No. 809,131. PATENTED JAN. 2, 1906.

F. PHELPS.

COTTON GIN.

APPLICATION FILED FEB. 23, 1905.

Fig. 1.

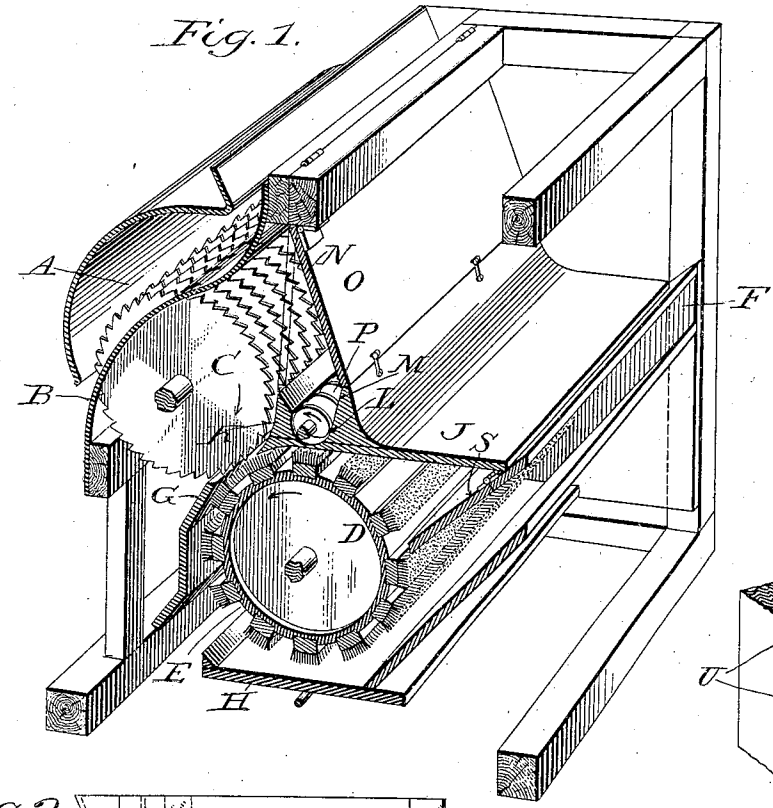


Fig. 4.

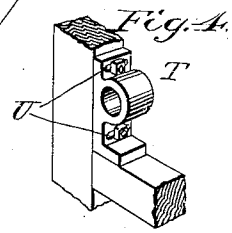


Fig. 2.

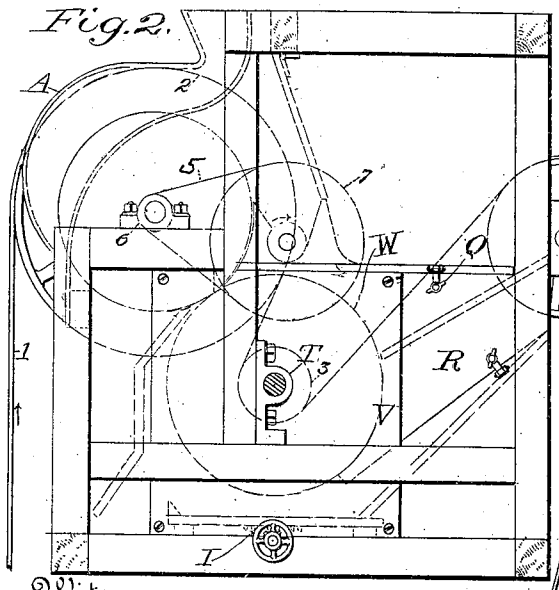
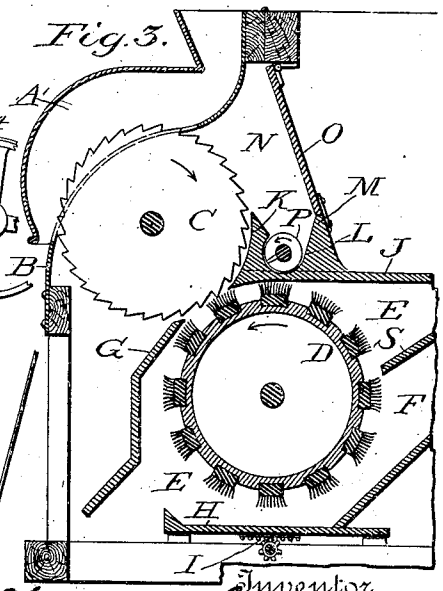


Fig. 3.



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COTTON-GIN.

No. 809,131. Specification of Letters Patent. Patented Jan. 2, 1906.

Application filed February 23, 1905. Serial No. 246,974.

To all whom it may concern:

Be it known that I, FRANK PHELPS, a citizen of the United States, residing at Wellston, in the county of Lincoln, Oklahoma Territory, have invented certain new and useful Improvements in Cotton-Gins; 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.

My invention relates to cotton-gins and similar machines for separating cotton or the like fibrous material from its seed, hulls, or other cellular matters associated therewith, and more especially to gins of the familiar type in which a revolving gang of saws or equivalent member constitutes the primary separator and a revolving brush removes the lint from the saws.

The invention comprises an improved gin of novel construction and arrangement of the working parts having incorporated with the ginning mechanism simple and efficient provision for causing the cleaning of the fiber or separation of all dust, motes, dirt, and waste from the lint adhering on the peripheries of the saws before reaching the brush, which is accomplished simply by the centrifugal action of the saws and the supplementary action of gravity without the importation into the machine of any specific contrivance, such as a blower or suction device, for effecting said separation, and the construction being also characterized by ready and convenient accessibility to the working parts and by great compactness, the machine taking up a minimum floor-space consistent with the performance of its functions, and further characterized by the several specific improvements and desirable features hereinafter explained.

As well known in the operation of ginning the centrifugal action of the revolving saws tends to throw off from the adhering lint or fiber much of the motes, dirt, and waste associated therewith, and hitherto this action has been utilized in connection with a blast of air or suction acting upon the peripheries of the saws between the breastplate and the brush for effecting separation of such matters and cleaning the lint, as exemplified in the modern types of gins illustrated and described in my Patents Nos. 796,861 and 796,862, dated August 8, 1905.

One of the chief distinctions of my present invention is such a structural arrangement of the gin that the cleaning function referred to is performed without the use of an air-blast or suction; in fact, without importing into the machine any specific device for the purpose, but, as above stated, simply by the centrifugal action due to rotation of the saws, supplemented by the force of gravity acting upon the motes and other particles ejected from the fiber. This accomplishment is attained by superposing the axis of rotation of the saws above that of the brush, leaving a relatively large free or exposed space for the peripheries of the saws between the breastplate and brush to allow a sufficient interval for the centrifugal ejecting action before the lint on the saw-teeth reaches the brush and providing ample allowance for the fall of the waste, motes, and other particles by gravity. According to this construction as the saws rapidly rotate the waste matter ejected centrifugally from the lint falls or settles upon the top of the brush-chamber or into a suitable pocket or recess, whence it can be removed. I prefer to provide for such removal by means of a conveyer acting in unison with the rest of the machine, so as to make the entire operation automatic.

A preferred embodiment of the invention securing the above and other advantages is shown in the accompanying drawings, which form part of this specification, and with reference to which the invention will be fully described and then particularly pointed out and defined in the appended claims.

In said drawings, Figure 1 is a cross-sectional perspective view of the gin. Fig. 2 is an end elevation thereof. Fig. 3 is a cross-section. Fig. 4 is a detail view of one of the adjustable bearings for the brush-shaft.

A indicates the roll-box; B, the breastplate; C, the gang of saws; D, the brush; E, the brush-chamber, whose discharge-chute F leads to the lint-flue.

G is a deflector-board in front of the lint-removing side of the brush and which gives the lint its downward course after it has been removed by the brush from the saws.

H is the usual bottom board of the brush-chamber or mote-board, which is preferably adjustable, as shown, by means of a rack and pinion I thereunder.

A gin comprising the above-named elements properly correlated and actuated is a type of the art, and the general construction

and functions are therefore understood so far as concerns the ginning mechanism and the operation thereof. It is understood, of course, that the saws and brush rotate in opposite directions, as indicated by the arrows in Fig. 1. The cotton in the roll-box is caught by the revolving saw-teeth and drawn through the bars of the breastplate, thus separating the lint or fiber from the seeds, which are retained in or dropped from the front of the roll-box, while the lint adheres to the peripheries of the saws until it is removed by the brush into the brush-chamber, whence it is discharged into the lint-flue, this being the usual operation of gins. A distinctive feature of the structure is that the saws are practically superposed above the brush, though preferably slightly in advance thereof, the brush coacting with the saws just behind the lowermost parts of their peripheries. Inasmuch as only the upper front peripheral portions of the saws pass through the breastplate or into the roll-box, there is a relatively large open space between the breastplate and brush-chamber where the peripheries of the saws are free or exposed, allowing a sufficient space and interval in the ginning operation for the effective ejection of the dust and waste particles centrifugally from the saws into the aforesaid open space or chamber above the brush-chamber, where they can fall or settle by gravity. This construction also renders the machine compact and lessens the floor-space required, which is an important advantage where the machine must be installed in narrow quarters or when a number of stands of machinery are run together.

Above the brush, back of the saws, is the ceiling J of the brush-chamber, provided on its top with an upright longitudinal "divider-board" K, so called because of its function. This divider-board, which is adjacent to the saws, is preferably shaped at its lower front to extend tangentially toward or between the meeting peripheries of the saws and brush, and it has a curved or concave front face approximately conforming to and disposed close to the peripheries of the saws. The top of said divider-board turns sharply back from the concave front face thereof and slopes downward into a longitudinal channel or trough L, which is back of the divider-board or between it and a rear longitudinal upstanding part M, which also slants downward into the depression L, the said trough extending from one end to the other of the gin substantially parallel with the saws and brush. This trough or channel L constitutes the bottom of the settling-chamber N, into which the motes, dust, and waste particles are ejected centrifugally from the rapidly-revolving saw-teeth during the ginning operation. The back of said settling-chamber is the board or gate O, which is preferably hinged or swung from a frame-beam above, having its lower end adapted to reach both the top of the divider-board K and the top of the projection M, so that the discharge of motes and waste into the settling-chamber and the trough L may be permitted or not, as desired. The top of the divider-board K slanting rearwardly downward away from the peripheries of the saws below the axis of rotation thereof causes every particle thrown from the saws to slide directly down into the trough or pocket L. When the board or gate O is in the position shown in full lines in Fig. 1, it also aids by the slanting under surface it presents in throwing the motes into the pocket. In this position the gate O may be secured by providing a latch connection with the top of the projection M. When unlatched, the gate will swing back to vertical or approximately vertical position, when its lower end will contact with the divider-board K. The effect of this construction, as shown in Fig. 1, is to provide a waste or dust chamber N approximately tangential to the free or exposed peripheries of the saws from which the dust and waste are ejected or slanting rearwardly downward from the saws into the pocket a receptacle for collecting the waste. Hence all matter thrown centrifugally from the saws falls or settles by gravity into the longitudinal receptacle or trough L, whence it can be removed by means of any suitable conveyer. I preferably provide for such removal by means of a worm or screw conveyer P, driven by suitable transmission connection with the shaft of the saws. This conveyer carries off the collected or settled dirt and waste out through one end of the gin and may deposit it either on the floor or into a suitable receptacle, or it may be spouted into the seed-auger. Thus exceedingly simple and efficient provision is made for self-cleaning of the fiber or lint before it reaches the brush by the effective separation of all dirt, motes, and trash and the settling and collection thereof by gravity, the divider-board K preventing any of the particles from passing into the brush-chamber. The positions of the divider-board K and deflector-board G are such that only a very small portion of the saws are presented to the brush-chamber. Particles of waste which may fall with the seed through the breastplate in front of the saws will fall to the outside of the deflector-board G, which prevents such waste and seed from being drawn into the brush-chamber by the air-currents created by the brush.

To promote ready accessibility to the working parts, the ceiling J, together with the parts supported thereby, is made removable, being supported upon suitable lugs or otherwise in the frame of the machine and retained in place by catches Q at the sides of the brush-chamber. The sides of the brush-chamber also have removable parts R, and the top S of the discharge-chute F is hinged, so that it

can be swung up rearward. With these parts removed and out of the way ready access can be had to the saws and brush for repairs or other purposes, and the brush may be bodily lifted out when necessary.

To secure longitudinal adjustment of the brush, the shaft-bearings T thereof at each end are adjustable, as by bolt-and-slot fastenings U, to the frame-beams, movement of the bearings T permitting longitudinal adjustment of the shaft to the extent of the length of the slot. The ends of the brush are located in circular openings in the side boards of the brush-chamber, covered by covering-boards V. Said circular openings are indicated by dotted lines by W in Fig. 2. By using this construction the brush can be longitudinally adjusted to bring fresh portions of the brush-surface into contact with the saws at different times.

In Fig. 2, 1 denotes a belt passing around pulley 2 on the saw-shaft, around pulley 3 on the brush-shaft, and around pulley 4. 5 is a belt passing around pulleys 6 and 7 on the saw-shaft and conveyer-shaft.

What I claim is—

1. In a gin, the combination of the ginning member, brush, and brush-chamber, the ginning member and brush being so relatively disposed that matter centrifugally discharged from the ginning member will fall upon the top of the brush-chamber, and an upright divider-board upon the top of the brush-chamber, closely adjacent to the ginning member.

2. In a gin, the combination of the saws, means for removing the lint from the lower sides thereof, and a settling-chamber for motes, dirt and waste open to the exposed rear portions of the saws, and a divider-board in the bottom of said chamber having a concave front face immediately adjacent to the rear of the saws and an inclined back face slanting rearwardly downward from the peripheries of the saws toward the bottom of said settling-chamber.

3. In a gin, the combination of the saws, means for removing the lint from the lower side thereof, a receptacle for centrifugally-ejected motes, dust and waste particles located back of the saws below the axis of rotation thereof, and a divider-board between said receptacle and the saws closely adjacent to the latter.

4. In a gin, the combination of the saws, means for removing the lint from the lower side thereof, a receptacle for centrifugally-ejected motes, dust and waste particles located back of the saws below the axis of rotation thereof, a divider-board between said receptacle and the saws adjacent to the latter, and a swinging gate having its lower end adapted to reach either the top of said divider-board or the opposite side of said receptacle to permit the discharge of such particles into said receptacle or not, as preferred.

5. In a gin, the combination of the saws, the lint-removing brush below the saws, a divider-board between the approaching peripheries of the saws and brush curved to the shape of the saws, and a deflector-board between the opposite or receding peripheries of the saws and brush.

6. In a gin, the combination of the breast-plate, saws, and lint-removing brush below the saws, the brush-chamber whose ceiling is back of the lower part of the saws, a dust or waste chamber above said ceiling, said chamber having a longitudinal recess or trough in its bottom, and a divider-board between said recess and the saws having a concave front face adjacent to the saws and a rearwardly downwardly slanting rear face.

7. In a gin, the combination of a ginning member or saws, the brush, and brush-chamber, the ginning member and brush being so relatively disposed that matter centrifugally discharged from the ginning member will fall upon the top of the brush-chamber, and an upper divider-board upon the top of the brush-chamber adjacent to the rear portion of the saws and curved in conformity therewith.

8. In a gin, the combination of the saws, means for removing the lint from the lower sides thereof, and a settling-chamber for waste, &c., opening to the exposed rear portions of the saws, a divider-board at the bottom of said chamber having a concave front face adjacent to the rear of the saws, a longitudinal trough or pocket back of said divider-board, and a conveyer therein.

9. In a gin, the combination of the saws, a brush-chamber lower than the saws having a removable ceiling supported upon the inside of the gin-frame, an inner discharge-chute having a hinged ceiling, a mote-receptacle above the brush-chamber, a swinging gate behind the saws adapted to permit or cut off the discharge of motes thereinto, the sides of the brush-chamber having circular openings axially alined with the brush, and removable coverings for the same, whereby access can be had to the ends of the brush and the rear of the saws and brush.

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

FRANK PHELPS.

Witnesses:
A. E. KING,
W. H. SPURR