No. 811,736. PATENTED FEB. 6, 1906.

J. W. NETHERY.

PNEUMATIC STRAW STACKER.

APPLICATION FILED JUNE 26, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

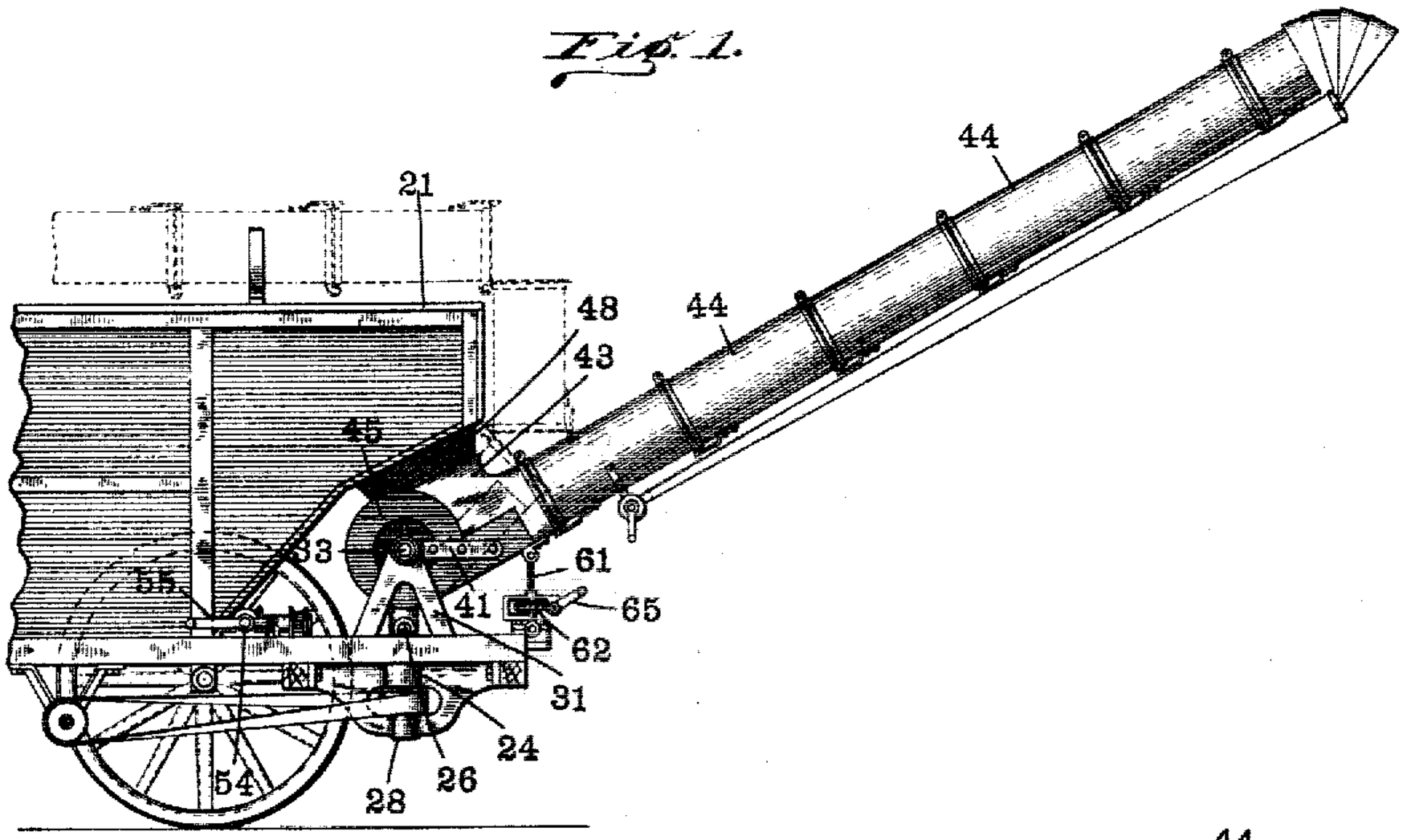

Fig. 2.

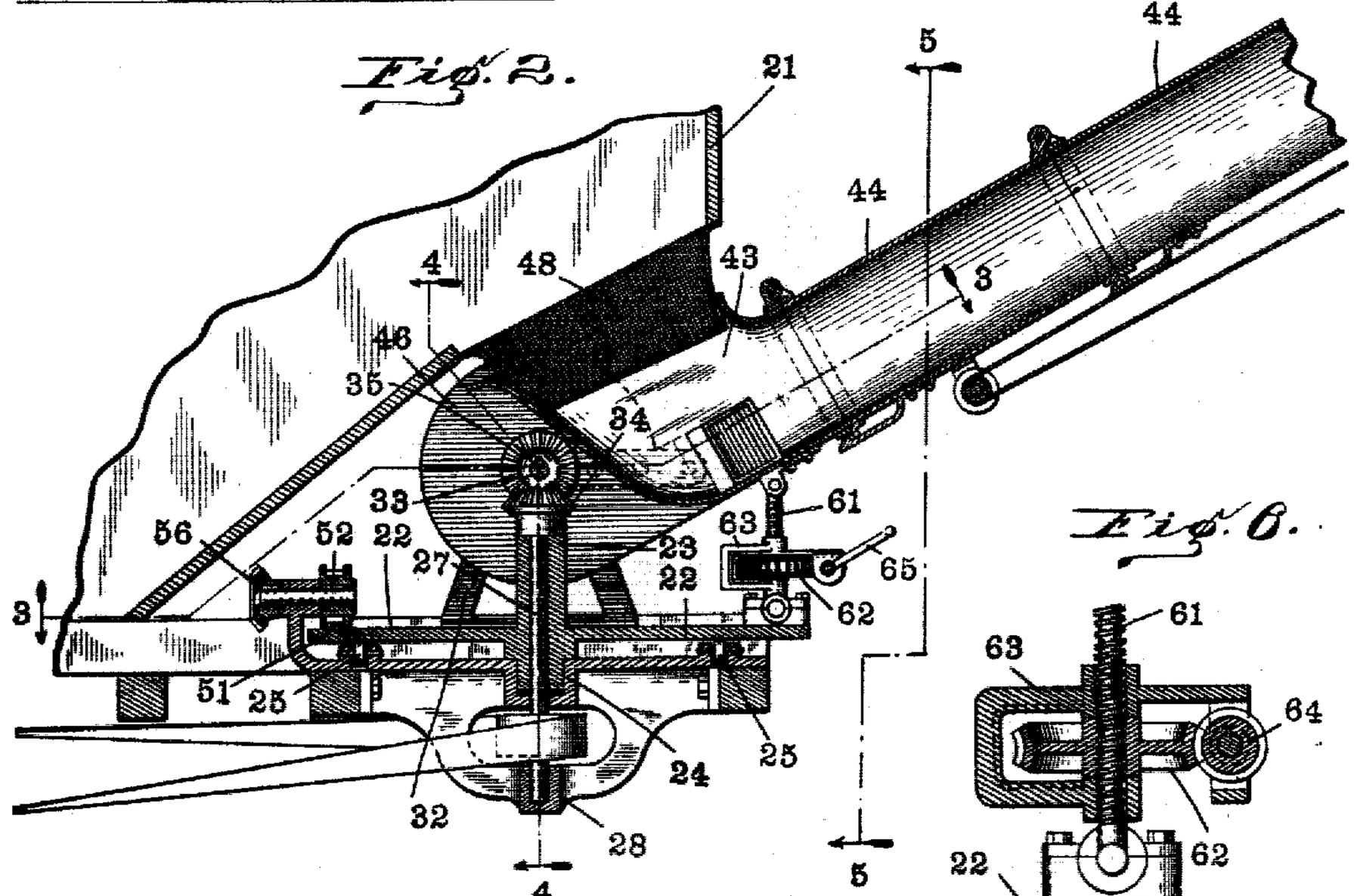

Fig. 6.

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2 SHEETS—SHEET 2.

Fig. 3.

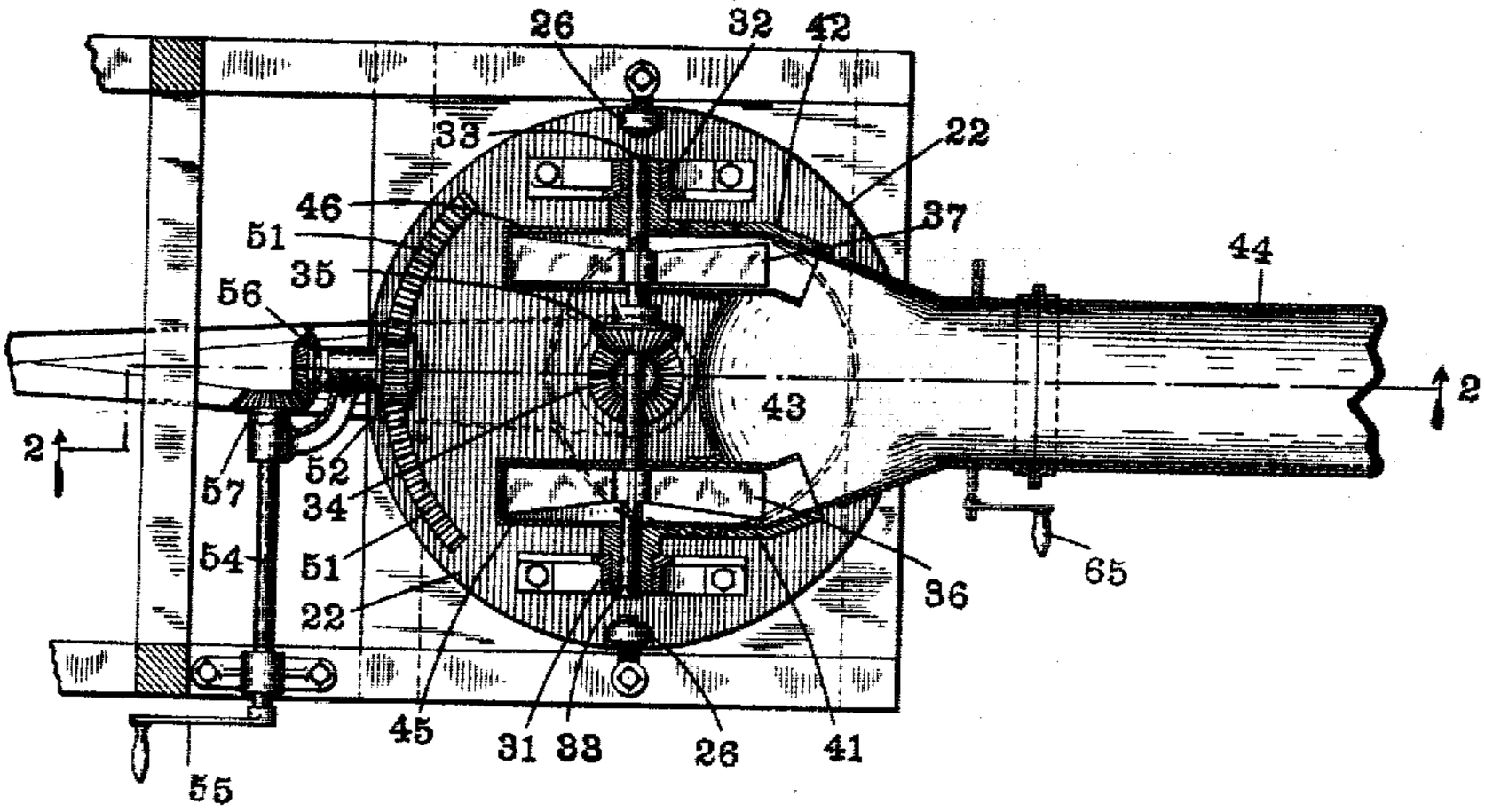


Fig. 4.

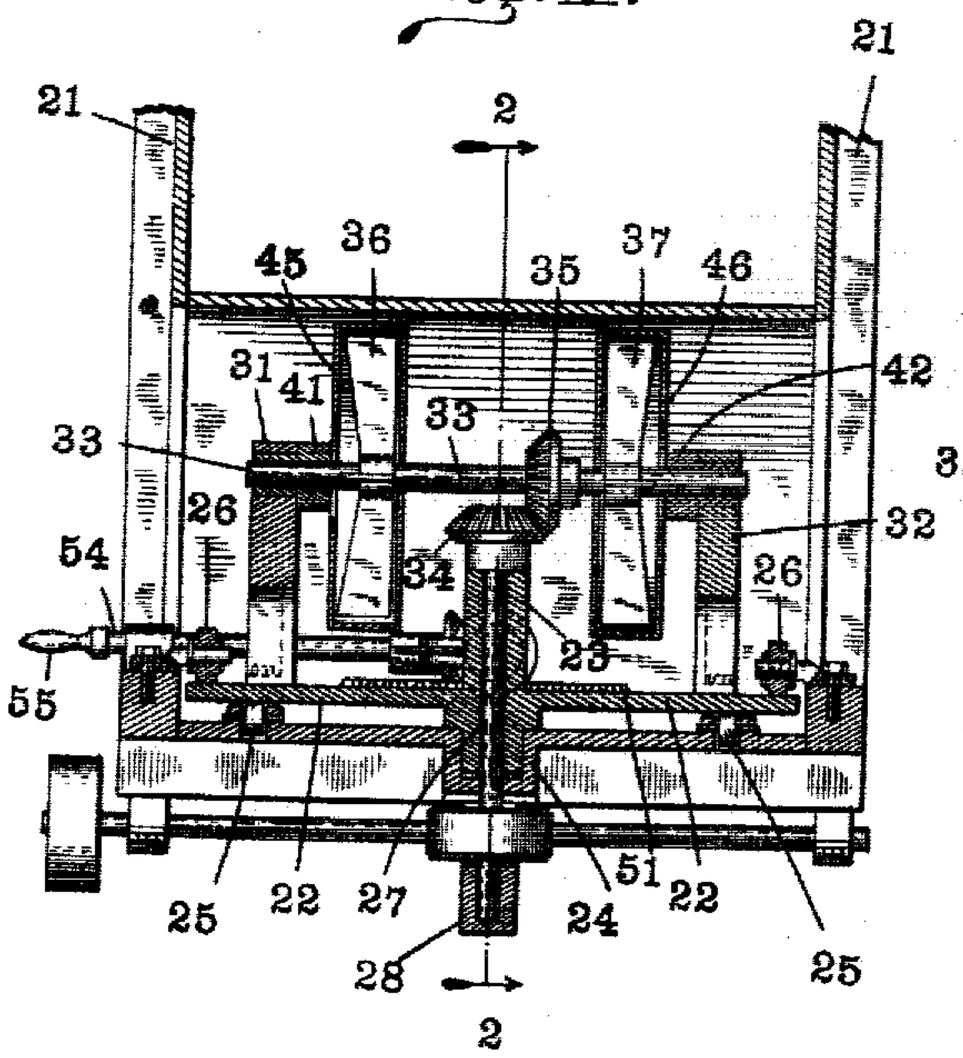
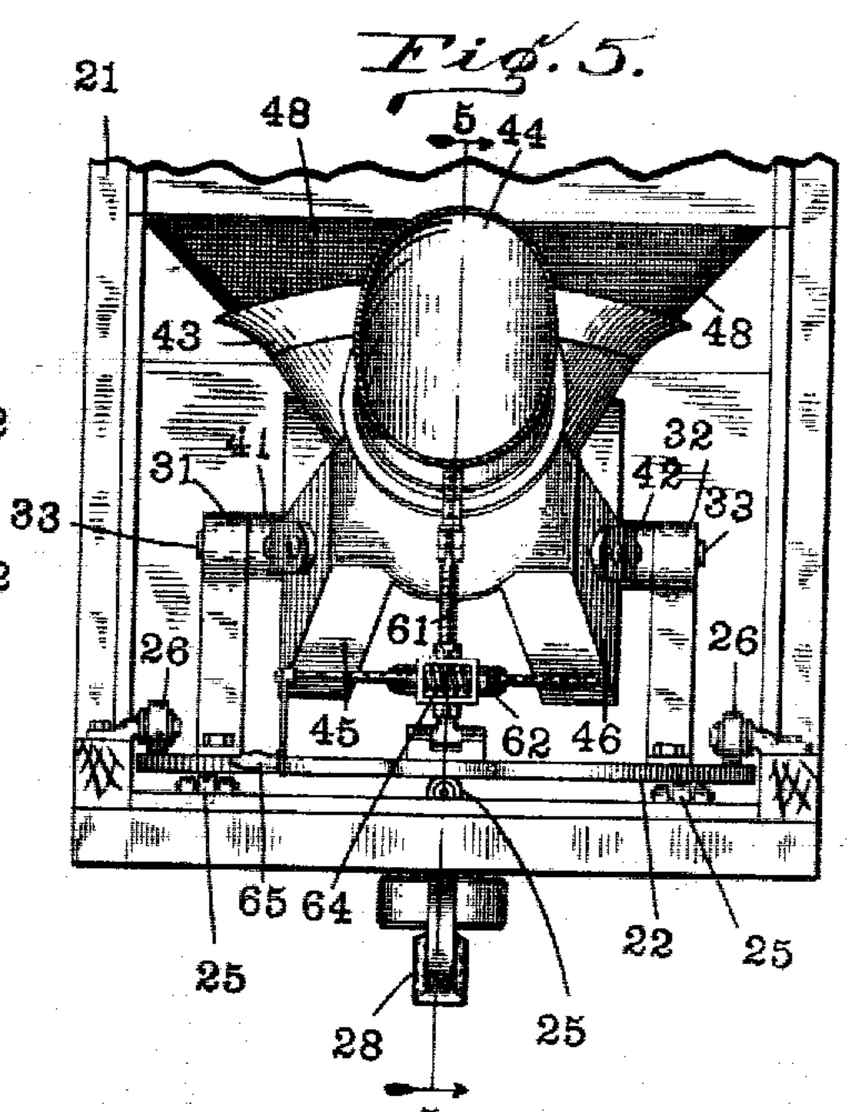


Fig. 5.



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PNEUMATIC STRAW-STACKER.

No. 811,736. Specification of Letters Patent. Patented Feb. 6, 1906.

Application filed June 26, 1905. Serial No. 267,025.

To all whom it may concern:

Be it known that I, JOSEPH W. NETHERY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Pneumatic Straw-Stackers, of which the following is a specification.

In conveying material by pneumatic force it is desirable that the conveyer-tube should have as few turns as possible and that the direction in which it extends from the blast mechanism should always remain the same relatively thereto. In the stacking of straw, however, it is necessary that the discharge end of the conveyer-tube be raised and lowered and swung from side to side during the building of the straw-stack in order to deliver the straw to the various points necessary to produce a stack of the size, height, and shape required. In most pneumatic stackers the conveyer-tube includes a flexible joint or elbow to permit of these movements. This is of course open to the objection that the conveyer-tube can neither be maintained in a direct line nor in uniform relation to the blast mechanism, and, as is well known, any departure in these particulars reduces the efficiency of the apparatus. Many attempts have been made to overcome the difficulties indicated, but so far without practical success.

It is the object of my present invention to produce a pneumatic straw-stacker in which the structure may freely swing from side to side and the discharging end of the stacker be raised and lowered, as desired, without changing the relations of the conveyer-tube and the blast mechanism, or, in other words, to produce a pneumatic stacker in which the blast mechanism and the conveyer-tube may move together as the various horizontal and vertical movements and adjustments required are made.

The embodiment of said invention shown and described in the present application mainly consists in a horizontally-revoluble turn-table provided with a vertical driving-shaft for the blast mechanism mounted therein at its axial point and carrying also a horizontal fan-shaft arranged so that the axes of the two shafts intersect, so that the turn-table may revolve around said driving-shaft, and the blast mechanism may swing vertically around the fan-shaft to any extent desired without interfering with the operation of either.

Various other novel features of construction and arrangement are also embodied therein, as will be hereinafter more particularly described.

The accompanying drawings illustrate a pneumatic stacker embodying my said invention.

Figure 1 is a side elevation of a fragmentary rear portion of a threshing-machine or separator and so much of a pneumatic stacker embodying my said invention applied thereto as is necessary to illustrate said invention; Fig. 2, a longitudinal central vertical sectional view through the turn-table of the pneumatic stacker and adjacent parts, on an enlarged scale, at the point indicated by the dotted line 2 2 in Figs. 3 and 4; Fig. 3, a horizontal sectional plan view as seen when looking downwardly from the point indicated by the dotted line 3 3 in Fig. 2; Fig. 4, a tranverse vertical sectional view as seen when looking in the direction indicated by the arrows from the dotted line 4 4 in Fig. 2; Fig. 5, a rear elevation as seen from the point indicated by the dotted line 5 5 alongside Fig. 2; and Fig. 6, a detail sectional view, on an enlarged scale, illustrating more particularly the special conveyer-tube-elevating mechanism which I have chosen to show in connection with this apparatus.

The threshing-machine or separator 21, a fragment of which is shown in the drawings, is or may be of any usual or desired form or construction and will not, therefore, be further described herein except incidentally in describing the invention. Upon the lower portion of the framework of this separator or a suitable extension thereof I mount a substantially horizontally positioned turn-table 22. The central hub 23 of this turn-table is mounted in a suitable step-bearing 24, carried from the framework situated at the lower portion of the separator, as above stated. The turn-table is also supported at the inner edges by suitable means, as rollers 25, so that the weight of said turn-table and its load will not bear upon the central shaft. Other rollers 26 are shown as resting in bearings adjacent to the edge of the turn-table

and overhanging said edge, and these rollers serve to hold the turn-table in place and prevent it from tipping under the force of the load. The central hub of the turn-table is hollow and forms a bearing within which a vertically-positioned shaft 27 is mounted, the lower end of said shaft also preferably extending down into a suitable step-bearing 28, carried by the same framework upon which the turn-table is mounted. As the weight of the turn-table itself is carried by the roller-bearings, above described, or other suitable equivalent supports, the step-bearing 28 only has to sustain the thrust of the shaft itself, being entirely relieved from the weight of the turn-table and its load. The axes of the shaft and of the turn-table are coincident, so that anything which may be mounted upon the turn-table will maintain the same relation to the shaft at all points in the rotation of either the table or the shaft. This enables the turn-table to swing about its axis freely, as may be desired, and in either direction without at all interfering with the rotation of the driving-shaft.

The turn-table 22 is provided with bearings 31 and 32 on opposite sides of the vertically-arranged shaft 27. In these bearings and directly above the shaft 27 the fan-shaft 33 is mounted in such relation to the shaft 27 that the axes of the two shafts intersect. Bevel-gears 34 and 35 are mounted upon these shafts and are in engagement, and the fan-shaft is thus driven from the driving-shaft. Two fans 36 and 37 are mounted on the fan-shaft and are driven thereby in a usual and well-known manner.

The fan-casings, the straw-receiving hopper, and the lower end of the conveyer-tube are rigidly connected, so as to form substantially a single structure. To the two sides of this structure suitable gudgeons 41 and 42 are attached and extend thence into the bearings 31 and 32. These gudgeons are hollow and form the immediate bearings for the fan-shaft 33. As will be readily understood, therefore, the structure in question (including the receiving-hopper 43, the conveyer-tube 44, and the attached fan-casings 45 and 46) may swing about the fan-shaft 33 without in any way affecting the relations of said parts or changing the character of their operation, so that when said parts are assembled in the most efficient relation the discharge end of the tube may be raised and lowered and swung from side to side, while still preserving the highest efficiency of the apparatus and without increasing the power required to propel the straw through the conveyer-tube, as all deflecting or bending of the passage-way through which the straw must travel is entirely avoided. As the mouth of the hopper must necessarily travel somewhat as the conveyer-tube is raised and lowered, I provide a flexible introduction-mouth 48, the upper end of which is flared into hopper-like form and is connected to the adjacent portions of the straw-chamber of the separator, while its lower end extends to within the mouth of the conductor-tube. By these means a substantially tight connection is provided and the escape of straw and chaff prevented.

The egress-openings from the fan-casings lead to the lower and outer sides of the main conductor-tube somewhat in advance of the middle of the receiving-hopper, so that the material to be conveyed away will fall into said hopper between and somewhat behind the two blasts. The said two blasts are thus enabled to tear off comparatively small portions of the mass of straw from its under and outer portions and force them into the main conductor-tube evenly. This aids the operation greatly, as said tube is never clogged by heavy massed bunches of straw, as is the case where the straw falls in one mass directly in front of the fan-nozzles. I am thus not only enabled to maintain the relative arrangement of the blast mechanism and straw receiving and discharging parts, but am also enabled to secure the highest possible efficiency of said parts in their best arrangement.

The means which I have shown for rotating the turn-table 22 consists of a rack 51, secured to said turn-table at or near its periphery, and a corresponding gear 52, the shaft of which is suitably mounted on the adjacent framework. I have shown another shaft 54, leading off at right angles to the side of the machine, where it is provided with a crank 55, and said two shafts are shown as connected by means of suitable bevel-gears 56 and 57.

The elevating means for the conveyer-tube which I have chosen to illustrate consists of a pivoted screw 61, threaded into a worm-gear 62, mounted in a suitable housing 63, which in turn is pivotally mounted in suitable bearings on the turn-table. A worm 64 is also mounted in suitable bearings in the housing 63, and is adapted to engage with and operate the worm-gear 62. By means of a crank 65 this worm may be turned and the screw thus drawn in or pushed out and the conveyer-tube thus lowered or raised. While I conceive this to be a desirable device for this purpose of raising and lowering the conveyer-tube, I desire to be understood that other elevating and lowering mechanisms may be employed without departing from the remainder of my invention.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a pneumatic stacker, of a horizontally-positioned turn-table, a centrally-arranged driving-shaft vertically mounted therein, a horizontally-arranged fan-shaft mounted above said driving-shaft, a

blast mechanism and conveyer structure pivotally mounted on said turn-table with the axes of the pivots and of the fan-shaft substantially coincident, a suitable means for revolving said turn-table, and suitable means for swinging the blast mechanism and conveyer structure on its pivot.

2. The combination, in a pneumatic stacker, of a horizontally-positioned turn-table, a driving-shaft vertically mounted therein, bearings carried by said turn-table at diametrically opposite sides of said driving-shaft, and a blast mechanism and conveyer-tube structure provided with gudgeons which rest in said bearings, the said gudgeons being hollow and forming the bearings for the fan-shaft of the blast mechanism.

3. The combination, in a pneumatic stacker, of a turn-table, a centrally-arranged driving-shaft mounted in said turn-table, bearings also mounted on said turn-table on diametrically opposite sides of said driving-shaft and extending to and beyond the end of said driving-shaft, a rigidly-constructed blast mechanism and conveyer structure provided with hollow gudgeons which extend to and rest in said bearings and which also form bearings for the fan-shaft, said driving-shaft and said fan-shaft being arranged so that their axes intersect, and suitable power-transmission devices connecting said two shafts.

4. The combination, in a pneumatic stacker, of a turn-table, a rigidly-constructed blast mechanism and conveyer structure pivotally mounted on said turn-table, a means of swinging said structure relatively to the turn-table consisting of a pivoted screw, a suitable screw-socket engaging therewith, and a pivoted housing in which said socket is mounted.

5. The combination, in a pneumatic stacker, of a horizontally-positioned turn-table, supports independent of the driving-shaft therefor, a driving-shaft mounted centrally in said turn-table, bearings carried by said turn-table at opposite sides of said driving-shaft, a blast mechanism and conveyer structure pivotally mounted in said bearings, and power-transmission devices connecting the driving-shaft and the fan-shaft of the blast mechanism.

6. The combination, in a pneumatic stacker, of a turn-table, a blast mechanism and conveyer structure carried thereby, a vertically-arranged driving-shaft mounted centrally in said turn-table, and suitable supports for said turn-table independent of said shaft.

7. The combination, in a pneumatic stacker, of a suitable horizontally-pivoted straw-receiving hopper having a conveyer-pipe leading therefrom, a suitable blast mechanism communicating with said hopper, the axes of the blast mechanism and of the hopper-pivot being coincident, a turn-table provided with bearings for the support of said devices, and a vertical driving-shaft positioned centrally in said turn-table.

8. The combination, in a pneumatic stacker, of a horizontally-rotatable turn-table, a vertical driving-shaft mounted centrally therein, a blast mechanism embodying a horizontal shaft positioned vertically above said driving-shaft, power-transmission devices connecting said two shafts, and a suitable horizontally-pivoted straw-receiving hopper having a conveyer-pipe leading therefrom, the axes of the hopper-supporting pivots and of the blast mechanism shaft being coincident.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 6th day of June, A. D. 1905.

JOSEPH W. NETHERY. [L. S.]

Witnesses:
CHESTER BRADFORD.
JAMES A. WALSH.