

H. G. VARDELL, EXECUTRIX.

APPLICATION FILED AUG. 9, 1919.

Patented Apr. 26, 1921.

3 SHEETS—SHEET 1.

This detailed cross-sectional view of a mechanical device, likely a pump or engine, shows a complex internal mechanism. Key components include a large central cylinder (1) with a piston (2) and a connecting rod (3). The piston is driven by a crankshaft (4) and a flywheel (5). The flywheel is connected to a gear (6) which meshes with a smaller gear (7). The gear (7) is part of a larger gear assembly (8) that drives a series of smaller gears (9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82). The device also features a series of valves (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82) and a series of pipes (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82) that facilitate the flow of fluid through the system. The diagram is labeled with various numbers (1-82) and letters (a, b, c, e) to identify specific parts and components.

Edward;
 Arthur A. Vardell,
 by Robt. Roberts Clerk
 his Attys.

A. A. VARDELL, DEC'D.

H. G. VARDELL, EXECUTRIX.

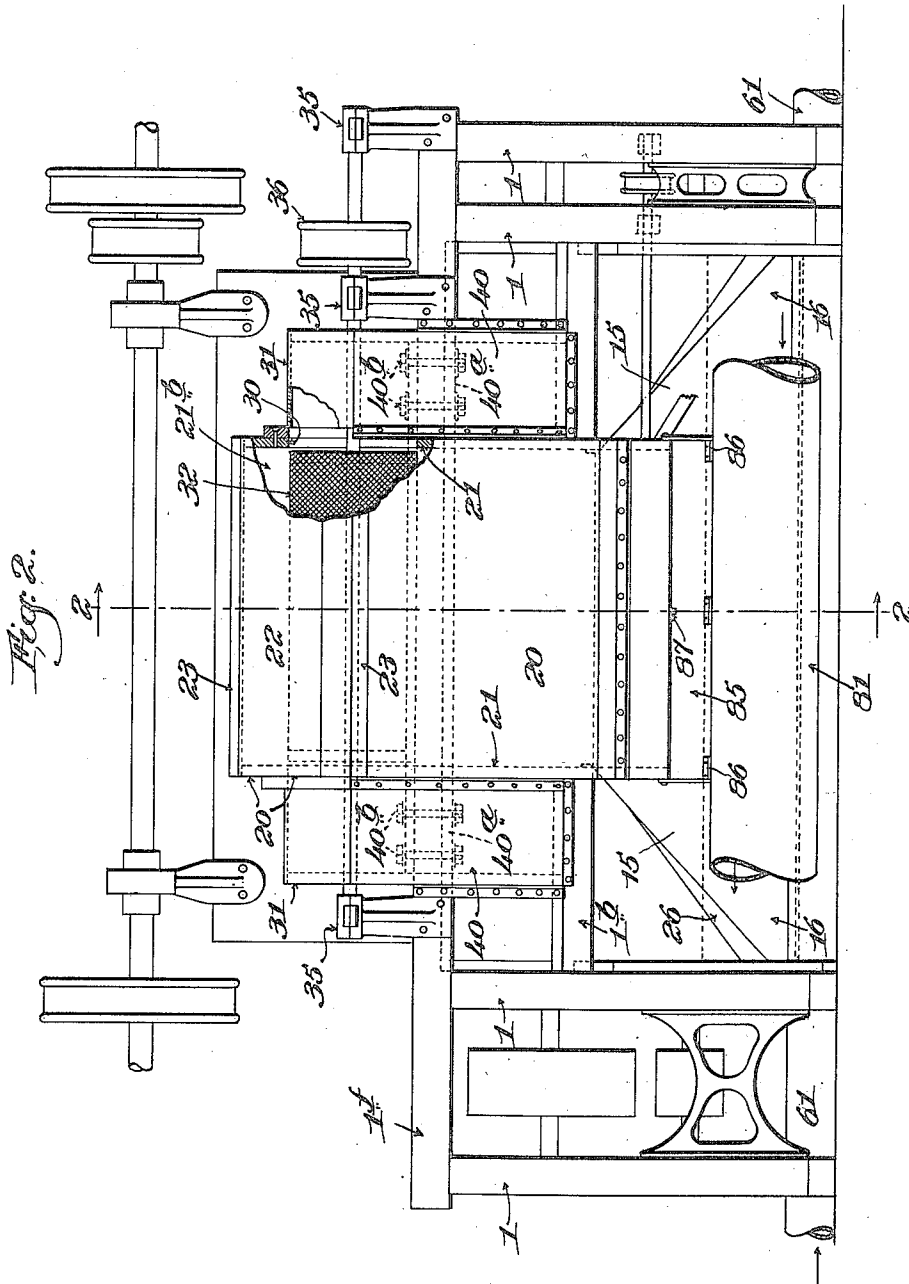
MECHANISM FOR REMOVING USEFUL FIBER FROM SEEDS.

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3 SHEETS—SHEET 2.



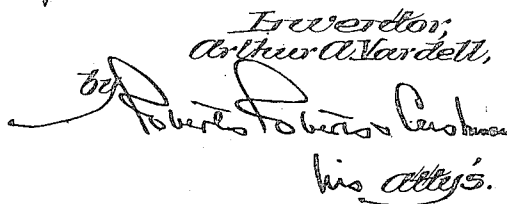
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Arthur A. VardeLL,
by Robert Robert Johnson
his atty.

H. G. VARDELL, EXECUTRIX.

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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

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MECHANISM FOR REMOVING USEFUL FIBER FROM SEEDS.

1,375,985.

Specification of Letters Patent.

Patented Apr. 26, 1921.

Application filed August 9, 1919. Serial No. 316,459.

To all whom it may concern:

Be it known that I, ARTHUR A. VARDELL, citizen of the United States of America, and resident of Dallas, in the county of Dallas and State of Texas, have invented new and useful Improvements in Mechanism for Removing Useful Fiber from Seeds, of which the following is a specification.

This invention relates to the general class of machines adapted to remove fibers from their attachments, such as gins, cotton seed linters, wool-burring machines and the like.

Machines of this type are broadly alike, but for cotton the operation is customarily carried out in two stages, the gin proper being relied upon to remove the long-fibered cotton from the seed and the linter (or delinter) gin being employed to work upon the cotton seed, the product of the gin proper, to remove from it the short adherent fibers. The gin proper and the linter gin differ from each other essentially only in the adjustments, proportions or dimensions of the parts appropriate to their specific duties. This invention has particular reference to means for the recovery of fiber or particles, applicable to saw gins and other machines adapted for either use.

Gins proper are customarily worked in a battery or multiple unit of from two to six gins delivering to a common air flue, in turn delivering to a condenser, by which the fiber is removed from the air current and the dust and some short fiber delivered as waste to the outer air. Linter gins may also be joined in a battery, but customarily heretofore linter gins have been provided with individual condensers. This is due to the greater necessity for care in the adjustment and operation of the linter gin, it being desirable for this reason to observe constantly the product of each individual machine in order to maintain its adjustments for delivering a proper portion of the lint or for making a proper type of product in regard to freedom from motes.

The individual-condenser linter, like all saw gins, delivers a great volume of air as an incident of the operation of the doffing brush forming a part of the gin. This air, charged with fine particles of lint and dust, passes into the room, menaces the health and efficiency of the operators, and constitutes a serious fire risk. I am aware of attempts to minimize these risks by connecting the

linters or the individual condensers to a suction pipe, or by air-doffing the saws by separately generated blast or suction currents, or by other expedients not wholly successful for this purpose. Such expedients consume much power and sacrifice the capacity, deemed essential by ginners caring for economy of operation, to examine the product of each individual linter frequently. The same considerations also apply to the operation of gins proper; a great gain in efficiency, freedom from gin damage and in quality of the lint cotton follows capacity for an expert foreman to examine from time to time the product being produced by the individual gin, so that prompt discovery of need for corrections and identification of the particular gin responsible may be made.

In the best practice of which I am aware in the prior art, pneumatic doffing, or the common collection of fiber by suction applied to discharge openings or to individual condensers has resulted in unnecessary expenditure of power, often amounting to four or more horse-power per gin. The rotating elements of the gin itself move a great volume of air and expend power for this purpose. When external pneumatic means are employed the air-moving effort of the elements of the gin is waste effort.

So far as I am aware, the operation of prior gins and linters also has been defective in failure to prevent removal with the seed of a proportion of the fiber actually separated by the gin saws, and in failure properly to separate from the good lint a large portion of motes capable of such separation during the removal of the fiber from the seed, and difficult or impossible to remove at a later stage of treatment.

Principal objects of my invention are to provide for the complete and economical recovery of the fiber separated from the seed by the gin, to separate from the fiber a maximum percentage of motes and impurities, to provide capacity for determining at will the behavior of each individual gin of any number of gins joined in a battery or multiple unit; and to utilize the driving force employed to work the gin elements to a larger extent than heretofore by employing the air-currents set up by the moving parts to perform new functions. Further objects are to provide a gin or linter adapted to operate without delivering into the work-room

a stream of air containing dust and fibers from the material being ginned; to reduce the volume of air carrying the fiber, and to provide for pneumatically conveying and delivering fiber from a fiber-removing implement, such as a gin saw, by means utilizing the same volume of air over and over. Further objects are to provide in a gin or linter gin for the improved separation of motes from the product, to provide for the improved separation from the saws of a saw gin of fibers and thereby to save lint heretofore wasted, and to provide for separating from the lint and removing from each gin a large proportion of the dirt, sand, leaf-scrap and other waste, and to improve the fiber-collecting means.

In some aspects the invention is not confined to gins but is applicable to opener-beaters, pickers, cards and fiber-working or other machines delivering a volume of air-borne flocculent or separated light substances carried by a current of air as an incident of the operation of the machine, the invention comprising a system for pneumatically conveying away from the disintegrating point the substance in question for removing the substance from the air current, carrying it, and for removing waste materials, and for then returning the air freed of the substances for further use in the same cycle, the system thus being characterized by a closed pneumatic circuit and the separate collection of the useful fiber or particles and the waste substances.

I do not herein claim the genus including certain features relating to moting and the recovery of separated fibers heretofore commingled with the seed and lost, these generic features being described and claimed in my application Case III, presently to be filed.

I have elected to illustrate the genus comprising the invention by an example of one species for use as a linter gin, as shown in the accompanying drawings, in which—

Figure 1 is a vertical central section on lines 2—2 of Figs. 2 and 3 of a linter gin according to my invention;

Fig. 2 is a rear elevation of the same;

Fig. 3 is a plan; and

Fig. 4 is a diagram plan on a reduced scale illustrating a battery or multiple unit of such linter gins and their adjuncts.

Referring now to Fig. 1, the machine frame may as usual comprise uprights 1, side panels 1^a and wooden or metal longitudinal struts 1^b, 1^c, etc., the end frames having thereon bearings for a saw shaft 2, a doffer brush shaft 3 and a breast pivot 4 in the desired relation. The pivoted breast, as usual may carry a float roll shaft 6. Preferably the center of the shaft 3 for the doffer brush 5 having the usual longitudinal lags 5^a with longitudinal rows of wires or bristles

thereon is placed farther forward than usual so that the contact of the saws 10 with the brush 5 occurs nearer the bottom of the saw cylinder than usual, for purposes which will presently appear.

Any usual or preferred breast 8, grate 9, and seed-board 11 may be provided, the seed-board 11, the grate 9, and the upper rail 9^a constituting the grate fall pivoted at 4, as usual. The longitudinal frame member 1^c may carry any preferred feeder hopper 12 and bearings and actuating means for feeder roll 13, feeder gate 15 and other desired adjuncts of the feeder mechanism. The brush 5 is as usual driven at a much higher peripheral speed than the saws 10, and as usual in the art operates by sweeping the fibers caught in the saw teeth out from the saw teeth, and then delivers these fibers from its surface by centrifugal action and by the effect of the intense air current set up by its operation.

In the preferred form of my device illustrated, a beveled longitudinal frame member 1^d provided near the rear periphery of the brush cylinder and a frame member 1^e carry a preferably metal housing extending the length of the brush cylinder and forming a stop 15 in the internal space between the panels 1^a. The space enclosing the brush 5 is further restricted by curved metal walls 16 between the panels 1^a and extending from the frame member 1^b at the rear of the gin to a point beneath and in front of the axis of the saw cylinder 10, this curved wall being supported by frame longitudinals 1^c in such a manner as to provide a passage surrounding the brush cylinder preferably of a form as shown in the figure, somewhat wider at its entrance beneath the saw cylinder than at a point immediately beneath the brush, and then sweeping into a passage between the stop 15 and the point of attachment of the wall 16 to the frame member 1^b.

The passage defined by the plates 16 is a pneumatic delivery passage 17 which is extended by any convenient structure to an individual condenser at the rear of the gin. The passage 17 may be extended vertically by its communication with a somewhat narrower passage 18 formed in an extension 20 at the rear of and preferably somewhat less wide than the saw cylinder 10 and brush cylinder 5. A preferred construction provides end frames 21 for a casing 20 erected on the longitudinals 1^b and 1^c, held by the end frames 1. Frames 21 may be of cast or stamped metal and preferably are of the form best shown in Fig. 1 outlining a separator casing of relatively large proportions at the back and to the rear of the gin. The frame 21 may be separated at 21^a the upper part 21^b being provided with a bent metal cover 22 and strengthening lags 23.

The construction is such as to provide for

the entrance of the passage 18 continuing the passage 17 in a direction along the curved wall 22 of the separator casing 20.

The reduction in width of the passage 17 to enable it to communicate with the narrower passage 18 may be effected by metal plates 26 closing the passage between the stops 15 and the wall 16 of the passage 7 at a sloping angle as best shown in Figs. 2 and 3. The longitudinal struts 1^b and 1^c are employed to support one wall 18^a of the passage 18 and the front wall of this passage may be provided by the boards 1^s resting on the longitudinal 1^a. Above the frame member 15 1^c an extension 18^b of the wall 18^a is preferably placed.

The casing 20 is provided at its sides with large openings 30 communicating with hollow casings 31 integral with or attached to the ends 21 of the separator casing 20. The full interior width of the casing 20 between the openings 30 may if desired be occupied by a revolving condenser screen 32 mounted on suitable spiders 33 on a condenser shaft 34 having bearings at 35, 35, in brackets on the longitudinal strut 1^c and provided with a pulley 36 or other suitable means for rotating the screen 32 at a relatively high speed, preferably above about 200 R. P. M. The casings 31 at each end communicate with integral or attached curved casings 40 which may be cast or stamped metal ducts communicating with or formed as a part of the upper part 1^k of the main side frames 1 of the gin, and preferably having bridges 40^a bolted at 40^b to strut 1^c. Longitudinal cover boards 41 and curved plates 42, 42 complete with the casings 40 passages leading from the open ends of the condenser 32 past the blast passages 17, 18 and above the stop 15 to the intake surface of the fan constituted by the rotating gin brush 5. While it is preferred to provide the screen 32 to reduce the amount of fiber carried by the circulating air, its use is not essential to full recovery of the fiber.

By reason of the position of the gin brush 5 that exposed portion of the surface of the saw cylinder 10 emergent from the grate 9 is a greater arc of the periphery of the saw cylinder than usual. In order to separate motes (by which I refer to all impurities such as immature seed, sand, sticks and seed particles or leaf scrap and other matters having sufficient weight to be thrown from the saw by the centrifugal action of the saw) I employ the primary velocity given to the motes by the motion of the saw, relying on their separation by this means rather than by the secondary velocity given the motes after their engagement with the brush and commingling with the lint on the brush which has heretofore constituted the best practice of which I am aware. By removing the brush to a part of the periphery of

the saw substantially opposite to its engagement with the roll of cotton seed in the roll box between the breast 8 and grate fall 9, there is sufficient room to place a deflector for the motes in position to separate the particles thrown off tangentially to the saw from the fibrous particles and fibers engaged upon the saw and traveling with it. The mote deflector may comprise a plate 50 mounted on a triangular strut 51, and may be mounted to be adjusted by the screws 52 taking into the strut 51. The structure 50, 51, 42, effectively separates the motes from the gin brush 5, and constitutes an air-seal against air flowing out of casing 40.

Outside of and beneath the mote deflector 50 an exterior cover 53 is arranged so as to form a channel 54 for a spiral conveyer 55 adapted to be suitably driven from one end. In operation the motes thrown out by the mote deflector 50 are removed from the machine by the conveyer 55 and deposited at one end of the gin. The opening at the back of the vertical frame member 1ⁿ which supports the breast and feeder may if desired be closed by a plate 57, but ordinarily so little lint is thrown off with the motes by the rotating saws as to make this provision unnecessary.

At the front of the gin immediately beneath the seed board 11 and near the periphery of the saws between the place where they are doffed by the action of the brush 5 and the place at which the saw teeth reënter the grate 9, a suction nozzle 60 communicating with a suction trunk 61 extending beneath the gin and, if desired, common to a battery of gins, is arranged. Preferably the nozzle 60 comprises the plate 16 as its rear wall and a curved plate 62 as a front wall suitably attached to the plate 16 at each side of the gin at each end of the saw cylinder, and communicating with the duct 61 throughout its width. In all saw gins a substantial proportion of the fibers, usually short fibers, is engaged with the side of the saws well within their peripheries, or is carried in the dead air rotating with the saws and between the same, and this proportion of the fiber is not reached and cannot be removed by the bristles of the brush 5. The supposed action of the air-current from the brush to doff this space is not in fact effective. But as the rotating peripheries of the saws approach the grate an ejection current of the dead air between the saws flows out from between them and this causes a material proportion of the fiber either to be delivered through the grate bars to the roll box, or out through the seed delivery opening, or beneath the seed-board 11, in all prior gins of which I am aware. By providing a strong outflowing current of air from within the saw peripheries into the suction duct 60, lint not doffed by the brush

5 is taken from this dead air space between the saws and delivered into the duct 51, and the loss of this fiber by commingling it with the stripped seed is avoided.

5 It will be observed that the condenser cylinder 32 occupies a small part only of the casing 20 and is separated from the extension 18^b of the duct 18 by a considerable distance, sufficient to encourage an eddy flow
10 of the air current delivered by the brush 5 in the casing 20. The effect of this current of air in the casing 20 is not only to deliver a greater part of the lint past the upper surface of the rotating condenser cylinder 32,
15 but to cause the current to eddy within the space in the casing 20 and so to cause the lint to drop out of the currents of lessened velocity in the casing 20, the already stripped or partly stripped air then
20 passing toward the condenser and the space between the extension 18^b and cylinder 32, where much of the lint remaining in it is deposited or thrown back into the eddy current in casing 20 before all
25 of the air moving in this current blows out through the openings 30 in the ends of the cylinder 32. The rapid rotation of this cylinder throws from it any considerable accumulation of fiber, and prevents adhesion
30 of fiber masses requiring to be mechanically removed. The stripped air is returned through the passage in the casing 40 to the intake side of the rotating brush to be repeatedly passed through the screen cylinder
35 32. All of the fiber is thus eventually removed from the air-current, although a considerable portion of the fiber may pass through the meshes of cylinder 32.

Advantage is also taken of the eddy current in the casing 20 to separate from the lint moving in the casing 20 the greater part of its contained heavy but fine sand and dust. The casing 20 comprises a dirt hood 70 as a
40 closed projection from one of the lower inclined walls of the casing throughout its width, but the curve of the wall 22 is continued within the casing by the perforated metal or woven wire mesh screen 71 defining
45 within the hood 70 a space 72 containing comparatively dead air in which the dust can settle. The fiber-laden air current flows past the screen 71, through which the dust is swept by the minute concretions of fiber traveling on its inner surface. The space 72
50 communicates at the bottom with a trough 73 in which a spiral conveyer 74 is mounted for rotation by any suitable means (not shown).

The good and clean lint collecting in the
60 bottom of the casing 20 falls against a rotating valve 75 having flexible ribs 76 working in a fitting concave 77 and nearly but not quite touching the inclined bottom 78 of the casing 20. The valve 75 delivers into a

conduit 80 which in turn delivers into a 65 blast conduit 81. Preferably the opening of the conduit 80 into the conduit 81 is protected by an air baffle plate 82.

To enable the frequent inspection of the individual product of any gin of a battery 70 or series, an inwardly opening gate 85 hinged at 86 above the conduit 81 and having a latch 87 permitting it to be turned into the dotted line position is provided, in order to permit the entire delivery of the 75 gin to take place outside of the conduit 81 for inspection of the quality of the product.

Referring now to Fig. 4, whether or not the gins are arranged in a battery or series the exhaust through the conduit 61 and the 80 blast through the conduit 81 is effected by a fan 90 delivering into the conduit 81 and taking air from the conduit 61. The air taken into the conduit 61 through the nozzles 60 is delivered to the condenser 85 through the conduit 81. Any suitable means may be provided in the condenser for ventilation to take care of the stripped air excess such as the usual screened flue 92 for a battery condenser delivering to the outer 90 air. Conduits 61 and 81 may extend past and receive lint from any desired number of linters or gins. It will be observed that the destination of the lint taken in by the nozzle 60 at the front of the saws is the 95 conduit 81, where it joins the other cotton directly received through the delivery valve 75 and delivery conduits 80 of the respective gins. It will also be observed that the pneumatic currents employed within the gins are 100 closed currents, and the internal conduits 17, 18, 20, 40, constituting an individual closed air-circuit at each gin. The volume of air moved by fan 90 may be no more than that customary for delivering the cotton 105 from the gins.

By the above-mentioned devices the air of the work room containing the gins is completely protected from dust and fine lint thrown off by the operation of the gins, the 110 recovery of useful lint from the air currents made absolute, and the power required for the pneumatic operations is taken from air-currents set up as incidents of working the ginning parts, and heretofore wasted. 115

Any suitable means for driving the respective elements of the machines shown, such as those common in the prior art, may be employed, and being within knowledge of artisans skilled in this art have not been 120 described or fully shown.

What I claim is:

1. The combination in a gin with the means for separating useful fibers from their attachments of mechanical means for dof- 125 fting the separator means and throwing the fiber into an air-current set up by the doffer and flowing in a closed circuit, means for

separating the fiber from the laden air-current, and means for returning the current to the doffer to receive more fiber.

2. In a gin, the combination of means for separating useful fibers from their attachments with means comprising a doffer for throwing the fiber into an air-current set up by the doffer and flowing in a closed circuit within the gin, and means for removing the fiber from the air at one or more parts of said circuit.

3. The combination of ginning means with separator means and with pneumatic means for delivering fiber to the separator means comprising a rotary doffer for the ginning means adapted to set up a current of air, and a return passage for delivering the air stripped by the separator means to the ginning means, there to receive from the doffer and convey further fiber.

4. A gin having wholly therein a closed air-circuit, means for delivering the fiber product into said air-circuit, means for separating the fiber-product from the current of air, and means for delivering the collected product out of the separator means.

5. A gin or linter having therein separator means for removing from an air current created by the operation of a part of the gin its contained fiber, said gin parts and the separator means being inclosed in a casing forming a closed circulatory air passage, said separator comprising an enlargement of the passage in which an eddy current of the fiber-collecting air may flow.

6. A gin or linter having therein a separator device for removing from an air-current created by the operation of the gin its contained fiber, the air-current creating gin part and the separator being inclosed in a casing forming a circulatory air passage, said separator comprising a screen and an enlargement of the passage in which an eddy current of the fiber-collecting air is formed.

7. The combination with ginning means of a doffer brush and a casing having a passage in which the doffer brush creates a current of fiber-laden air, with means for depositing the fiber from the air-current by the action of the air-current, and means for delivering the stripped air to the doffer brush to repeat the operation.

8. Mechanism for separating useful fibers from seeds having therein means for detaining the seeds and rotating means for stripping the fiber from the seeds and means for doffing the fiber from said fiber stripping means, in combination with a casing comprising a circulatory passage having therein the doffing means and means for stripping an air current traveling in said passage of fiber delivered into the air-current induced by rotation of the doffing means.

9. Mechanism for separating useful fibers from seeds, having therein a grate for de-

taining the seeds and a rotary saw cylinder for stripping the fiber from the seeds and a rotary brush for doffing the fiber from the fiber stripping means in combination with a casing having a circulatory passage including the doffing brush, and means for separating from the air moving in said passage useful fibers, and for returning the stripped air to the doffing brush.

10. A gin of the saw type comprising a rotary doffing brush and having therein a casing surrounding the doffing brush and comprising a pneumatic delivery passage receiving the air-current set up by rotation of the brush, said casing having a return passage delivering to the suction side of the fan constituted by the brush, and means for stripping the air current flowing in said passages of fiber conveyed thereby, said passages and stripping means being substantially closed to the outer air.

11. In a series of gins each comprising in combination, separator means, a closed circulatory air passage including the separator means, and means for delivering the fiber removed by the operation of the gin into said closed air passage, and for creating a circulatory current of air in said passage and through said separator means, means common to the series for recovering fiber thrown off by the separator means and not taken into the circulatory passage.

12. A gin having therein a closed air-circuit, a rotary doffer for delivering the fiber product into and maintaining air flow in said air-circuit, means for separating the fiber from the current of air, and means for delivering the separated fiber from the gin.

13. A gin having wholly therein a closed air-circuit, means for delivering the fiber product into said air-circuit, means for separating the fiber from the current of air comprising a separator casing and a screen interposed in the closed air-circuit within said casing, and means for delivering the separated fiber from the gin.

14. A gin having therein a closed air-circuit, means for delivering the fiber product into said air-circuit, means for separating the fiber from the current of air, comprising a separator casing, a screen interposed in the closed air-circuit within said casing and means for rotating said screen at a relatively high speed adapted to prevent adhering deposits of fiber on said screen, and means for delivering the separated fiber from the gin.

15. A gin having therein an individual condenser-screen in a closed air-circuit, and adapted to centrifugally discharge accumulations of lint formed upon its surface.

16. A gin having therein a casing comprising part of a closed circulatory air-passage in which the current of air drops a portion of the lint conveyed thereby.

17. A gin having a casing comprising part of a closed circulatory air-passage in which the current of air eddies and drops a portion of the lint conveyed thereby in combination with a rotary screen interposed in said air-passage, and adapted to prevent a further portion of the lint from continuing to circulate in said passage.

18. A gin having a casing comprising part of a closed circulatory air-passage in which the current of air drops a portion of the lint conveyed thereby in combination with a rotary screen interposed in said air-passage and means for rotating said screen at a speed adapted to throw off accumulations of lint.

19. The combination of a series of machines for separating useful fibers from their attachments each characterized by an internal pneumatic circuit and means for separating the fiber from air flowing in said circuit, means for delivering the separated fiber from each machine, and a common conveyer for receiving the delivered products, with means for inspecting the individual deliveries of the respective machines.

20. The combination of a series of machines for separating useful fibers from their attachments each characterized by an internal pneumatic circuit and means for separating the fiber from air flowing in said circuit and each having pneumatic means for collecting otherwise wasted product at a point outside of said circuit, with a pneumatic conveyer common to all of the machines for delivering the fiber collected by both said separating and said waste-collecting means.

21. A saw gin having therein a grate, a seed-board, a saw cylinder, and a doffing brush, in combination with pneumatic means for doffing from the saws at and near the point of entry of the saw-teeth through the grate lint traveling in the spaces between the saws.

22. A saw gin having therein a grate, a seed-board, a saw cylinder, and a doffing brush, in combination with a suction trunk, and a suction nozzle having its intake beneath the seed-board and near the saws for doffing from the saws between the place of action of the brush and the grate lint traveling in the spaces between the saws.

23. Ginning mechanism having therein a saw-cylinder, a doffer brush, and closed-circuit pneumatic means for conveying fiber away from the doffer brush comprising means for separating the fiber from the air in combination with independently actuated pneumatic means for collecting fiber from the space between saws of the saw-cylinder.

24. In ginning mechanism having a grate, a saw-cylinder, a seed-board and a substantially closed air-circuit for fiber laden air

delivered by the ginning means, pneumatic means for collecting fiber not taken into the air-circuit comprising a suction-nozzle and conveyer pipe adapted to receive air and fiber at a point beneath the seed-board and through and from the spaces between the saws subject to ejection eddies set up by the grate-ribs.

25. A gin having therein a casing for an eddying air-current, educt passages leading from the sides of the casing, a blast-passage leading into the casing, adapted to deliver its air-current in the direction of an exterior wall of the casing, the casing having an unobstructed passage for eddy currents throughout its periphery, and means adapted to exhaust air from said educt passage and deliver said air and the fiber product of the gin into said blast-passage.

26. A gin having therein a casing peripherally free for an eddying air-current, means for supporting a rotating screen in said casing, and one or more air discharge passages leading from the discharge surface of the screen to means for blowing an air-current into the casing, whereby to circulate in the casing the same air, and means for delivering the fiber product into and for circulating said air-current.

27. A gin having therein a casing for an eddying air-current, educt passages leading from the sides of the casing, a blast-passage leading into the casing, adapted to deliver its air-current in the direction of an exterior wall of the casing, the casing having an unobstructed passage for eddy currents throughout its periphery, and means adapted to exhaust air from said educt passage and deliver said air and the fiber product of the gin into said blast-passage.

28. A gin having therein a casing for an eddying air-current, educt passages leading from the sides of the casing, a blast-passage leading into the casing adapted to deliver its air-current in the direction of an exterior wall of the casing and a rotary doffer-brush adapted to exhaust air from said educt passage and deliver said air and the fiber product of the gin into said blast-passage.

29. The art of separating useful fibers from their attachments comprising pulling the fibers from their attachments by action of a rotating instrument, such as a gin-saw, separating motes thrown from the instrument from the fiber carried thereby, then removing the fibers from said instrument and throwing the released fibers into a circulating air-current moving in a substantially closed passage, and collecting the useful fiber deposited from said air-current at a part of said passage.

Signed by me at Dallas, Texas, this 12th day of July, 1919.

ARTHUR A. VARDELL.