

F. E. SMITH.  
SEED COTTON CLEANER AND CONVEYER.

No. 494,902.

Patented Apr. 4, 1893.

FIG. 1.

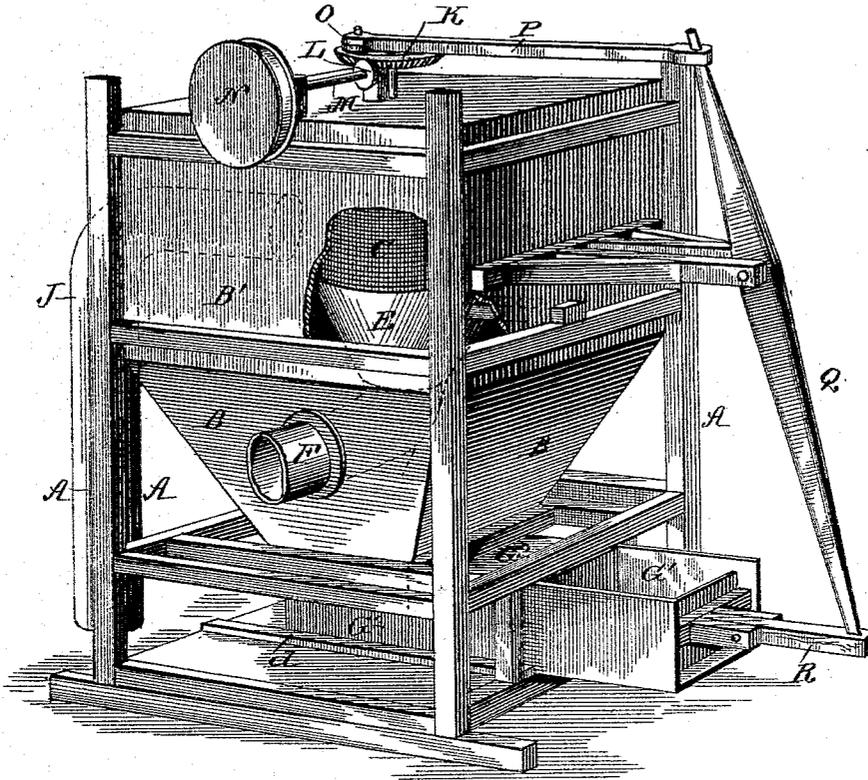
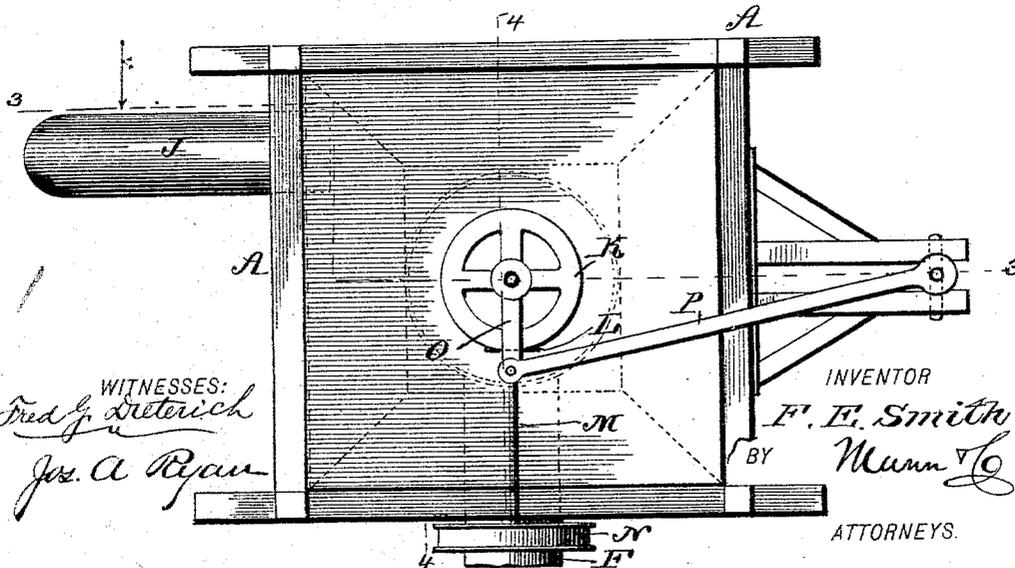


FIG. 2.



WITNESSES:  
*Fred J. Dietrich*  
*Jos. A. Ryan*

INVENTOR  
*F. E. Smith*  
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 ATTORNEYS.

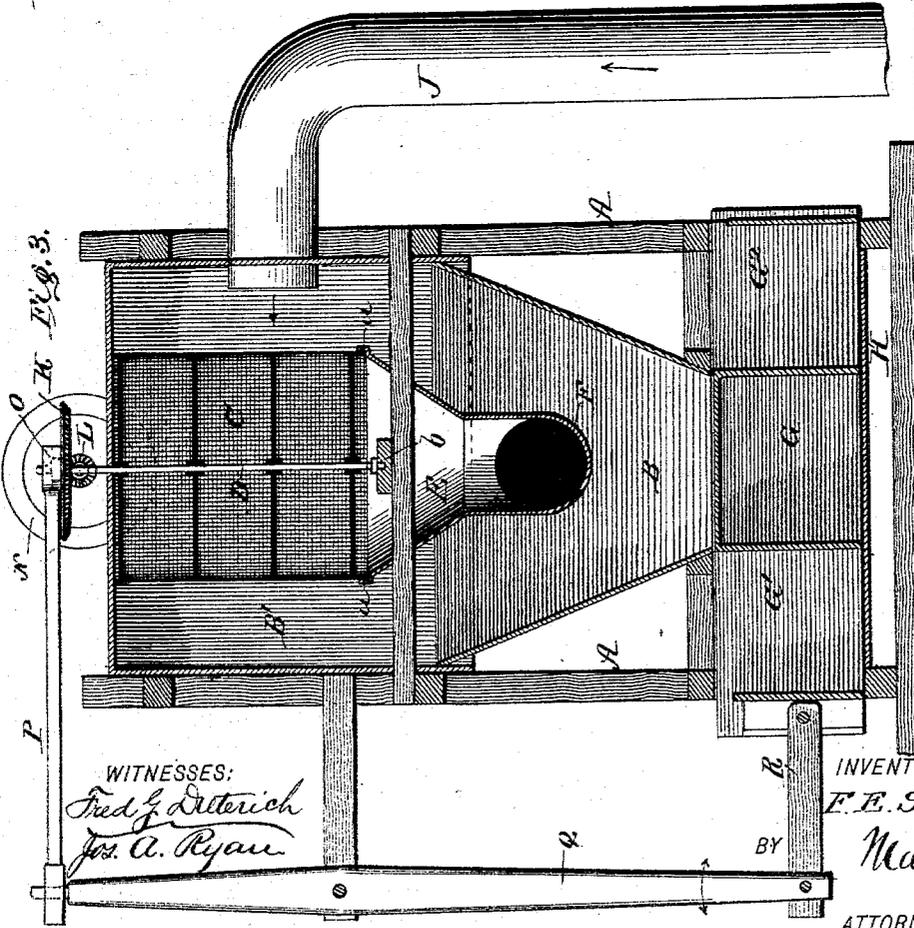
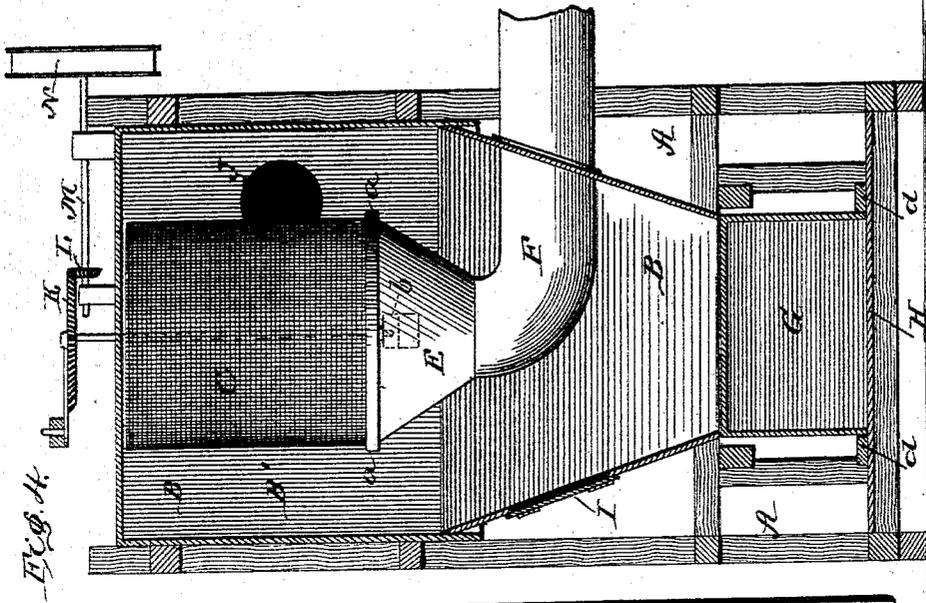
(No Model.)

2 Sheets—Sheet 2.

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SEED COTTON CLEANER AND CONVEYER.

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# UNITED STATES PATENT OFFICE.

FERDINAND E. SMITH, OF BIRMINGHAM, ALABAMA, ASSIGNOR TO THE  
SMITH SONS GIN AND MACHINE COMPANY, OF SAME PLACE.

## SEED-COTTON CLEANER AND CONVEYER.

SPECIFICATION forming part of Letters Patent No. 494,902, dated April 4, 1893.

Application filed November 9, 1892. Serial No. 451,466. (No model.)

*To all whom it may concern:*

Be it known that I, FERDINAND E. SMITH, residing at Birmingham, Jefferson county, in the State of Alabama, have invented a new and useful Improvement in Seed - Cotton Cleaners and Conveyers, of which the following is a specification.

My invention is in the nature of an improved seed cotton cleaner designed to take the cotton mixed with seed, dirt and other trash as it comes from the field, and clean it of such dirt and trash and then feed it to any convenient receptacle such as a gin stand or bin. It relates to that class of seed cotton cleaners in which the cotton with its seed and impurities are fed to the cleaning device by pneumatic action; and it consists in a novel construction and arrangement of parts operating upon this principle, which accomplishes the objects sought in a very convenient, effective and practical manner, as will be hereinafter fully described.

Figure 1 is a perspective view of the cleaner, with the outer case partly broken away. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section of the same taken on line 3-3 of Fig. 2, and Fig. 4 is a similar view taken on line 4-4 of Fig. 2 at right angles to the plane of Fig. 3.

In the drawings A represents an upright frame-work in the upper part of which is constructed a tight casing B' communicating with a funnel-shaped chamber B below. In the upper part of the casing there revolves a vertical screen cylinder C whose sides are composed of woven wire. The shaft of this cylinder is stepped upon a bearing b at its lower end, and its upper end is provided with a bevel gear K which receives motion from a smaller bevel gear L on a shaft M driven by a band pulley N. Any other means for rotating the cylinder may, however, be employed. Just below the cylinder C there is a stationary funnel E which at its lower end communicates with a suction pipe F which emerges through the side of the casing and communicates with an exhausting device for drawing air out of the cylinder. The upper edge of this stationary funnel E is flanged at a to form a close joint with the revolving woven wire cylinder.

J is the induction pipe through which the

air and cotton laden with impurities pass, the draft or feed being induced by the suction in pipe F. One end of the induction pipe J communicates with the upper part of the casing, and the other end extends to the wagon or receptacle containing the cotton to be treated and cleaned.

At the bottom of the part B of the casing there is a valve composed of three parts G G' G<sup>2</sup>, which valve slides in guide ways d d, Fig. 4 upon an imperforate base H. The middle portion G of the valve has an imperforate top which, when the valve is in the position of Fig. 3, forms the bottom of the casing. The chambers G' and G<sup>2</sup> on opposite sides of G are merely cells closed on four sides but open at both top and bottom. These cells correspond in size and shape to the opening at the bottom of chamber B, so that the walls of the cell accurately fit this opening when under the same, and, in connection with the subjacent stationary base board H, prevent air from entering the chamber B through the cells when they are under the opening. These three sections are operated together with a reciprocating motion under the casing, and for this purpose they are connected by link R with the lower end of lever Q which at its upper end is connected by pitman P to a crank O on wheel K.

I is a door opening into the lower part of the casing. This is used for stopping the induction or feed of cotton as hereinafter described.

The operation of this device is as follows: The suction fan at the end of pipe F being set in motion, a partial vacuum is set up within the casing which draws strongly through pipe J carrying the seed cotton and impurities with it. This seed cotton with the seed and adhering impurities is distributed against the cylinder C of woven wire and the dirt, dust, and small impurities pass at once through the meshes to the interior of the screen cylinder, and pass out directly through the suction pipe F. As the cylinder C revolves it will be seen that new portions of the screen are brought constantly to receive the seed cotton, and as it strikes the cylinder it drops off, being loosened by centrifugal action, and falls to the bottom of the casing,

where it accumulates. As the valve  $G' G^2$  moves back and forth, the part  $G$  when under the casing allows a quantity of cleaned cotton to accumulate thereon. Then when the compartment  $G'$  passes under chamber  $B$  this quantity of clean cotton drops into the cell  $G'$ . When the valve moves the other way a quantity of clean cotton again accumulates on  $G$ , and when cell  $G^2$  gets underneath this chamber  $B$  this cell receives the clean cotton while the charge held by  $G'$  drops through its open bottom as in Fig. 1 as soon as its open bottom passes beyond the edge of base  $H$ . In this way the charges of clean seed cotton are dropped from the cells alternately upon opposite sides of the machine, the valve serving all the while to preserve the air tight character of the casing, and insuring a continuity of feed through the induction pipe  $J$  of air, seed cotton, and impurities. As the cleaned cotton drops on opposite sides of the machine it may fall directly into two gin stands or it may be deposited upon a belt or carrier and be distributed as desired. If it is desired to stop the action of the machine, it is not necessary to stop the exhaust fan, but instead thereof the door  $I$  in the casing is opened, and the draft of the suction fan then instead of operating to continue the feed in pipe  $J$  is short circuited by the ingress of fresh air at the open door  $I$  which causes said draft to be no longer felt in pipe  $J$ , and the feed of the cotton ceases.

With reference to the merits of my machine, I would state that the revolving cylindrical screen presents a clear and unobstructed surface to the impact of the cotton, which is free to drop from gravity as the screen revolves, thus presenting a constantly new and clean surface to the cotton, and preventing the clogging of the screen, and permitting the sand and dirt to be readily and completely separated and carried out by the draft. The valve also affords a positive, automatic, effective, and simple means of getting the seed cotton out without impairing the draft by a leakage of air.

With reference to the means shown for working the valve, I would state that for the best results in automatic working, the mechanism  $O P Q R$  should be so modified as to give a quick adjustment to the valve in shifting the cells, so that any one of the cells may not remain long in partial registration with the bottom of chamber  $B$ , as they would allow air to pass down one cell of the valve and leak upwardly into the chamber  $B$ , which would impair the positiveness of the suction and in a measure affect the pneumatic feed-

ing of the cotton. I merely show the lever, links, and crank, to illustrate the automatic operation of the valve, but do not confine myself at all to the construction shown.

Having thus described my invention, what I claim is—

1. In a seed cotton cleaner, the combination of a tight casing, an induction pipe  $J$  for the seed cotton and air opening into the upper part of the casing, a revolving cylindrical screen  $C$  arranged within the casing about a vertical axis, a suction pipe  $F$  passing through the lower portion of the casing and communicating with the lower open end of the cylindrical screen, and a discharge valve for the cleaned cotton arranged at the bottom of the casing substantially as shown and described.

2. In a seed cotton cleaner, the combination of a tight casing, an induction pipe  $J$  for the seed cotton and air opening into the upper part of the casing, a revolving cylindrical screen  $C$  arranged within the casing about a vertical axis, a suction pipe  $F$  passing through the casing and communicating with the lower open end of the screen, a draft regulating door  $I$  opening into the casing to short circuit the draft and stop the feed, and a valve arranged at the bottom of the casing to permit the discharge of the cleaned cotton substantially as shown and described.

3. The combination of the casing composed of the upper portion  $B'$ , and the lower funnel shaped portion  $B$ , the vertical cylindrical screen  $C$  arranged to revolve in the upper portion of the casing, the induction pipe  $J$  opening through the upper part of the casing against the periphery of the cylindrical screen, a discharge valve arranged at the bottom of the casing, and a suction pipe passing through the sides of the lower part of the case and flared at its upper end to connect with the cylindrical screen, substantially as shown and described.

4. The combination of the casing  $B B'$ , the valve  $G' G^2$  arranged at the bottom thereof, the induction pipe  $J$  opening through the top portion of the casing, the vertical revolving screen  $C$  arranged in the upper part of the casing, the suction pipe  $E F$  communicating with the lower end of the cylindrical screen and passing through the side of the casing, and the pitman  $P$ , lever  $Q$ , and link bar  $R$ , connecting the cylinder shaft with the valve to impart a reciprocating motion to the latter, substantially as shown and described.

FERDINAND E. SMITH.

Witnesses:

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Z. T. RUDOLPH.