

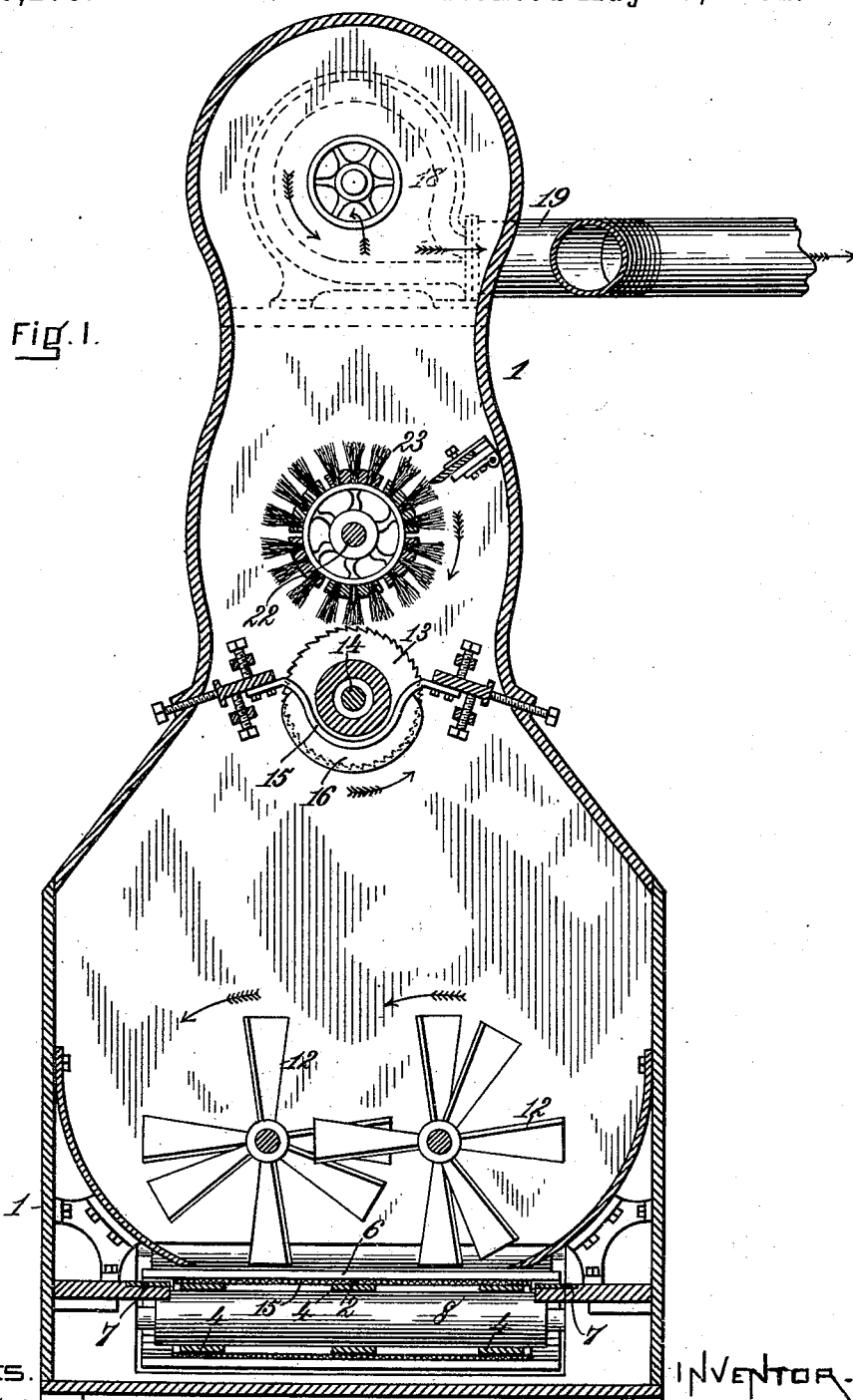
(No Model.)

6 Sheets—Sheet 1.

A. M. CROOKER.
SAW COTTON GIN.

No. 475,206.

Patented May 17, 1892.



WITNESSES.
J. A. Kellumford.
Robert Everett.

INVENTOR.

By Alfred M. Crooker.
James L. Norris, Atty.

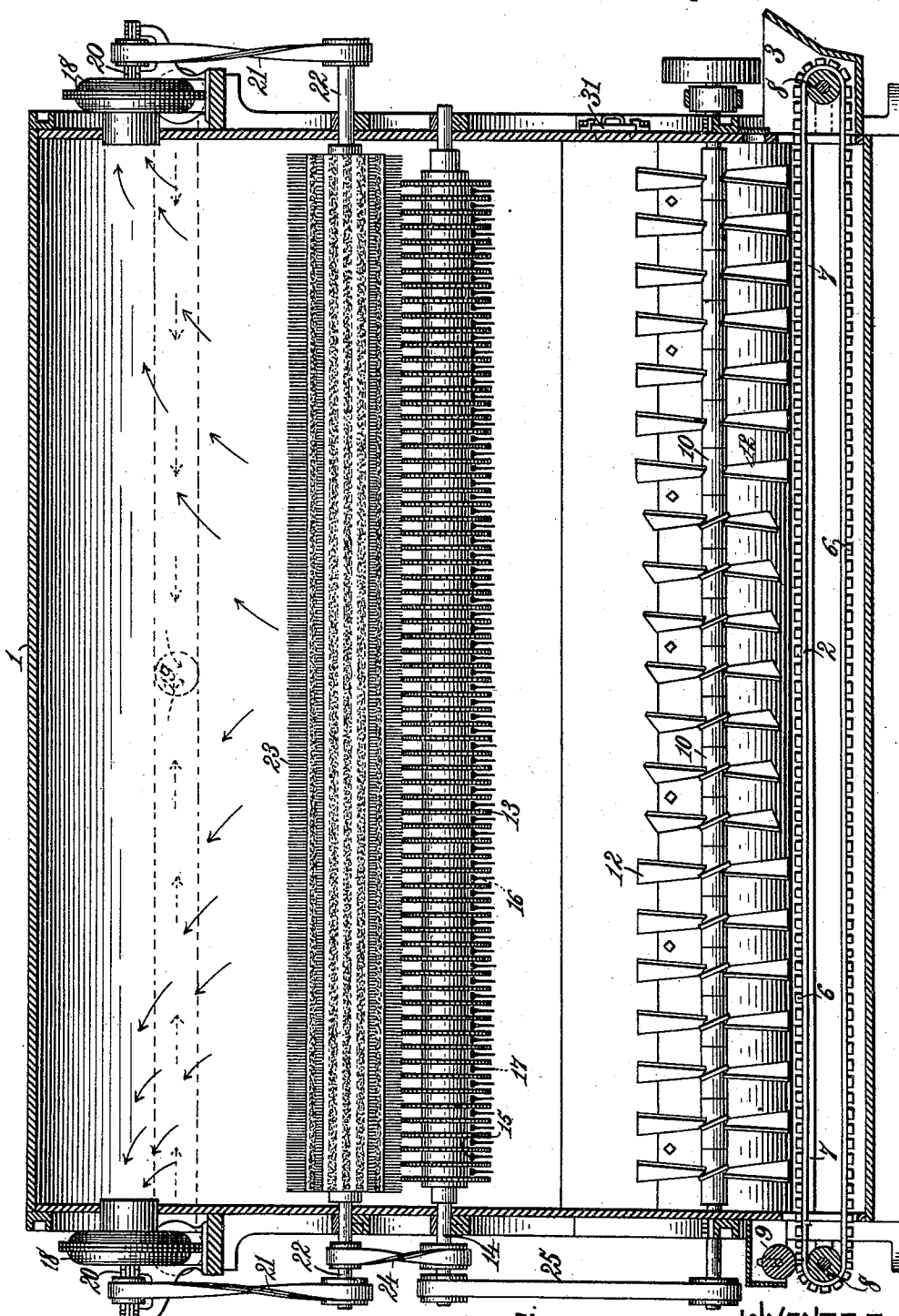
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6 Sheets—Sheet 2.

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WITNESSES
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FIG. 2.

INVENTOR A.
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(No Model.)

6 Sheets—Sheet 3.

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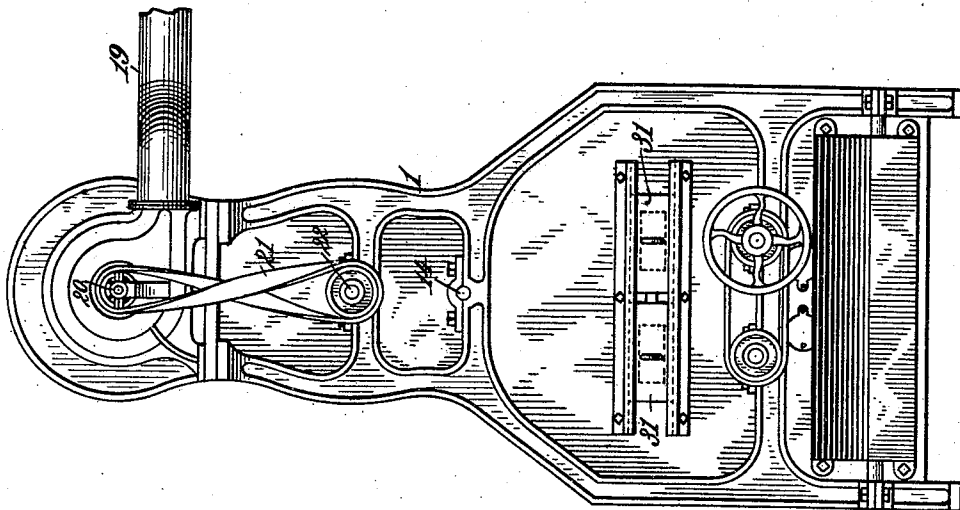


FIG. 3.

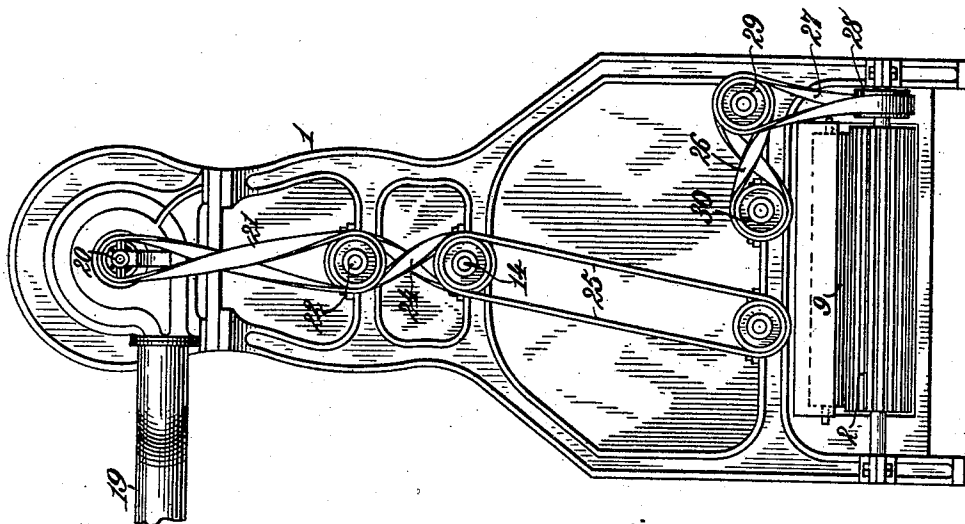


FIG. 4.

WITNESSES.

J. A. Rutherford.
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(No Model.)

6 Sheets—Sheet 4.

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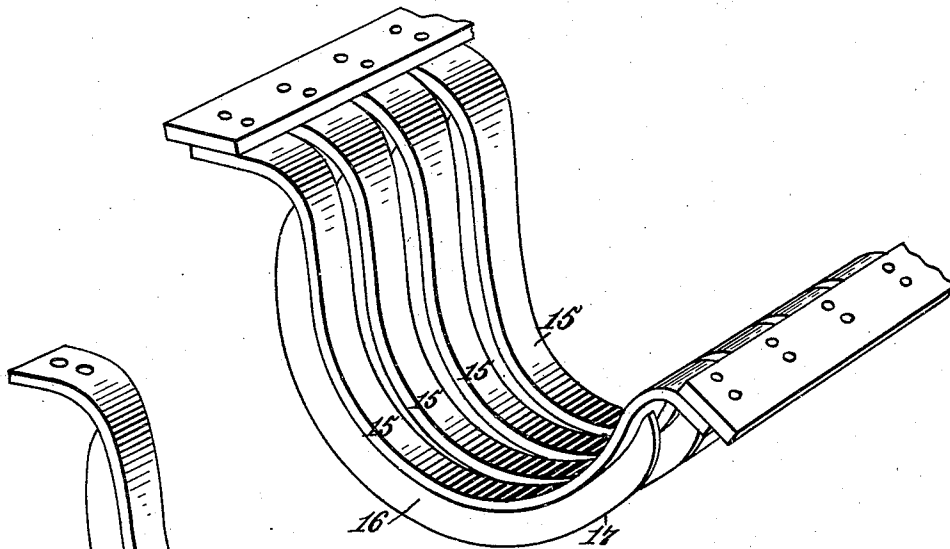


Fig. 5.

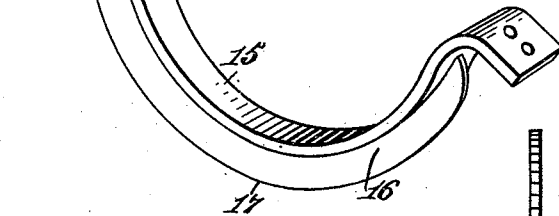


Fig. 6.

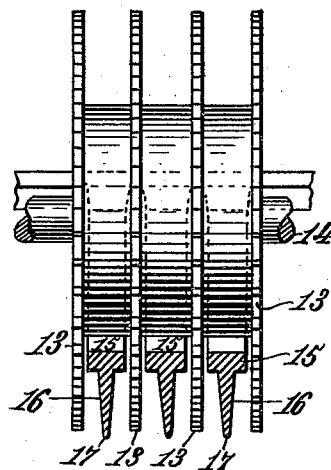


Fig. 7.

WITNESSES.

J. A. Rulheyford
Robert Connett

INVENTOR

Alfred M. Crooker

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James L. Norris

Atty.

(No Model.)

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A. M. CROOKER.
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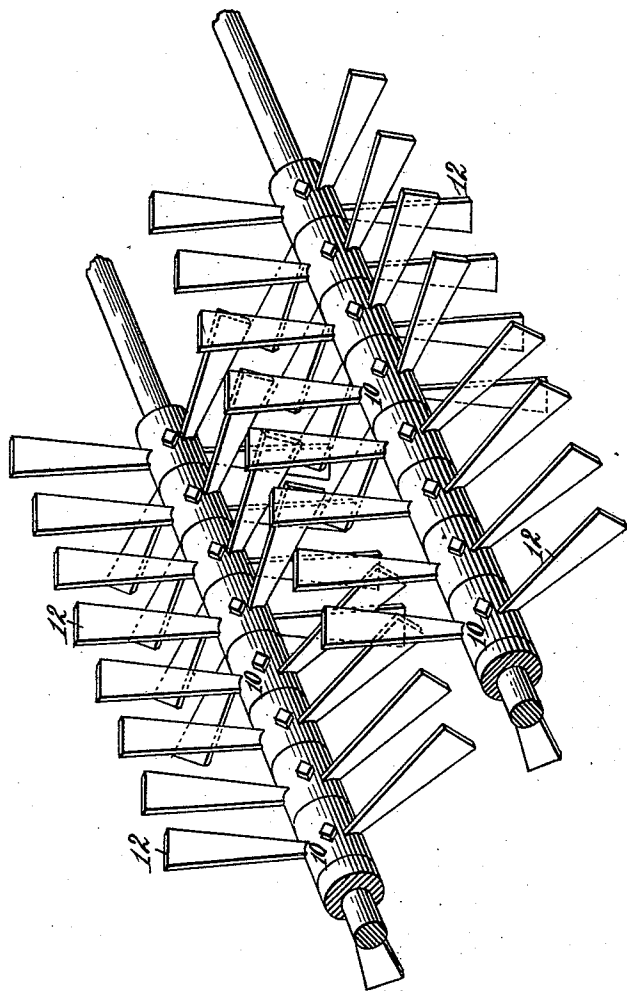


Fig. 8.

WITNESSES
J. A. Rutherford
Robert G. Smith

INVENTOR
Alfred M. Crooker
By *James L. Norris*
Atty

(No Model.)

6 Sheets—Sheet 6.

A. M. CROOKER.
SAW COTTON GIN.

No. 475,206.

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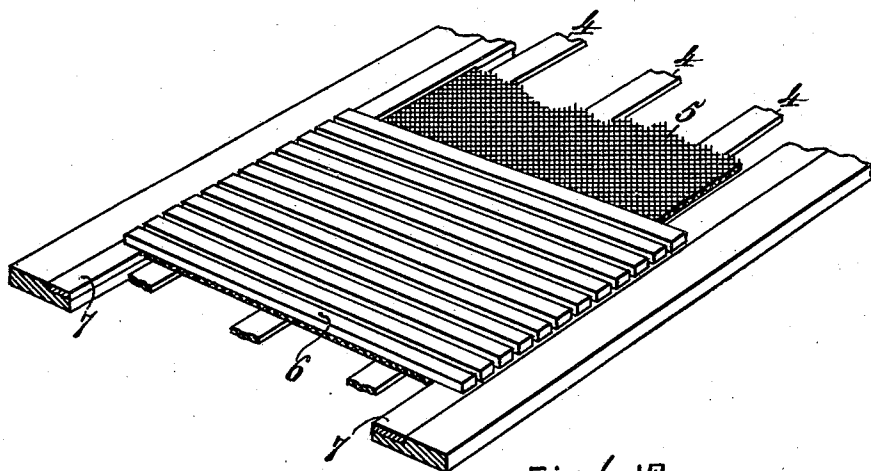


Fig. 12.

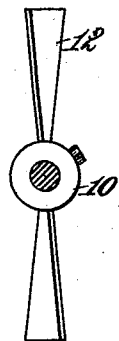


Fig. 9.

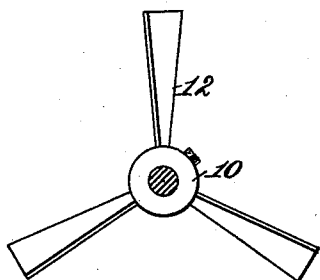


Fig. 10.

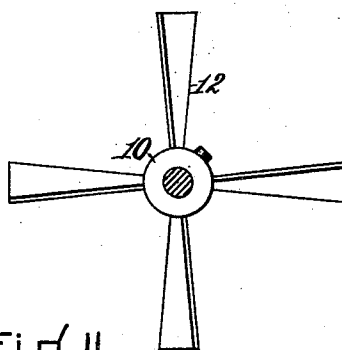


Fig. 11.

WITNESSES.

J. A. Rutherford,
Robert Smith.

INVENTOR

Alfred M. Crooker.
By *James H. Norris.*
Atty.

UNITED STATES PATENT OFFICE.

ALFRED M. CROOKER, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO DENNIS J. GRIFFIN, OF SAME PLACE.

SAW COTTON-GIN.

SPECIFICATION forming part of Letters Patent No. 475,206, dated May 17, 1892.

Application filed September 29, 1891. Serial No. 407,156. (No model.)

To all whom it may concern:

Be it known that I, ALFRED M. CROOKER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Saw Cotton-Gins, of which the following is a specification.

This invention has for its object to provide a new and improved ginning apparatus for completely separating the fiber or lint of cotton from all parts of the seed and pods or bolls, even though the latter are undeveloped, whereby a merchantable fiber is produced from immature field cotton.

The invention consists, essentially, in the combination, with a gin-casing, a gang of saws, a rotary brush, and a gin-breast, of an air-trunk, and means for producing a current of air through the casing and trunk for the purpose of conveying the material to the gang of saws in such manner that the lightest and desirable portion of the material is invariably uppermost, and is thereby first presented to the action of the saws, while the heaviest or refuse parts will descend by the force of gravity, as will more fully hereinafter appear.

The invention also consists in an improved construction of gin-breast, whereby the saws are protected from heavy refuse or foreign matter.

The invention also consists in a novel construction of beater-cylinders and in other features of combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a transverse sectional view taken in a vertical plane through the ginning apparatus. Fig. 2 is a longitudinal sectional view taken vertically through the center of the ginning apparatus. Fig. 3 is an end elevation looking at the feed end of the apparatus. Fig. 4 is a similar view looking at the delivery end of the same. Fig. 5 is a detail perspective view of a portion of the gin-breast. Fig. 6 is a detail perspective view of one of the breast-bars. Fig. 7 is a detail vertical sectional view showing the saws in elevation, for the purpose of clearly exhibiting the construction of the breast-bars. Fig. 8 is a detail

perspective view showing portions of the beater-cylinders. Figs. 9, 10, and 11 are detail sectional views of one of the beater-cylinders to exhibit the manner in which the beater arms or flukes increase in number from the feed to the delivery end thereof, and Fig. 12 is a detail perspective view of a portion of the endless apron for conveying the material into and out of the apparatus.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a gin-casing having in its base portion a horizontally-traveling endless apron 2, one portion of which projects through the gin-casing at one end thereof into a feed hopper or mouth 3, while the opposite portion projects through the other end of the gin-casing for delivering the refuse material. The delivery end of the gin-casing is made as air-tight as is practicable, but air can enter the gin-casing at the feed end thereof for a purpose which will hereinafter appear. The endless apron is preferably composed of a series of flexible parallel bands 4, Fig. 12, supporting a sheet 5 of flexible material, on which is arranged a plurality of transverse slats 6, adapted to travel at their end portions on horizontal guides 7, so that the uppermost portion of the traveling apron is properly supported and thereby rendered susceptible of sustaining the mass of material which is being operated upon. The endless apron extends around suitable rollers 8, and an auxiliary roller 9 is located above the apron at the delivery end of the gin-casing for the proper delivery of the refuse material.

A pair of beater-cylinders 10 are arranged parallel to each other and in the same horizontal plane at a point above the traveling conveyer or apron, and each cylinder is provided along its length with a gang of flattened beater arms or flukes 12, so angularly set or arranged that when the cylinders are rotated the arms or flukes operate to drive the material from the feed end to the delivery end of the gin-casing.

The material is fed to the endless conveyer or apron at the feed hopper or mouth 3, and

as such material is conveyed into the apparatus it comes in contact with the revolving beater-cylinders, and their action on the material is such as to beat and separate the stock
 5 and facilitate its progress toward the delivery end of the gin-casing. This result is materially facilitated by setting the flat arms or flukes at the proper angle and gradually increasing the number of arms or flukes from
 10 the feed end to the delivery end of the casing, as will be understood by reference to Figs. 2, 9, 10, and 11.

The gang of gin-saws 13 are arranged on a shaft 14 in the usual manner and co-operate
 15 with a gin-breast composed of breast-bars 15, Figs. 5, 6, and 7, having pendent guards 16, preferably formed by constructing each breast-bar of a piece of metal or other suitable material which is T-shaped in cross-section to form a curvilinear flange, which constitutes the guard 16. The outer edge 17 of
 20 each guard-flange 16 projects slightly beyond the periphery of the saws, and consequently the flanges shield or protect the saw-teeth from contact with the pods and other heavy
 25 refuse matter. In other words, the breast-bars constructed as described operate as guards to the saw-teeth when material other than the fiber or lint is presented thereto.

The upper end portion of the gin-casing is provided at each end with a suction-fan or blower 18, which connects with an air-trunk 19, common to both fans or blowers. The driving-shafts 20 of the fans or blowers are
 30 belted, as at 21, to the shaft 22 of the gin-brush 23, which operates to clean the lint or fiber from the gin-saws. The brush-shaft is belted, as at 24, to the saw-shaft 14, and this saw-shaft is belted, as at 25, to one of the beater-cylinders.
 40 The two beater-cylinders are rotated through the medium of any suitable mechanism. The endless conveyer or apron may be operated through the medium of belts 26 and 27 and pulleys 28, 29, and 30, the latter being
 45 on one of the beater-cylinders. I do not, however, confine myself to any particular mechanism for driving the various working parts of the ginning apparatus, for obviously other means will suggest themselves to those skilled
 50 in the art. The action of the fans or blowers is to create an ascending current of air through the gin-casing, and as the material is fed into the apparatus it is beaten and separated by the beater-cylinders, whereby the ascending
 55 air-current readily acts on and conveys the material to the gang of gin-saws, where the material undergoes the usual process employed in ginning cotton, except that I protect or shield the teeth of the gin-saws from refuse
 60 and foreign matter through the medium of the guard-flanges 16 of the breast-bars 15. The air-current tends to carry the material upward and the force of gravity tends to draw the material downward, and consequently the lightest and desirable portion of
 65 the material is invariably uppermost and will

be first presented to the ginning action of the saws. After the lightest part has been removed by contact with the saws, the force of air-current on the remaining part will be lessened and the heaviest parts or refuse matter will drop by the force of gravity. The velocity of the air-current should be regulated according to the conditions required and as experience will demonstrate. For this purpose any suitable means may be provided;
 75 but I prefer to employ adjustable shutters or valves 31 at one end of the gin-casing, as in Fig. 3.

Throughout the passage of the material 80 over the endless conveyer or apron in contact with the two beater-cylinders a current of air is produced through the gin-casing and acts to force the material against the revolving saws so that the lightest part of the material
 85 must first come in contact with the saws. This lightest part is the product desired, and after it has passed through the breast it is cleaned from the saws by the rotary brush and is discharged from the gin-casing into
 90 the air-trunk through the medium of the fans or blowers.

I have described and shown means whereby the current through the gin-casing is produced by suction fans or blowers; but I do
 95 not confine myself thereto, as the air-current can be produced by any type of fan or blower, one or more, and instead of the air-current ascending, it may flow in any direction which will convey the material to the gin-saws.
 100

By my invention I provide a simple, efficient, and economical ginning apparatus which operates to completely separate the fiber or lint of cotton from all parts of the seed, pods, and bolls, even though the latter
 105 are undeveloped, thereby producing a merchantable article from fiber which is ordinarily worthless, or nearly so.

Having thus described my invention, what I claim is—
 110

1. The combination, with a gin-casing, a gang of gin-saws, a brush, and a gin-breast, of a fan or blower arranged to produce a current of air through the gin-casing to convey material to the saws, substantially as described.
 115

2. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of an air-trunk and means for producing a current of air through the trunk and gin-casing for conveying material to the saws, substantially as described.
 120

3. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of a fan or blower for producing an ascending current
 125 of air through the casing for lifting the material from the base portion of the casing to the saws, substantially as described.

4. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of a trunk and a fan or blower connected therewith and communicating with the interior of the gin-
 130

casing for producing an ascending current of air therethrough to lift the material to the saws, substantially as described.

5 5. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of a conveyer for moving the material through the casing and discharging the refuse of foreign matter therefrom, a beater mechanism arranged in juxtaposition to the conveyer, and
10 means for producing a current of air through the gin-casing for moving the material to the saws, substantially as described.

6. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of a conveyer located in the gin-casing for conducting the material into and out of the same, a beater mechanism arranged in juxtaposition to the conveyer for beating and separating the stock and facilitating its progress toward the delivery end of the casing, and a fan or blower
20 for producing a current of air through the gin-casing to move the material to the saws, substantially as described.

7. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of a traveling conveyer arranged in the base portion of the gin-casing for conducting the material thereinto at one end and therefrom at the opposite end, a pair of co-operating beater-cylinders rotated in juxtaposition to the conveyer, and an air-draft-producing mechanism for causing a column of air to flow through the gin-casing and move the material to the saws, substantially as described.
30

8. The combination, with a gin-casing, a gang of saws, and a brush, of a breast composed of breast-bars interposed between the sides of the saws, and having guard-flanges projecting outwardly beyond the peripheries of the saws to shield the saw-teeth from refuse or foreign matter, substantially as described.
40

9. The combination, with a gin-casing, a gang of saws, and a brush, of a breast composed of breast-bars substantially T-shaped in cross-section to produce guard-flanges,
45

which project beyond the periphery of the saws to guard them from heavy refuse or foreign matter, substantially as described.

10. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of an endless conveyer for carrying the material through the gin-casing and beater-cylinders arranged above the conveyer and having flattened angularly set arms or flukes for advancing the material from the receiving end toward the delivery end of the gin-casing, substantially as described. 50 55

11. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of a traveling conveyer arranged in the base portion of the gin-casing and a pair of beater-cylinders having flattened angularly set arms or flukes increasing in number from the receiving to the delivery end of the casing, substantially as described. 60 65

12. The combination, with a gin-casing, a gang of saws, a brush, and a breast, of a pair of co-operating beater-cylinders provided with flattened angularly set arms or flukes, which increase in number from the receiving to the delivery end of the casing for the purpose of effectually beating and separating the stock, substantially as described. 70

13. The method herein described of ginning cotton, which consists in subjecting the material to the action of a forced air-current moving through the gin-casing, separating the lint or fiber from the seed and pods or bolls, and causing the heavier matter to descend by gravity while the separated lint or fiber follows the forced air-current, substantially as described. 75 80

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

ALFRED M. CROOKER. [L. s.]

Witnesses:

WILLIAM P. MARTIN,
BENJ. F. HAYES.