(No Model.) 2 Sheets—Sheet 1.

J. E. ATWOOD.

COTTON GIN.

No. 346,573. Patented Aug. 3, 1886.

Fig. 1.

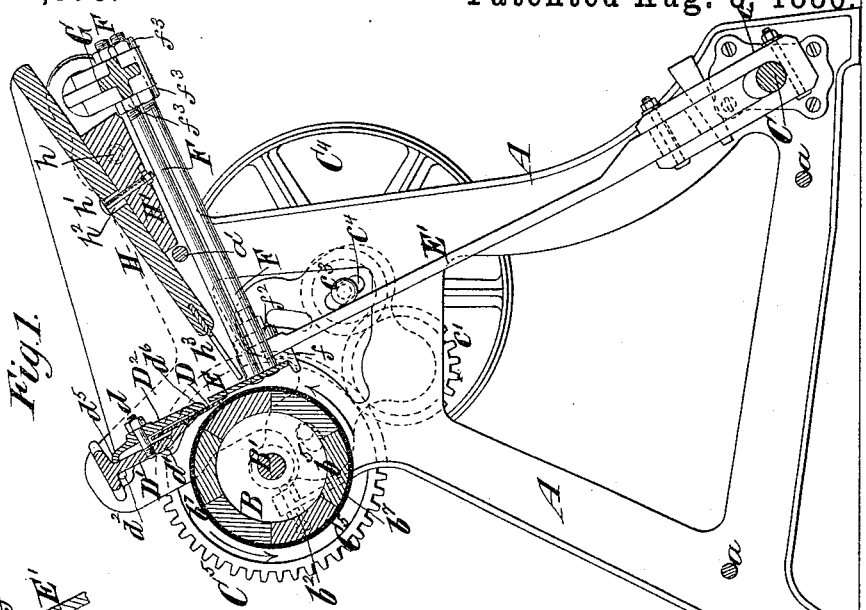

Fig. 3.

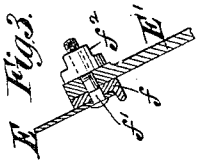

Fig. 2.

Witnesses:
Emil Herter
Fred Haynes

Inventor:
John E. Atwood
by his Attys
Brown & Hall

(No Model.)

2 Sheets—Sheet 2.

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Fig. 6.

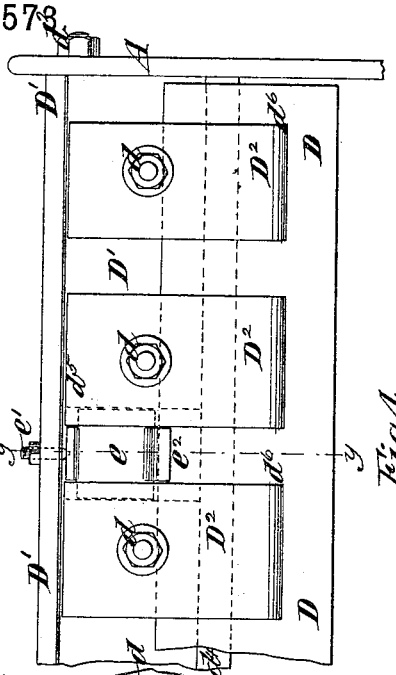

Fig. 4.

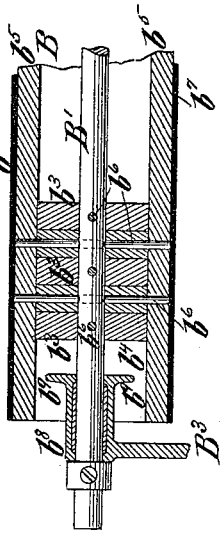

Fig. 7.

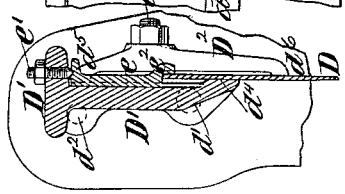

Fig. 5.

Witnesses:
Emil Herter.
Fred't Haynes

John E. Atwood Inventor:
by his Attys
Brown & Hall

UNITED STATES PATENT OFFICE.

JOHN E. ATWOOD, OF STONINGTON, CONNECTICUT.

COTTON-GIN.

SPECIFICATION forming part of Letters Patent No. 346,573, dated August 3, 1886.

Application filed February 6, 1886. Serial No. 190,997. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. ATWOOD, of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Cotton-Gins, of which the following is a specification.

My invention relates to gins of the class commonly known as "roller" or "drum" gins, and an example of which is shown in patent to E. C. Horne, dated January 11, 1881, No. 236,591. In such a gin is employed a rotary roller or drum, which is commonly leather-covered, and against the face of which bears a blade which is stationary while the gin is in operation, but is capable of adjustment in order to properly fix the relation between its lower edge and the roller or drum. In connection with the roller or drum and stationary blade is employed a stripper or stripping-blade, which, by means of cranks and suitable connecting-rods or spring-bars, receives a rapid reciprocating motion, which carries its upper edge both above and below the edge of the stationary blade. This stripper is commonly supported by a series of rods which extend toward the front of the machine, and are there adjustably fixed in a rock-shaft. Cotton to be ginned is placed upon an inclined feed table or hopper, and as the roller or drum rotates the cotton fibers are caught upon its surface and carried through between the surface of the drum and the edge of the stationary blade, while the reciprocating stripper serves to knock off the seeds from the fibers of cotton which are being drawn by the rotary drum between its surface and the stationary blade.

The objects of my invention are to enable certain parts of the machine to be made more cheaply than heretofore and to support the reciprocating stripper in a more secure manner, so as to give it more effective operation; also, to provide for the ready adjustment of the feed-table, both toward and from the cylinder and upward and downward at different angles of inclination; also, to enable the rotary drum to be always driven in one direction by a straight belt from a pulley on the crank-shaft, whether said crank-shaft be rotated in one or other direction; also, to prevent the fibers of cotton from becoming wound around the rapidly-rotating shaft of the drum; also, to construct a drum the surface of which will remain round and straight, in contradistinction to the ordinary solid wooden roll, which is liable to shrink and get out of round and crooked, and, also, to provide a more secure means of holding the stationary blade and a more convenient means of adjusting it, so that its edge will bear with proper force and at the proper point upon the surface of the rotary drum.

My invention consists in novel combinations of parts and features of construction, as hereinafter described, and pointed out in the claims, whereby the above enumerated results are attained.

In the accompanying drawings, Figure 1 is a vertical section of a gin in a plane transverse to the axis of the rotary drum, and which embodies my invention. Fig. 2 is a front view of the gin, a portion of the driving-gear being shown in section, and a portion of the machine between its ends being broken away to reduce the length of the figure. Fig. 3 is a sectional view of the reciprocating stripper and the end portion of a connecting-rod or spring-bar, showing the means employed to connect the two together. Fig. 4 is a sectional view of one end portion of the drum, including the bearing of the drum-shaft. Fig. 5 is an end elevation of the machine, looking from the right hand of Fig. 2, the driving-pulley being removed, and a section through its hub and the fixed stud which supports it, being taken on the plane of the dotted line *x x*, Fig. 2. Fig. 6 is a front view of the end portions of the stationary blade and its holder upon a larger scale; and Fig. 7 is a transverse section upon the plane of the dotted line *y y*, Fig. 6.

Similar letters of reference designate corresponding parts in all the figures.

A A designate the two side frames of the machine, which are connected by proper tie-rods or stretchers, *a a a'*, and which are preferably of cast metal.

B designates a rotary drum, which extends between these side frames, and constitutes an essential part of the machine. The bearings for the drum-shaft B' might be formed integral with the side frames; but I prefer to form

such bearings in swinging frames or brackets B^2 B^3, which are fulcrumed or pivoted to the side frames at b b', so that the drum may be adjusted by swinging said brackets or frames upon their pivots. In Figs. 1 and 5 I have represented in dotted outlines set-screws b^2, which bear against the upper portion of said swinging frames B^2 B^3, and by which the drum B may be adjusted toward the front of the machine, and in proper relation to the stationary blade and stripper, hereinafter described.

In machines of this class the rotary roller or drum has commonly been made in the form of a solid wood roller having a leather covering. Such a roller is apt to crack, and, by shrinkage, is liable to get out of round and crooked. In preference to such a solid wood roller I make my roller or drum hollow, and construct it of several pieces, as best shown in Figs. 1 and 4.

Upon the drum-shaft B′, near each end of the roller, are secured a number of wood disks, b^3, which are arranged with the grain of the wood crossing each other, and which are placed closely together side by side, to form a substantial head. This head is, however, somewhat removed inward from the extreme end of the drum, as shown in Fig. 4, so that a recess, b^4, will be provided in each end of the drum. The periphery or cylindric body of the drum is composed of staves or lags b^5, which surround the heads constructed of a number of disks, as before described, and the staves and the disks composing the heads are all secured firmly together by pins b^6, inserted through the entire drum, as shown in Fig. 4. The several component parts of the drum may be glued together in addition to the pins b^6, and the drum has a covering or jacket, b^7, which is of leather or other suitable material. The bearings b^8 for the drum-shaft project inward from the swinging frames B^2 B^3, as shown in Fig. 4, and has at or near the inner end an outwardly-projecting flange, b^9, which serves as a guard or shield to prevent the long fibers of cotton from winding around the rotary drum-shaft B′. These bearings b^8, with their flanges b^9, are accommodated in the recesses b^4 in the ends of the drum B.

Near the bottom of the machine I have represented a crank-shaft, C, supported in suitable bearings, c, which may be made separate from the side frames, A, but secured thereto; and this crank-shaft receives motion by a driving-belt running upon fast and loose pulleys C′ C^2. Upon the opposite end of the shaft from the fast and loose pulleys I have represented another pulley, C^3, from which motion is to be transmitted by a belt and pulley, C^4, which is in turn geared with the drum B, in order to impart rotary motion thereto. It is necessary that the drum B should always be rotated in one direction, as indicated by the arrows in Fig. 1, while the crank-shaft C will be rotated in either direction, as may be most convenient. The distance between the pulleys C^3 and C^4 is too short to enable them to receive a cross-belt, and I have therefore provided a system of gearing which is adjustable, to enable the drum B to be rotated through the said gearing and pulley C^4 by a straight belt from the pulley C^3, whether the crank-shaft C turn in one or other direction. This gearing is represented best in Figs. 2 and 5.

Upon the end of the drum-shaft B′ is a gear-wheel, C^5, with which engages an intermediate wheel or pinion, c', fitted to rotate upon the stud b, which forms the pivot for the swinging frame B^2. The driving-pulley C^4 and the driving-pinion C^6, which gears into the wheel c', turn as one piece upon the fixed stud or sleeve c^2, which is secured by a bolt, c^3, to the swinging frame B^2, as best shown in Fig. 2. This bolt c^3 is adjustable in a slot, c^4, in the swinging frame B^2, so as to bring the pinion C^6 properly into gear with the intermediate wheel, c'.

Suppose that the crank-shaft C be rotated in the direction of the arrow, Fig. 5. The gearing above described is properly adjusted for imparting to the drum B rotary motion in the direction indicated by the arrows thereon in Fig. 1. I have represented in the swinging frame B^2 a second slot, c^5, which is arc-shaped, as shown in Fig. 5, and concentric with the drum-shaft B′. When the crank-shaft is operated in an opposite direction to that indicated by the arrow in Fig. 5, the bolt c^4 will be fixed in the slot c^5, and the driving-pinion C^6 will then engage directly with the wheel C^5 on the drum-shaft B′, and the drum will still be rotated in the direction indicated by the arrow in Fig. 1.

The driving-pinion C^6 is subject to very rapid wear, and in order to enable it to be renewed readily without the aid of any mechanic, and without renewing the pulley C^4, I have represented the hub on the pulley as entering the recess c^6 in the hub of the driving-pinion, and I have shown the pulley as provided with a tooth or projection, c^7, entering a notch, c^8, in the hub of the driving-pinion, as shown in Figs. 2 and 5. When the pinion and pulley are secured upon the fixed stud or sleeve c^2, they are connected by the tooth and notch c^7 c^8 and rotate as one piece.

In connection with the rotary drum B is employed a blade, D, which is stationary while the machine is in operation, and is capable of adjustment, and the stripper E, which has a rapid reciprocating motion upward and downward, imparted to it through connecting-rods or spring-bars E′ from the crank-shaft C.

The stationary blade D is secured in fixed position between the blade-holder D′ and a series of clamps, D^2, secured by bolts d to the blade-holder or bar D′, as shown in Fig. 1, but more clearly in the larger views Figs. 6 and 7. The blade-holder or bar D′ extends between the side frames, A, and is pivoted at d' to said side frames, and the upper portion of the

blade-holder or bar D′ is secured in position by bolts d^2, which pass through slots d^3 in the side frames, A, as shown in Fig. 5. The bolts d^2 and slots d^3 afford provision for swinging the upper portion of the bar D′ so as to cause the lower edge of the blade D to bear with greater or less force against the periphery of the rotary drum B. The blade D has a bearing between its edges upon the lower portion of the bar D′, as shown at d^4, and the clamps D^2 have a bearing at d^5 upon the bar above the blade and a bearing at d^6 upon the blade below the bar D′.

Upon the face of the bar D′, and above the blade D, are adjustable abutments or pieces *e*, which, by screws *e′*, may be forced downward to a bearing against the upper edge of the blade D, to force it downward to bring its edge to a proper point on the rotary drum B. The adjustable abutments *e* have at the lower ends tongues or lips e^2, which overlap the front of the blade D, and the abutments *e* have wings or portions which are overlapped by the clamps D^2, as shown by dotted lines in Fig. 6. By this means the blade D is held in a very secure manner, and is capable of accurate and easy adjustment to bring its lower edge to a proper bearing-contact with the periphery of the rotary drum B.

The stripper E, which is reciprocated by the rods E′, is commonly supported by a series of small rods which extend toward the front of the machine, and are there connected with a rock-shaft; and in order to obtain in the stripper E sufficient metal to secure in it the rods which connect it with the rock shaft, it has been usual to make the stripper of a bar of steel, which is, for example, about one-half an inch thick, and to then plane the bar down throughout a portion of its width to bring it to about three-sixteenths of an inch thick, more or less. This construction is expensive, and I therefore make the stripper E of a thin bar or plate of uniform thickness throughout, and not thicker than the thin portion of the strippers heretofore used. The connecting-rods or spring-bars E′ are usually made of hard wood, and in order to prevent the deflection of the stripper E by the spring of these bars, I have introduced between each rod or spring-bar E′ and the stripper E a base piece or block, *f*, (shown best in Fig. 3;) and the rod E′ is connected with the stripper by a bolt, *f′*, and nut f^2, the bolt passing through the stripper and rod E′ and the interposed base-piece *f*.

F designates the series of rods which extend from the stripper E, and G designates the rock-shaft with which these rods are connected. In machines heretofore made there has been a single line or row of rods placed at intervals in the length of the stripper.

In order to more firmly connect the thin stripper with the rock-shaft G, I have arranged the rods F in two lines or rows, the rods in each row being alternated between the rods of the other, or arranged in staggered relation thereto. The inner ends of the rods F are riveted in the stripper E, and their outer ends are screw-threaded and adjustably secured by nuts f^3 in the rock-shaft G. In order that the rods F shall stand at right angles to the plane of the stripper and parallel with a line drawn through the pivots of the rock-shaft G and the drum-shaft B′, I have represented the rock-shaft G as offset downward between its ends, as best shown in Fig. 2. The bearings for this rock-shaft are formed by screws *g*, which have conical points fitting conical seats in the ends of the rock-shaft, and which, after adjustment, may be fixed and held in proper position by jam-nuts *g′*. These adjusting-screws not only prevent play of the rock-shaft by reason of its side wear, but also by their adjustment prevent end-play of the rock-shaft.

H designates the feed-table, chute, or hopper, over which the cotton is fed toward the drum B. As here represented, this table or board is supported in a position inclined toward the drum upon a girt, H′, which extends between the side frames, A. This girt is pivoted at *h* near one edge to the side frames, and the stretcher or tie-rod *a′*, before referred to as connecting the side frames, A, is adjacent to its opposite edge. By loosening the bolts, which form the pivots *h*, and also the tie-rod *a′*, the girt H′ may swing upon the pivots *h*, so as to adjust the table H into a more or less inclined position, and the girt and table will be retained in such position by tightening the bolts forming the pivots *h*, and also the tie-rod *a′*. The table H is secured to the girt H′ by bolts *h′* passing through slots h^2, and this slotted connection between the girt and table provides for the adjustment of the table toward and from the drum B. At its lower edge, which is adjacent to the drum, the table H has a grating, h^3, of comb-teeth, through which the cotton seed may drop.

In the operation of this machine the long fibers of cotton are caught upon the surface of the drum B, and are carried by it beneath the stationary blade D. As the stripper E reciprocates, its upper edge comes alternately above and below the lower edge of the stationary blade D, and said stripper serves to knock off the seed from the fiber, and the seed drops through the grating or comb-teeth h^3.

Cotton-gins of this class are very desirable for ginning sea-island and other long-fiber cotton, because they do not tear and break the fiber, as do saw-gins.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the rotary drum and stationary blade, of a reciprocating stripper, a rock-shaft, and two rows of rods connecting the rock-shaft and stripper and arranged in staggered relation to each other, the rods in one row being alternated with the rods in the other row, substantially as herein described.

2. The combination, with the rotary drum and stationary blade, of a reciprocating strip-

per, a rock-shaft having the portion between its ends deflected or offset below the centers on which it swings, and rods connecting the rock-shaft and stripper, and serving to support the latter, substantially as herein described.

3. The combination, with a rotary drum and stationary blade, of a reciprocating stripper of uniform thickness throughout, a rock-shaft, rods connecting the stripper and rock-shaft, crank-actuated spring-bars rigidly secured to the stripper for reciprocating it, and base-pieces *f*, interposed between the stripper and spring-bars at their point of rigid attachment to the stripper, for strengthening and preventing deflection of the stripper by the crank-actuated spring-bars, substantially as herein described.

4. The combination, with a stationary blade and reciprocating stripper, of a rotary drum, B, composed of a shaft, B′, heads b^3, made up of disks of wood, having their grain crossed, and lags or staves b^5, pins b^6, inserted through the lags or staves and heads and shaft, and a covering, *b*, surrounding the lags or staves b^5, substantially as herein described.

5. The combination, with a stationary blade and reciprocating stripper, of a rotary drum having its ends recessed, as at b^4. bearings b^8 for the drum-shaft, entering the recesses b^4, and provided at a point entirely inward of the ends of the drum with the flanges b^9, projecting outward transversely to the length of the bearings, substantially as herein described.

6. The combination, with the rotary drum, the stationary blade, and the reciprocating stripper of a cotton-gin, of a gear-wheel on the drum-shaft, a crank-shaft, bars for reciprocating the stripper, a pulley and driving-pinion, a stationary stud on which they rotate, a frame comprising slots providing for the change in position of the stationary stud, and an intermediate wheel, which may be engaged with the wheel on the drum, and with the driving-pinion, whereby provision is afforded for driving the gear on the drum-shaft either by the direct engagement of the driving-pinion therewith or by the operation of the driving-pinion through an intermediate wheel, substantially as herein described.

7. The combination, with the stationary blade, the reciprocating stripper, and rotary drum of a cotton-gin, and gearing for driving the drum, of a driving-pinion and pulley for transmitting motion to the drum, the hub of one of said two parts being recessed and notched to receive a hub and a tooth or projection on the other, whereby the pinion and pulley are connected to rotate as one, and providing for the renewal of either the pinion or pulley independently of the other, and a stationary stud on which the pinion and pulley rotate, substantially as herein described.

8. The combination, with the side frames, the rotary drum, the stationary blade, and the reciprocating stripper of a cotton-gin, of a feeding-table, H, a supporting-girt, H′, extending between the side frames, the pivots *h*, whereby the ends of the girt are pivotally connected with the side frames, and means for securing the feeding-table to the supporting-girt, substantially as herein described.

9. The combination, with the side frames, the rotary drum, the stationary blade, and the reciprocating stripper of a cotton-gin, of the feeding-table H, provided with a longitudinal slot, a supporting-girt, H′, pivots *h*, connecting said girt with the side frames, and a bolt passing through the slot and adjustably connecting the feeding-table with the supporting-girt, substantially as herein described.

10. The combination, with the side frames, A, provided with slots d^3, a rotary drum, and a reciprocating stripper having its working edge presented upward, of the blade-holder or bar D′, pivoted near its lower edge at *d′* between the side frames, the bolts d^2, passing through the slots d^3 and adjustably connecting the bar D′ near its top with the side frames, the blade D, projecting downward below the pivots of said bar, the clamps D^2, bearing on the blade below the lower edge of the bar D′, the adjustable abutments *e*, overlapped by the clamps at the sides and having lips e^2, overlapping the front of the blade, and the screws *e′*, whereby said abutments may be forced down against the upper edge of the blade, substantially as herein described.

11. The combination, with the blade D, the bar D′, and clamps D^2, bolted thereto for clamping the blade, of the adjustable abutments *e*, bearing on the upper edge of the blade, and screws *e′*, adjustable in the bar, for forcing down said abutments against the upper edge of the blade, substantially as herein described.

JOHN E. ATWOOD.

Witnesses:
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E. E. BRADLEY.