Sept. 6, 1938. J. A. STREUN 2,129,312

GIN SYSTEM

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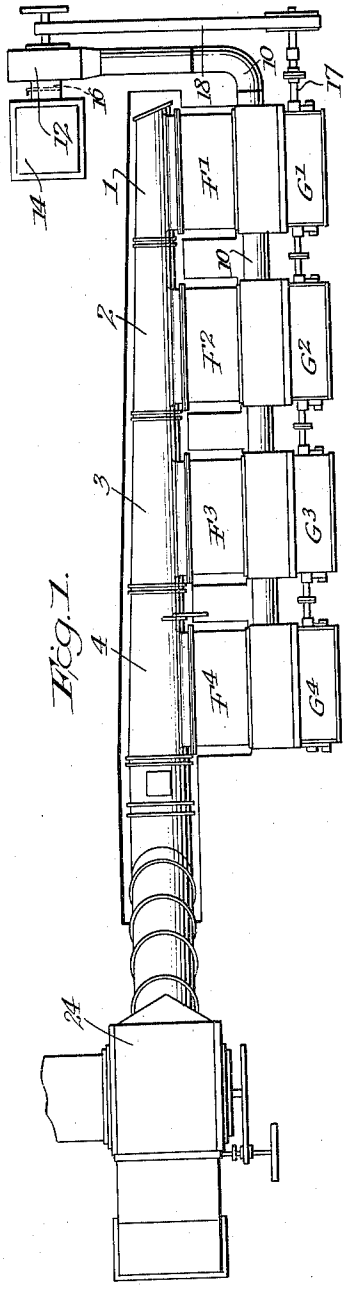


Fig. 1.

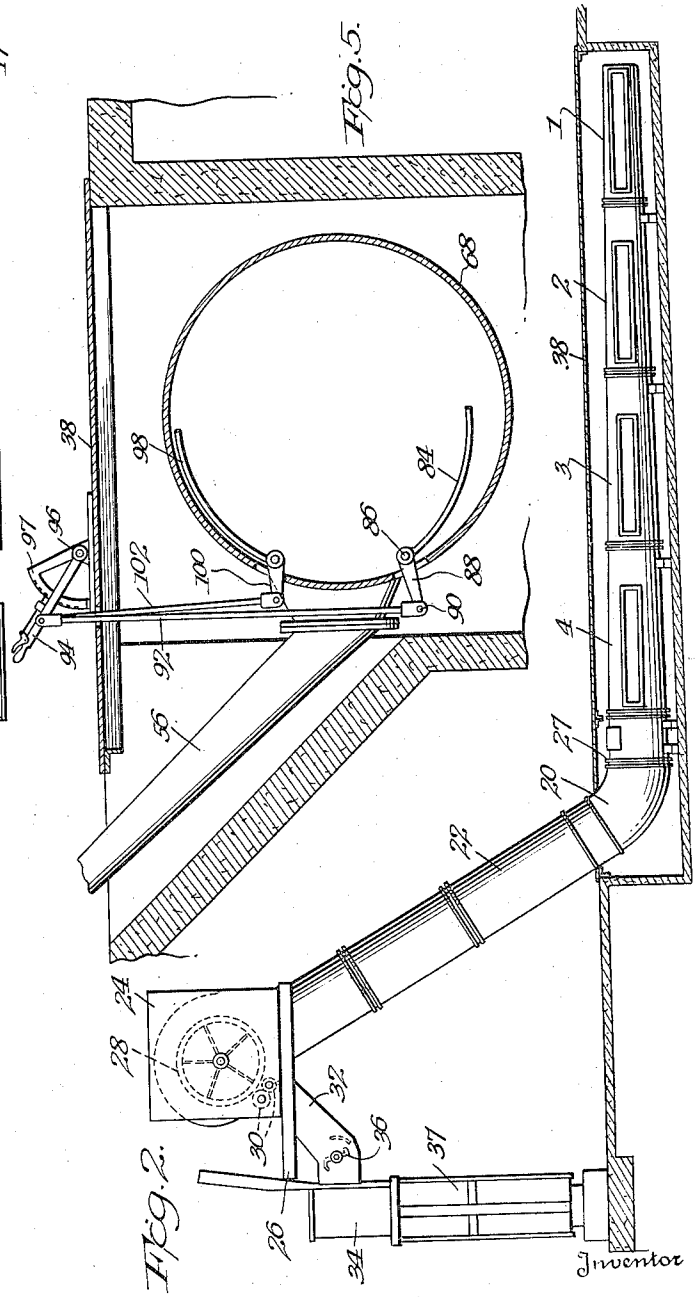


Fig. 5.

Fig. 2.

Inventor

John A. Streun.

By Cushman, Darby & Cushman

Attorneys

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Fig. 4.

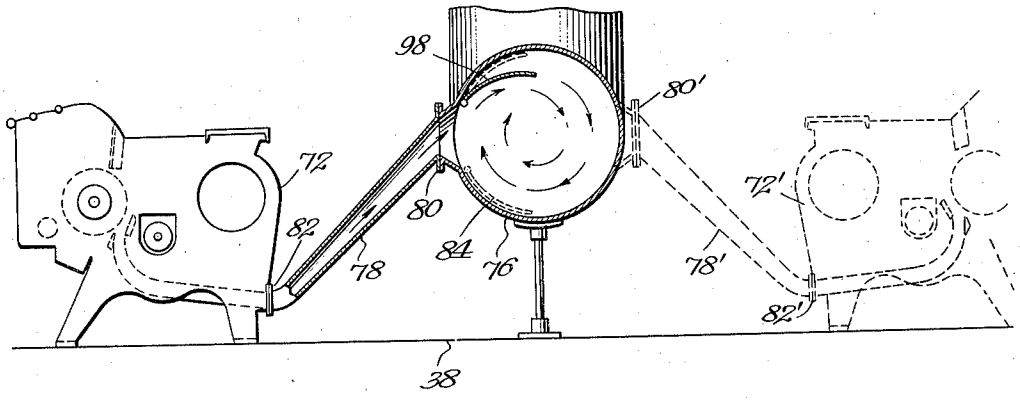
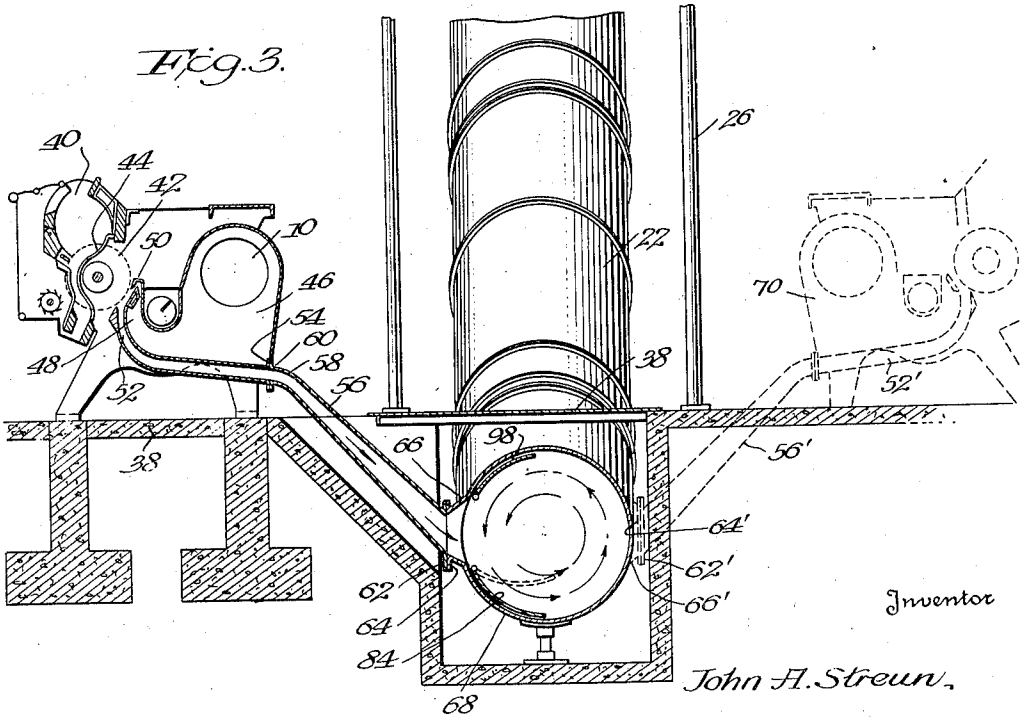


Fig. 3.



Inventor

John A. Streun.

By Cushman, Darby & Cushman

Attorneys

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UNITED STATES PATENT OFFICE

2,129,312

GIN SYSTEM

John A. Streun, Sherman, Tex., assignor to Hardwicke-Etter Company, Sherman, Tex., a corporation of Texas

Application December 22, 1936, Serial No. 117,208

15 Claims. (Cl. 19—59)

The present invention relates to cotton ginning systems, particularly an apparatus for conveying lint from the gins to the condenser.

The principal object of the invention is to provide an apparatus for conveying lint from the gins composed of standard parts susceptible of arrangement for either right or left hand disposition of the lint flue either above or below the floor level of the gin house.

Another object of the invention is to provide an apparatus for controlling the conveyance of lint from the gins to the condenser including the production of a controlled cyclonic action of the air within the lint flue, so that the lint will be disposed in an even bat upon the rotary drum of the condenser.

A further object of the invention is to provide an apparatus for conveying lint from the gins to the condenser, which is of pronounced simplicity and which provides easy access to the rear of the gins.

In the drawings, which are illustrative of the invention, but which are in no sense restrictive:

Figure 1 is a plan view of the ginning system;

Figure 2 is a partial sectional front elevational view of the lint flue and condenser;

Figure 3 is a transverse vertical sectional view through one of the gins and a submerged lint flue;

Figure 4 is a transverse vertical sectional view similar to Figure 3, showing the invention applied to an above floor lint flue; and

Figure 5 is an enlarged vertical sectional view through the lint flue, showing the deflectors and means for operating the same.

In Figure 1, a battery of gins are shown at G^1, G^2, G^3 and G^4, said gins being located in longitudinal alignment along the floor of the gin house, and being adapted to discharge lint through their respective connecting flues F^1, F^2, F^3, and F^4 into the detachably connected sections of the lint flue 1, 2, 3, and 4, respectively.

The gins are of the air blast type, in which type the lint is blown from the saw blades by a blast of air, which blast conveys the lint from the saws through the connecting flues F^1–F^4 to the lint flue.

In the arrangement disclosed, the gins are in series, and currents of air are supplied to the saws of the respective gins through the conduit 10, which extends successively through all four of the gins disclosed. The current of air in the conduit 10 is generated by a fan 12, the air being drawn into the conduit through a screen 14. A valve 16 is provided between the screen and the fan to control the flow of the air current. The fan 12 is driven from the main drive shaft 17 of the battery of gins through a belt 18.

The sections 1–4 of the lint flue are of constantly increasing diameter as the lint flue traverses the successive gins, to accommodate the increased volume of air as the lint flue is joined by the connecting flues from the successive gins. The lint flue terminates in an upwardly bent section 20 which connects with an elevated transition section 22 which leads to the condenser 24 carried upon the elevated platform 26. The horizontal portion of the lint flue is detachable from the bent portion 20 thereof at 27, for a purpose later apparent.

The condenser is of conventional construction, comprising a revolving screen drum 28 which collects the lint on its periphery, the drum being rotated by any suitable means in a counter-clockwise direction as viewed in Figure 2. On the outlet side of the condenser, a pair of doffing rollers 30 are provided for removing the lint which has collected on the periphery of the drum, the lint being discharged by the doffing rollers into the downwardly directed lint slide 32 which leads to the tramper hopper 34, there being a kicker 36 located in the lower end of the lint slide. The lint passes from the tramper hopper 34 to the press boxes 37, where the lint is formed into bales.

In Figure 3, one of the gins is disclosed in vertical cross section, said gin being mounted upon the floor 38 of the gin house on suitable legs. The gin is of well known construction, having a roll box 40 into which the cotton is fed, a gin cylinder 42 comprising a plurality of gin saws disposed below the roll box, the saws of the cylinder being separated by the conventional ginning ribs 44. On the rearward side of the gin is an air chamber 46 into which the air under pressure is discharged from the conduit 10. The air chamber includes an upwardly extending channel 48 which terminates in a nozzle 50, the nozzle directing the air under pressure downwardly and tangentially of the gin saw blades, in order to remove the lint therefrom. Located below the nozzle is the upper end of the gin flue 52, which extends downwardly and then substantially horizontally toward the rear of the gin where it terminates in a flange 54 for connection with the flange of a connecting member hereinafter described.

The connecting member is in the form of a conduit or flue 56 which flares outwardly from the end which connects with the gin flue to the end which connects with the lint flue. The connecting flue 56 is substantially as wide as the gin, and is bent in a vertical plane as at 58 and its flange 60

engages the flange 54 of the gin flue in a vertical plane.

The wider end of the connecting flue 56 is provided with a flange 62 located in a vertical plane, which engages and is secured to a vertical flange 64 formed on the outer end of the throat 66 of the lint flue 68.

In the arrangement disclosed in Figure 3, the lint flue 68 is positioned below the floor level 38 of the gin house, and is laterally offset from the rear of the battery of gins. By this arrangement, the floor at the rear of the gins is clear, thus making it convenient for the attendant to approach the rear sides of the gins to perform any necessary operations. The space above the floor at the rear of the gins is clear with the exception of that portion of the connecting flue 56 which extends above the floor level to connect with the rearward end of the gin flue. While it is convenient to have the rear side of the gins clear of floor obstructions, the arrangement disclosed in which the upper end of the connecting flue joins with the rearward end of the gin flue above the floor level is of convenience, in that this connection is accessible for the disconnecting of a particular gin in order to clear the gin flue or connecting flue if the same are clogged, or to perform any other necessary operation.

The elongated throat 66 of the lint flue is centrally intersected by the horizontal plane through the axis of the lint flue, so that the flanged opening in the lint flue is centrally disposed on the side thereof when the connecting flue is joined thereto as in Figure 3. The importance of this disposition of the throat and opening in the wall of the lint flue will be hereinafter apparent.

The arrangement illustrated in Figure 3 provides what is known as a left hand system, meaning that the lint is carried to the left through the lint flue as viewed looking toward the gins from the front side thereof.

While the opening in the wall of the lint flue is disposed substantially centrally in one wall thereof with respect to the horizontal plane passed through the axis of the lint flue, the air and lint from the connecting flue enters the lint flue substantially tangentially of the lower inner surface of the flue, causing the whirling or cyclonic action of the air as illustrated by the arrows in Figure 3. This cyclonic action is augmented by the fact that the blast of air from the connecting flue enters the lint flue at substantially right angles to the path of air passing longitudinally of the flue, by reason of the fact that vertical planes passed longitudinally through the connecting flue 56 would be at right angles to a longitudinal vertical plane passed through the axis of the lint flue, rather than being at an acute angle thereto as in other constructions.

This cyclonic action creates a turbulence or whirling effect of the air within the lint flue, causing an even distribution of the lint throughout the flue and preventing the lint from settling to the bottom of the flue or massing at one side thereof, which would result in an uneven distribution of the lint upon the revolving screen drum 28 of the condenser. If the lint is unevenly distributed on the drum, it will be unevenly distributed in the tramper hopper 34, and wedge shaped bales will result.

The construction of the connecting flue with its substantially vertical flanges 60 and 62, and the construction of the lint flue with its central opening and substantially vertical flange 64 permits the gins and the lint flue to be relatively positioned with respect to one another in various ways, as illustrated in Figures 3 and 4.

As illustrated in the dotted lines of Figure 3, the standard lint flue and connecting flue are capable of association to produce a right-hand submerged lint flue system, in which system the gins 70 are disposed on the opposite side of the lint flue from the disposition illustrated in full lines. As illustrated, the throat 66' of the lint flue is positioned on the opposite side thereof, and the connecting flue 56', which is the same as or is identical in construction with the connecting flue 56 is connected with the vertical flange 64' of the lint flue by the vertical flange 62' of the connecting flue. The connecting flue extends upwardly and connects above the floor level with the rearward end 52' of the gin flue in a manner hereinbefore described.

From the above description, it will be apparent that when using a lint flue and connecting flues of the type described, the gins may be disposed on one side of the lint flue providing a left hand submerged lint flue system as shown in full lines, or on the opposite side of the lint flue providing a right hand submerged lint flue system as shown in dotted lines. Furthermore, if a left hand system has been installed, the same may be changed to a right hand system by changing the gins from the side shown in full lines to the side shown in dotted lines. By disconnecting at 27 the portion of the lint flue at the end of the battery of gins from the elbow portion 20, the former may be rotated through 180° to dispose the throat in position for engagement with the connecting flue on the opposite side of the flue. The same connecting flue 56 may be used on the opposite side of the lint flue.

In Figure 4, the lint flue is shown disposed above the floor level 38. The lint flue is shown in full lines connected with the gins 72 on one side of the machine to provide a left hand above floor lint flue system, and in dotted lines an above floor right hand lint flue system with the gins 72' disposed on the opposite side of the lint flue. The lint flue 76 is identical in construction with, or may be the same as the lint flue 68 disclosed in Figure 3, and the connecting flues 78, 78' are identical in construction with, or may be the same as the connecting flues 56, 56' shown in Figure 3, except that the connecting flues are turned through 180° from their positions illustrated in Figure 3, so that they extend upwardly from the gins to the lint flue. It will be apparent that the same standard construction of connecting flues may be used in the arrangement shown in Figure 4, as when said flues are disposed in this figure, the flanges 80 and 82 will be in a substantially vertical plane to engage the vertical flanges on the lint flue and on the rearward end of the gin flue respectively. As in the arrangement previously described in connection with Figure 3, the opening in the side wall of the lint flue is centrally disposed with respect to a horizontal plane passing through the axis of the lint flue.

Furthermore, the blast of air entering the lint flue in this system, while it enters said flue centrally of the side thereof, passes tangentially of the inner upper wall of the lint flue, causing a cyclonic turbulent effect as indicated by the arrows in Figure 4, with the resulting advantages as discussed in connection with Figure 3.

It will be apparent that with the construction of lint flue and connecting flues disclosed, either

a left hand above floor lint flue system with the gins on one side of the lint flue may be installed, or a right hand above floor lint flue system may be installed as shown in dotted lines with the gins on the other side of the lint flue. Furthermore, as mentioned above in connection with Figure 3, the system may be changed from right to left hand or vice versa by moving the gins and connecting flues from one side of the lint flue to the other, and by rotating the lint flue through 180°.

From the above description, it will be apparent that the standard equipment of lint flues and connecting flues may be associated in any manner found to be convenient in the building in which the equipment is installed, without changing the direction of the air current through the lint flue, and consequently without making necessary changing the position of the basic elements of the plant, such as the elevated condenser and press boxes. That is to say, the identical equipment is capable of association to form either a right or a left hand submerged lint flue system, or a right or left hand above floor lint flue system. In addition, equipment after installation may be conveniently changed from any one of the arrangements disclosed to any other of the arrangements disclosed without the necessity of adding to or changing the equipment previously provided.

For example, and if desired, the equipment may be changed from a left hand system with the lint flue submerged as shown in the full lines in Figure 3, to a right hand system with the lint flue above floor as shown in the dotted lines in Figure 4, or vice versa. As a further example, the system may be changed from a right hand system with a submerged lint flue as shown in the dotted lines in Figure 3, to a left hand system with the lint flue above floor as shown by the full lines in Figure 4. All of these exemplified changes may be made as stated before without the necessity of providing additional parts.

Referring particularly to Figure 5, a curved deflector **84** is shown pivoted at **86** to brackets or the like within the lint flue **68**. The deflector is equipped with an operating lever **88** connected at **90** with the lower end of an operating rod **92** which extends up through the floor of the gin house where it is pivoted to an operating handle **94**. The handle is adapted to be operated around the pivot **96** to adjust the deflector around its pivot **86** into and out of the path of the air blast from the connecting flue **56**, in order to control the distribution of the lint within the lint flue. A notched segment **97** may be provided to retain the handle **94** and deflector in adjusted position.

For instance, it may be determined from the formation of the bat of lint on the condenser screen **28** that the lint is not evenly distributed within the lint flue and the upwardly extending transition **22**. It will be understood that a deflector may be provided in each of the lint flue sections **2** through **4** where the connecting flues join therewith, and the position of the deflector at any one of the gin stations may be adjusted to control the distribution of the lint within the lint flue as desired. In practice, however, it has been found that it is only necessary to provide a deflector at the last gin G^4, as the blast from this gin tends to drive the lint toward the side of the lint flue opposite the gins, and the lint does not have an opportunity to become evenly distributed in the short length of the conduit from the last gin to the condenser. If it is observed that the formation of the bat upon the condenser screen **28** is not uniform by reason of a massing of the lint in the right hand side of the lint flue as viewed in Figure 5, resulting from pressure of the air blast from the last connecting flues which enter the lint flue from the left hand side thereof as viewed in this figure, the deflector **84** at the gin G^4 is elevated into the path of the air blast from the connecting flue **56** to deflect the air into the left hand upper side of the lint flue resulting in a breaking up of existing currents and a more even distribution of the lint within the flue. If the formation of the bat upon the revolving drum **28** of the condenser is uniform, and the operation of the deflector **84** is not necessary, the handle **94** may be adjusted to position the deflector down against the lower interior face of the lint flue out of the path of the air blast from the connecting flue.

To further control the distribution of the lint within the lint flue, an upper deflector **98** may be provided, said deflector being provided with an operating lever **100** connected with a similar vertical operating arm **102** actuated from above the floor **38** by means identical with that described in connection with the deflector **84**. The deflector **98** may be operated independently of or in conjunction with the deflector **84** to control the distribution of the lint within the lint flue. While the deflector **98** may be used in association with the deflector **84**, the primary reason for providing this additional deflector is for use when the lint flue is positioned as shown in the dotted lines in Figure 3, or as shown in the full lines in Figure 4. It will be apparent from Figure 3 that if the lint flue is positioned 180° from its position shown in full lines, the deflector **98** may be positioned below the side opening in the lint flue, so that it may be adjusted into and out of the path of the air blast from the connecting flue **56'**. Furthermore, if the lint flue is used above floor as shown in full lines in Figure 4, the deflector **98** will be above the side opening in the lint flue and in the path of the air blast from the connecting flue **78**.

When the lint flue is used above floor, as shown in Figure 4, the deflector actuating mechanism including the connecting rods **92** and **102** may be dispensed with, and the deflectors may be operated by any suitable lever such as the levers **88** and **100**, in association with any appropriate mechanism attached to the outer wall of the lint flue to hold the deflectors in their adjusted positions.

It will be evident that the present invention provides an apparatus of pronounced simplicity and accessibility, and one formed of standard parts capable of association in various ways for any type of plant convenient to the gin house in which it is used, which plant may be altered at any time as desired without the necessity of supplying extra or different parts.

I claim:—

1. In apparatus of the character described, a lint flue having an opening in a wall thereof, means providing a current of air in one direction through said lint flue, a lint conveying connecting flue joining with said lint flue at said opening, and a deflector within said lint flue on each side of the opening movable into the path of the lint entering from said connecting flue.

2. A lint flue having an opening in the side wall thereof, and means adjacent the opening for connection with a lint conveying connecting flue

adapted to be joined with said lint flue at the opening in a plurality of positions with respect to said lint flue to convey lint thereto tangentially to the inner wall thereof on either side of the opening, and a deflector within said lint flue on each side of said opening, said deflectors being selectively operable for controlling distribution of the lint in the lint flue depending on the tangential direction in which the lint enters the lint flue from the connecting flue.

3. A lint flue to be positioned substantially horizontally and constructed for passage of air in one direction therethrough, and having an opening in a side wall thereof, said lint flue being adapted to be positioned with the opening facing to one side laterally of the direction of flow of air therethrough, or to the opposite side thereof, means adjacent the opening for connection with a lint conveying connecting flue entering said lint flue from above and adapted to be joined with said lint flue on either side thereof at the opening to convey lint tangentially to the lower inner wall thereof, and a deflector within said lint flue on each side of said opening, said deflectors being selectively operable to control distribution of the lint in the lint flue depending on which side of the direction of flow the opening faces.

4. A lint flue to be positioned substantially horizontally and having an opening in a side wall thereof, and means adjacent the opening for connection with a lint conveying connecting flue entering said lint flue from below or above the same to convey lint into said lint flue either tangentially to the upper or lower wall thereof, and deflectors within said lint flue, one above and one below the opening, said deflectors being selectively operable to control the distribution of lint in said lint flue depending on whether said connecting flue enters said lint flue from below or above the latter.

5. In an apparatus for conveying lint from a gin, a lint flue adapted to be disposed in a horizontal position and for passage of a current of air therethrough in one direction to convey lint from a gin, said lint flue having an opening in the side wall thereof centrally disposed with respect to a horizontal plane through its axis, a connecting flue for use between said lint flue and a gin and formed to connect the gin and said lint flue when they are disposed at different levels with respect to one another, said connecting flue having inlet and outlet ends, means at the inlet end of said connecting flue for securing the same to the gin, and cooperating means at the outlet end thereof and on said lint flue adjacent its opening for securing said connecting flue to said lint flue, said connecting flue being formed so that when secured to said lint flue, vertical longitudinal planes through said connecting flue are substantially at right angles to the vertical longitudinal plane through the axis of said lint flue, whereby said lint flue may be positioned either above or below the gin and said connecting flue used between the gin and said lint flue with the air passing through said lint flue in the same direction.

6. In an apparatus of the character described, a lint flue section adapted to be disposed in a horizontal position as a part of a conduit for passage of a current of air therethrough in one direction to convey lint from a gin to a condenser or the like, said lint flue having an opening in the side wall thereof centrally disposed with respect to a horizontal plane through its axis, said lint flue being adapted to be connected in the conduit with its opening on either side thereof, a connecting flue for use between said lint flue and a gin formed to connect the gin and said lint flue when they are disposed at different levels with respect to one another, said connecting flue having inlet and outlet ends, means at the inlet end of said connecting flue for securing the same to the gin, and cooperating means at the outlet end thereof and on said lint flue adjacent its opening for securing said connecting flue to said lint flue, said connecting flue being formed so that when secured to said lint flue, vertical longitudinal planes through said connecting flue are substantially at right angles to the vertical longitudinal plane through the axis of said lint flue, whereby the gin may be disposed on either side of said lint flue and said connecting flue used between the gin and said lint flue with the air passing through said lint flue in the same direction.

7. A connecting flue for use between a gin and a horizontal lint flue, said connecting flue being formed so that when connected between a gin and lint flue, vertical longitudinal planes passing through the connecting flue are at substantially right angles to the vertical longitudinal plane through the axis of the lint flue, said connecting flue being formed to extend from a gin to a lint flue positioned at different levels and having inlet and outlet ends, a flange on said inlet end for connection with a gin, and a flange on said outlet end for connection with a lint flue, said flanges being disposed in a vertical plane when said connecting flue is fixed in position between the gin and the lint flue.

8. In an apparatus of the character described, a lint flue section adapted to be disposed in a horizontal position as a part of a conduit for passage of a current of air in one direction therethrough to convey lint from a gin, said section having an opening in the side wall thereof centrally disposed with respect to a horizontal plane through its axis, connecting means on said section in a vertical plane surrounding the opening for connection with a connecting flue extending from a gin, said section being constructed to be detachably connected in the conduit with its opening on either side thereof, whereby said section may be used to convey lint from a gin positioned on either side of said section, with the air passing through said section in the same direction.

9. In an apparatus of the character described, a lint flue section adapted to be disposed in a horizontal position as a part of a conduit for passage of a current of air in one direction therethrough to convey lint from a gin, said section having an opening in the side wall thereof centrally disposed with respect to a horizontal plane through its axis, a flange on said section surrounding the opening and disposed in a vertical plane for connection with a connecting flue extending from a gin, said section being constructed to be detachably connected in the conduit with its opening on either side thereof, whereby said section may be used to convey lint from a gin positioned on either side of said section, with the air passing through said section in the same direction.

10. In an apparatus of the character described, a lint flue adapted for passage of a current of air in one direction therethrough, a lint conveying connecting flue joining with said lint flue, a deflector within said lint flue, and means for retaining said deflector in adjusted position in the

path of the lint entering said lint flue from said connecting flue to control the distribution of the lint in said lint flue.

11. In an apparatus of the character described, a lint flue adapted for passage of a current of air in one direction therethrough, a lint conveying connecting flue joining with said lint flue, a deflector within said lint flue, and means for selectively adjusting said deflector in and out of the path of the lint entering said lint flue from said connecting flue to control the distribution of the lint in said lint flue.

12. In an apparatus of the character described, a lint flue adapted for passage of a current of air in one direction therethrough, a lint conveying connecting flue joining with said lint flue, a deflector within said lint flue, and means for selectively retaining said deflector in a plurality of adjusted positions in the path of the lint entering said lint flue from said connecting flue to control the distribution of the lint in said lint flue.

13. In an apparatus of the character described, a lint flue adapted for passage of a current of air in one direction therethrough, a lint conveying connecting flue joining with said lint flue, and a curved deflector within said lint flue in the path of the lint entering from said connecting flue, said deflector having its concave face presented to the lint entering from said connecting flue.

14. In an apparatus of the character described, a lint flue, a condenser for lint at one end of said lint flue, means providing a current of air through said lint flue toward said condenser, a plurality of lint conveying connecting flues extending from a battery of gins disposed along said lint flue and joining with said lint flue, and a deflector positioned at the juncture of the connecting flue nearest the condenser, and means for retaining said deflector in adjusted position in the path of the lint entering said lint flue from said connecting flue for controlling the distribution of lint in said lint flue preparatory to the delivery of the same to the condenser.

15. A connecting flue for use between a gin and a horizontal lint flue, said connecting flue being formed so that when connected between the gin and the lint flue, vertical longitudinal planes passing through the connecting flue are at substantially right angles to the vertical longitudinal plane through the axis of the lint flue, said connecting flue being formed to extend from a gin to a lint flue positioned at different levels and having inlet and outlet ends, means on said inlet end adapted to be disposed in a plane parallel to the vertical longitudinal plane through the axis of the lint flue and to connect with corresponding means on the gin in said plane, and means on said outlet end adapted to be at the same time disposed in a plane parallel with the vertical longitudinal plane through the axis of the lint flue and to connect with corresponding means on the lint flue in said plane.

JOHN A. STREUN.