J. DAVIDSON.

LINT COLLECTING SYSTEM.

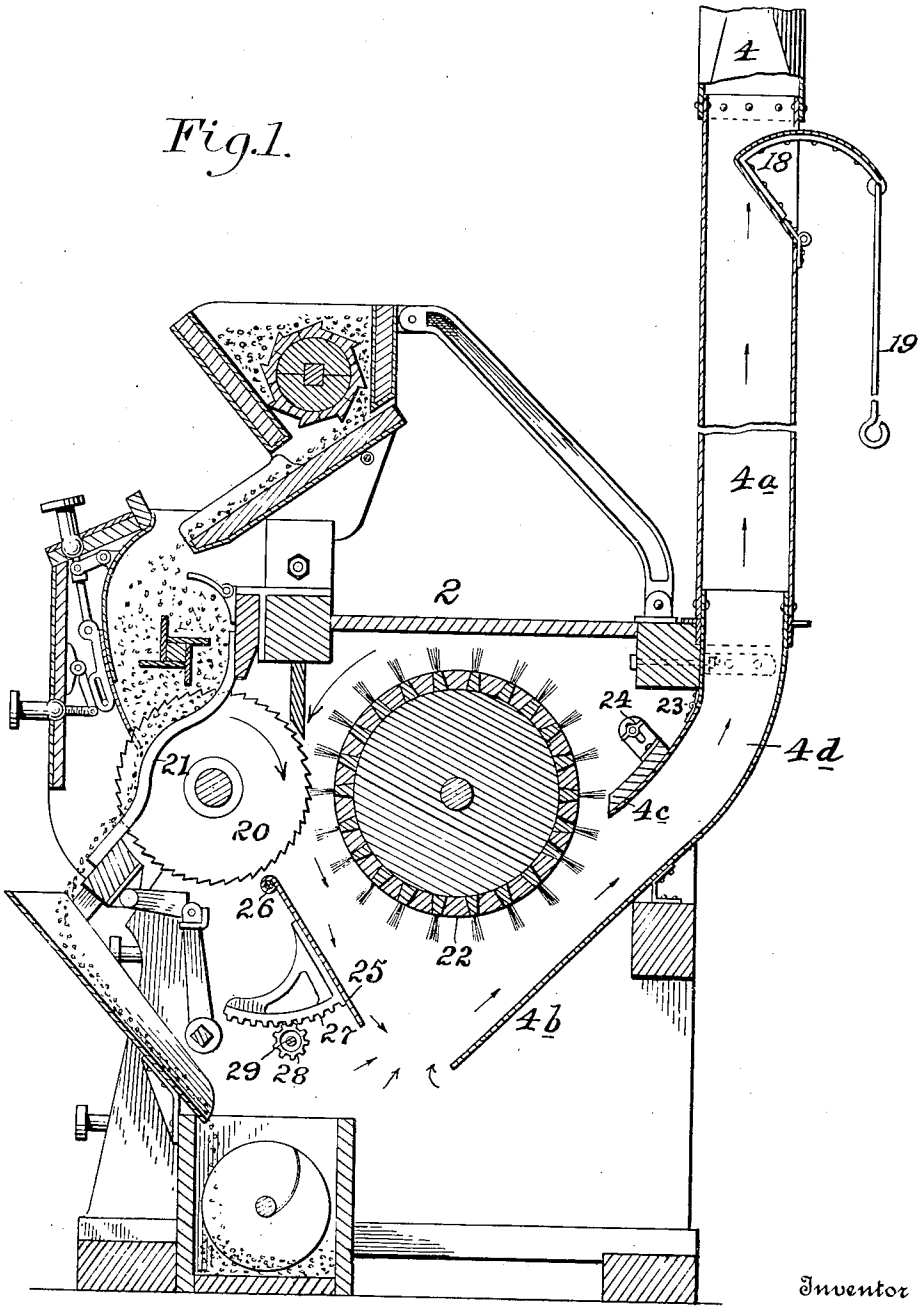
APPLICATION FILED MAR. 29, 1917.

1,350,439.

Patented Aug. 24, 1920.

2 SHEETS—SHEET 1.

Fig. 1.



Inventor

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By

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Witnesses

Frederick W. Ely.

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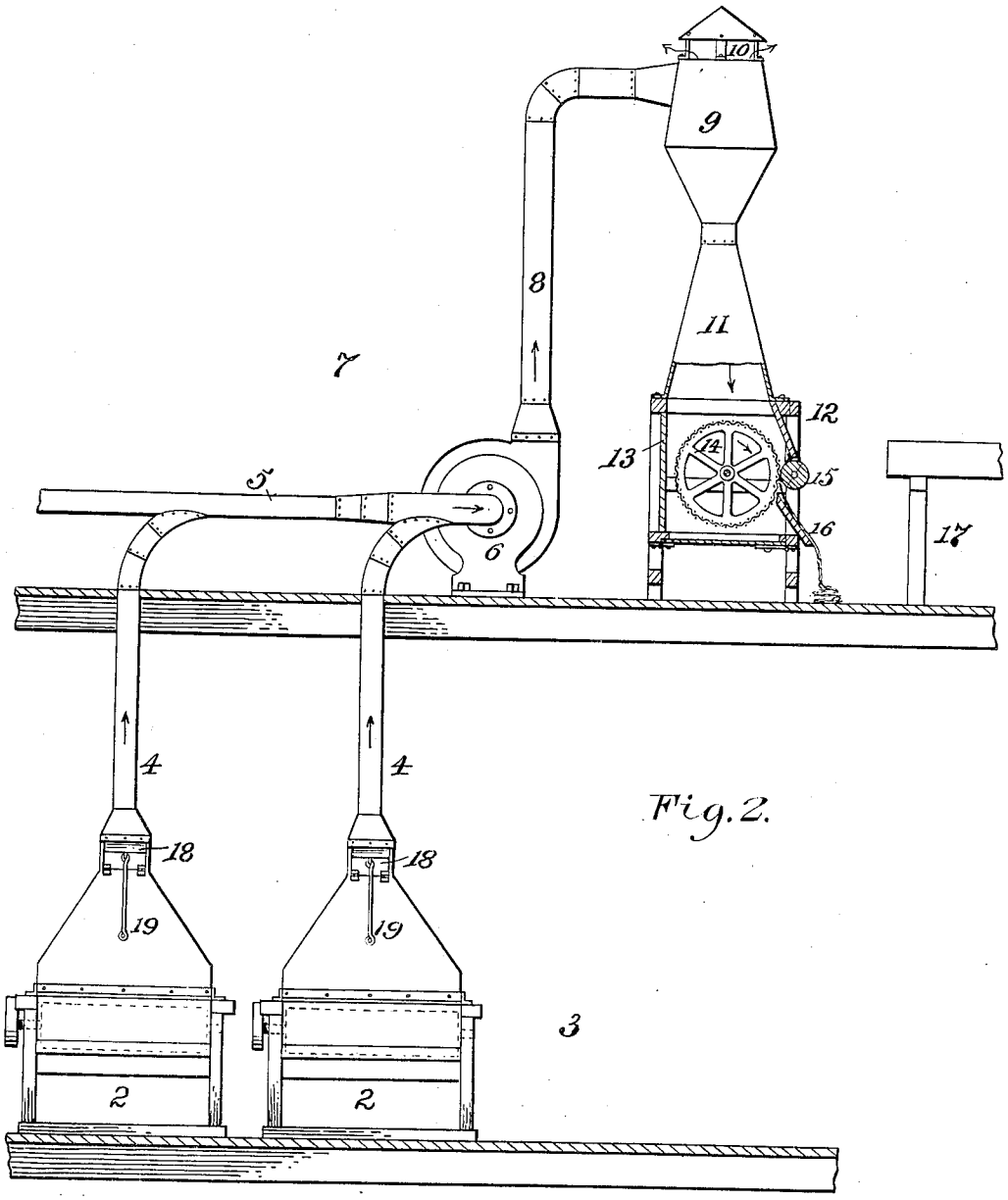

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOSEPH DAVIDSON, OF GREENVILLE, SOUTH CAROLINA, ASSIGNOR OF ONE-HALF TO AMERICAN MACHINE & MANUFACTURING COMPANY, A CORPORATION OF NORTH CAROLINA.

LINT-COLLECTING SYSTEM.

1,350,439. Specification of Letters Patent. Patented Aug. 24, 1920.

Application filed March 29, 1917. Serial No. 158,174.

To all whom it may concern:

Be it known that I, JOSEPH DAVIDSON, a citizen of the United States, and resident of Greenville, county of Greenville, and State of South Carolina, have invented an Improvement in Lint-Collecting Systems, of which the following is a specification.

The object of my invention is to provide an improved system and apparatus for collecting lint obtained from the treatment of cotton seed, whereby less manual labor is required and a consequent reduction in cost is accomplished.

Prior to my invention, the customary method of collecting lint from cotton seed linters has been by means of an individual wire drum condenser attached to each linter machine, the lint from the linter being collected by rolling up on a mandrel on the condenser, and said rolls of lint so produced then separately carried by hand from the linter and its condenser to a lint baling press located in a separate room. This operation was performed in connection with each linter machine, and has proven unsatisfactory, due more especially to the labor necessarily required in separately conveying the numerous rolls of lint from the plurality of linter machines to the baling press, also to the objection caused by the dust and short lint flyings being discharged through the wire covering of the condenser out into the room and thereby making the linter room very uninhabitable to the operators, and further producing a fire hazard owing to the accumulations of this short fiber and dust settling around the machines, on the floors, ledges and timbers of the building.

More specifically, my invention comprehends dispensing entirely with a separate condenser with each linter machine; also the elimination from the room containing the linter machines the lint condensing apparatus; also the locating of a single condenser in a separate room and adapted to receive the lint from a plurality of linter machines through the employment of suitable devices for creating a draft, and arranging the said condenser adjacent to the baling press so that the handling of the lint rolls may be reduced to a minimum. Furthermore, in the system thus stated, there is no discharge of flyings and dust from the linters into the linter room, and in the case of the condenser common to the plurality of linters, this is preferably inclosed to prevent any possibility of the flyings and dust escaping into the baling room. The objects of my system, therefore, may be concisely stated to facilitate more economical handling of the lint by eliminating the manual labor of carrying the lint rolls produced from each linter into a separate room where the press is located, and instead, automatically delivering all of the lint from the linters directly to a common condenser arranged in the baling press room and close to the press; further to eliminate any lint flyings and dust from the linter room thereby keeping it clean and the atmosphere wholesome and with a resulting lessant fire hazard; to avoid the waste of lint which heretofore has been considerable; to improve the cleanliness of the lint itself by the positive control of the air set in motion by the linter brush, whereby the motes and fine particles of hulls knocked off the saw by the brush of the linter are caused to fall out of the air suction while avoiding loss of lint itself; and great saving in floor space in the linter room by the elimination of the condensers to each linter machine.

Aside from the general improvements directed to the system as a whole, my invention includes specific features in the construction of the linter which provides for means whereby the currents of air set in motion by the revolving linter brush may be modified or controlled by suitable valve devices and dampers which may regulate the extent of the draft so that foreign particles heavier than the lint itself may be caused to separate from the lint and thereby provide a more cleanly condition of the lint passing to the condenser than has heretofore been possible.

My invention also consists of improvements hereinafter described whereby the above objects and results are attained, said improvements comprising certain organization and combination of parts which are fully described hereinafter and more particularly defined in the claims.

For the purpose of illustrating my invention, I have shown in the accompanying drawings the embodiment thereof which is

at present preferred by me, since the same is in form to give satisfactory and reliable results, but it is to be understood that the several instrumentalities of which my invention consists, can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities herein shown and described.

Referring to the drawings:—Figure 1 is a cross section of a linter machine embodying my improvements; and Fig. 2 is an elevation with part in section showing the arrangement of the various parts from the linter to the baling press which enter into the operation of my improved lint collecting system.

2, 2, illustrate a plurality of linter machines arranged in a room 3; 4, 4, are suction conduits leading from the respective linter machines and communicating with a conduit 5 which delivers into the suction of an exhaust-blower 6 arranged at a distance from the linter machines and preferably in a separate room 7. The discharge side of the exhaust-blower 6 discharges through a conduit 8 into a collector 9 from which the lint passes through the hood 11 into the batting condenser 12. This condenser is shown as having an inclosed chamber 13 within which is arranged a suitable cylinder 14 having a circumference of wire cloth which receives the lint descending through the hood 11. 15 is a pressure roller rolling in contact with the surface of the cylinder 14 and densifying the batting of lint which is formed between said roller and the cylinder while being carried downward by said operation and delivered at 16 close to the baling press 17. This condenser and baling press are arranged in the compartment 7 which is separate and distinct from the compartment 3 in which the linter machines are arranged. The collector 9 may be of any suitable construction corresponding to those now in commercial use, and the upper portion is open as at 10 so as to materially relieve the air pressure so that the collected lint is discharged downward to the batting condenser under reduced pressure. The condenser itself is not essential to the broad system here disclosed, because the lint may be brought to a condition whereby it can be transferred to the baling press without being first brought into the more condensed batting form, but I prefer to employ a batting condenser as it brings the lint to a more definite form. It will be noted that there is no discharge of any air from the linters within the room 3 in which the linters are located, and consequently the air of said room is in a satisfactory condition without flyings or dust therein due to an internal pressure created within the linter machines as heretofore. It will be noted that the conduits 4 leading from the separate linter machines 2 are each provided with a gate or valve 18 having a depending rod 19 by which it may be adjusted. By means of these valves the degree of suction put upon the respective linter machines may be varied to suit the particular requirements of any machine and also to compensate for the varying distances of the linter machines from the suction-blower 6.

Referring more particularly to the linter machines shown in Fig. 1, the following features of construction are pointed out:—The usual saws 20 coöperate with the breast 21 and are combined with the brush cylinder 22 as heretofore, the lint being removed from the seeds by the saws and being liberated therefrom by the brush which revolves at a relatively higher speed and in the reverse direction to the saws, so that the lint is brushed downward and from the saw teeth. The high speed of the brush sets the air within the chamber of the linter machine into motion and holds the lint in suspension, and this air and its contained lint is drawn off through the conduit 4 and 4^a by the action of the exhaust-blower 6, heretofore described. The conduit portion 4^a leads downward from the tube 4 and broadens to the full width of the linter casing, as indicated in Fig. 2, and communicates with a curved neck portion 4^d having an oblique bottom plate 4^b extending well below and from the rear forward in respect to the revolving brush 22. The forward wall 4^c of the neck portion 4^d is hinged at 23 so as to be adjusted toward or from the brush, and when adjusted so as to snugly fit close to the brush, it may be clamped in place by the clamping device 24. By this adjustment, the air carrying the lint put into motion will not be carried upward over the brush, and at the same time the suction due to the action of the exhaust-blower will be concentrated in drawing off the air containing the lint at the bottom part of the rotating brush. The principle on which my improved linter operates is that I am enabled to produce just the right amount of vacuum or suction in the brush chamber to approximately just take up the air (charged with the lint) which is set in motion by the rotary linter brush 22, thus avoiding any internal pressure and ejection of the lint-laden air or flyings into the linter room. Further, the provision made between the conduit wall 4^b and the apron 25 allows the inflow of air in sufficient quantity to just compensate for the air removed by the conduit 4 and exhausting devices, so that the rotating brush 22 is continually providing lint laden-air under approximately normal pressure and operating with fresh air as rapidly as the exhausting devices remove the surcharged air. In other words, I provide a continuous current of fresh air to the

linter while exhausting the lint-laden air and maintain this condition without internal pressure.

Heretofore the linter brush did not free itself of the lint-laden air which it set in motion; and as its action tended to create an internal pressure, the result was to discharge flyings into the linter room; and moreover, the brush did not have capacity to keep up a sufficient velocity in the main trunk flue to the condenser to prevent the heavier portions of the lint dropping and accumulating in the bottom of the flue, thereby causing objectionable choking at intervals and also giving a very uneven grade of lint, by reason of the fact that dirt and the heavy portions of the lint which settled in the flue become discharged intermittently. These defects in operation are entirely overcome by my invention employing the suction or vacuum to take care of all the air from the brushes and by using a comparatively small intake and discharge thoroughfares, thus keeping up ample velocity, insuring perfect circulation and avoidance of all tendency to choking.

The employment of the apron 25 enables the air and floating lint to be deflected, preventing it getting too far away from the brush 22 and the intake end 4^a of the conduit leading to the exhausting device 6, and thereby insuring the lnt-laden air from being removed from the influence of the draft of the suction conduit.

The apron provides means for adjusting the air space between itself and the plat 4^b and thereby to regulate the fresh air currents guided to the brush, and at the same time acts as a guide for the discharge of any motes or fine particles of the hulls which are knocked off by the saws, and for delivering them out of the influence of the suction leading to the conduit 4. The adjustment of this apron may be accomplished in many ways, but that shown being by a rack 27 upon the apron and a pinion 28 meshing therewith and rotated by a hand operated shaft 29.

I have not described in detail the linter machine other than is required to an understanding of my improvements, as the feeding and other devices are all well known and are in no way to be understood as limitations of my improvements. My invention is adaptable to various constructions of linter machines, and for that reason I have only referred to the saws, breast and brush when defining my improvements, as it is with these portions my improved features are more directly associated.

In the operation of my improved system of collecting lint, it is manifest that after removing the lint from the various linter machines by the suction of the exhaust-blower 6, the commingling and discharge of the said lint from the various machines are completed in the discharge thereof into the conduit 8, and broadly considered, my invention would comprehend any means which would receive this commingled lint and sufficiently densify it to enable it to be handled for delivery into the baling press. This may be accomplished either by the collector 9 and the batting condenser 13 separately or together. I prefer to use the two devices as shown, but it will be manifest that the particular means for densifying the commingled lint sufficiently that it may be handled for delivery to the baling press, is a matter of secondary importance to the principles involved in the system; and while the forming of the lint into batting is perhaps most desirable, I do not in any manner restrict myself thereto.

It will now be apparent that I have devised a novel and useful construction and system which embody the features of advantages enumerated as desirable, and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that I do not restrict myself to the details, as the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The herein described method of collecting lint which consists in causing a plurality of freely floating separate bodies of lint to be formed from separate sources and to be held respectively in suspension within separate confined spaces, collecting all of the plurality of bodies of suspended lint and commingling them under the action of suction from a common source, and continuously thereafter delivering the commingled lint so collected to a condenser under light atmospheric pressure, condensing the lint into a common batting suitable for baling.

2. The herein described method of collecting lint directly from a plurality of separate sources such as linters, which consists in causing a plurality of separate bodies of freely floating lint to be formed from the separate sources under independent regulated air blast in respect to each of said sources and suction from a common source sufficiently to cause the separate bodies of lint to be respectively held in suspension within separately confined spaces, collecting all of the plurality of bodies of suspended lint and commingling them under the action of said suction from the common source, transferring the commingled and collected lint to a distant place by means of air pressure, relieving the air pressure employed in transferring the lint before the lint is subjected to the condensing treatment to convert

it into batting, and finally condensing the said commingled lint under a relatively light atmospheric pressure.

3. In apparatus of the character stated, a plurality of linter machines, combined with a plurality of upright chambers into which the linter machines respectively deliver the lint and in which it is held suspended, a combined suction blower, a conduit leading from the suction side of the blower and in communication with the upper portions of the plurality of upright chambers whereby all of the several bodies of lint are lifted and commingled on the way to the suction blower, separate means arranged transversely of each of the upright chambers for independently controlling the extent of action of the common suction upon the suspended bodies of lint in the respective upright chambers, a condenser for condensing the lint into batted form suitable for baling, and a conduit leading from the pressure side of the suction blower and communicating with the condenser.

4. In apparatus of the character stated, a plurality of linter machines, combined with a plurality of upright chambers into which the linter machines respectively deliver the lint and in which it is held suspended, a combined suction blower, a conduit leading from the suction side of the blower and in communication with the upper portions of the plurality of upright chambers, whereby all of the several bodies of lint are lifted and commingled on the way to the suction blower, a condenser for condensing the lint into batted form suitable for baling, a conduit leading from the pressure side of the suction blower and communicating with the condenser, and means in communication with the pressure conduit adjacent to the condenser for relieving the air pressure whereby the lint is received in the condenser under relatively light pressure and the blower may operate under substantially constant resistance.

In testimony of which invention, I hereunto set my hand.

JOSEPH DAVIDSON.

Witnesses:
E. W. SMITH,
R. E. SMITH.