No. 676,483. Patented June 18, 1901.

E. A. WRIGHT.

PNEUMATIC STRAW STACKER.

(Application filed July 10, 1899.)

(No Model.)

Fig. 1.

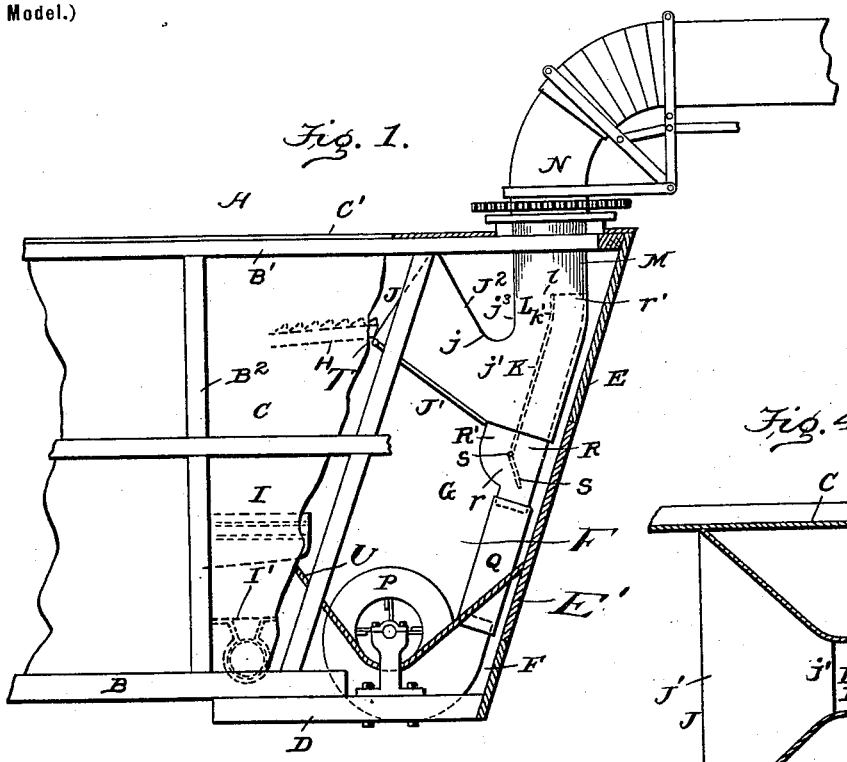


Fig. 4.

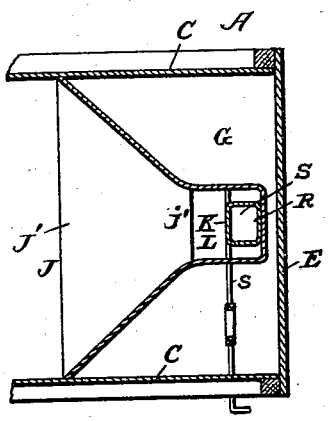


Fig. 2.

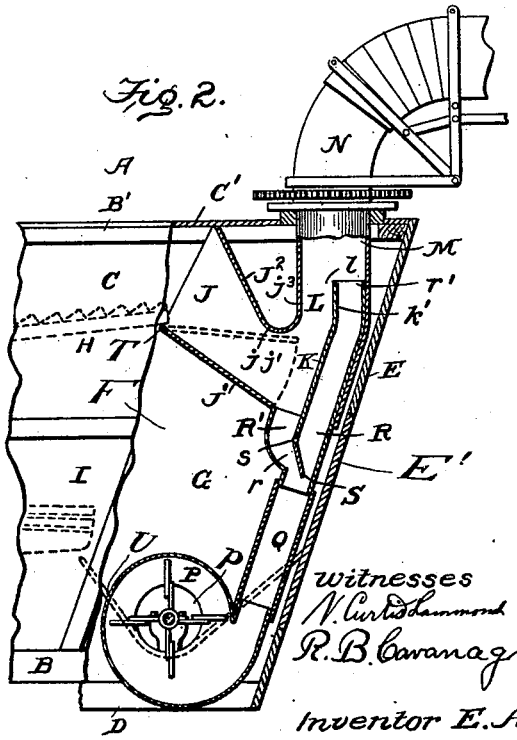
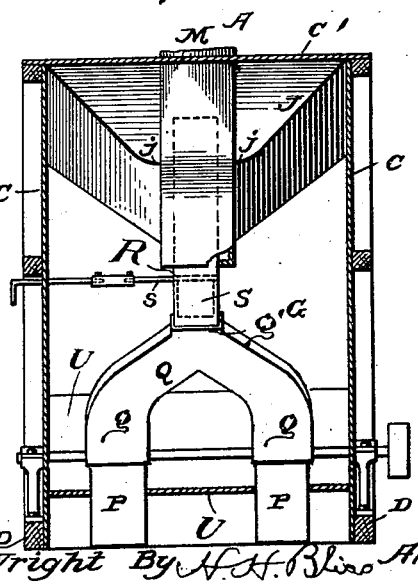


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

EDGAR A. WRIGHT, OF CANTON, OHIO, ASSIGNOR TO THE AULTMAN COMPANY, OF SAME PLACE.

PNEUMATIC STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 676,483, dated June 18, 1901.

Application filed July 10, 1899. Serial No. 723,389. (No model.)

To all whom it may concern:

Be it known that I, EDGAR A. WRIGHT, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Pneumatic Straw-Stackers, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a view, partly in side elevation and partly in section, of a mechanism embodying my improvements. Fig. 2 is a similar view, except that the section is taken at planes nearer to longitudinal vertical planes of the machine. Fig. 3 shows the rear end of the machine in cross-section with some of the interior parts in end elevation. Fig. 4 is a horizontal section of the rear part of the machine.

In the drawings, A indicates the rear end portion of a thresher mechanism, which so far as concerns the essential features of the present invention may be of any of numerous forms. As shown it comprises the main longitudinal sills B at the bottom, the top stringers B′, and vertical uprights or posts B^2, with casing-walls C C at the side and a top or cover C′.

The above-described parts, which, as aforesaid, may be the ordinary parts at the rear end of a thresher, I prefer to extend rearward, as by employing sills D, a rear wall E, and backward-extended side walls F F, these parts being arranged to form an inclosed chamber G, wherein the straw and chaff can be initially received and from which they can be conducted and ejected upward and outward; but with respect to all of these matters there can be modification.

H indicates the rear end of the vibratory straw-table generally present in threshing-machines as ordinarily constructed, though it can be here considered as a conventional indication of the final support and conveyer for the straw, receiving it just prior to its escape from the threshing mechanism proper.

I indicates more or less conventionally those parts of the winnowing and screening mechanism which support and conduct rearwardly the chaff that has been separated from the grain, a transversely-acting conveyer being conventionally illustrated at I′.

The straw that is shaken or otherwise delivered at the end of the part H is deposited in a chamber at J. This has a bottom J′, which is inclined sharply downward, and a top wall J^3, which is also curved or inclined downwardly, preferably inclining more rapidly at j, so as to form a comparatively-reduced mouth at j', and then is inclined upward and backward, as at j^3. The straw that drops through this chamber J reaches the wall or upward and backward inclined partition K, which at its upper edge k' approximates parallelism to the part j^3 of the upper wall. Thus there is formed a straw-duct extending from the separating-chamber, it having the two sections J and L, which, as a whole, can be considered as gradually narrowing somewhat until it reaches a throat at l. The latter is in or at the lower end of the vertical uptake-duct M, which extends up to the main delivery-duct N and constitutes, in effect and function, a part of the main delivery-duct. The latter may be of any of the now well-known forms, I preferring one in which there is an elbow-like section at the inner end connected with the mechanism for horizontally rotating and reversing it and an outer vertically-adjustable section whose lower end can be moved telescopically around the elbow-like part.

The winnowing and screening mechanism at I acts to deliver the chaff in the rear chamber G in the separator-casing. Here in my construction the chaff is deposited in the air-duct in such way as to be held at least temporarily therein independent of the straw, the former not being allowed to mingle with the latter until they have reached those points where they are both fully under the impetus of the blast.

P indicates the blast mechanism, composed of one or more blower-fans mounted in the lower part of the thresher-casing. The air is carried therefrom through a duct Q, and with the upper end of the latter there communicate two ducts R and R′. The duct R extends from the fan-duct Q upward and backward, a little at first, until it reaches the up-

take straw-duct M at r'. The other air-duct R′ at its lower end communicates with the ducts Q and R and at its upper end with the above-described straw-duct J L, it preferably being arranged so that the air-currents are directed with force on lines parallel to the wall K.

At S there is a deflector or valve hinged on the axis s and adapted to open or close the throat at r and to vary the extent to which the latter is opened. When this damper or deflector is closed, the entire body of air is forced through the duct R and as it escapes through the throat at r' impinges upon the straw, which by suction is carried to that point, and ejects it through the straw-delivery duct. To supplement the suction exerted by the air at that point, I can direct any desired amount of the blast through the duct R′ by properly adjusting the deflector or valve S, and the air so deflected impinges upon the bottom of the mass of straw in the duct J L and elevates it to the throat l, where it is impinged on by the main body of air. With a mechanism of this sort not only do I relieve the fan entirely of the load imposed upon it in many machines by having the straw pass through it or in contact with its blades, but I can deliver the air to the straw mass in a way much superior to that incident to any of the stacking mechanisms with which I am acquainted. The upper end or throat r' of the air-duct R is much smaller than (from one-third to one-half) that at l, through which the straw is delivered, and the air thus acts as aforesaid with powerful suction to lift up and draw in the straw, and supplemental to this I can delicately adjust the force of that air which positively engages with the under side of the straw with a lifting action.

It will be observed that the pneumatic means for advancing the straw have independent and separated discharge-orifices arranged one in advance of the other and all arranged so that the blast from each enters the straw passage-way from below, and also with a movement in substantially the direction which is being taken by the straw as it advances toward the main delivery-duct, and from this arrangement it follows that the straw is successively both lifted and advanced by the air.

The several parts forming the ducts can be made and arranged in such way as to permit freedom of access to the interior of said ducts and to the interior of the separator-casing, as desired. Thus the bottom wall J′ can be hinged, as at T, to permit access to the ducts J and L for repairing, cleaning, or withdrawing of obstructions. The parts which constitute the walls of the ducts R and R′ can be adjustable or hung upon hinges, so that they can be moved to permit access to the interior of the separating and winnowing casing, as for the insertion or withdrawal of winnower-screens or for other purposes. Thus, as shown, the duct Q has two legs or branches q, respectively, connected with the fan-mouths and an upper joining part q', attached to the lower part of the air-duct R. This section of the air-passage (indicated as a whole by Q) has slip-joint attachment with the fan-mouths and with the upper duct, and when it is desired to get access to the interior of the casing it is only necessary to open the door or slide E′ in the rear chamber-wall, then lift the duct Q up and slide it a short distance along the lower end of the upper duct until the lower ends of the branches q are free from the fan-mouths, and then withdraw the said part Q from the machine. This leaves an entirely open passage-way clear into the winnowing-screens at I and the full width of the machine. The chaff and materials blown out by the winnowing mechanism I are received upon a floor or concave U, so arranged as to guide them to the eyes p of the fans P. Two fans are shown, each having two eyes, one upon each side of the fan. Thus there are provided copious inlets for air and for the reception of the chaff, and the chaff can be expelled with great force and carried to the delivery-duct N without its being immediately intermingled with the straw before the latter gets into full outward motion.

The arrangement of fans which I have shown—that is to say, two fans arranged in rear of the screening mechanism and with the four eye-openings to the fan-casings situated so as to divide the space transversely across the machine into four substantially equal parts—is preferable to those forms of machine in which a single fan is used, necessitating the collection of the chaff into streams of relatively large size to be delivered to two widely-separated fan-openings, or, in some instances, directing the whole mass of chaff to a single fan-opening. As shown in the construction described, the floor or concave U upon which the chaff is delivered from the screen I extends entirely across the machine, and after being received thereon the chaff has to be moved but little in a transverse direction in order to be divided into the relatively small streams which are taken through the fan-eyes into the blast mechanism.

Of course it will be understood that in numerous respects there can be modification of the mechanism here selected for illustration without departing from the invention.

What I claim is—

1. The combination with a threshing-machine of the straw-delivery duct, the straw-receiving duct communicating therewith, the chaff-duct communicating therewith and situated below the straw-receiving duct, blast devices supplying air to all of said ducts, and means for dividing the blast to cause the same to act independently on the straw at different points, substantially as set forth.

2. The combination of the delivery-duct N, the straw-receiving chamber communicating

with the delivery-duct, the air-blast mechanism, an air-delivering duct having an orifice below the straw at points relatively remote from the delivery-duct, and an air-duct having an orifice relatively nearer the delivery-duct, and arranged substantially as set forth to direct air against the straw just before it enters the delivery-duct, substantially as described.

3. The combination of the delivery-duct N, the straw-receiving chamber communicating with the delivery-duct, the air-blast mechanism below the straw-receiving chamber, the air-duct leading from the blast mechanism and having two air-delivering orifices, one relatively remote from the delivery-duct and adapted to direct air against the straw, and one relatively nearer to the delivery-duct, and means for varying the air-currents delivered respectively at the said orifices, substantially as set forth.

4. The combination of the delivery-duct N, the inclosed straw-receiving chamber, the inclosed chaff-receiving chamber below the straw-receiving chamber, the blast mechanism, the air-duct communicating with the chaff-receiving chamber and extending up to points near the inner end of the delivery-duct, and arranged substantially as set forth to impinge upon the straw just before the latter reaches the delivery-duct, substantially as described.

5. The combination of the delivery-duct N, the straw-receiving chamber communicating with the delivery-duct, the air-blast mechanism below the straw-receiving chamber, the air-duct leading upward from the blast mechanism and having two air-delivering orifices, one relatively remote from the delivery-duct and one relatively higher and nearer to the delivery-duct, substantially as set forth.

6. The combination with a threshing-machine, of the straw-delivery duct N, the straw-receptacle J L, the chaff-receptacle U below the straw-receptacle, the blast mechanism, the duct Q for air and chaff adapted to be moved substantially as set forth to permit access to the winnowing mechanism of the threshing-machine, and the duct R arranged to communicate with the straw-delivering mechanism, substantially as described.

7. The combination with a threshing-machine of the straw-delivery duct N, the straw-receptacle J arranged to receive the straw from the threshing-machine, and communicating with the delivery-duct, the chaff-receptacle U below the straw-receptacle, the blast mechanism arranged to receive the chaff and eject it with the air, the duct R communicating with the blast mechanism and with the delivery-duct, and arranged substantially as set forth to direct the air against the straw just before the latter reaches the delivery-duct, substantially as described.

8. The combination of the delivery-duct N, the straw-receiving duct J L, the chaff-receptacle U, the blast mechanism, the duct Q for air and chaff, and the ducts R and R′, substantially as set forth.

9. In a pneumatic straw-stacker, the combination, with the separator and its frame, having a casing forming an inclosed chamber at the rear end of the separator, and in rear of the winnower, of the air-blast mechanism, the straw-delivery duct N, the straw-receiving duct extending downward from the separator, and then upward, the air-delivery duct independent of the straw-duct, and the supplemental air-duct delivering air into the lower part of the initial straw-duct, substantially as set forth.

10. In a pneumatic straw-stacker, the combination, of the straw-receiving duct having a straw-passage which first descends and then rises, the straw-delivery duct N, the air-blast mechanism below the straw-receiving duct, the air-duct extending from the blast mechanism independently of the straw-receiving duct to points adjacent to the delivery-duct, and the supplemental air-duct arranged to deliver air-currents to the straw-duct at the points where it begins to rise, substantially as set forth.

11. In a pneumatic straw-stacker, the combination, of the straw-receiving duct, having a straw-passage which first descends and then rises, the straw-delivery duct N, the air-blast mechanism, the air-duct extending from the blast mechanism independently of the straw-receiving duct to points adjacent to the straw-delivery duct N, and the supplemental air-duct arranged to deliver air to the upward-rising part of the straw-receiving duct, substantially as set forth.

12. In a pneumatic straw-stacker, the combination, of the straw-receiving duct having a descending portion arranged to receive the straw from a threshing-machine, and another portion extending upward and rearward on inclined lines, the straw-delivery duct N, the air-blast mechanism, the air-duct extending from the blast mechanism on inclined lines behind the straw-receiving duct and independently thereof, and arranged to deliver air-currents at points adjacent to the delivery end of the straw-receiving duct, and a supplemental air-duct communicating with the blast mechanism and with the straw-receiving duct, and an adjustable deflector or valve for closing or controlling said supplemental air-duct, substantially as set forth.

13. In a pneumatic straw-stacker, the combination, of the straw-receiving duct, the straw-delivery duct N communicating therewith, the air-blast mechanism, the air-duct extending from the blast mechanism to points near the lower end of the straw-delivery duct, and a supplemental air-duct communicating with the blast mechanism and inclined backward and upward and communicating with the straw-receiving duct, substantially as set forth.

14. In a pneumatic straw-stacker, the combination, of the straw-receiving duct, the

straw-delivery duct N, the air-blast mechanism, the air-duct extending from the blast mechanism to points adjacent to the straw-delivery duct, and the supplemental air-duct inclined backward and upward and communicating with the straw-receiving duct, said straw-receiving duct terminating in a throat or mouth of larger area than the throat or mouth of the first aforesaid air-duct, substantially as set forth.

15. In a pneumatic stacker, the combination of the main straw-delivery duct, a chaff-receptacle arranged transversely across the machine at the rear end of the thresher, a plurality of fans also arranged transversely across the said receptacle and having the inlet-openings to the fan-casings arranged as described to take air and chaff from the said receptacle from the opposite sides of the fans, whereby the chaff is subdivided into a number of relatively small streams before being acted upon by the fans, and delivery-ducts leading outward from the fan-casings to the main straw-delivery duct, substantially as set forth.

16. In a pneumatic straw-stacker, the combination of the main delivery-duct, the straw-receiving duct, the duct or passage for the chaff, both the last said ducts communicating with the main delivery-duct, and means for supplying an air-blast to the straw-receiving duct, and a separate air-blast to the main delivery-duct, substantially as set forth.

17. In a pneumatic straw-stacker, the combination of the main delivery-duct, a supplemental straw-duct communicating therewith, an air-duct delivering air-currents to the supplemental straw-duct, and a supplemental air-duct delivering air-currents to the main delivery-duct, substantially as set forth.

18. In a pneumatic straw-stacker, the combination of the main delivery-duct, the straw-duct, and two air-blast ducts, one communicating with the main delivery-duct independently of the straw-duct, substantially as set forth.

19. In a pneumatic straw-stacker, the combination of the main delivery-duct, the supplemental duct for the straw communicating with the main delivery-duct, an air-duct for delivering air-currents to the straw-duct, another air-duct delivering currents of air to the main delivery-duct, and means independent of the said supplemental straw-duct for delivering the chaff to the said air-ducts, substantially as set forth.

20. In a pneumatic straw-stacker, the combination with the separating-machine having a straw-chamber at its rear end, the main delivery-duct above the straw-chamber, the contracted straw-duct having one end in the upper part of the straw-chamber and its other end communicating with the main delivery-duct, and an air-duct separate from the straw-duct extending upward from points below the lower part of the straw-duct, and arranged to deliver air-currents to the main delivery-duct at points at or near the place of entrance of the straw into the main delivery-duct, substantially as set forth.

21. In a pneumatic stacker, the combination with a separator having a straw-chamber at its rear end, of the main delivery-duct arranged above the separator, the straw-duct arranged to extend from the said straw-chamber to the delivery-duct, the air-delivery duct entering the lower part of the straw-duct, the supplemental air-duct separate from the straw-duct delivering air to the main delivery-duct, and two air-blast mechanisms communicating with the said air-ducts, substantially as set forth.

22. In a pneumatic straw-stacker, the combination with the separator having an inclosed extension at its rear end, a straw-chamber in said extension, of the main delivery-duct above the separator, and a straw-ejecting mechanism having tubes or ducts connected to the main delivery-duct and formed in two or more parts of which one is movable relatively to the other, and situated in the longitudinal plane of the machine between the side walls of said extension, substantially as set forth.

23. In a pneumatic straw-stacker, the combination of a separator having a straw-chamber in its rear end provided with a door E′, a main delivery-duct arranged above the separator, and the pneumatic straw-ejecting devices arranged within the said straw-chamber and having substantially vertically arranged ducts, formed of a plurality of sections of which one is detachably connected to the other, and is arranged in position whereby it may be removed from working position through the door E′, when the latter is opened, substantially as and for the purposes set forth.

24. In a pneumatic straw-stacker, the combination with the separator having a straw-chamber in the rear end thereof, of the main delivery-duct above the separator, an air-duct communicating with the straw-duct in front of its connection with the main delivery-duct, a supplemental air-duct separate from the straw-duct communicating with the delivery-duct, two fans mounted on a common shaft, two fan-casings respectively around said shaft and communicating with the said air-ducts, and means for delivering chaff to the air-ducts, substantially as set forth.

25. In a pneumatic stacker, the combination with the separator having a straw-chamber in its rear end, of the main delivery-duct above the separator, a passage-way through which the straw passes from the straw-chamber to the delivery-duct, and two independent air-ducts arranged to deliver air in such way as to impinge at two places upon the straw in its transit from the separator to the delivery-duct first at the forward lower part of the said straw-duct, and independently at the rear of the straw and above the first-men-

tioned place of air-delivery, substantially as set forth.

26. In a pneumatic straw-stacker, the combination with a separator, of the main delivery-duct, a straw passage-way arranged between the separator and the main delivery-duct, air-blast devices for advancing the straw, having independent separated discharge-orifices arranged one in advance of the other, and all arranged below the straw-passage and so as to direct the air against the straw in the direction of its movement toward the main delivery-duct, whereby the straw is both successively lifted and advanced by the air, substantially as set forth.

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

EDGAR A. WRIGHT.

Witnesses:
PRIMUS PHILIPPI,
HARRISON N. HILES.