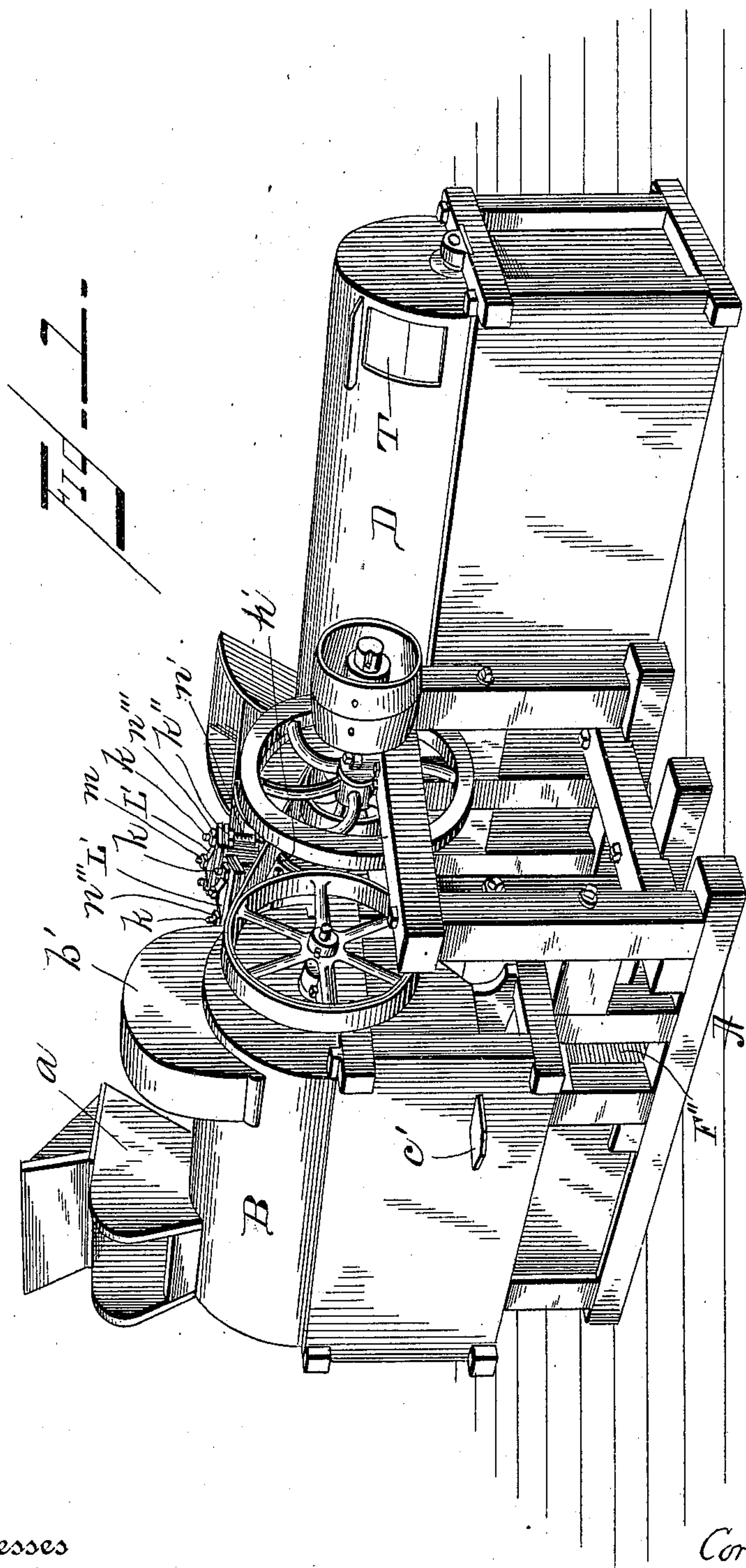
C. YOUNG.

COTTON SEED HULLER, CLEANER, AND SEPARATOR.

(Application filed Nov. 15, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses
Marcus L. Byng.
G. M. Anderson

Inventor
Cornelius Young
by E. W. Anderson
his Attorney

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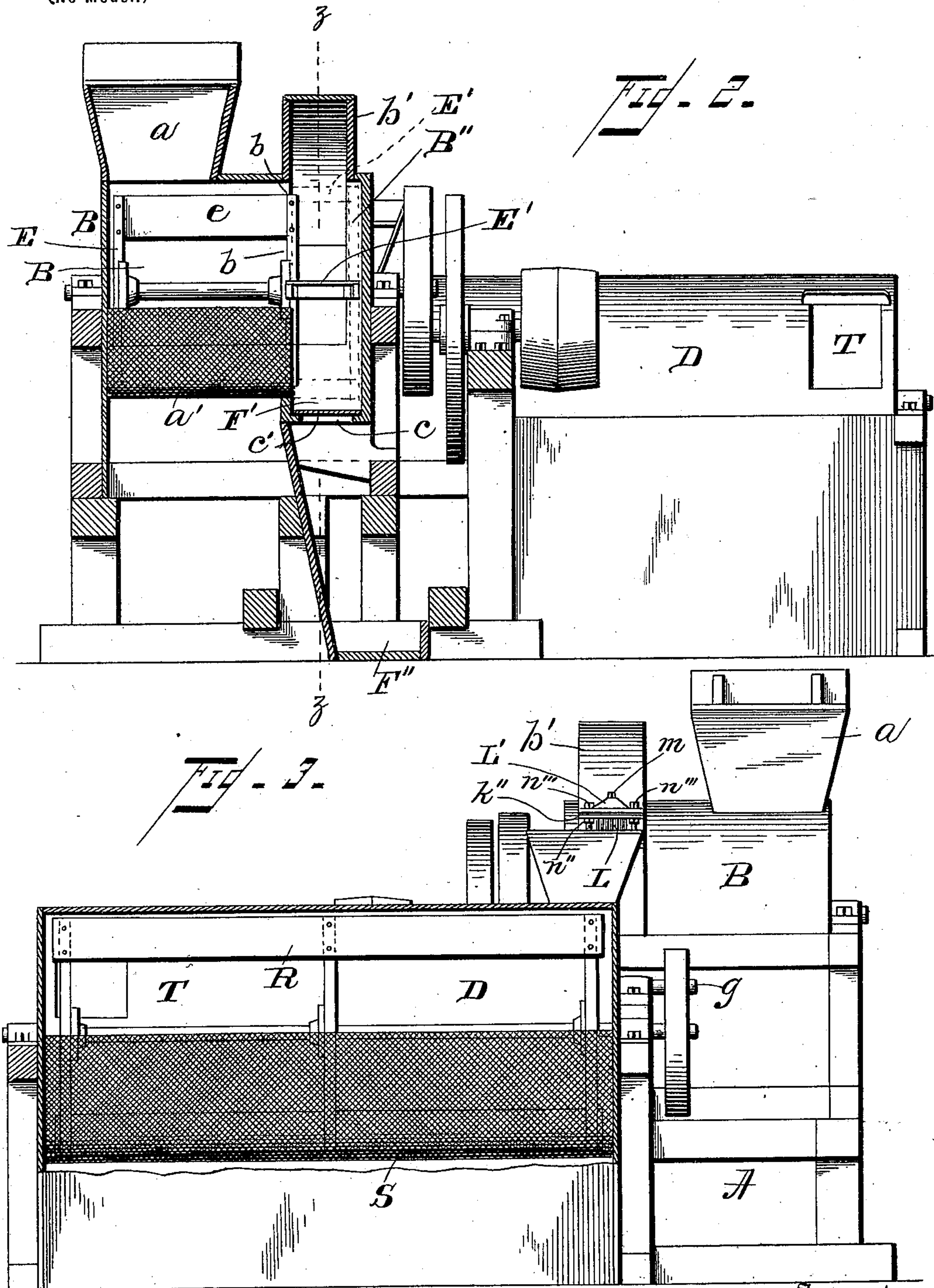
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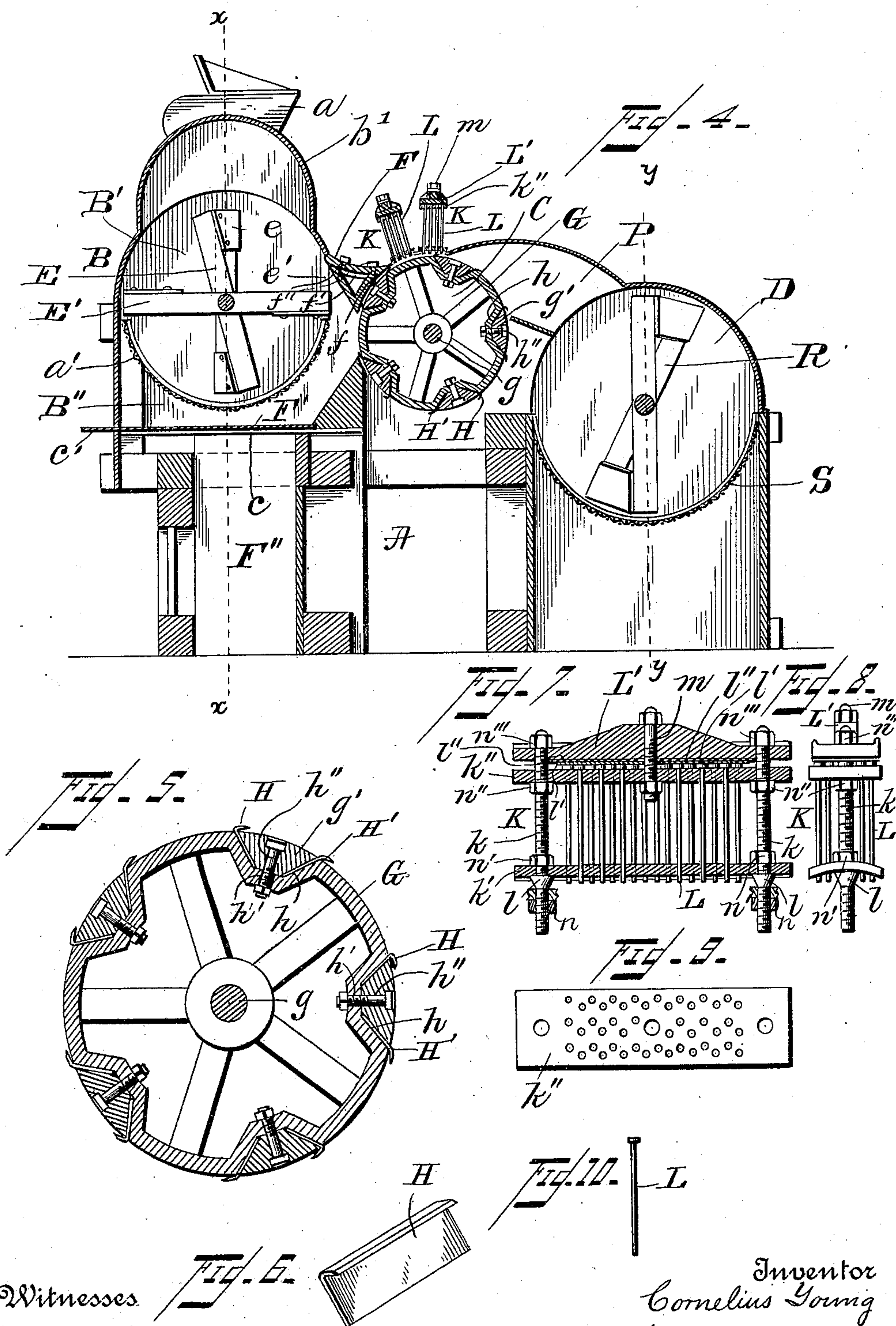
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Marcus L. Byng
M Anderson

Inventor
Cornelius Young
by E. W. Anderson
his Attorney

UNITED STATES PATENT OFFICE.

CORNELIUS YOUNG, OF SELMA, ALABAMA, ASSIGNOR TO COTTON STATES
MACHINERY COMPANY, OF SAME PLACE.

COTTON-SEED HULLER, CLEANER, AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 674,350, dated May 14, 1901.

Application filed November 15, 1899. Serial No. 737,053. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS YOUNG, a citizen of the United States, and a resident of Selma, in the county of Dallas and State of Alabama, have invented certain new and useful Improvements in Cotton-Seed Hullers, Cleaners, and Separators; 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 letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view of the invention. Fig. 2 is a section on the line xx , Fig. 4. Fig. 3 is a section on the line yy , Fig. 4. Fig. 4 is a section on the line zz , Fig. 1. Fig. 5 is a detail sectional view of the grinding or cutting roller. Fig. 6 is a detail view of one of the knives. Figs. 7 and 8 are detail views of the concave. Fig. 9 is a detail view of the outer concave plate. Fig. 10 is a detail view of one of the grinding-teeth.

This invention has relation mainly to improvements in mills for cleaning and reducing cotton-seed and separating the hulls from the meal; and it consists in the novel construction and combinations of parts, as hereinafter set forth.

In the accompanying drawings the letter A designates the framework of the mechanism.

B represents the cleaner and feeder.

C indicates the grinding and reducing mechanism, and D the separator.

The cleaner and feeder B consists of a first compartment B' , into which the seed are fed through a hopper a , said compartment being provided with a screen-bottom a' , through which light stuff is driven off by the action of the beating-reel E, whose blades e are placed somewhat obliquely to the axis of the compartment B' around the central shaft e' or in such a manner as to cause the feed to flow toward the lateral opening b into the second compartment B'' . This compartment is of larger diameter and somewhat deeper than compartment B' , and its upper portion is higher, forming a dome or raised portion b' . In the bottom of this compartment, below the beaters thereof and below the

screen a' , is a basin or pocket F' , provided with a slide-bottom c' , which when withdrawn precipitates the contents of such pocket into a receiver F'' . A feeding-reel E' is provided upon an extension of shaft e' in this compartment, which agitates the material flowing into it from the compartment B' and forces the seed toward the reducing-cylinder, which is exposed in this compartment at the opening e' . A block F, of substantially triangular prismatic form, is provided between the compartment B'' and the reducing-cylinder and forms the top or cover of the space therebetween. This block has a concave cylindrical surface in close relation to the reducing-cylinder and acting to closely confine the seed to the knives thereof in approaching or feeding to the concaves K for the purpose of a positive reducing effect. This block is adjustable for the purpose of taking up wear, &c., and acts also as a guard or fender to prevent injurious extraneous matter from being carried to the concaves. The seed in the compartment B'' is thrown by the beaters therein against the wall f and is deflected therefrom upon the cylinder G. This wall f of the feed-block forms the top of the passage through which the seed is thrown from the beater-compartment to the reducing-cylinder, said passage having a substantially tangential relation with respect to both said compartment and cylinder. The block may be adjusted to work closer to the reducing-cylinder by placing packing f' between its upper surface and that of the framework, to which the feed-block is secured by means of suitable screws or bolts f'' . Extraneous matter—such as gravel, stems, and particles of iron—is designed to fall during the agitation of the contents of this compartment into its bottom portion or basin F' , from which such matter may be discharged into a receiver F'' at such time as it may be desired by withdrawing the slide c' , this separation of such heavy extraneous matter being rendered more complete by the dome b' , into which it will be thrown by the beaters, thus checking its velocity and facilitating its fall into pocket F' .

The grinding or reducing compartment is cylindrical and is provided with a grinding or cutting roller G, working therein, and the

concaves K K, which are secured to the framework. The roller G on the shaft *g* is formed with longitudinal recesses *h*, the walls of which are double inclined or beveled in each direction and the bottom of which is flat and provided with perforations *h'* for the reception of bolts *h''*, the heads of which are countersunk. Secured by these bolts in said recesses are the V-form bars *g'*, by which the knives H and H' are secured in oppositely-inclined position. Each knife consists of a plate of high-grade steel which should be capable of being bent cold. The body of each knife being held clamped between the sloping bearing of the recess *h* and the beveled side of the bar *g'* at an angle of about forty-five degrees, the bent cutting edges are designed to have a low inclination beyond the roller-surface, rising therefrom to a height less than the thickness of a cotton-seed or so that a disintegration of the seed will be effected. The forward knife of each set having its cutting-flange bent at a lower angle with the plane of the body of the knife than is the case with the rear knife of the same set has a more positive action. When the cutting-flanges are worn out, the knives may be removed and straightened and then sharpened and rebent.

The concaves K K are secured to the framing by means of suitable bolts *k k*, which also hold parts of the concaves together. Each bolt is provided with a shoulder at *l* and is threaded above and below said shoulder. On the shoulder rests the perforated concave plate *k'*, and through the perforation of this plate project the ends of the grinding-teeth L, which consist of round steel nails having flat flange-heads. The outer plate *k''* of the concave is correspondingly perforated to receive these grinding-nails, the flange-heads of which rest against its outer surface. A steel projecting plate *l'* is placed on the heads of the teeth, and upon this rests the cast-iron cap-plate L'. Usually a cushion-piece of yielding material (leather or thin wood *l''*) is placed between the cap-plate L' and the steel plate *l'* in order to provide against too great rigidity of the points of the grinding-teeth in their work.

The plates *k'*, *k''*, and L' are held together and to the framework by the bolts *k k*, which pass through perforations in the ends of said plates. A nut *n*, engaging that end of the bolt *k* below its shoulder, secures it to the frame. A nut *n'* above the concave plate *k'* holds it to position. A nut *n''* below the perforated plate *k''* holds the latter plate in place and a nut *n'''* holds the cap-plate down. To prevent vibration of the middle portion of the perforated plate *k''*, a short bolt *m* holds it to the middle portion of the cap-plate. The teeth can be adjusted to project more by loosening the nuts under the perforated plate *k''* and tightening those on the cap-plate. Reverse manipulation of these nuts will shorten the projecting ends of the teeth.

The material disintegrated by passing between the concaves and the knife-roller, which revolves at a high rate of speed, is thrown through the passage or spout P into the separator D, whereof the lower portion D' is separated from the upper portion D'' by means of a concave or semicylindrical screen S, designed to allow the meal to pass through its meshes into the lower part. The reel R is designed to be provided with spiral blades or such as will cause a gradual movement of the material toward the outer end of the separator, where the hulls are discharged, an opening at *t* being provided for this purpose.

In the operation of the invention the seed is fed to compartment B', and while being fed endwise thereof the beaters therein act to drive chaff and other light stuff, sand, and small gravel through the screen, nails, large gravel, &c., traveling with the seed into compartment B'', when they drop into pocket F', thus thoroughly cleaning the seed and saving the knives of the reducing-cylinder and the concaves from injury.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine of the character described, the combination of the cleaner-compartment having an open end, a screen-bottom, a central shaft carrying beater-blades, means for effecting a feed of the seed endwise of said compartment, a feed-compartment in line with said cleaner-compartment, and communicating therewith through such open end, the shaft in said feed-compartment in line with said first-named shaft, and carrying beater-blades, said feed-compartment having a space or pocket below its beater-blades, and below said screen-bottom of the cleaner-compartment, and reducing mechanism in communication with said feed-compartment, substantially as specified.

2. In a machine of the character described, the combination of the cleaner-compartment having an open end, a screen-bottom, a central shaft carrying beater-blades arranged to effect a feed of the seed endwise of said compartment, a feed-compartment in line with said cleaner-compartment and communicating therewith through such open end, the shaft in said feed-compartment in line with said first-named shaft, and carrying the beater-blades, said feed-compartment having a space or pocket below its beaters, and below the screen-bottom of the cleaner-compartment, reducing mechanism in communication with said feed-compartment, and a separator-chamber having beaters and communicating with said reducing mechanism, substantially as specified.

3. In a machine of the character described, the combination with the cleaner-compartment having the screen-bottom, means for beating and for effecting a feed of the seed endwise of said compartment, a feed-compartment in line with said cleaner-compartment,

communicating therewith, having means for beating the seed therein, and having a space or pocket below such last-named means and below the screen-bottom of the cleaner-compartment, said feed-compartment having also an upper extension or dome into which any heavy extraneous matter mixed with the seed is thrown to check its speed and facilitate its fall, and reducing mechanism in communication with said feed-compartment, substantially as specified.

4. In a reducing-mill, a cylinder provided with knives having their working edges inclined toward said cylinder, and separated therefrom by a space or interval less than the thickness of the seed to be operated upon, a concave for said cylinder, and an adjustable block having a concave cylindrical surface in close relation to the reducing-cylinder and inclosing the approach to said concave, substantially as specified.

5. In a reducing-mill, a cylinder provided with knives having their working edges inclined toward said cylinder, and separated therefrom by a space or interval less than the thickness of the seed to be operated upon, a concave for said cylinder, and a feed-block of substantially triangular prismatic form, between said compartment and cylinder, and having a concave cylindrical surface in close relation to said cylinder and inclosing the approach to said concave, and means for adjusting said block, substantially as specified.

6. In a reducing-mill, the combination of the cleaner-compartment, having a screen-bottom, means for beating the seed in said compartment and for feeding the seed endwise thereof, a feed-compartment in line with said cleaner-compartment, communicating therewith, having beaters, and having a space or pocket below the beaters thereof, and below such screen, a reducing-cylinder in com-

munication with said feed-compartment, provided with knives having their working edges inclined toward said cylinder and separated therefrom by a space or interval less than the thickness of the seed to be operated upon, a concave for said cylinder, and an adjustable feed-block having a concave cylindrical surface in close relation to the reducing-cylinder, and inclosing the approach to said concave, substantially as specified.

7. A reducing-mill concave, consisting of a concave perforated plate, and a perforated plate arranged radially outward therefrom, steel nails extending through said perforated plates, a steel protector-plate bearing on the heads of the nails, a cap-plate, and a cushion between said cap-plate and protector-plate, and bolts and adjusting-nuts, substantially as specified.

8. In a reducing-mill, the combination with the reducing-cylinder and its knives, of the incasement, the concave perforated plate, the outer perforated plate spaced from said first-named plate, the headed pins passing through the perforations of both said plates, means for cushioning said pins and for protecting said cushions, and means for adjusting said pins, substantially as specified.

9. In a reducing-mill, the combination with the reducing-cylinder and the knives, of the incasement, the concave perforated plate, the outer perforated plate, the steel pins, the cap-plate, the cushion, the steel protector-plate, and the securing-bolts and adjusting-nuts, substantially as specified.

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

CORNELIUS YOUNG.

Witnesses:

H. F. COOPER,
ROBT. W. YOUNG.