

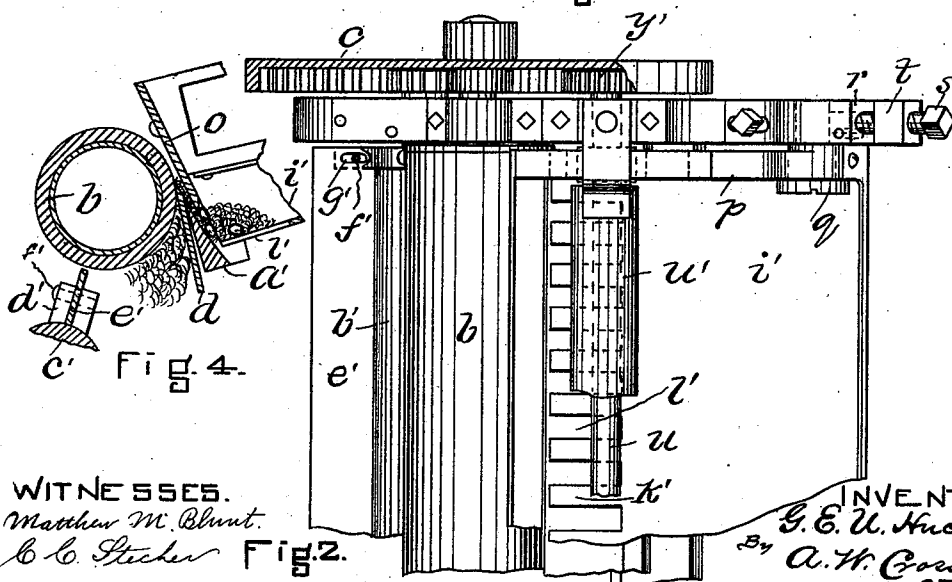
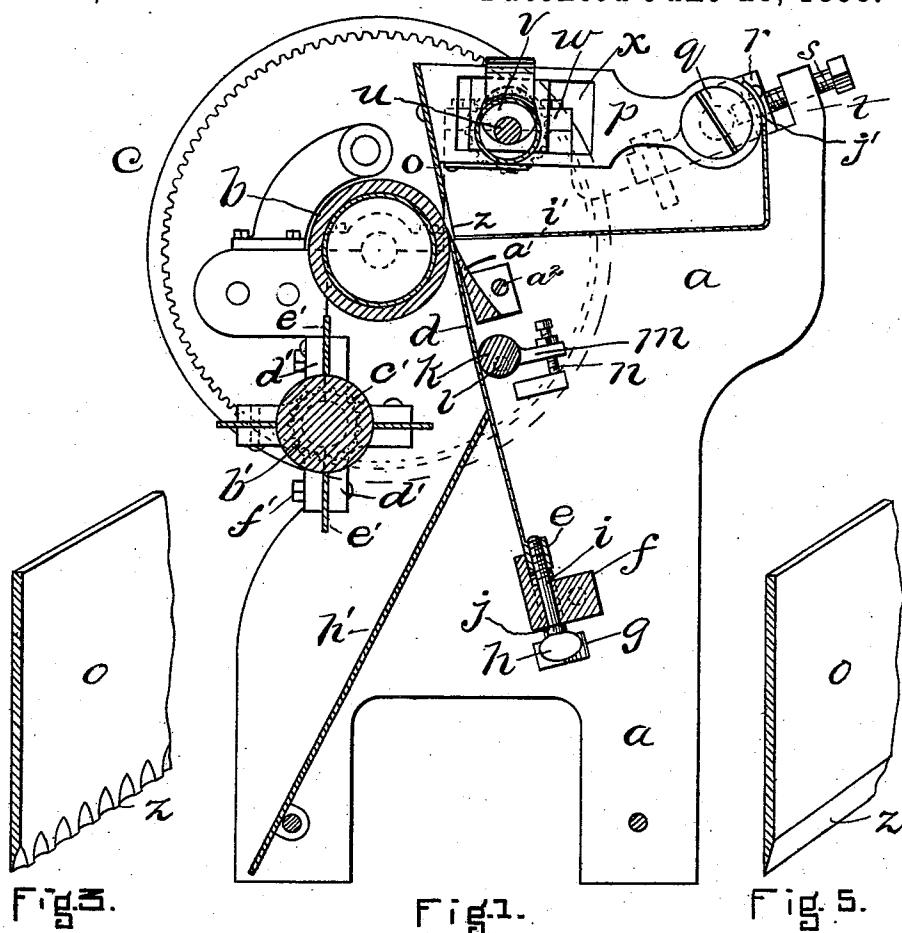
(No Model.)

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COTTON GIN OR WOOL BURRER.

No. 541,753.

Patented June 25, 1895.



WITNESSES.

Matthew M. Blunt.

C. C. Stecher

INVENTOR

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ATTY.

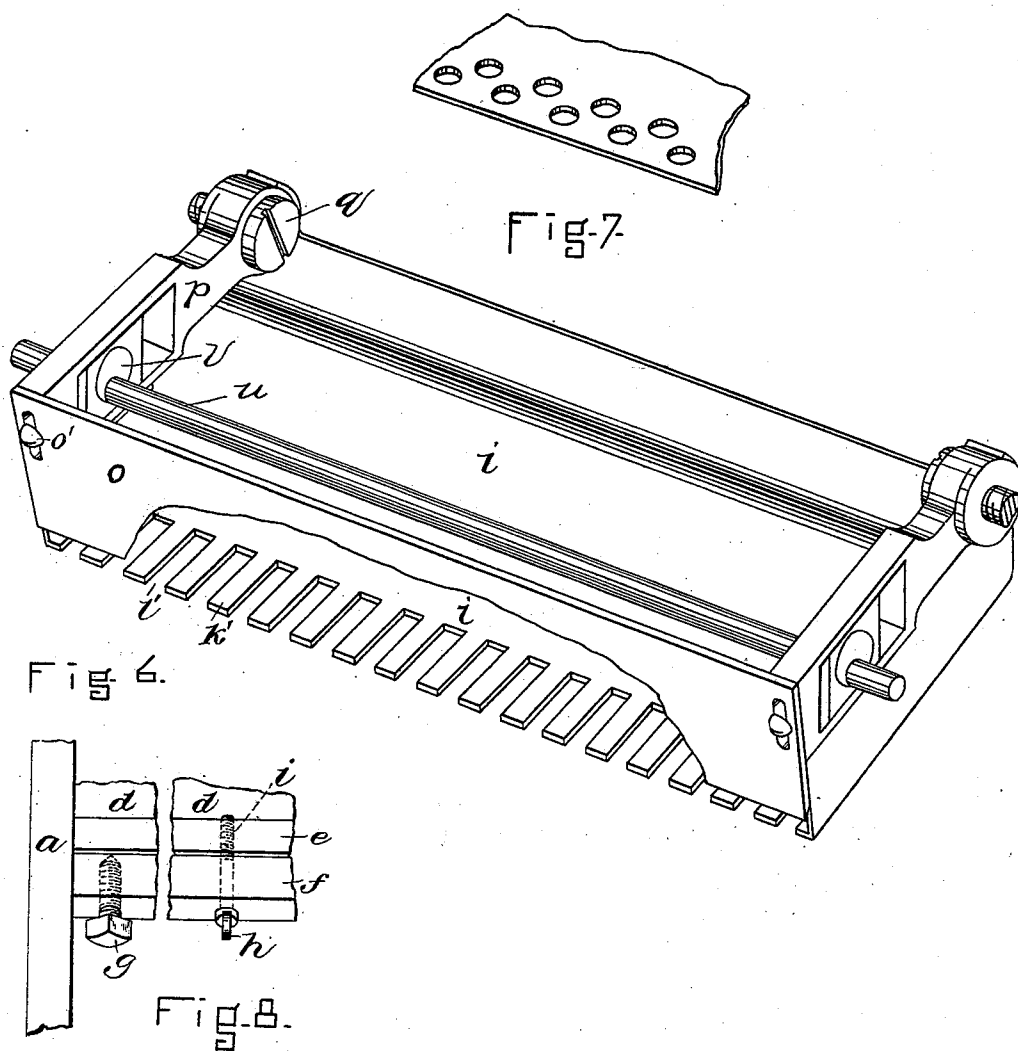
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by Alv. Rossley
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UNITED STATES PATENT OFFICE.

GRABEL E. U. HUCKABY, OF MALDEN, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO LYMAN B. JORDAN, OF SAME PLACE.

COTTON-GIN OR WOOL-BURRER.

SPECIFICATION forming part of Letters Patent No. 541,753, dated June 25, 1895.

Application filed December 19, 1894. Serial No. 532,284. (No model.)

To all whom it may concern:

Be it known that I, GRABEL E. U. HUCKABY, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Cotton-Gins or Wool-Burrers, of which the following is a specification.

This invention has relation generally to machines for ginning cotton, burring wool, and freeing textile fibers, hair, and similar material from foreign substances such as cotton seeds, burrs, &c, and it has particular reference to the kind of machines commonly known as "roller gins."

It is the object of the invention to provide a machine of the kind mentioned which shall be efficient in the highest degree in removing seeds from cotton, burrs from wool, and accomplish like functions upon similar substances, without breaking the fibers to any appreciable extent, and without crushing the seeds or other foreign substances.

It is also the object of the invention to provide other improvements of greater or less importance, incidental to the foregoing, all as I will now proceed to describe and claim.

Reference is to be had to the annexed drawings and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a central sectional view of my improved machine, equipped for ginning cotton. Fig. 2 is a top plan view of the same, parts being represented as broken out the better to illustrate the means therebeneath. Fig. 3 is a perspective view drawn to an enlarged scale, of a part of a reciprocating blade, particularly well adapted for use in burring wool, and performing similar work. Fig. 4 is a sectional detail view showing the relationship of the parts which act immediately upon the material. Fig. 5 is a perspective view of part of a reciprocating blade adapted for use in ginning cotton and performing similar work. Fig. 6 is a perspective view of the reciprocating blade and under feed and means for actuating the same. Fig. 7 is a detail plan view of a part of a modified form of under feed. Fig. 8 shows

in detail the adjusting and holding screws for the stationary blade.

In the drawings, *a* designates the frame of the machine.

b is the gin roller—that is, a roller covered with any friction material suitable to the engagement of fibers and similar substances brought into contact therewith. The said roller, which is suitably journaled in the frame, is operated by means of a belt and pulley or other means (not shown) and is provided on one end with an internally toothed gear *c*.

d designates a stationary blade, the upper free edge of which is arranged in close proximity to the roller *b* and extends from end to end of the same. The said stationary blade is enlarged at its lower edge, as at *e* where it rests upon a bearing or seat *f* supported by the frame.

g designates screws tapped through the bearing *f* and turned at their upper ends against the lower face of the enlarged lower edge of the stationary blade so as to adjust the same vertically.

h are thumb screws, the shanks *i* of which extend through holes formed in the bearing *f*, the upper end of said screws being tapped into the enlargement *e*. The shanks *i* of the thumb-screws *h* are provided with shoulders *j* which bear against the lower face of the bearing *f*, so that by turning the screws *h* into the enlargement *e*, after the stationary blade has been properly adjusted by the screws *g* said blade may be held down upon its seat or bearing and not be accidentally drawn up out of place.

k is a rod or roller resting against the stationary blade and having journals *l* eccentrically arranged on its ends. Arms *m* connected with said rod *k* have set screws *n* tapped through and acting upon their outer ends in such manner that by turning the said set screws in one direction or the other, the said rod may be partially rotated also in one direction or the other to press the stationary blade toward the roller *b* or allow it to move back therefrom, as will be readily understood by an inspection of Fig. 1.

o designates an oscillating blade which is

secured to the forward or inner ends of arms *p*, pivotally supported at their rear ends upon studs or bolts *g*, having bearings in sliding supports *r*. The blade *o* is adjustably mounted upon the arms *p*, by means of screws *o'*, which pass through elongated slots in the said blade into the ends of the said arms. Thus the blade is easily adjusted vertically to suit the particular cotton which is being ginned.

s is a set screw, tapped through a lug *t* of the frame and having a loose connection with the support *r*, so that by the turning of the said set screw, the said support and consequently the arm *p* and the oscillating blade *o* may be adjusted toward and from the roll *b*.

u designates a shaft extending across the machine from side to side, and provided near its ends with eccentrics *v* which rotate in boxes *w* adapted to slide in slots *x* made in the arms *p*. On one or it may be both ends of the shaft *u*, there is a pinion *y* which is engaged by the internal teeth of the gear-wheel *c*, so that as the latter is rotated the pinion *y* and shaft *n* will rapidly be operated oscillating the blade, through the medium of the eccentrics *v*, boxes *w*, and slotted arms *p* to which the oscillating blade is secured. The lower edge *z* of the said oscillating blade may be beveled, so as to make it more or less sharp, as shown in Figs. 1 and 5, or it may be corrugated or notched, as shown in Fig. 3, or otherwise formed, as circumstances and the material under treatment may suggest. The form shown in Fig. 5 has been demonstrated to be well adapted for the treatment of cotton and similar stock, while that illustrated in Fig. 3, is well suited for use in the treatment of wool, curled hair, &c.

The blade *o* will be adjusted to move as near as need be, and as near as the material under treatment may suggest, to the roll *b* and the upper edge of the stationary blade *d*, and as the lower edge of the oscillating blade moves in the arc of a circle, it will be noted that it not only moves downward from the upper edge of the stationary blade and roll *b* but away therefrom, so that there would be liability of cotton seeds, burrs, and other foreign matter becoming wedged between the oscillating and stationary blades and being crushed, and escaping to a greater or less extent with the treated stock. To avoid this I provide a guard *a'* which extends from side to side of the machine, and from or near the upper edge of the stationary blade downward as far as need be, the form of the outer face of the said guard conforming to the path of travel of the lower operative edge of the oscillating blade. This avoids the objections mentioned, and secures advantages in the operation of the machine as will presently appear. The guard is separate from the stationary blade, and is secured independently thereof to the frame by means of screws or bolts *a''*, so that the stationary blade is ad-

justable both laterally and vertically relatively to it.

b' designates a doffer, consisting of a rotary shaft or roll *c'* provided with radial arms *d'* to which are secured flights *e'*, radially adjustable by means of fastening bolts or screws *f'* passing through slots *g'* in the flights, as is most clearly illustrated in Fig. 2. The flights will be adjusted so that in use their outer edges may move as close as need be to the roller *b* to doff or free the same from stock that has a tendency to wind thereon.

h' is a guard extending from the stationary blade *d* downward and rearward in order to keep the stock treated separate from the seeds, burrs, or other foreign matter removed therefrom.

i' designates what I term the "under feed," the same consisting of a light box or bed composed of any suitable material, connected at its rear end as at *j'* to the arms *p*, and extended inward to the roller *b*, the guard *h'* and the oscillating and stationary knives. At its inner free edge the under feed is provided with fingers *k'* leaving spaces *l'* between the fingers, through which the seeds and other foreign matter separated from the material may fall. In Fig. 7 the forward end of the under-feed is shown as provided with holes *m'*, which construction, under some circumstances, serves the same purpose as the fingers *k'* and spaces *l'*.

In the use of the invention, supposing that it is desired to gin cotton, the machine will be started, and the stock placed in the under feed or support *i*, in such position that the fibers may be caught by the roller *b*, by which the stock is drawn over the upper edge of the stationary blade *d* and moved to such position that when the oscillating blade *o* descends it will simply bear upon the fibers and coming in contact with the seeds push the same from place through to the ends of the fibers, whence they will be discharged and fall through the spaces *l'* as before explained, the cotton being doffed from the roller *b* and sliding down the guard *h'* upon the floor or into any suitable receptacle. The oscillating blade in moving on the arc of a circle and away from the upper edge of the stationary blade acts more efficiently by way of extracting the seeds, burrs, and other foreign matter than though it moved vertically close to the vertical blade, and besides, a crimping of the stock over the edge of the stationary blade is avoided, and a breaking or tearing of the fiber is entirely prevented. When the oscillating blade rises the under feed will be raised in unison with it, lifting the stock so that it can be readily caught by the gin roller and drawn through the machine. In the burring of wool and the treatment of curled hair, mohair, and similar stock the under feed may not be used. Hence it is made removable.

Various fibers require that the roller *b* be exposed to varying extent between the sta-

tionary and oscillating blades. Hence the said devices are made adjustable, as described; and the flights on the doffer are rendered adjustable to suit it to different fibers and to the roller *b* as it wears away or becomes compacted.

A hood or guard *u'* may be arranged around the shaft *u* to prevent the possibility of fiber in the under feed winding thereon when the machine is in motion.

It will be observed that in my gin the axis of shaft *q* (and therefore the axis of the curved path of the oscillating blade) is at a point very considerably above the horizontal plane of the roller axis, and that the first said axis is laterally remote from the axis of the roller, so that the curved path in which the lower edge of the oscillating blade travels is an arc of a circle whose radius is very long relatively to the radius of the roller, being in fact from three to four times as great in length, and it will be further observed that the movable blade is mounted upon its arms *p* which are so pivoted and so combined with the power devices, that when the oscillating blade is in motion, its lower edge travels from its highest point which is substantially in the plane connecting the axes of roller *b* and shaft *q*, in a downward diverging line away from said roller to points in planes considerably below the horizontal plane of the roller axis—that is to say, the lower edge of the oscillating blade moves in a curved path which is substantially entirely below the plane of the axes of roller *b* and shaft *q* (or the point of tangency of the roller and the curved path of the lower edge of the oscillating blade). The stationary blade is slightly inclined from the vertical, and has its upper edge in close proximity, or resting against the roller just a short distance below said point of tangency, (or the said plane of the axes of roller *b*, and shaft *q*.) so that the lower edge of the oscillating blade is a short distance above it, when said edge is at its highest point. The cotton locks are fed to the roll by a feed in a plane below the point of tangency of the lower edge of the oscillating blade and the roller, so that when the gin roller begins to draw the fibers down over the top of the stationary blade the lower edge of the oscillating blade loosely engages the remainder of the lock with the seed, and moving with a long stroke down and away from the roller, engages the seed positively so that while the roller draws the remainder of the fibers over the stationary blade without crimping or tearing them, the oscillating blade forces the seed off from the ends of the fibers. The stroke of the oscillating blade is considerably longer than the fibers of the cotton which is being ginned, so that the seeds are effectually removed, and can be regulated to suit the particular cotton which is being ginned.

It will be understood that I do not limit myself to any particular form of feeding device, for any device may be used which feeds

the seed cotton to the roller below the point of tangency of the roller and the curved path of the edge of the oscillating blade, for it will be observed that by feeding the cotton in to the roller below the said point of tangency, the said edge of the oscillating blade draws down and laterally from the stationary blade; and it does not crowd the cotton down toward the point of tangency first, before it exerts a partial downward movement after leaving said point, as it does in other machines where the cotton is fed in practically the horizontal plane of the tangent point, and the lower edge of the oscillating blade has the greatest part of its travel above said point of tangency.

In burring wool the detachable underfeed may be removed, and some other feeding device employed in its place.

These features and functions of my machine as above set forth are in contradistinction to those of the machines in which the radius of the curved path of the edge of the oscillating blade is very short; and the said curved path is for the greater part above the plane of the axes of the roller and the pivot for the oscillating blade. In such machines the lower edge of the oscillating blade merely strikes the cotton lock and then immediately leaves it, instead of loosely engaging it and pressing down with a long stroke away from the roller so as to force out the seeds. Then again in such machines, when the cotton is fed to the roller in such way that the roller and the oscillating blade both engage the cotton in the plane in which it is fed to the roller and draw it down on both sides of the stationary blade which extends up to said plane, the cotton is mutilated, torn and crimped.

I have found that in my machine, when the lower edge moves away from the roller in the diverging curved line, there will be so great a space left between the two blades that the roller will draw the cotton lock and its inclosed seed up between them, where the seed will be crushed when the oscillating blade begins its upward movement. Hence I employ as aforesaid a guard *a'* which is wedge shaped with one face conforming to the curved path of the lower edge of the oscillating blade and place it between the two blades, but far enough away from the oscillating blade so that the cotton fibers can pass between them while the seeds cannot. Thus I not only prevent the seeds from getting between the blades, but present a long curved surface against which the lock of cotton can be pressed by the edge of the oscillating blade so that the seeds are effectually removed, while at the same time the lock is so loosely held that the roll will draw the fibers freely between the guard and the oscillating blade, and over and down past the stationary blade.

I am aware of the fact that in a wool burring machine, an oscillating blade has been used in connection with a stationary blade, which latter is curved on one side to conform to the path of the lower edge of the oscillating

blade; but such a construction is incapable of the fine adjustment which is necessary in a cotton gin. Certain conditions require the adjustment of the stationary blade, while the oscillating blade remains unchanged, so that the curved surface of the guard should also remain unchanged, and therefore it is necessary that the stationary blade and the guard should be independent of each other; and again it is expensive to form a steel stationary blade with a curved side, as it is much cheaper and easier to provide a flat blade of tempered steel, and a guard of softer iron or other metal.

Experience has demonstrated that a machine constructed in accordance with my invention will gin a variety of cotton without injuring the fiber or breaking the seeds—whether it be sea-island cotton with small seeds or staple or upland cotton with large seeds;—and that it will treat wool, hair, and similar material with like effect.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made, or all of the modes of its use, it is declared that what is claimed is—

1. In a machine of the character described, the combination with the frame, the roller journaled in the frame, the flat stationary blade secured at its lower edge to the frame, and the adjusting devices pressing laterally against the blade intermediate of its upper and its lower edges, of an oscillating blade having its lower edge traveling in a curved path down past the roller and the upper edge of the stationary blade, and a curved guard independent of said stationary blade and said adjusting devices, and lying between said oscillating blade and said stationary blade substantially as set forth.

2. In a machine of the character described, the combination with the frame, the roller journaled in the frame, the flat stationary blade having its lower edge secured to the frame, laterally adjusting devices for said blade pressing against it at points between its upper and its lower edges, and vertically adjusting devices for said blade, of an oscillating blade, and a curved guard lying between said stationary blade and said oscillating blade, said guard being mounted on said frame independently of said stationary blade, where-

by said stationary blade is adjustable laterally and vertically relatively thereto, substantially as set forth.

3. A machine of the character described comprising in its construction a gin roller, a stationary blade, a movable blade, means for oscillating the lower edge of said movable blade in a long curved path down and laterally from said roller, a guard interposed between said blades, and means for vertically adjusting the stationary blade relatively to said roller and said guard, substantially as set forth.

4. A machine of the character described, comprising in its construction a gin roller, a stationary blade, an oscillating blade, supports for said oscillating blade pivoted at a point vertically and laterally remote from the said roller, means for moving the lower edge of said blade in a long curved path down and laterally from said roller and the upper edge of the stationary blade, a guard interposed between said blades, means for vertically adjusting the oscillating blade relatively to its supports, and means for vertically adjusting the stationary blade relatively to the guard, substantially as set forth.

5. A machine of the character described, comprising in its construction a roller, a stationary blade, an oscillating blade, pivoted arms for the last said blade provided with longitudinal slots intermediate of their ends, a shaft, and eccentrics mounted on said shaft and working in said slots, whereby power is imparted to said oscillating blade to move it in a curved path relatively to the roller and the stationary blade, substantially as and for the purposes set forth.

6. A machine of the character described, comprising in its construction a roller, a stationary blade, an oscillating blade, a blade shaft, eccentrics secured to the same, pivoted arms provided with slots in which said eccentrics operate, and a vibratory underfeed secured to said pivoted arms, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of November, A. D. 1894.

GRABEL E. U. HUCKABY.

Witnesses:

L. B. JORDAN,
ARTHUR W. CROSSLEY.