

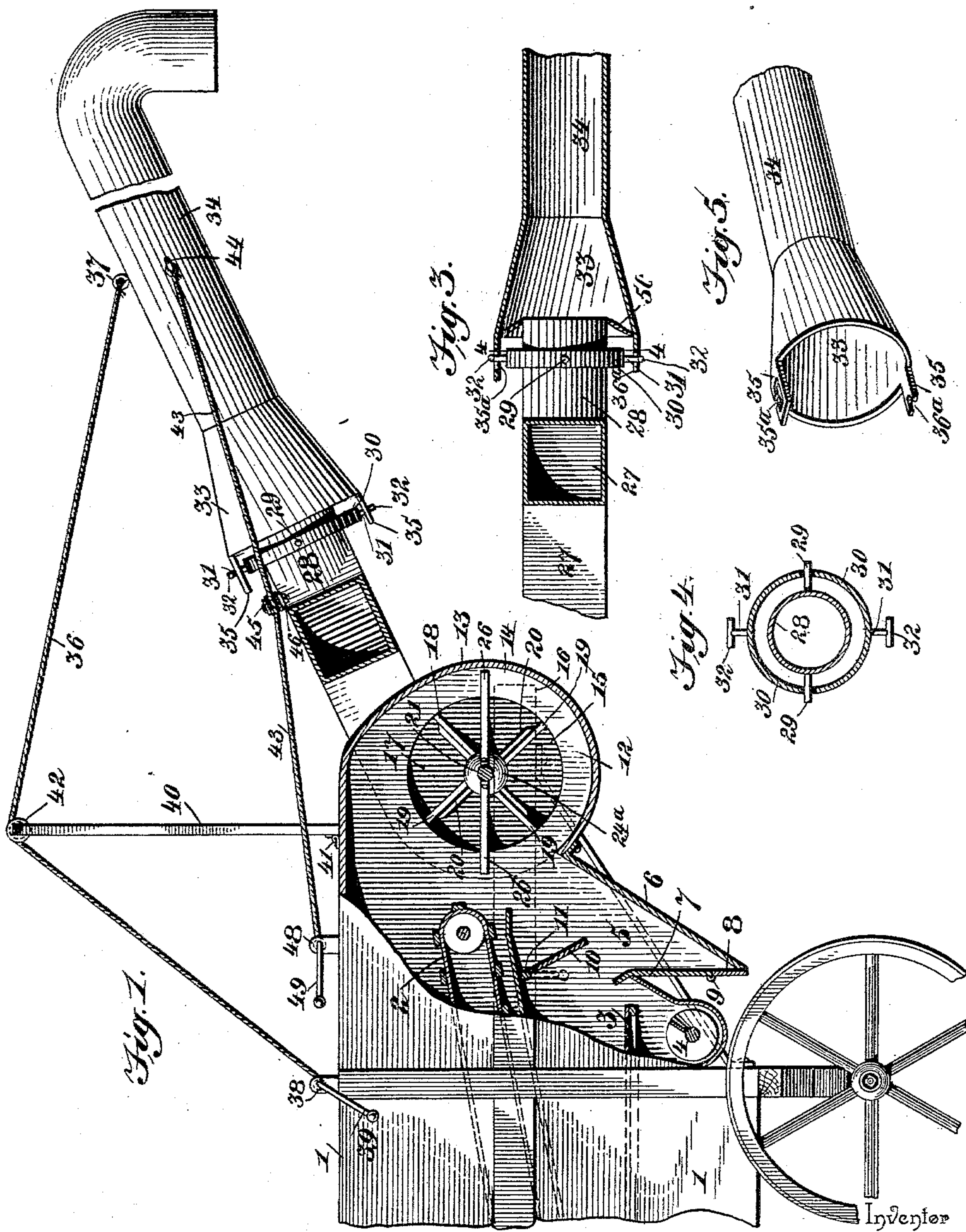
(No Model.)

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W. J. RANDOLPH.
PNEUMATIC STRAW STACKER.

No. 597,364.

Patented Jan. 11, 1898.



Witnesses

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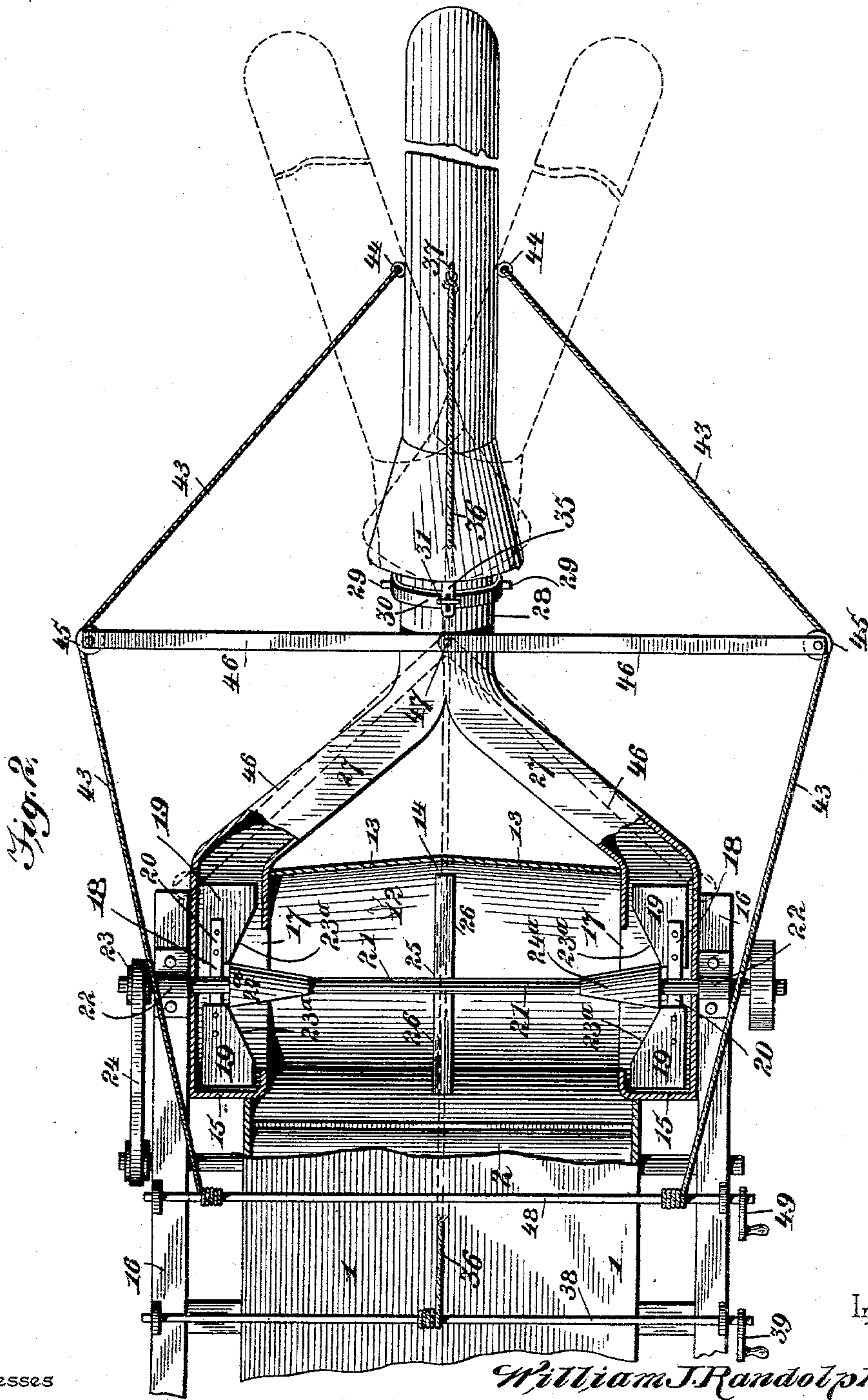
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UNITED STATES PATENT OFFICE.

WILLIAM J. RANDOLPH, OF JENNINGS, LOUISIANA.

PNEUMATIC STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 597,364, dated January 11, 1898.

Application filed August 14, 1896. Serial No. 602,804. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. RANDOLPH, a citizen of the United States, residing at Jennings, in the parish of Calcasieu and State of Louisiana, have invented a new and useful Pneumatic Straw-Stacker, of which the following is a specification.

This invention relates to pneumatic straw-stackers; and it has for its object to provide a new and useful stacker of this character used as an attachment for an ordinary grain-threshing machine to provide simple and efficient means for receiving the threshed straw from the rear end of the thresher and discharging the same onto the stack by a blast of air.

To this end the invention contemplates a construction of stacker having every adjustment necessary for the proper distribution of the straw onto the stack and so arranged in connection with the rear end of the thresher as to save all grain worked out of the straw and prevent the grain from being blown out with the chaff and threshed straw.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a side elevation, partly in section, of the rear portion of a grain-thresher equipped with a straw-stacking attachment constructed in accordance with this invention. Fig. 2 is a plan view, partly in section, of the same construction as illustrated in Fig. 1. Fig. 3 is an enlarged vertical sectional view of the gimbal-joint connection between the delivery-neck of the discharge-spouts and the inner end of the stacking-tube. Fig. 4 is a detail sectional view on the line 4 4 of Fig. 3. Fig. 5 is a detail in perspective of the inner flared end of the stacking-tube.

Referring to the accompanying drawings, the numeral 1 designates the casing of a grain-threshing machine of any approved construction and having therein the usual straw-carrier 2 for delivering the threshed straw at the rear end of the machine, and directly below the straw-carrier 2 at the rear end of the machine-casing 1 is arranged the usual riddle or sieve 3 for cleaning and grading the grain

in the ordinary manner. In conjunction with the riddle or sieve 3, within the rear end of the thresher, is employed the usual return-conveyer 4, and below the extreme rear end of the straw-carrier 2 and beyond the rear end of the riddle 3 the thresher-casing 1 has built therein a grain pocket or trap 5, inclosed at its outer side by the cant-board 6, which serves to catch some of the grain blown directly over the conveyer 4 and direct the same into the bottom of the said pocket or trap. At the extreme lower end of its inner side wall 7 the grain pocket or trap 5 is provided with a self opening and closing trap-door 8, hinged at its upper edge, as at 9, to the inner wall 7, and said trap-door 8 is held normally closed by the suction existing within the rear end of the thresher-casing, so as to retain within the pocket or trap 5 the grain which falls therein until the grain accumulates in sufficient quantities to open the door 8 and dribble out or drop onto the ground or into a suitable receptacle that may be provided to receive the grain collected within the said pocket or trap. Arranged above the grain pocket or trap 5 and between the rear end of the straw-carrier 2 and the riddle 3 is an adjustable grain-deflecting board 10, hinged at its upper edge, as at 11, within the thresher-casing and adapted to be adjusted on its pivot by any suitable means from the outside of the machine-casing. The grain-deflecting board 10 serves to catch most of the grain flying off of the riddle 3 and deflects the same down into the pocket 5 or against the cant or return board 6 thereof, and said grain-deflecting board 10 therefore serves to prevent the grain from being blown by the blast from the thresher-fan into the transverse straw-chamber 12, formed at the extreme rear end of the thresher-casing 1 beyond the delivery end of the straw-carrier 2 and above the plane of the grain pocket or trap 5.

The straw-chamber 12 at the extreme rear end of the thresher-casing 1 is inclosed at its outer side by the outer circular end wall 13 of the thresher-casing, and said outer circular end wall 13 is contracted toward the sides of the thresher-casing to produce a central widened portion 14, the function of which portion of the wall 13 will be presently referred to. At opposite ends of the transverse straw-chamber 12 the opposite sides of

the thresher-casing have fitted therein the inner sides of the circular fan-casings 15, that are supported in position by supporting-sills 16, arranged at opposite sides of the thresher-casing and suitably fastened thereto. The opposite circular fan-casings 15 are suitably connected with the sills 16 and are offset from the sides of the thresher-casing, so as to have their inner sides project but a slight distance within the opposite sides of the thresher-casing, thereby leaving only a narrow curbing within the thresher-casing, on which the straw cannot accumulate to any extent, which would be the case if the fan-casing was set entirely within the casing of the threshing-machine.

The oppositely-located fan-casings 15 are provided in their inner sides with the enlarged inlet-openings 17, communicating with the interior of the straw-chamber 12 and sufficiently large to receive therethrough all the straw that the fans are capable of drawing into the fan-casing. The fan-casings 15 have arranged for rotation therein the circular rotary blast-fans 18, essentially comprising a circular group of fan-blades 19, having the arms 20 thereof suitably attached to the single transverse fan-shaft 21. The single transverse fan-shaft 21 carries both of the fans 18 for the opposite fan-casings, and, extending longitudinally through the straw-chamber 12, projects at its opposite ends through the outer sides of the fan-casing and is journaled in suitable bearings 22, arranged on the supporting-sills 16 for the fan-casing. The said fan-shaft 21 is provided at one or both ends with the belt-pulleys 23 to receive a driving-belt 24, driven from one of the shafts of the threshing-machine.

The fan-blades 19 of the oppositely-located rotary fan are provided with inner inclined edges 23^a, flaring toward the inlet-openings 17 of the fan-casings and serving to direct the straw out toward the outer ends of the blades 19, so as to carry it directly into the draft or blast of the wind and at the same time prevent the straw from a tendency to wrap around the shaft and the blade-arms of the fan, and at the inner sides of the rotary fans are arranged the oppositely-located conical straw-deflectors 24^a. The conical straw-deflectors 24^a are fitted on opposite portions of the shaft 21 and have their widened or flared ends projected into the fan-casings, so as to abut against the inner sides of the blades of the rotary fans. In this position the conical straw-deflectors 24^a serve to start or deflect the straw out toward the outer ends of the fan-blades and prevent it from wrapping on the arms of the blades.

At an intermediate point between the oppositely-located fan-casings and rotary fans therein the transverse fan-shaft 21 has mounted thereon a straw-distributor 25, substantially comprising a plurality of straight distributing-arms 26, suitably connected with the shaft 21 and extending radially therefrom.

The shaft rotates the distributor 25 within the central widened portion 14 of the straw-chamber 12, and this widened portion 14 of the straw-chamber 12 allows the distributing-arm 26 to be made longer than the fan-blades, so as to extend close to the discharging-point of the straw-carrier 2 and pull the straw into the suction of the opposite fans. The distributor 25 not only serves to draw the straw into the straw-chamber, but at the same time agitates or shakes the straw to prevent the same from piling up between the fans and choking the same, thereby keeping the straw at all times sufficiently loose to be readily caught up by the fans and forced thereby through the discharge-spouts 27 of the fan-casings.

The discharge-spouts 27 are connected at their inner ends with the peripheries of the fan-casings, so as to receive the blast of air and straw impelled rearwardly by the rotary fans, and said discharge-spouts converge rearwardly and merge at their outer adjacent ends into a common cylindrical delivery-neck 28, the spouts 27 being preferably square or rectangular in cross-section. Normally the discharge-spouts 27 and their common delivery-neck 28 are disposed at an inclination to provide for the proper discharge of the straw onto the stack, and said delivery-neck 28 is provided at diametrically opposite sides with the offstanding side pivot-studs 29, which form horizontal pivots for the pivotal joint-ring 30, loosely encircling the neck 28 and having a pivotal or swinging movement on the horizontal pivots 29. The pivotal joint-ring 30 is provided at diametrically opposite upper and lower sides, at right angles to the pivot-studs 29, with the upper and lower pivot-pins 31, having cross-pieces 32 to hold in position the inner flared end 33 of the inclined vertically and laterally swinging stacking-spout 34, which is of any desired length and provides for delivering the straw directly onto the stack. The inner flared end 33 of the spout 34 has projected from diametrically opposite edges the upper and lower pivot-ears 35, having a pivotal engagement with the upper and lower pivot-pins 31 of the pivotal joint-ring 30. The upper of said pivot-ears 35 of the stacking-spout is provided with a T-shaped slot 35^a, having a detachable engagement with the upper of said pins 31, while at the same time preventing the stacking-spout from becoming disengaged from the joint-ring while being adjusted up and down or laterally, and the lower of said pivot-ears 35 is provided in its end with a notch 36^a, loosely engaging over the lower of said pins 31 above its cross-piece 32. The connection just described between the stacking-spout and the delivery-neck 28 forms a gimbal-joint to permit of the lateral and vertical oscillation of the stacking-spout 34.

A single adjusting-cable 36 provides for the vertical adjustment or oscillation of the spout 34, and said cable is connected at its

outer end, as at 37, with the spout 34 and winds and unwinds at its inner end on the windlass or adjusting-shaft 38, mounted in suitable bearings on top of the thresher-casing and carrying at one end an operating-crank 39. The intermediate portion of the adjusting-cable 36 is held elevated out of the way by the standard 40, hinged at its lower end, as at 41, to the top of the thresher-casing and carrying at its upper end a guide-pulley 42, over which the cable 36 passes. When the stacker is not in use, the standard 40 can be readily folded down on top of the thresher-casing.

A pair of oppositely-arranged cables 43 are employed for swinging or oscillating the stacking-spout 34 in a lateral direction. The opposite cables 43 are respectively connected at one end, as at 44, to opposite sides of the spout 34, and pass around the guide-pulleys 45 at the outer ends of the laterally-extended spreader-bars 46, which spread the cables 43 away from opposite sides of the stacking devices, and are pivotally connected at their inner ends, as at 47, to the delivery-neck 28, so as to be capable of being folded inward over the spouts 27 when the apparatus is not in use.

The inner ends of the oppositely-arranged cables 43 respectively wind in different directions on the windlass or adjusting-shaft 48, journaled in suitable bearings on top of the thresher-casing and carrying at one end an operating-crank 49. By turning the shaft 48 in either direction the stacking-spout 34 may be oscillated on its vertical axis or pivots to secure the desired adjustment. When not in use, the spout 34 is disconnected from the upper and lower pivot-pins 31, carried by the joint-ring 30, and is laid on top of the thresher out of the way. If found necessary, a canvas or other flexible closure-piece 50 may be suitably fitted to the inner flared end of the stacking-spout and the delivery-neck 28 to prevent the backward escape of air at this point.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. The combination of a threshing-machine having a transverse straw-chamber at the rear end of its casing, said chamber being of a greater diameter or width at its central portion than at the sides of the thresher-casing, a pair of oppositely-located fan-casings arranged at opposite ends of the straw-chamber and communicating therewith, said fan-casing having rearwardly-converging discharge-spouts leading to a common stacking-spout, a single fan-shaft extending longitudinally through the straw-chamber, oppositely-located rotary fans mounted on the shaft and

working within the fan-casings, and radial straw-distributing arms mounted on the fan-shaft at an intermediate point and working within the central enlarged or widened portion of the straw-chamber, said arms being of a greater length than the fan-blades so as to extend close to the discharging-point of the straw-carrier of the thresher and provide for pulling the straw into the suction of the opposite fans, substantially as set forth.

2. In a pneumatic straw-stacker, the combination with a threshing-machine; of a pair of fan-casings arranged at opposite sides of the rear end of the thresher-casing and provided with rearwardly-convergent discharge-spouts leading to a common delivery-neck, rotary fans working in said fan-casings, a vertically and laterally swinging stacking-spout having a gimbal-joint connection at its inner end with said delivery-neck, a pair of windlasses mounted on top of the thresher-casing, a single adjusting-cable winding and unwinding at one end on one of the windlasses and connected at its other end with the stacking-spout, a folding standard mounted on top of the thresher-casing at one end and carrying at its other end a guide-pulley for the single adjusting-cable, oppositely-extending folding spreader-bars connected at their inner ends with said delivery-neck and carrying at their outer ends guide-pulleys, and oppositely-arranged cables passing around the guide-pulleys of the spreader-bars and connected at one end respectively to opposite sides of the stacking-spout, the inner ends of said oppositely-arranged cables respectively winding in different directions on the other of said windlasses, substantially as set forth.

3. In a pneumatic straw-stacker, the combination with a threshing-machine; of a pair of fan-casings arranged at opposite sides of the rear end of the thresher and having rearwardly-convergent discharge-spouts leading to a common delivery-neck, said delivery-neck being provided at diametrically opposite sides with horizontal pivot-studs, a pivotal joint-ring loosely encircling said neck and pivotally mounted on said pivot-studs, said joint-ring being provided at diametrically opposite upper and lower sides with upper and lower pivot-pins, and a vertically and laterally swinging stacking-spout provided with an inner flared end having projected from diametrically opposite edges upper and lower pivot-ears detachably and pivotally engaging with the pivot-pins of said joint-ring, and means for adjusting said stacking-spout laterally and vertically, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM J. RANDOLPH.

Witnesses:

ISAAC D. WILLIAMS,
C. L. PARDEE.