(No Model.) 2 Sheets—Sheet 1.

T. A. JACKSON.

COTTON SEED SEPARATING MACHINE.

No. 520,315. Patented May 22, 1894.

Fig. 1.

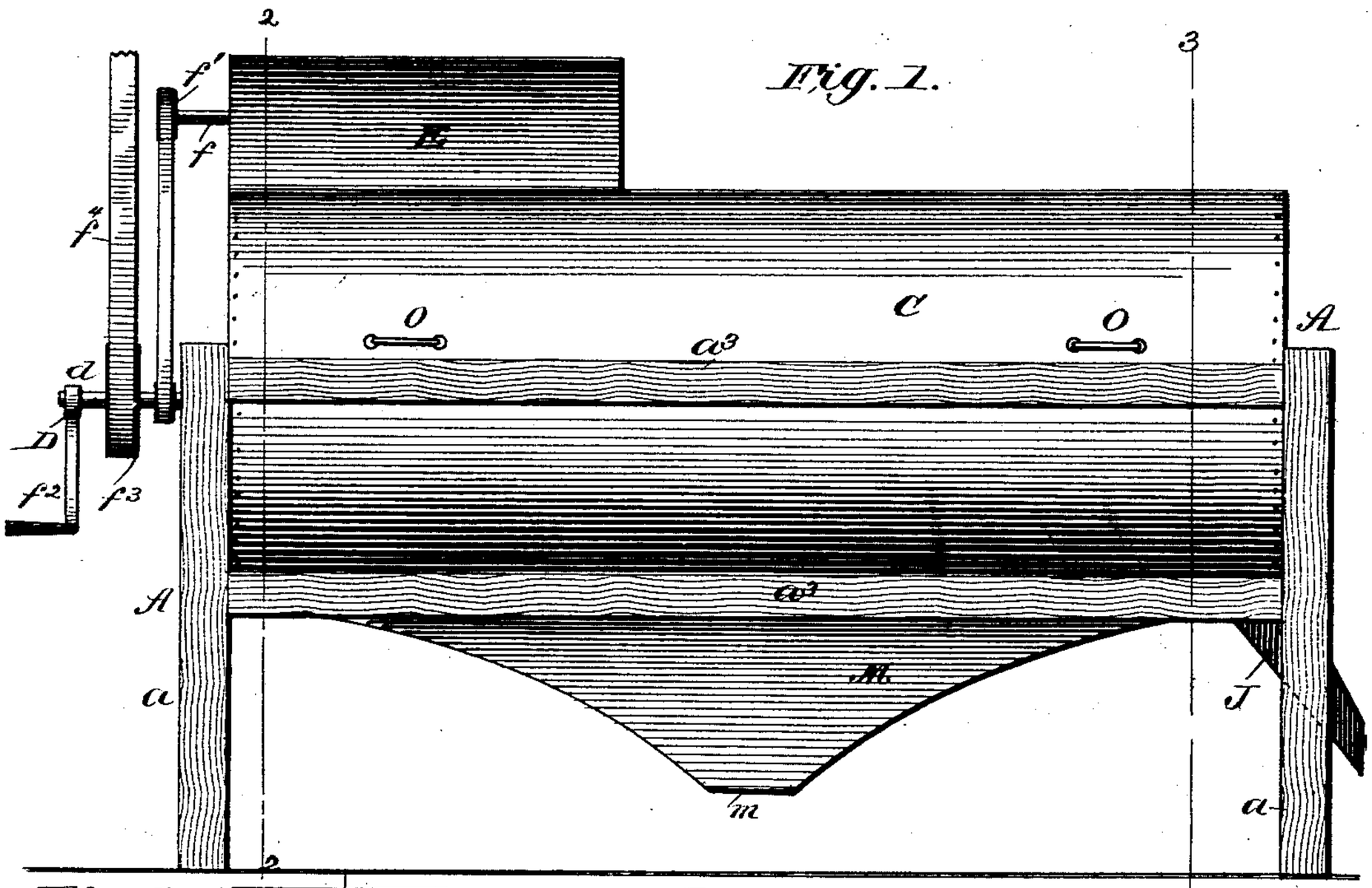


Fig. 5.

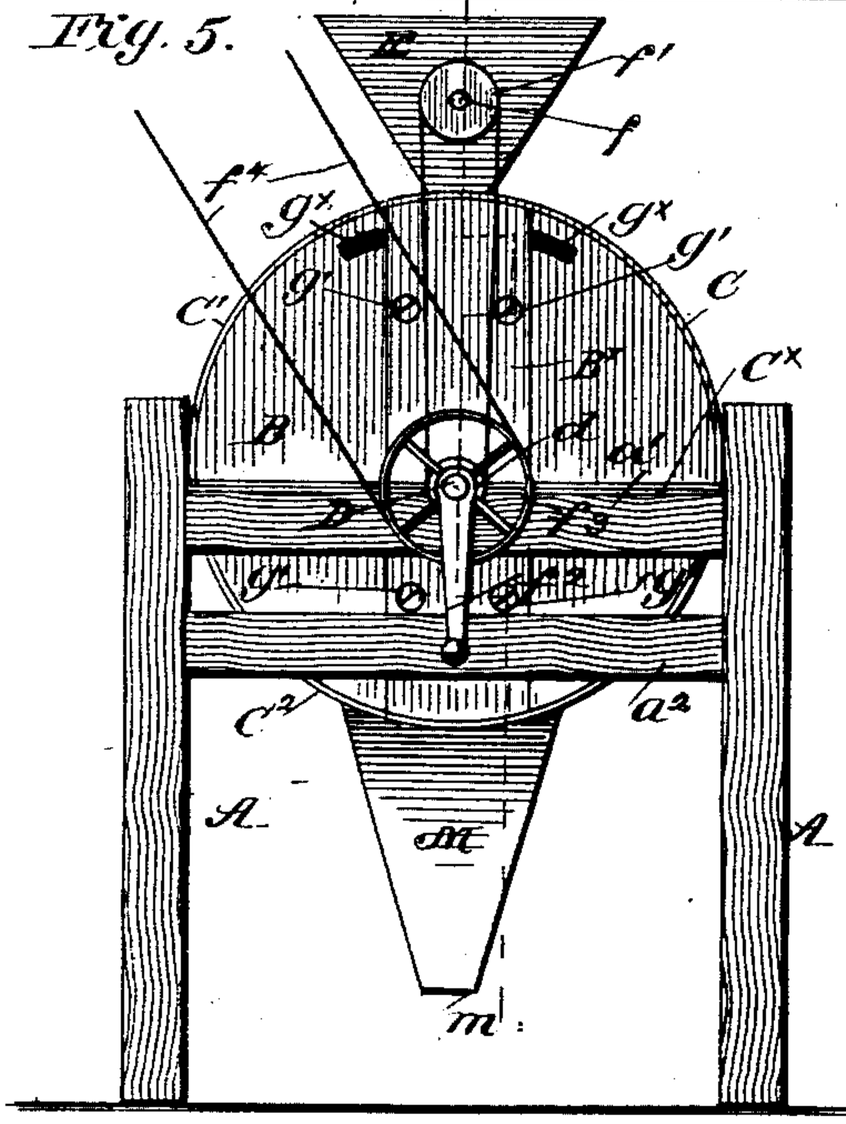
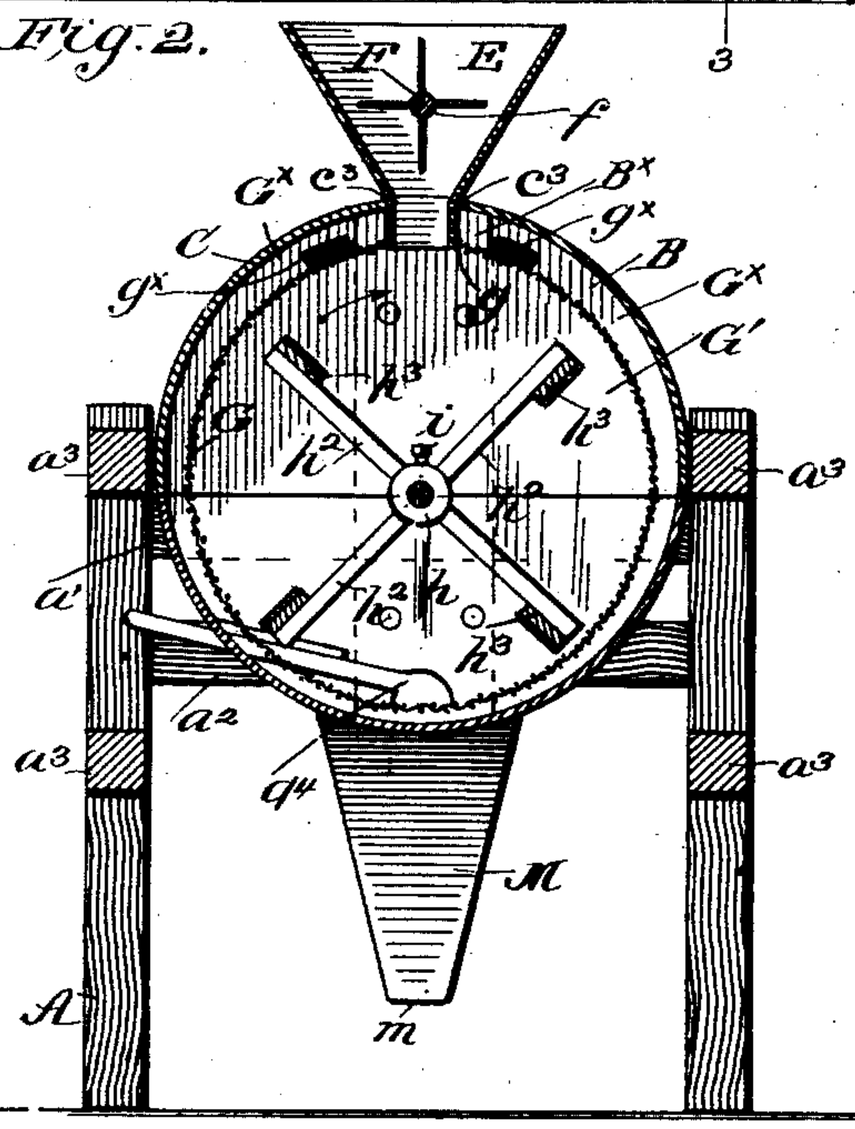


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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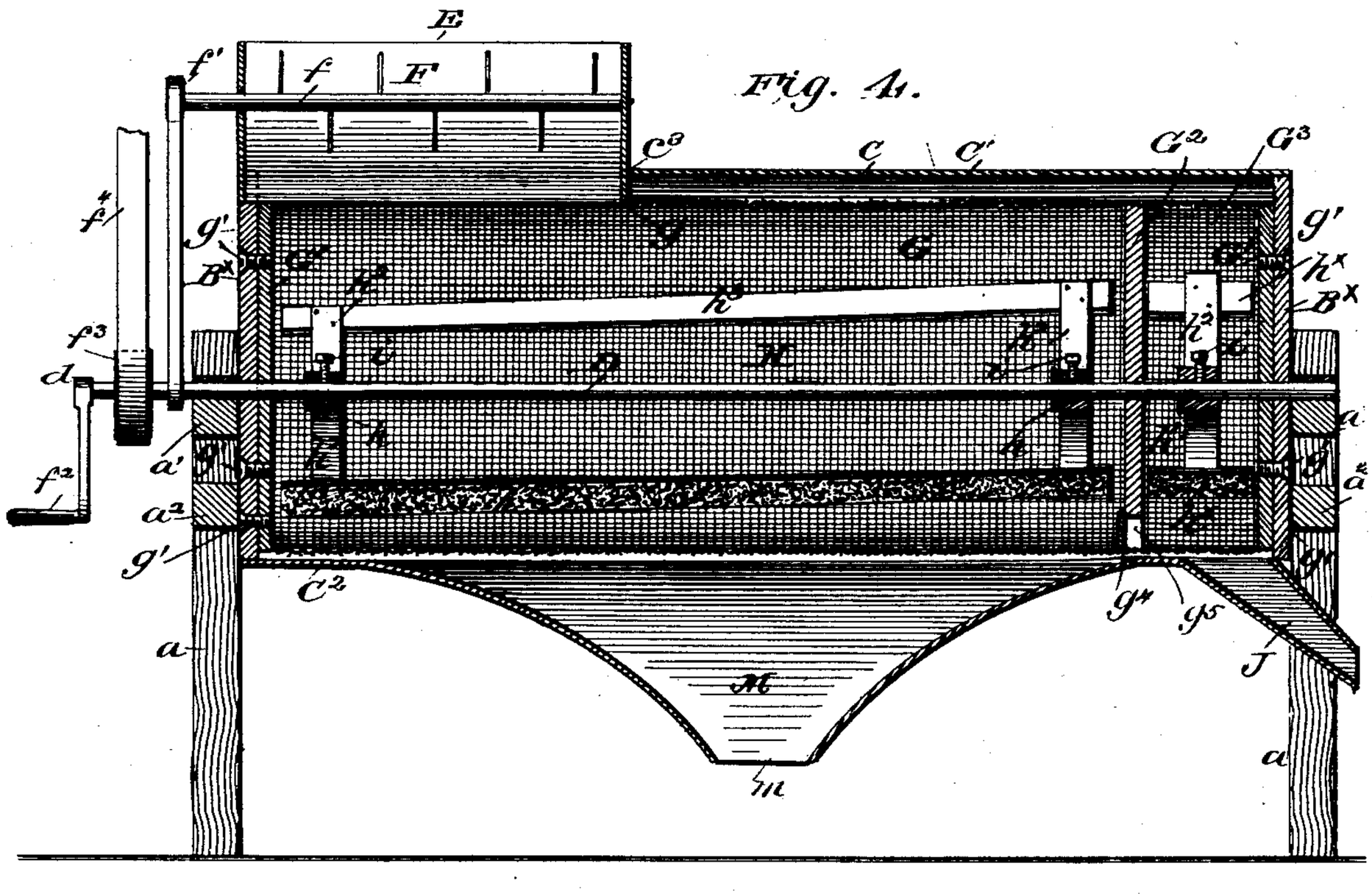


Fig. 3.

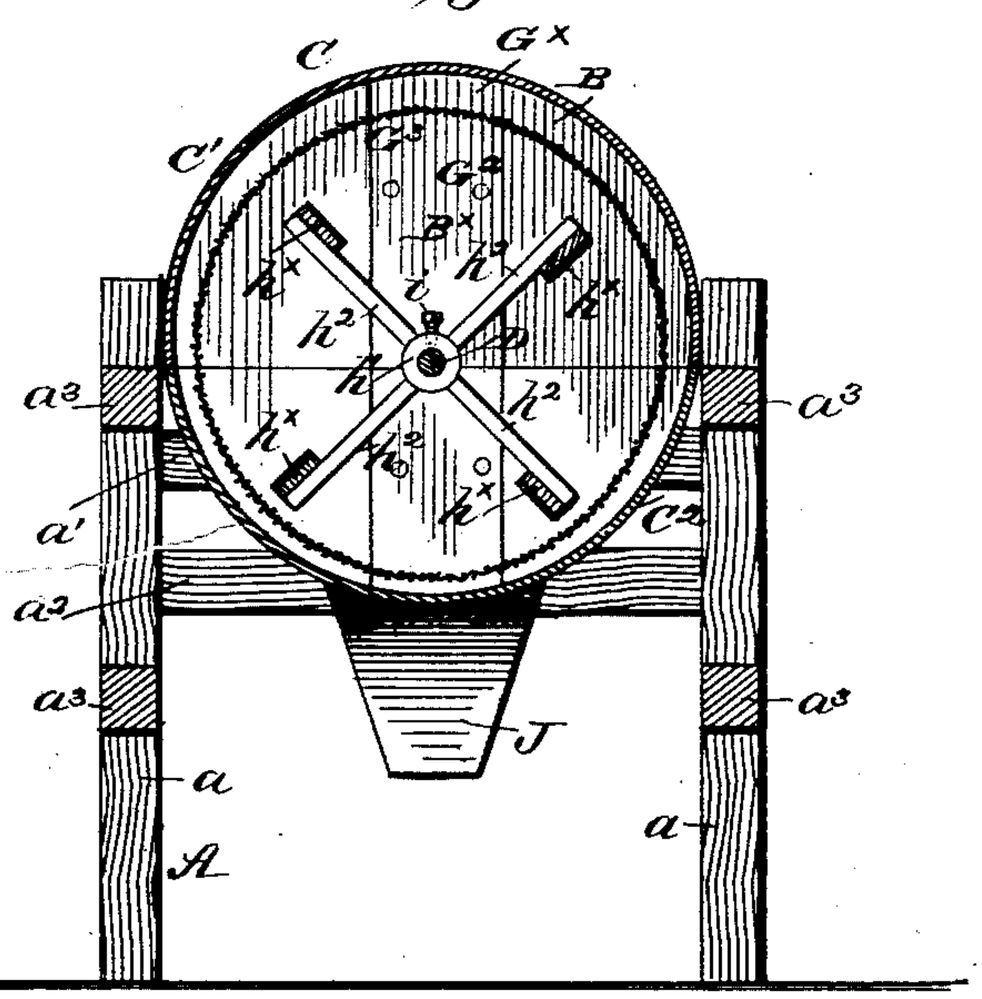
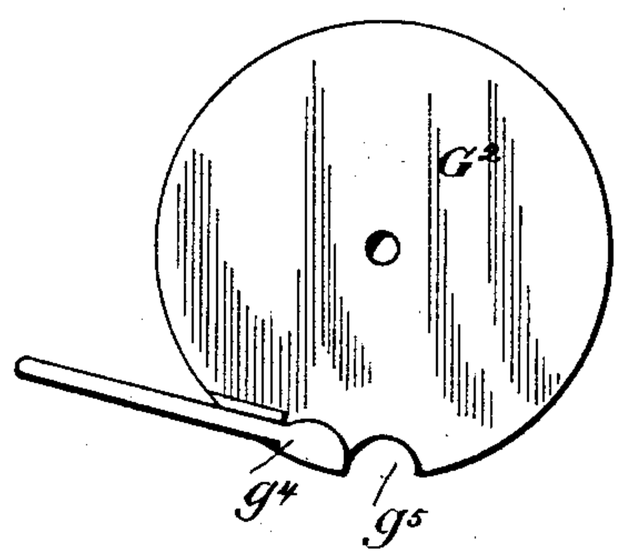


Fig. 6.



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UNITED STATES PATENT OFFICE.

THOMAS A. JACKSON, OF EASTON, GEORGIA.

COTTON-SEED-SEPARATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 520,315, dated May 22, 1894.

Application filed November 18, 1893. Serial No. 491,324. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. JACKSON, of Easton, in the county of Fulton and State of Georgia, have invented a new and Improved Cotton-Seed-Separating Machine, of which the following is a specification.

My invention more especially refers to a machine for separating the imperfect cotton seed from the perfect seed, and it has primarily for its object to provide a machine of this character simple and compact in construction, easily manipulated, and very effective for its desired purpose.

It has also for its object to provide means whereby the smaller or imperfect seed can be quickly separated from the larger or perfect seed, without being crushed or broken, and at the same time removed with such imperfect seed all the dust and lint or other impurities from the perfect seed.

Furthermore it has for its object to provide a seed separator, in which the use of rotary screens and rotary blast fans having side suction is dispensed with, and in which a fixed screening body having air inlets at its feed end is provided, whereby a greater air force can be attained, than is usually obtained in the ordinary rotary screen mechanisms.

With other minor objects in view, which will hereinafter be referred to, the invention consists in such novel construction and peculiar combination of parts, first described in detail and then specifically pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved separator. Fig. 2 is a transverse vertical section of the same on the line 2—2 Fig. 1. Fig. 3 is a similar view on the line 3—3 Fig. 1. Fig. 4 is a central longitudinal section of the same. Fig. 5 is an end view taken from the feed end and Fig. 6 is a view of the division disk hereinafter referred to.

In its practical construction, my improved machine comprises a frame A, which consists of end legs a connected by transverse beams a' a^2 and longitudinal beams a^3. At each end of the frame is secured a disk B, preferably of wood, about which are secured the ends of a longitudinal cylinder C or outer casing formed of sheet metal, preferably galvanized iron. It will be noticed by reference to Fig. 5 that the cylinder C is set on the frame A, in such a manner, that its center will be at a point above the upper cross beams a', whereby the main drive shaft D, preferably more particularly referred to can be journaled on the tops of such beams a', as at d, and to pass eccentrically through such cylinder C. This cylinder may be of a single sheet, or of two sections, an upper one C′ and a lower one C^2, the lower one being in practice of a diameter of about four inches less than the upper section whereby the meeting ends of such cylinder are at a point marked C in Fig. 5 to facilitate the securing of the cylinder on the frame. The upper section of cylinder C has at its front end in its top a longitudinal slot c^3 through which projects the nozzle or lower end of a feed hopper E, in which is held a stirrer F of any ordinary construction, the shaft f of which projects at the front and has a belt pulley f', which is belted with the main drive shaft D, which in turn has a crank handle f^2 or a pulley f^3 to receive the main drive belt f^4, as clearly shown in Figs. 1 and 4.

Referring now more particularly to Figs. 2 and 4 of the drawings, it will be noticed that the lower end of the hopper E connects with a longitudinal opening g in a fixed separating or screen cylinder G, which is composed of woven wire of a mesh, large enough to allow for the passage of an imperfect or small seed but to retard the passage of a large and perfect seed. This screening cylinder has solid wooden ends G′ which are rigidly connected with the end disks B B by screws g' as shown in Fig. 4. It will be noticed by reference to Fig. 2 that the inner or screen cylinder G is mounted eccentric to the outer casing, its bottom being disposed closely to the bottom of such casing while its upper end is some distance therefrom, such arrangement, providing as it were, an air space $G^\times$ at the upper end which gradually decreases toward the bottom, and such air chamber $G^\times$ has inlets $g^\times$ $g^\times$ which extend through the end disks near the top as shown in such Fig. 2 and Fig. 5.

By arranging the screening cylinder as stated, the chamber $G^\times$ will have its largest area at the feed or upper end, and by providing the openings $g^\times$, at such end additional air inlets are provided, which, with the air drawn down through the hopper, will produce a large

volume of air at such point, which will be forced down and outward into the gradually decreasing chamber $G^{\times}$, and thereby produce a gradually increased blast, which will serve to the more effectively separate the defective seed and impurities, than could be done, were such cylinder arranged concentric.

Referring now more particularly to Fig. 4, it will be noticed that the discharge end of the inner cylinder G has a division plate G^2, whereby a supplemental screening chamber G^3 is formed, which is held in communication with or closed off from the main separating portion, by means of a valve g^4, held to operate over an opening g^5, in the lower edge of the plate G^2, (see Fig. 6.)

H indicates a combined rotary agitator and conveyer device, which consists of hubs h fitted on the shaft D to turn therewith, two of such hubs h being disposed in the main separating portion of cylinder G, while a single hub h' is held thereon in the supplemental chamber. From the hubs h project radial arms h^2 which are connected by longitudinal blades h^3 provided on their beating or lifting face with a strip of rubber or other yielding material h^4 whereby the seed will be protected from injury as they are struck by the blades h^3. The hub h' also has radial arms h^2 on the ends of which short blades $h^{\times}$ are fitted as shown.

It will be noticed by referring to Fig. 2 that the hubs h are adjustably fitted on the shaft D by means of the set screws i, whereby they can be differently set on the shaft, to give the blades h^3 a slightly twisted or spiral curve from the feed toward the discharge end, whereby such blades will serve to impart a spiral forward movement to the seed to gradually feed it to the discharge end. It will also be observed in such Fig. 2 that, the agitator device is concentrically mounted on shaft D, while such shaft is eccentrically passed through the cylinder G. By such construction the arms h^2 h^2 and blades h^2 $h^{\times}$ are caused to travel closely to the bottom of such screen and some distance away from the same at the top, whereby to the more effectively carry the seed and other accumulations from the bottom to the top of the screen cylinder.

I desire it understood that the eccentric relation of the outer and inner cylinders and the rotary agitator forms an essential feature of this invention, in that, by such construction and arrangement of parts, a better and quicker separation of the seed is effected, by providing an increased area of air volume at the upper or feed end of the machine, and contracting such air volume or space at the bottom where it is desired the accumulations should concentrate to be the more readily elevated by the blades of the agitator.

In practice the agitator is rotated in the direction indicated by the arrow in Fig. 2, and it follows that as the material is carried up by the blades into the upper or blast portion proper, the impurities and small seed will by the centrifugal action of the blades and the air blast be forced out through the meshes of the inner cylinder into the space between it and the outer cylinder, from which they drop down into a chamber M, extended longitudinally across the bottom of the machine, and discharge through its contracted mouth m. A further advantage in having the inner and outer cylinders arranged eccentrically in the manner shown is that, the air or discharge space between such cylinders being contracted at the bottom, and the greatest volume of air being always in the top, the small seed and impurities as they pass through the screen will not be retarded by a too great counter air current, thereby allowing for a free and uninterrupted discharge for such seed and impurities.

In operation before the machine is started, the valve on the partition G^2 is closed, and held closed until a quantity of perfect seed has accumulated at the front side thereof, after which such valve is opened and held open during the remaining time in which the separating operation continues. As the seed is fed into the hopper, it is somewhat separated from the lint and other impurities by the stirrer and falls with such separations into the inner cylinder; as it falls the air blast entering through the top will serve to blow off the light particles in the direction of rotation of the agitator through the screen. The seed as it gathers, on the bottom of the cylinder is then continuously carried up, spirally, in the cylinder, and the smaller or defective seed forced through it, such operation continuing until the perfect seed passes into the supplemental portion G^3 where it receives a final sweep, and separation, after which it discharges through a spout J at the end thereof, as shown in Figs. 1 and 4.

To simplify the construction of the several parts and to render the same readily detachable, the screening cylinder may be also made in sections as shown, the end disks B, recessed vertically and provided with central portions $B^{\times}$ rigidly secured to the cross beams a^2, and the securing screws passed through such portion $B^{\times}$ into the end disks G'. By this construction, it will be observed that by removing the four upper screws g' the upper sections of the outer and inner cylinders can be lifted off, by the handle member O, and thereby leave the shaft and beater free to be lifted out of its bearings.

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

1. A cotton seed separating machine comprising a cylindrical screen body, a surrounding annular chamber decreasing in area from the feed to the discharge sides of such body, a rotary beater held to operate in such screen body, a feed hopper opening into the cylinder at the upper end and a discharge formed in the annular chamber, at the bottom all arranged substantially as shown and described.

2. As an improvement in cotton seed separating machines the combination with a main frame, a main fixed cylinder secured thereto closed at the ends, provided with a main discharge and a supplemental discharge, of a fixed screening cylinder held eccentrically within the main cylinder, with its bottom portion nearest the bottom of the main cylinder, whereby an annular chamber having its largest area at the top is provided said screen cylinder having a supplemental chamber at one end disposed over the supplemental discharge in the main cylinder, revolving beaters held to operate in the screening chambers, and a feed hopper discharging in the said screening cylinder all arranged substantially as shown and described.

3. An improved cotton seed separating machine comprising a supporting frame, a main cylinder having closed ends, and a longitudinal discharge at its lower edge, a shaft journaled in the frame and extended through the cylinder longitudinally, eccentrically nearer the bottom than the top, a fixed screen arranged eccentrically on the shaft, and with its lower edge nearest the bottom of the main cylinder whereby a blast chamber having its largest area at the top and gradually decreasing toward the bottom is formed, air inlets opening into the upper part of such blast chamber, a hopper held to discharge into the top of the screen cylinder, and beater arms arranged concentrically on the shaft, whereby they will approach the sides of the screen on the down stroke and move away from the same on the up movement as set forth.

4. In a cotton seed separating machine, the combination with the main frame and casing, said casing having a discharge in its bottom and air inlets at its ends in its upper part a longitudinal screening cylinder fixedly held eccentric within such casing, with its lower edge nearest said casing, a hopper opening into the said cylinder at one end, a discharge spout connected with the other end, a rotary beater eccentrically held within the cylinder, with its lower arms nearest the bottom thereof, all arranged substantially as shown and described.

5. In a cotton seed separating machine, in combination, a fixed screening cylinder closed at its ends, a casing forming an air space extended circumferentially about such cylinder, tapering from the top downward at each side, a feed hopper connected with the cylinder at one end at the top and a discharge connected with the other end at the bottom, a discharge connected with the bottom of the air space, air inlets opening through the ends of the cylinder into the air space at the top, and a rotary beater held within such cylinder all arranged substantially as shown and for the purposes described.

6. An improved cotton seed separator comprising a non-rotatable cylindrical screening body, having an inlet or feed hopper at the top at one end, a rotary beater, having radial arms spirally arranged thereon and connected by longitudinal blades, such beater being arranged eccentrically in the said screen, a stirrer held on the hopper belted with the beater shaft, and an outer casing surrounding the screen, and arranged eccentrically thereto with its lower edge nearest the screen whereby a blast chamber, having its largest area at the top and gradually decreasing toward the bottom is formed, said casing having an outlet or discharge throat at the bottom all arranged substantially in the manner hereinbefore shown and described.

THOMAS A. JACKSON.

Witnesses:
GEORGE H. JONES,
J. M. LIDDELL.