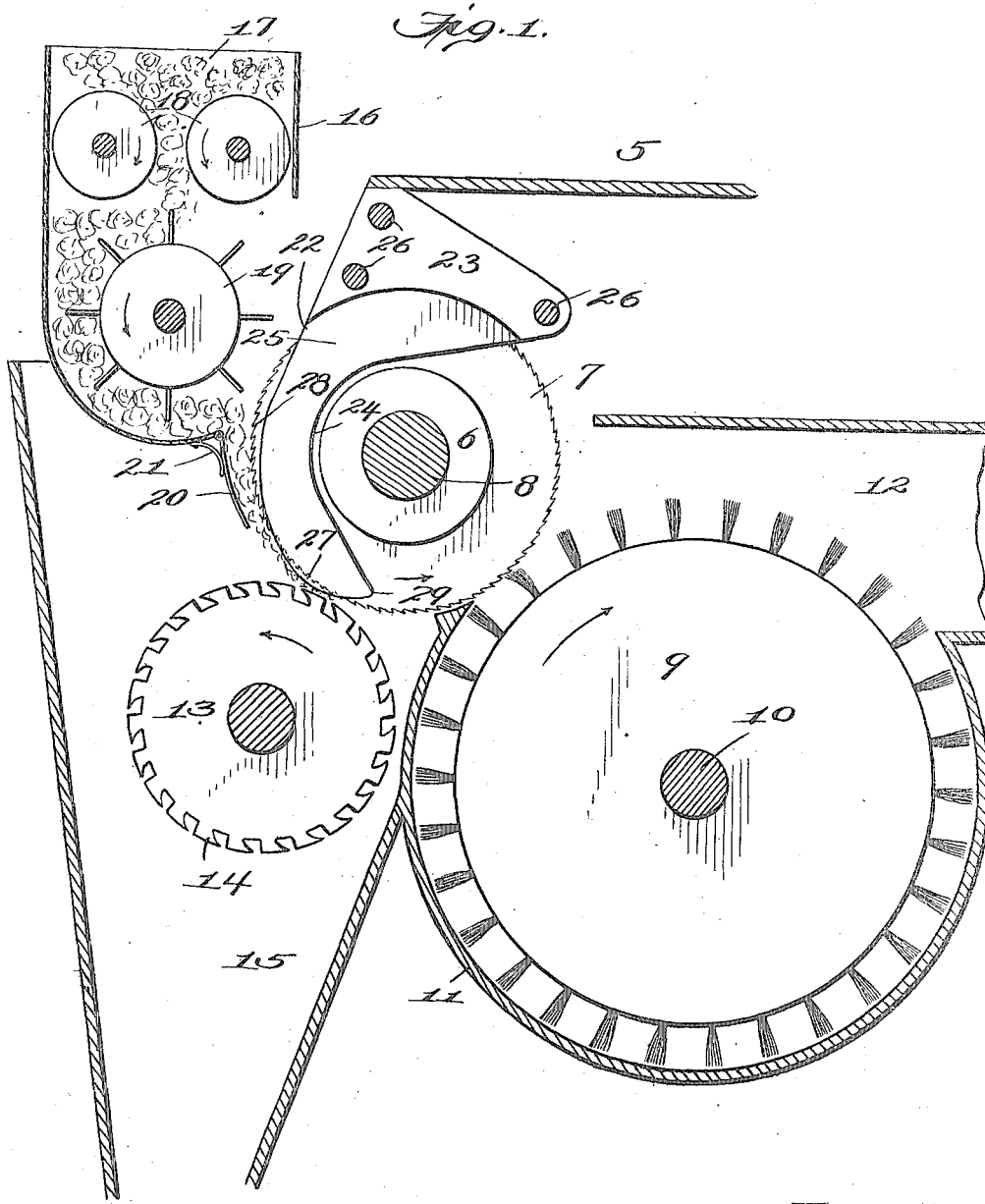


S. F. KRUPP.  
COTTON GIN.  
APPLICATION FILED SEPT. 12, 1916.

1,266,826.

Patented May 21, 1918.  
4 SHEETS—SHEET 1.



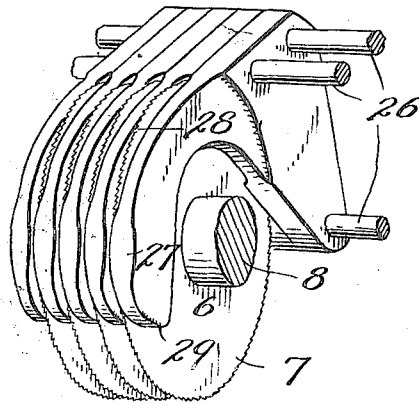
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Inventor  
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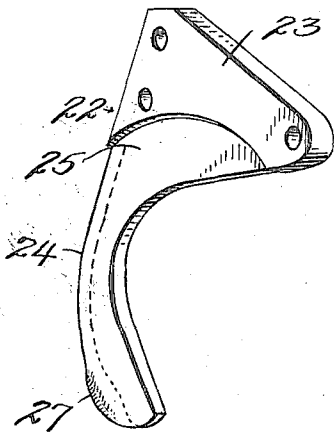
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4 SHEETS—SHEET 2.

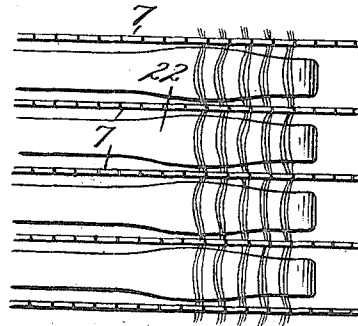
*Fig. 2.*



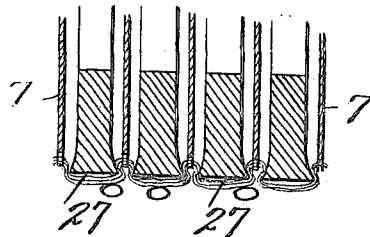
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



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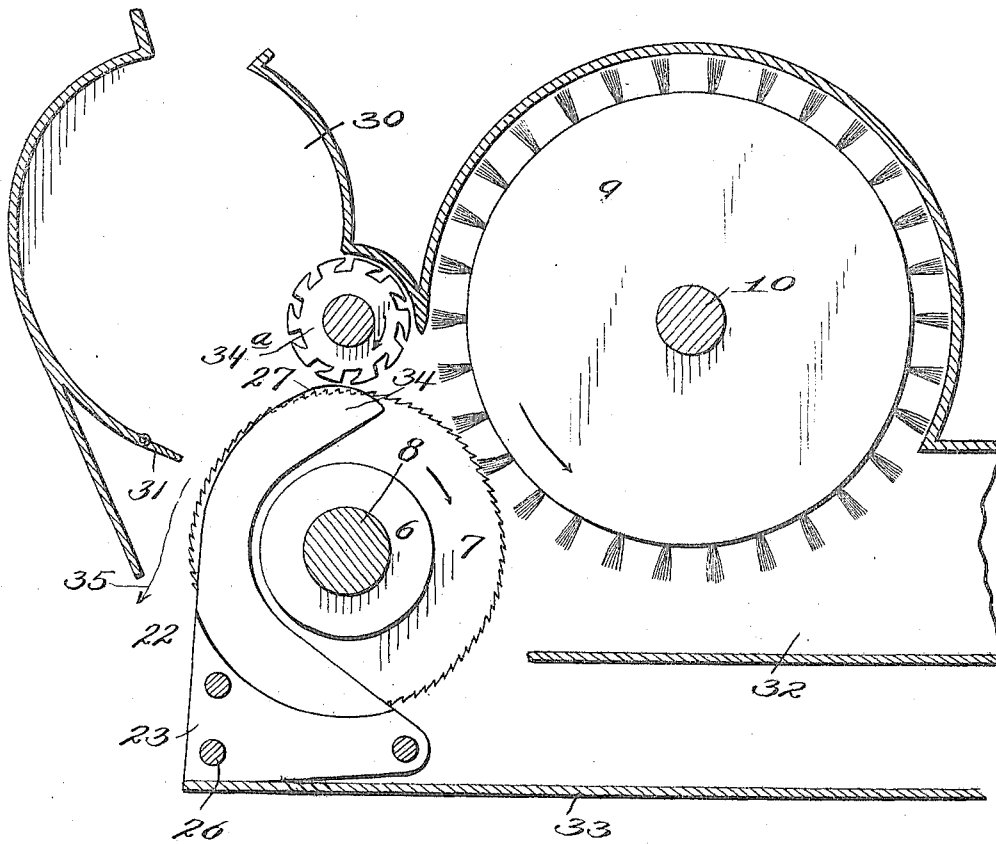
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4 SHEETS—SHEET 3.

*Fig. 6.*



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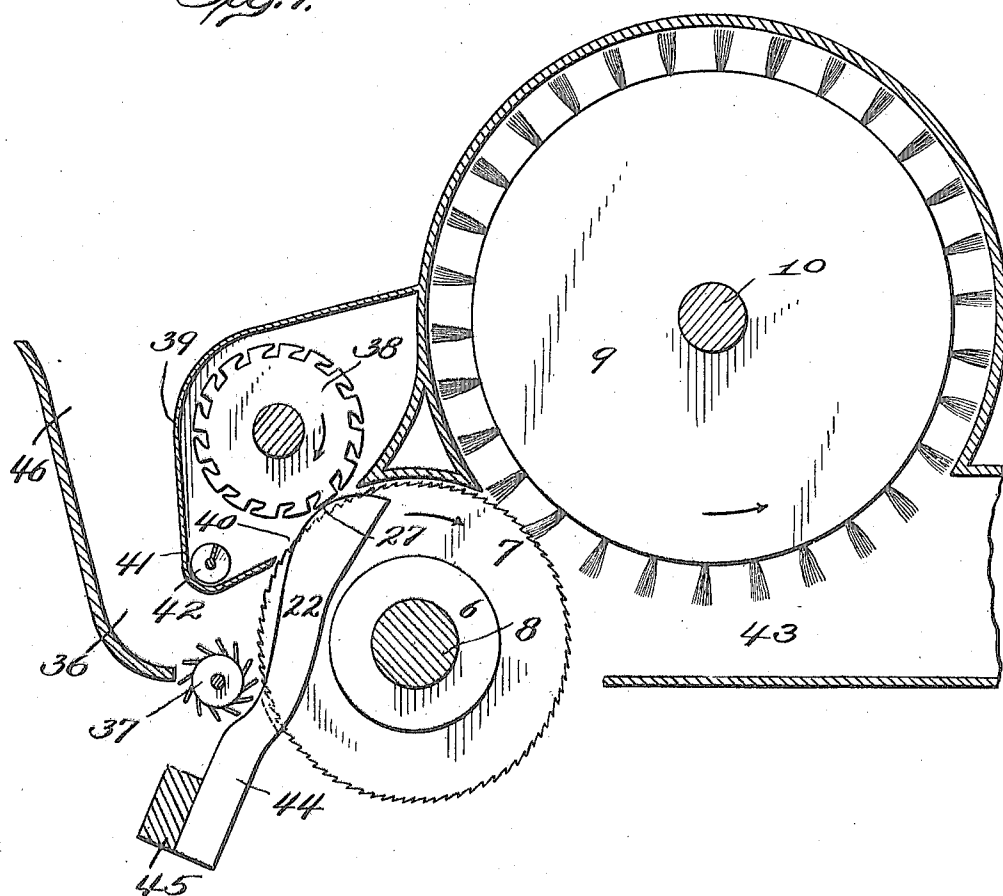
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4 SHEETS—SHEET 4:

*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

SMITH F. KRUPP, OF ATLANTA, GEORGIA.

COTTON-GIN.

1,266,826.

Specification of Letters Patent.

Patented May 21, 1918.

Application filed September 12, 1916. Serial No. 119,697.

*To all whom it may concern:*

Be it known that I, SMITH F. KRUPP, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented new and useful Improvements in Cotton-Gins, of which the following is a specification.

This invention relates to cotton gins for treating either long or short staple cotton or for delinting operations, but is particularly applicable to and effective in ginning long staple or sea island cotton which usually has been treated heretofore by roller gins in order to preserve and prevent injury to or breaking of the long fibers. The usual form of saw gins is inapplicable to ginning long staple cotton for the reason that the ribs of these gins have both ends fastened outside the circumference of the saws and their working faces or edges inside the circumference of the saws, and as a consequence the long fibers are thrown across, injured, broken or severed by the ribs and saws at the time these fibers are drawn between the ribs and the commercial value of long staple cotton is materially lessened by reason of the injury thereto. In the gin embodying the subject-matter of the present invention the ends of the ribs toward the direction of rotation of the saws are free and inside the circumference of the saws and the working faces or edges slightly outside of the saw circumference so that the fibers can be caught by as many saws as the fiber will reach over, and instead of injuring the fibers they will readily pass over the portions of the ribs outside of the circumference of the saws.

The main object of the present invention is to provide means for protecting the fiber of both long and short staple cotton, and especially long staple cotton, at the operative juncture of the saws of the gin with the ribs without the least injury to the fiber and thereby insure a maximum output capacity of a gin and a product of high commercial grade.

Other objects and advantages will appear in the subjoined description, and in the accompanying drawings several forms of the improvement are illustrated to adapt the same to cotton of different fiber characteristics, the gin in its organization aside from the improvements being provided with the usual complemental parts or devices embodied in a saw gin. Moreover, it will be

understood that the improved features do not in the least interfere with or modify the construction and function of well known gin attachments other than those illustrated and hereinafter described.

In the drawings:

Figure 1 is a transverse vertical section through a portion of a gin embodying the features of the invention.

Fig. 2 is a detail perspective view of a portion of a saw cylinder and a part of the improved rib structure associated therewith.

Fig. 3 is a detail perspective view of one of the improved ribs.

Fig. 4 is a diagrammatic plan view of a portion of the saws of a cylinder and the ribs showing the position of the cotton locks and the protection afforded the same in moving over the ribs.

Fig. 5 is a detail transverse section of a portion of the saws of the saw cylinder and the improved ribs together with the cotton locks to illustrate the position of the latter relatively to the ribs and saws.

Fig. 6 is a transverse vertical section through a portion of a gin embodying a modification in the improved structure.

Fig. 7 is a transverse vertical section through a portion of a gin showing a still further modification and the use of a huller chamber and roller in connection with the gin.

The numeral 5 designates a frame which may be of any preferred construction, and therein is mounted a saw cylinder 6 comprising a plurality of saws 7 and a shaft 8 having the usual mounting and driving means at the opposite extremities of the frame or casing 5 of the gin. Coöperating with the saws 7 of the cylinder 6 is an ordinary brush cylinder 9 also mounted on a shaft 10; the saw cylinder and brush cylinder being operated as usual in relative timed relation. The brush cylinder 9 is mounted in an inclosing casing 11 as usual and is operatively positioned relatively to a lint chute or lateral 12 which receives the lint cotton therefrom and is taken from the saws 7 of the cylinder 6. In advance of the brush cylinder 9 and below the saw cylinder 6 is a doffing cylinder 13 which may be of any suitable construction and is provided with doffing members or devices 14 which run closely to the teeth of the saws 7. The doffer 13 is located in the ordinary hopper 15 to catch the seed and deliver the latter to the lower portion of

the gin. Fitted in the casing or frame 5 at an elevation above the saw cylinder 6 is a feeder 16 having an upper open inlet end 17 with two feed rollers 18 mounted therein above a main or other suitably bladed or spiked roller 19 to straighten out the seed cotton and to regulate the feed relatively downwardly from the feeder. At the lower inner portion of the feeder adjacent to the saws is a movably mounted comb 20 engaged by a spring 21, the comb having a plurality of fingers which also operate to straighten out the locks of seed cotton and hold them toward the saws out of the way of the doffer 13 below and also apart from the locks of cotton immediately ahead which are being acted upon by the doffer.

One of the most important features of the improved gin is the ribs 22 each consisting essentially of an approximately angular head 23 and curved arms 24, recesses 25 being formed on opposite sides of each rib from the point of intersection of the arm 24 with the head 23 to the free end of the arm. These recesses 25 serve as seats for the saws 7, as clearly illustrated by Fig. 2; and in the form of the gin as shown by Fig. 1 the heads 23 are engaged by rib rods 26 secured in the casing or frame 5 above the saw cylinder. The arms 24 of the ribs project between the saws 7 and each arm has a laterally extended guard 27 formed as a part thereof, and the general shape or curvature of the arm is such that at the point where the guard 27 is formed the arm will stand outwardly beyond the circumference of the saws adjacent thereto, the saws above the guards 27 being exposed for engagement with the cotton, as at 28, and below the guards the arms extend rearwardly between the saws, as at 29. The combined guards 27 of the arms 24 prevent contact or engagement of the cotton locks with the saws as the latter rotate and draw the cotton locks downwardly and rearwardly toward the brush cylinder 9. The guards 27, as shown by Fig. 1, are located opposite the nearest approach of the periphery of the doffing devices 14 of the doffer 13 to the saws, and the increase in width of the arms 24 of the ribs at the points where the guards 27 are formed is such as to permit the locks of cotton to be drawn between the ribs and the saws by the latter, but obstruct the passage of the seed between the saws. It will be seen that the end of the arm 24 of each rib 22 toward the direction of travel or rotation of the saw teeth is free and inside of the circumference of the saws, and the working face is slightly outside of the saw circumference so that the fibers can be caught by as many saws as the length thereof is permitted to reach and be caused to freely pass over the guards of the rib arms without injury. The teeth of

the saws disappear below the surface of the ribs at the guards and the locks of lint picked up by the saws are held in a regular position and slip over the free ends of the ribs at about the point 29. The seed are exposed to the doffer 13 and it is proposed to dispose the doffer blades or projections 14 at an angle to the plane of rotation of the saws and brush the seed from the fiber in alternate directions. The fiber of the locks of cotton that are not caught with the saw teeth will slide with the seed over the high portions or guards 27 of the arms 24 of the ribs, and the part of the fiber which extends below the surface of the ribs and is caught by each saw serves as a loop by which the saw can drag the entire lock of cotton over the high portion or guard of the rib. This particular high portion or guard of each rib serves as an anvil for holding the fiber and the seed against the action of the doffer, the doffer as hereinbefore explained serving as a means to separate the seed from the cotton. This operation of the saws relatively to the cotton locks and the movement of the latter over the guards or high portions of the arms 24 of the ribs is clearly illustrated by Figs. 4 and 5, and it will be seen in Fig. 4 that the cotton locks regularly traverse the rib guards and are held intact by the latter and finally carried around by the saws to be acted upon by the brush cylinder 9 which of course relieves the saws of the locks and drives the detached lint into and through the lint flue or lateral 12. In the form of the gin as shown by Fig. 1 the saw and brush cylinders revolve in a direction opposite to that in ordinary gins, the brush cylinder rotating in a clock-wise direction and the saw cylinder in a counter-clock wise direction. In Fig. 5 it will be seen how the cotton locks are drawn between the ribs by the saw teeth and held while moving over the guards or high portions 27 of the ribs and also that the ribs constructed as specified prevent the passage of seed into the spaces between the saws. The feeder 16, as shown by Fig. 1, takes the place of the usual roll box of a gin, it being unnecessary in this particular construction of gin to use a roll box, but if desired the features of the invention might be adopted in connection with an ordinary gin structure or the ribs 22 and doffer 13 could be used in a gin having a roll box. The main advantage of the improved gin structure as thus far described is that it has a greater capacity in treating long staple cotton than the form of roller gin which has been ordinarily used for this purpose, in view of the fact that the present improved form of gin has a more rapid operation or is faster in its treatment of the cotton than the roller gin. It is also proposed to modify the proportions and general dimensions of the brush and saw cylin-

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ders as well as the doffer 13 and the rib structures will be modified accordingly. The ratio of the speed of the saw cylinder and doffer 13 will be such that the entire length of the fiber will be acted upon by the said doffer, and the speed of the brush cylinder 9 will depend upon the speed of the saw cylinder. While it is preferred to use a brush cylinder for removing the lint from the saws, it will be understood that any other well known lint removing means may be adopted, the brush cylinder and the saw cylinder being illustrated solely for the purpose of demonstrating one practical organization for separating the lint cotton from the seed and trash or other matter that may be fed with the cotton to the improved gin.

In Fig. 6 another application of the improved features of the gin is shown, the gin in this instance embodying a roll box 30 and supporting the foregoing statement that a roll box may be used with the improvements. At the lower end of the roll box 30 is an ordinary finger board 31 which performs its usual function relatively to the saw cylinder 6 embodying as in the foregoing structure saws 7 mounted on a shaft 8. The brush cylinder 9 in this instance is disposed above the plane of the saw cylinder 6 and a lint flue 32 is disposed below the brush cylinder 9, the casing and gin frame structure 33 in this instance being modified to accommodate the change of position of the parts just specified. A doffer 34<sup>a</sup> similar to the doffer 13 shown by Fig. 1 is mounted above the saw cylinder and the ribs 22 are reversed in this modified structure and have their heads 23 secured adjacent to the bottom of the gin casing or frame by rods 26 similar to those hereinbefore described. The ribs 22, as shown by Fig. 6, are in all respects constructed similarly to the ribs shown by Figs. 1 to 5 inclusive, and similar reference characters are applied to corresponding parts, the only difference being that the free end of each rib is projected upwardly and rearwardly between the saws, as at 34, but each rib is provided with a guard 27 similar to the guards heretofore described, and the saws are below the plane of the guards or stand inwardly within these projecting portions of the ribs. This modified form of the gin is intended for treating short staple cotton and separating the lint from the seed, trash, etc., that may come with the cotton into the roll box 30, the doffer 34<sup>a</sup> revolving in the direction of the arrow indicated and throwing the seed and other matter outwardly and downwardly toward the bottom of the roll box where it passes out, as indicated by the dotted arrow 35. The saws 7 take up locks of cotton from the cotton in the roll box below the guards 27 of the ribs 22 and the cotton fiber passes over the ribs free of the saws and is

preserved and operated upon precisely in the same manner as explained in the first form of the gin as shown by Fig. 1. The lint is released from the saws by the brush cylinder 9 and driven into and outwardly through the lint flue or lateral 32. Instead of the brush cylinder 9 any other lint removing device may be used in connection with the saws.

In Fig. 7 a further modification is shown wherein the improved features are applied to a gin embodying a hulling chamber 36 and a spiked hulling roller 37, and in this instance the doffer 38 which is similar to the doffers heretofore described is mounted in an inclosure 39 depending over a portion of the saws 7 of the saw cylinder 6, which in the present instance is also mounted on a shaft 8. The rear lower portion of the inclosure 39 of the doffer 38 is slotted, as at 40, for exposure of the saws and a portion of the ribs 22 relatively to the doffer 38, the seed being thrown outwardly away from the saws by the doffer 38 toward the lowermost portion of the inclosure 39 where a trough 41 is formed and provided with a feed screw or auger 42 by means of which the seed may be conveyed longitudinally through and outwardly from the inclosure 39. A brush cylinder 9 is also shown arranged by the saw cylinder 6 to remove the lint cotton from the saws 7 and drive it into and through a lint flue or lateral 43 similar to the flues and laterals 12 and 32 heretofore described. The shape of the ribs 22 in this instance is slightly different from the ribs heretofore disclosed. Instead of forming the ribs 22 with the enlarged heads 23 at one end, the ribs shown by Fig. 7 are provided with securing shanks or stems 44 which constitute the lower extremities thereof, said shanks or stems being attached to a rib rail 45. In other respects the ribs are essentially the same as those heretofore explained and are provided with guards 27 which project outwardly beyond the circumference of the saw cylinder 6 adjacent to the periphery of the doffer 38, which in the present instance has working teeth or projections as in all the forms of doffers hereinbefore disclosed. In the operation of this further modified form of the gin the hully cotton is deposited in the chamber 36 through an upwardly opening hopper 46 and passes down to the spiked roller 37 which operates to throw the hully cotton up against the saws 7 which are exposed in the lower rear portion of the chamber 36, and by this means the hulls and trash are removed from the cotton, or broken, and the cotton is taken up by the saws from the chamber 36 clear of the hulls and trash and drawn upwardly toward the doffer 38, and that part of the hulls which may adhere to the cotton is removed by the doffer 38 with

the seed and cast into the lower portion or trough 41 of the inclosure or hood 39. In the modified form of the gin shown by Fig. 7 the fiber is protected by the guards 27 of the ribs and a superior lint cotton product results.

From the foregoing it will be seen that the most important feature of the invention consists of means for protecting the fiber of cotton, whether it be long or short fiber, while the fiber is moving over the saws and during the time of separation of the seed, dirt and trash therefrom so that when the fiber reaches a position to be removed from the saws and delivered into a lint flue or lateral it will be in a good commercial condition, and in ginning long staple cotton of the character hereinbefore explained the long fibers are protected and will not become broken or injured while moving over the saws and the output or capacity of gins for treating long staple or sea island cotton is increased as the ginning operation of this kind of cotton may be expeditiously carried on through the medium of the improvements hereinbefore disclosed and as shown in the drawings.

What is claimed is:

1. In a cotton gin, the combination with toothed devices for taking locks of cotton from cotton in bulk, and a doffer, of means having working parts outside of the plane of movement of the devices and preventing the teeth of the devices from coming into contact or engagement with any of the seed and only a small portion of the fibers of the locks of cotton while the cotton locks are in engagement with a portion of the teeth of the devices and thereby also preventing all of the teeth of the devices from injuring the fibers of the cotton locks while the latter are moving toward the point of removal thereof from the devices, the said means having a portion of the extremities thereof unattached.

2. In a cotton gin, the combination with toothed devices for taking locks of cotton from cotton in bulk, and a doffer, of means between the devices having free ends in the direction of rotation of the devices, said means being provided with working faces having intermediate parts slightly projected outside the teeth of portions of the devices and over which the locks held by said devices have movement and the fibers thereby protected against injury or breakage while the locks are moved toward their point of removal from said devices.

3. In a cotton gin, the combination with saws, of a plurality of ribs between the saws, and a doffer, each rib having one end secured and the opposite end free, the ribs having working faces having intermediate portions slightly projected outside

the circumferences of the saws over which the cotton locks have movement to protect them against injury or breakage.

4. In a cotton gin, the combination with saws, of a plurality of ribs between the saws, and a doffer, each rib having one end in the direction of movement of the saws between the saws free and inside of the circumference of the saws, all the ribs having intermediate parts slightly projected outside of the circumferences of the saws and over which the cotton locks have movement to protect them against injury or breakage.

5. In a cotton gin, a plurality of saws, a doffer, and means alternately disposed with relation to the saws and having intermediate outward projections beyond a portion of the circumferences of the saws and also provided with free extremities and over which the fibers of the locks of cotton carried by the saws have movement to guard the said fibers against injury or breakage.

6. In a cotton gin, a plurality of saws, a doffer, and means interposed between the saws and having intermediate portions thereof extending outwardly beyond the circumferences of the saws and also laterally extended to cover over a portion of the openings between the said means and saws.

7. In a cotton gin, the combination of ginning saws, means for removing the lint cotton from the saws, a doffer, a plurality of ribs interposed between the saws, each rib having one end secured and the opposite end free in the direction of movement of the saws, the ribs having working faces slightly outside the circumferences of the saws and over which the cotton locks have movement to protect the fibers thereof against injury or breakage, and a doffer cooperating with the saws adjacent to said working faces of the ribs.

8. In a cotton gin, the combination of saws, ribs interposed between the saws and having unattached extremities and also provided with intermediate guards projected outwardly beyond the circumference of portions of the saws and over which the cotton fiber is drawn by the saws, the guards preventing all of the teeth of the saws from engaging and injuring the cotton fiber as the latter is moved over the ribs, and a doffer cooperating with the said saws and ribs adjacent to the guards.

9. In a cotton gin, ginning saws, means having unattached extremities and also provided with intermediate projections located outside of the circumference of portions of the saws and over which the cotton fiber is moved and prevented from having contact with the saws to obviate engagement of all of the teeth of the saws with and injury to the fiber during its move-



ment toward the point of removal from the saws.

10 5 10 In a cotton gin, a plurality of saws having means disposed between the saws and provided with unattached extremities and also with intermediate projections cooperating with the saws for preventing portions of the teeth of the saws from engaging and injuring the cotton locks during the movement of the cotton locks by the saws over the said projections, and a doffer coating with the saws and means.

15 11. In a cotton gin, the combination of saws, a doffer, a plurality of ribs between the saws, each rib having recesses on opposite sides for adjacent saws, each rib also having one end secured and the opposite

end free in the direction of movement of the saws, the ribs having portions projected slightly outside the circumferences of the saws and also extended laterally, the cotton locks taken up by the saws moving over the said portions of the ribs extending outside the circumferences of the saws to protect the cotton fibers against injury or breakage.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SMITH F. KRUPP.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."