

P. VON SCHMIDT.

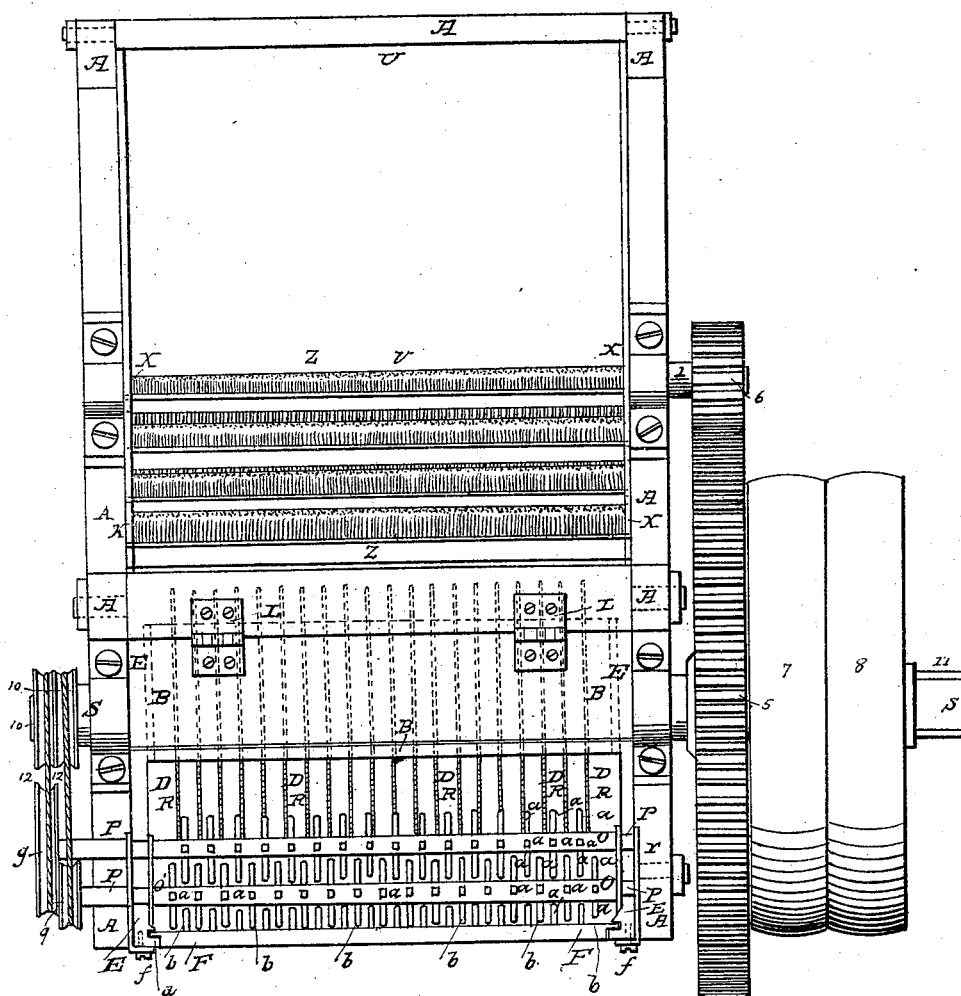
3 Sheets—Sheet 1.

Cotton Gin.

No. 4,817.

Patented Oct. 17, 1846.

Fig. 1



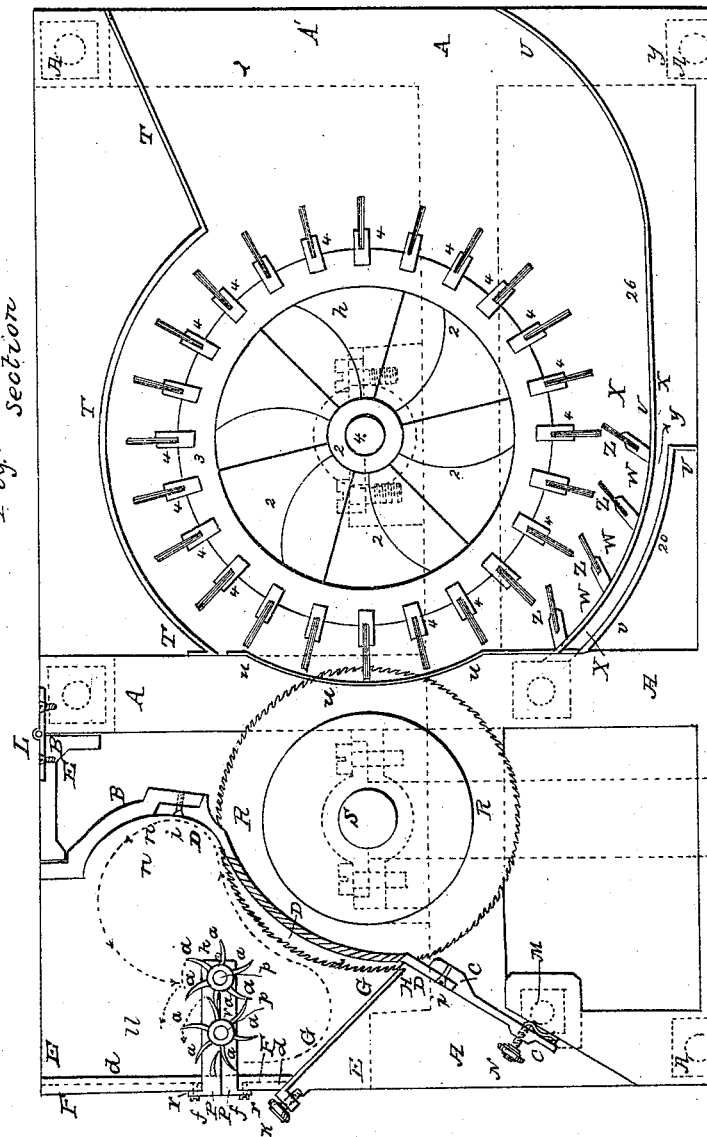
P. VON SCHMIDT.  
Cotton Gin.

3 Sheets—Sheet 2.

No. 4,817.

Patented Oct. 17, 1846.

Fig. 2 section



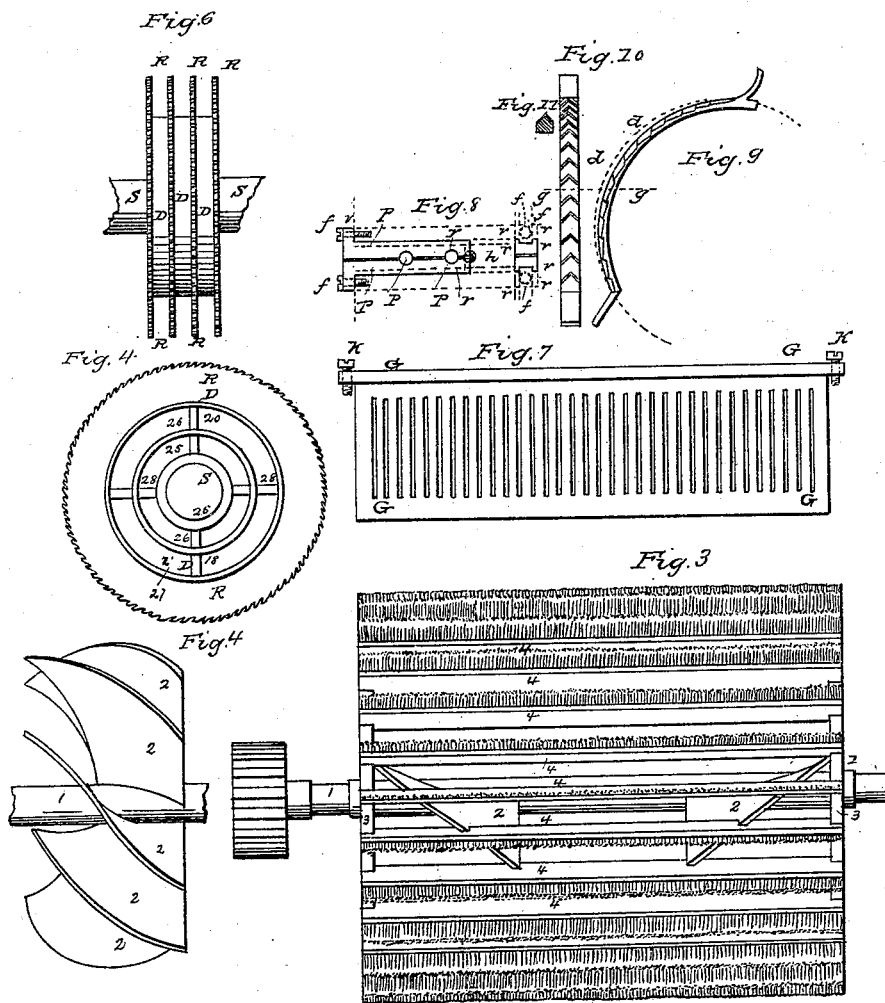
P. VON SCHMIDT.

3 Sheets—Sheet 3.

Cotton Gin.

No. 4,817.

Patented Oct. 17, 1846.



# UNITED STATES PATENT OFFICE.

PETER VON SCHMIDT, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN COTTON-GINS.

Specification forming part of Letters Patent No. 4,817, dated October 17, 1846.

*To all whom it may concern.*

Be it known that I, PETER VON SCHMIDT, of Washington, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Saw-Gins for Separating Cotton from the Seeds and Cleaning the Fibers; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan; Fig. 2, a longitudinal vertical section; Fig. 3, separate view of the rotary fan; Fig. 4, separate view of one of the fans separated from the brush; Fig. 5, section through the saw-cylinder; Fig. 6, plan of a portion of the saw-cylinder; Fig. 7, separate view of the grate below the cleaner; Fig. 8, end view and cross-section of the manner of attaching or connecting the cleaning apparatus; Fig. 9, side view of one of the ribs; Fig. 10, front view, and Fig. 11 cross-section of the same.

The same letters indicate like parts in all the figures.

The ginning of cotton with the saw-gin has for a long time been attended with much difficulty from the very nature of the fiber, its condition in the pod, and the operation of the instruments employed to separate the fibers from the seeds, to which they adhere with more or less tenacity, according to the quality. These difficulties have led to many modifications of the gin with the view to remedy the evils; but so far little improvement has been made in that most valuable of all modern inventions. The fibers are united to and surround the seed, forming pods which contain motes, particles of dead leaves, and other foreign matter very injurious to the gin, and particularly to the staple when passing through the gin with the fibers; and the tenacity with which the fibers adhere to the seed and to each other renders it very difficult to separate them without either cutting or breaking them, or otherwise injuring them by abrasion. When the fibers are not properly loosened preparatory to their being drawn through between the ribs by the saws, they are liable to coil

around the upper part of the ribs, and are there cut by the saws and choke the operation of the machine. Again, after the fibers have been properly separated from the seeds, much difficulty has attended the removal of them from the teeth of the saws by the rotating brush, which, by the action of currents of air drawn on both sides of the gin by the rotation of the brush, force the fibers toward and clog in the middle, so that the action of the brush fails to act equally in removing them from the saws and from the bristles, and at no time does the brush comb out the fibers and separate from them the foreign matter which is found with cotton in great quantities.

The object of my improvement is to avoid these serious evils—

First, by combining with the saws and ribs a rotating cleaner, consisting of one or two arbors placed parallel with each other, and provided with pins projecting therefrom radially and playing between each other, and between permanent teeth, so that by their rotation they act on the pods of cotton, loosen the fibers, and separate from them motes and other impurities which fall through the grated bottom of the hopper. From this cleaner the cotton falls onto the saws and is acted upon by the teeth; but if the pods are not sufficiently loosened they are carried up and again acted upon by the cleaner, and thence again fall onto the saws. In this way the pods are not only freed from all impurities, but the fibers are sufficiently loosened to be separated from the seeds without injury to the staple or the liability of breaking the seeds, the particles of which, when carried through by the saws, are very injurious to the staple.

Second, in making the upper surface of the ribs or grates between the saws with a double-beveled surface with a series of transverse projecting ridges from the bottom to the top, and also in having their lower ends attached to a hinged frame, which rests on springs, the effect of which will be that as the pods are carried up from the bottom of the hopper they strike against the projecting ridges or teeth, which causes them to roll up, at the same time giving to the ribs, in consequence of their spring attachment, a tremulous motion that greatly facilitates the action of the saw-teeth

on the fibers, as the pods are thus carried toward and from the teeth, which have the action of combs to loosen the fibers.

Third, in providing brushes below the rotating brushes and placed parallel with the axis thereof, and slightly inclined in the direction of the rotation, for the purpose of combing or brushing the fibers, which are caught by the stationary brushes and acted upon by the rotating ones, and, when properly brushed and the motes and other impurities separated from them and discharged through a grating below, are liberated from these stationary brushes and delivered in the usual manner; and, fourth, in providing the ends with spiral fans, which draw in a current of air from each end and force it out by centrifugal action equally from end to end of the saw-cylinder to liberate the fibers from the brushes and to generate an outward current to carry off the motes and other impurities below the stationary brushes and the concave, onto which the cleaned and brushed fibers are delivered.

In the accompanying drawings, A represents the main frame, properly adapted to the various parts, and B the front frame, jointed by hinges L to the main frame at top, to which frame B is connected the ribs D and the cleaning apparatus O, and in which is formed the hopper for the reception of the cotton to be ginned. The cleaner consists of two parallel shafts, O O', that have their bearings in the metallic boxes P P, the upper and lower halves of which at their inner ends are connected together by a hinge, h, and when folded together embrace the journals of the two shafts, are inserted in appropriate sockets in the hinged frame B, and then secured thereto by screws f f, passing through flanges r r, so that the cleaner can be readily removed by simply taking off the front plate, F, of the front frame, and taking out the screws f f. The shafts O O' receive rotary motion in the same direction and the reverse of the saws by belts 12 12, that run from pulleys 10 10 on the saw-shaft to pulleys 9 9 on the shafts O O', and the pulley on the shaft O' is much smaller than the other to give it a more rapid motion. These shafts are armed with teeth a, which may be either radial or slightly curved, those on the shaft O playing between the teeth of the other, O', which latter also play between permanent teeth b, attached to the frame. The cotton to be ginned is thrown onto and is acted upon by these teeth in their rotation, and when cleaned and loosened falls down onto an inclined grating, G, below, which forms the bottom of the hopper, and which permits the dirt separated from the pods to fall through, while the bars conduct the pods to the edges of the saws R. This bottom grating slides in the frame B, and is adjustable by means of set-screws k k, to regulate the distance between the lower edge and the saws for the delivery of the seeds. The saws R, made in the usual manner, are secured onto a shaft, S, and kept at the required distances

apart by means of three metallic rings, 25 26 27, connected by radial pieces 28, for the purpose of keeping the edges perfectly true, and avoiding the buckling, which tends to carry the edges of the saw-teeth against the ribs, and thus to injure the staple. The ribs D, between the saws, have their upper surface beveled in both directions to form a ridge in the middle, extending from top to bottom, as shown distinctly at Figs. 9, 10, and 11, and these inclined surfaces are notched obliquely in opposite directions, to constitute a series of V-formed teeth, extending from the bottom to within a short distance of the top, and these teeth project from the general surface of the ribs about one-sixteenth of an inch, and at the top their distance apart is about equal to the width of the rib, and gradually greater toward the bottom. Care should be taken not to make their edges so sharp as to catch and hold the fibers, but simply to present impediments to the upward movement of the pods and cause them to roll up until the fibers are sufficiently loosened, which loosening operation is greatly facilitated by the spring-connection, which is as follows: The upper ends of the ribs are secured to the bar B', and their lower ends to the lower bar, C, of the hinged frame B, and the bar C of this frame is provided with set-screws N N, the points of which rest on springs M M, attached to the permanent frame, so that as the pods are carried up over the toothed surface of the ribs they receive a tremulous motion, which carries the pods toward and from the saws, which greatly tends to loosen the fibers; but if the pods have not been sufficiently loosened they are carried up to the curved part B' of the frame and thrown in the direction of the arrows onto the cleaners, to undergo a second operation. After the saws have carried the fibers through the spaces between the back ribs, u, the teeth of the saws projecting beyond these sufficiently to receive the action of the rotating brushes, they remove the fibers from the teeth and carry them down to a series of permanent brushes, Z Z Z Z, inclined in the direction of the motion of the rotating brushes, and attached to bars running parallel with the axis of the rotating brushes; and the bars of the permanent brushes rest on a grating, w, which permits the motes and other impurities separated from the fibers as they are brushed to escape in the direction of the arrow x y, while the fibers, after being brushed, are discharged onto the concave v, which extends from the last of the series of permanent brushes Z to the aperture A' for the discharge of the cleaned cotton. The rotating brushes are attached to and project radially from bars 4, attached at each end to a ring, 3, connected with the shaft 1 by means of spiral or oblique vanes 2, which constitute fan-blowers, that produce inward currents of air at both ends, which are deflected and carried outward by centrifugal force to discharge the fibers from the rotating

fans equally from end to end, and to carry out the motes and other impurities in the direction of the arrow *x y*.

It will be obvious from the foregoing that the ribs, instead of being all attached to the hinged frame which rests on or is attached to springs, may be each separately jointed to a permanent frame and rest on a spring; but this would be much more expensive, and would be on the same principle. The teeth of the cleaners may be changed in form, and instead of having the two shafts to rotate in the same direction and the teeth of one passing between permanent teeth, these latter may be dispensed with by rotating the shafts in opposite directions; or one of the shafts may be dispensed with by retaining the permanent teeth; but the arrangement pointed out above is deemed the best. The number and size of the teeth on the ribs and the inclination of the beveled surface thereof may be increased or decreased without changing the principle or mode of operation of this part of my invention; and in like manner the number and inclination of the permanent brushes and wings or vanes of the fan-blowers can be increased or decreased without affecting the mode of operation except in degree.

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

1. The cleaner, when placed in the hopper and forward of the saw, in combination with the gin-saws and ribs, substantially as described, whereby the pods of cotton are loosened and the trash cleaned out and the un-ginned pods that have been acted upon by the

saws are carried back to the cleaner again to be acted upon by the teeth thereof, as described.

2. Making the upper or outer surface of the ribs between the saws with a series of teeth, substantially as described, for the purpose of resisting the upward movement of the pods and causing them to turn as they are carried up, as described.

3. Attaching the ribs so as to vibrate at top on a hinged joint when this is combined with the spring-connection at bottom, substantially as described, whereby they receive a tremulous or vibratory motion to carry the pods toward and from the saws, as described.

4. The series of permanent brushes below the rotating brushes when combined with the rotating brushes and saws, substantially as described, for brushing the fibers and more effectually removing the motes and other impurities therefrom, as described, and in combination with this the grate and discharge-passage for the motes and other impurities below the permanent brushes, substantially as described.

5. In combination with the rotating brushes, the spiral or oblique fan-blowers at each end, substantially as described, for the purpose of introducing within the brushes currents of air to discharge the fibers from the brushes and to carry out the motes and other impurities, as described.

PETER VON SCHMIDT.

Witnesses:

A. P. BROWNE,  
T. C. DONN.