

932,068.

2 SHEETS--SHEET 1.

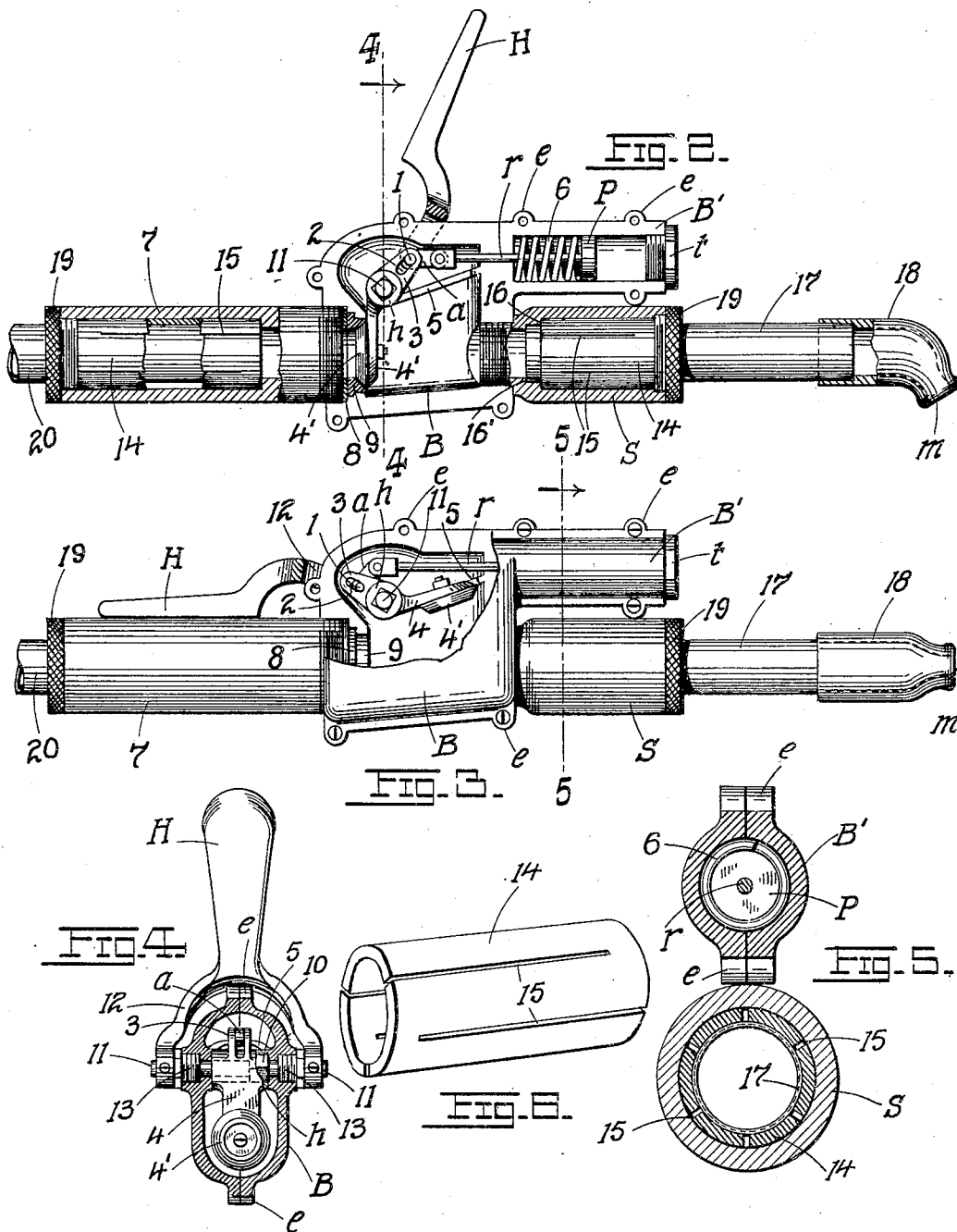


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 SUCTION HEAD FOR VACUUM COTTON PICKERS.
 APPLICATION FILED JULY 17, 1908.

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Patented Aug. 24, 1909.

2 SHEETS—SHEET 2.



WITNESSES:

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JOHN S. THURMAN, OF ST. LOUIS, MISSOURI.

SUCTION-HEAD FOR VACUUM COTTON-PICKERS.

932,068.

Specification of Letters Patent.

Patented Aug. 24, 1909.

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To all whom it may concern:

Be it known that I, JOHN S. THURMAN, citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Suction-Heads for Vacuum Cotton-Pickers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in suction-heads or tools for vacuum cotton-pickers; and it consists in the novel construction and arrangement of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a general view showing the application of my invention to a cotton-boll; Fig. 2 is a combined longitudinal section and elevation of the suction-head or tool and nozzle attached, with cut-off valve in closed position; Fig. 3 is a side elevation of the same, parts broken away, showing the operating handle swung against the tool-shank and with cut-off valve oscillated to full open position, and showing too a slightly different form of nozzle; Fig. 4 is a transverse cross-section on the line 4—4 of Fig. 2 with cut-off valve in elevation; Fig. 5 is a cross-section on the line 5—5 of Fig. 3; Fig. 6 is a perspective of the rotatable bushing of either the socket, carrying the nozzle, or the tool-shank to which the hose-coupling tube is coupled; Fig. 7 is an enlarged elevation of the hose-coupling tube, showing a section of the line-hose, and the end of the tool-shank receiving the tube; Fig. 8 is an enlarged face view of the cut-off valve and its hub, with the trunnion pin partially withdrawn to show the polygonal plug or key which locks the trunnion pin to the hub; Fig. 9 is a cross section on the line 9—9 of Fig. 8; and Figs. 10 and 11 are sectional views of two forms of nozzles employed in cotton picking.

The object of my invention is to construct a suction-head or tool which is applied to the cotton-boll, the suction through the head (effected by any suitable vacuum-producing means) severing the cotton from the boll and drawing it into the head across the gap or space between the cotton and the nozzle of the tool as the nozzle is passed in close proximity to the cotton. Unlike the suction-heads or tools employed in vacuum-cleaning systems where the nozzle is placed

in contact with the rug, carpet, wall or other surface from which the dust and dirt is to be removed, in the picking of cotton, the inrush of air into the nozzle of the tool should be sufficient to sever the cotton from its boll before any actual contact between the cotton and nozzle takes place, it being desirable that the cotton be entirely surrounded by a jet of air playing around it and rushing into the nozzle, whereby severing of the cotton may take place without subjecting it to any compression by actual contact of the nozzle therewith.

A further object of the invention is to provide a suction-head the mouth of whose nozzle may be turned in any direction about the axis of the nozzle, thereby avoiding the necessity of turning the body of the tool, or putting a twist in the hose coupled thereto.

A further object is to provide a tool having a cut-off valve so positioned that no dirt or dust can lodge behind it.

A further object is to provide the tool with a valve-controlling lever mounted in such a way as to insure a complete opening of the valve when the tool is ready for operation; and a further and final object is to provide the tool with such other structural details as will insure the maximum advantages therefor, as will be fully apparent from a detailed description of the invention which is as follows:

Referring to the drawings, B, represents the chambered body portion of the tool having formed therewith a cylinder extension B' closed at its outer end by a plug *t*. The body with its cylinder extension is preferably made in two halves or sections separable along a plane disposed in the direction of the width of the tool, the said sections being provided with ears or lobes *e* for the securing screws by which the sections are held together when once assembled. Operating within the cylinder B' is a piston-plunger P the piston rod *r* of which extends rearwardly through the rear wall of the cylinder and into the chamber of the body portion, the forked end of the piston rod having pivotally secured thereto one end of a link *a*, the opposite end of which is connected to a pin 1 operating in the elongated slots 2 of the arms 3, projecting from the hub *h* of a rock-valve 4, whose axis of oscillation is disposed transversely across the chamber of the body portion of the tool.

The body of the valve has secured thereto

a disk 4' serving as the valve proper, such disk engaging, when rocked to its highest, and past its full open position, the limiting ledges 5, 5, formed on the inner walls of the body sections. The valve is normally oscillated or rocked to a closed position by the action of the coiled expanding spring 6 interposed between the piston-plunger P and the inner terminal wall of the cylinder B'. The valve 4, 4', when in closed position covers the opening at the inner end of the hollow tool-shank 7, the latter being screwed into the body of the tool, a suitable washer 8 and packing ring 9 making a proper joint against the packing ring when in its closed position. The valve-hub *h* has a square or polygonal bore into which is inserted a key or plug 10 of corresponding polygonal cross-section, the ends of the plug terminating in cylindrical trunnions 11, 11, about the common axis of which the valve is free to rock or oscillate, the said trunnions having their bearings in the sides of the tool body as shown and normally projecting a suitable distance beyond the body. Freely spanning or straddling the body of the tool are the curved forked arms 12, 12 of an operating handle or lever H, the arms being secured to the trunnions 11, 11, and serving to rock the valve about its axis of oscillation upon a proper oscillation of the lever H. Interposed between the arms 12 and the body of the tool, and encompassing the trunnions are packing rings 13 entering suitable sockets formed in the walls of the body portion. The valve 4 is of course full open when occupying a position at right angles to the shank-opening which it normally closes; and to oscillate it to such full open position and to its highest position against the ledges 5, the lever H must necessarily be depressed toward the shank 7 by the hand of the operator (Figs. 1 and 3). Of course, the tool is most conveniently handled and manipulated when the lever H is pressed close to the shank for then the operator can more conveniently grip the tool with his hand. Without the presence of the slots 2 in the arms 3, the oscillation of the arms and valve through the angle between the full open position of the valve and the inclined position thereof shown in Fig. 3 would not only necessitate an undue draft on the spring 6, but would result in an undue binding of the parts. With the present arrangement however, the lever H which is still somewhat inclined to the axis of the shank 7 when the valve is full open, may be brought squarely against the shank, and the valve swung to the highest inclined position against the ledges 5, by a mere play of the pin 1 in the slots 2 and a corresponding deflection of the link *a* to meet this extreme position (see Fig. 3).

Screwed to the body B in contiguous rela-

tion to the cylinder B' is a hollow socket S which receives a bushing 14 provided with longitudinal peripheral slits 15, the bushing bearing against an outer annular shoulder 16 formed in the socket and freely rotatable within the same. The bushing receives the inner end of the shank 17 of the tubular nozzle 18, the latter having a terminal contracted mouth *m* which is placed close to the cotton when the latter is being picked pneumatically from the boll (Fig. 1). The nozzle is brazed to its shank 17 and may be of any suitable form, either that shown in Figs. 2 and 10, where the axis of the nozzle is inclined to the axis of the shank, or it may be parallel to such axis as shown in Figs. 3 and 11. The walls of the slit bushing snugly embrace the nozzle-shank so that as the latter is rotated about its axis, the bushing turns with it. The inner end of the nozzle-shank 17 bears against the inner annular shoulder 16' formed in the socket S. The outer end of the socket is closed by an annular ring or plug 19 surrounding the shank 17.

The tool-shank 7 likewise is provided with a rotatable bushing 14 which receives the hose-coupling tube 20, the tube 20 with its bushing 14 being likewise freely rotatable within the hollow tool-shank 7 which latter is closed by an annular plug or ring 19, the same as the socket S. The hose L leads from the tool to any suitable low pressure or vacuum receptacle (not shown) in which the cotton is deposited. When the tool is in working position, the handle H gripped as it is in conjunction with the tool-shank 7, comes squarely against the shank as would the members of a pair of shears or tongs. To direct the mouth of the nozzle 18 to any particular boll of cotton, said nozzle is rotated on its axis as described, so that the position of the main body of the tool need not be changed. This arrangement prevents any twist in the hose. This twist is further prevented by the freedom with which the tool body may turn about the axis of the hose-coupling tube 20 by reason of the swivel connection between these parts already referred to.

As the mouth of the picking nozzle 18 is placed in proximity to a boll of cotton, the latter is at once drawn into the nozzle, passing through the body and shank of the tool into the line hose L. The nozzle may be rotated about its axis so as to pick a boll beneath it or above it (Fig. 1) the swivel connection between the parts 17 and the socket S permitting this without necessity of turning the main body of the tool. The contraction of the mouth *m* as compared with the passage of the main portion of the nozzle has the effect of materially increasing the velocity of the current at this point so that a maximum suction takes place and the

entire contents of the boll almost instantly disappears into the nozzle.

If the tool is laid down on the ground, the valve 4, 4', will close automatically under the expanding action of the spring 6, so that in the closing of the valve there is no danger of the tool sucking in dirt and foreign substances when not being used for its legitimate purpose.

10 Having described my invention, what I claim is:—

1. In combination with a suction-head having a body portion, a valve within the body for cutting off, or establishing communication between the atmosphere and interior of the body, a shank forming a rear extension of the body portion, a pivoted lever controlling said valve and forcing the same to a full open position upon partial oscillation of the lever toward the shank, and means for permitting further oscillation of the lever toward the shank after the opening controlled by the valve has been fully uncovered.

25 2. In combination with a suction-head having a body-portion, an air-eduction shank leading from the head, an oscillating valve within the head for controlling the opening of said shank, a spring-controlled plunger mounted in the head, intermediate connections between the plunger and valve, a lever pivoted to the head for oscillating the valve to open position upon the swinging of the lever toward the shank, the valve be-

ing adapted to oscillate to full open position for a definite angular position of the lever relatively to the shank, and means for permitting the lever to be drawn against the shank after the valve has been fully opened.

3. In combination with a suction-head having a body portion, an air-eduction shank leading from the head and an oscillating valve closing the inner opening of the shank, a cylinder formed with the head, a spring-controlled piston-plunger in the cylinder, a piston rod leading from the piston into the head, a slotted arm disposed about the axis of oscillation of the valve and at an angle to the body of the valve, a link coupling the inner end of the piston rod with the slotted end of the arm aforesaid, an operating lever having forked arms straddling the body of the tool and secured to the spindle of the valve, said lever inclining forwardly for a closed position of the valve and opening the valve upon partial swinging thereof toward the shank, the slotted connection between the link and arm of the valve permitting the drawing of the lever up against the shank after the valve has been fully opened.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN S. THURMAN.

Witnesses:

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