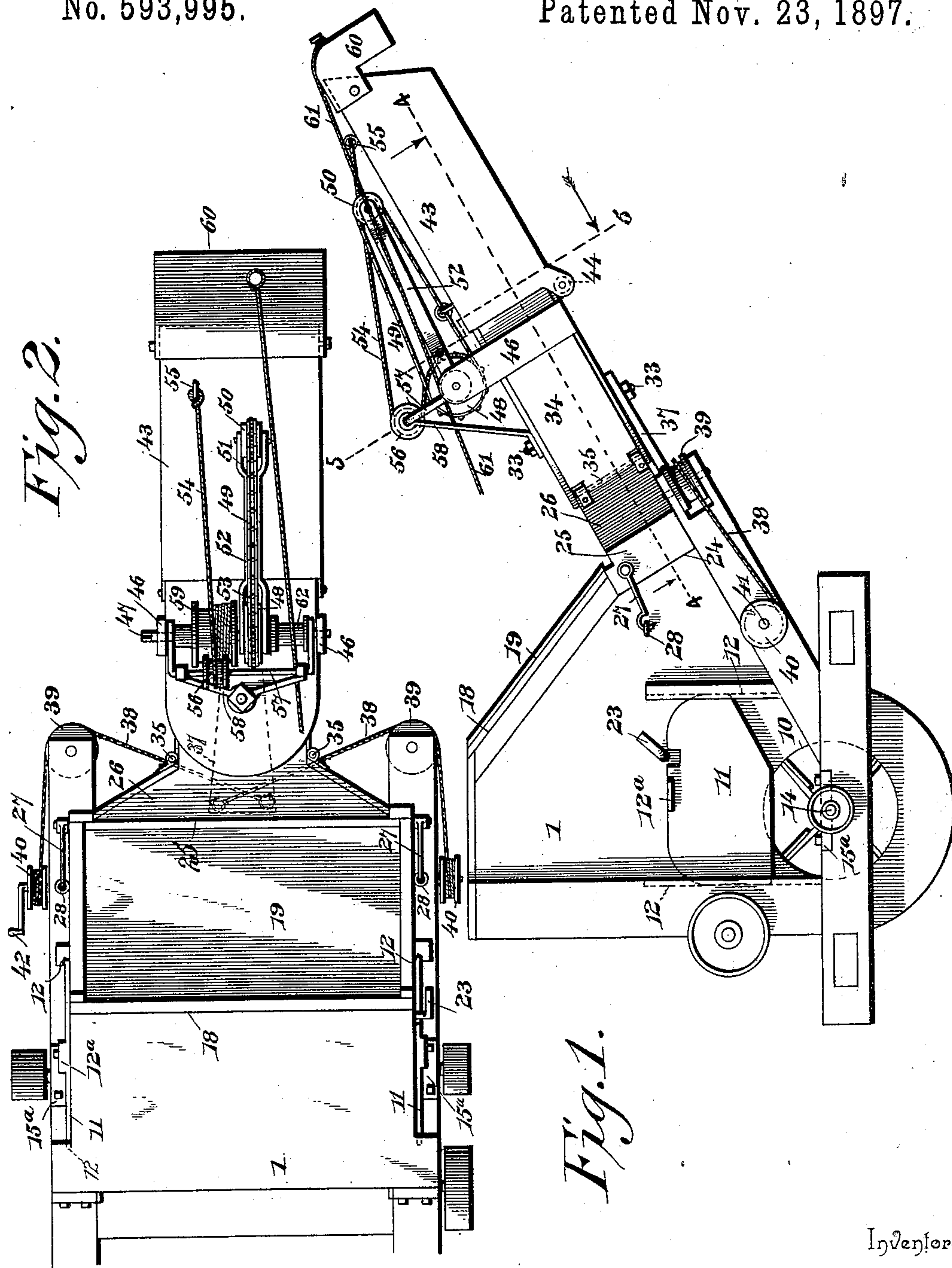


2 Sheets—Sheet 1.

No. 593,995.

Patented Nov. 23, 1897.



Witnesses

Jas. K. McCathran By  
S. J. Hoekstra (Per.)

By their Attorneys, *Elias A. Gustafson*

Chas. Snow & Co.

Inventors

(No Model.)

2 Sheets—Sheet 2.

S. D. FELSING & E. G. GUSTAFSON.  
PNEUMATIC STRAW STACKER ATTACHMENT.

No. 593,995.

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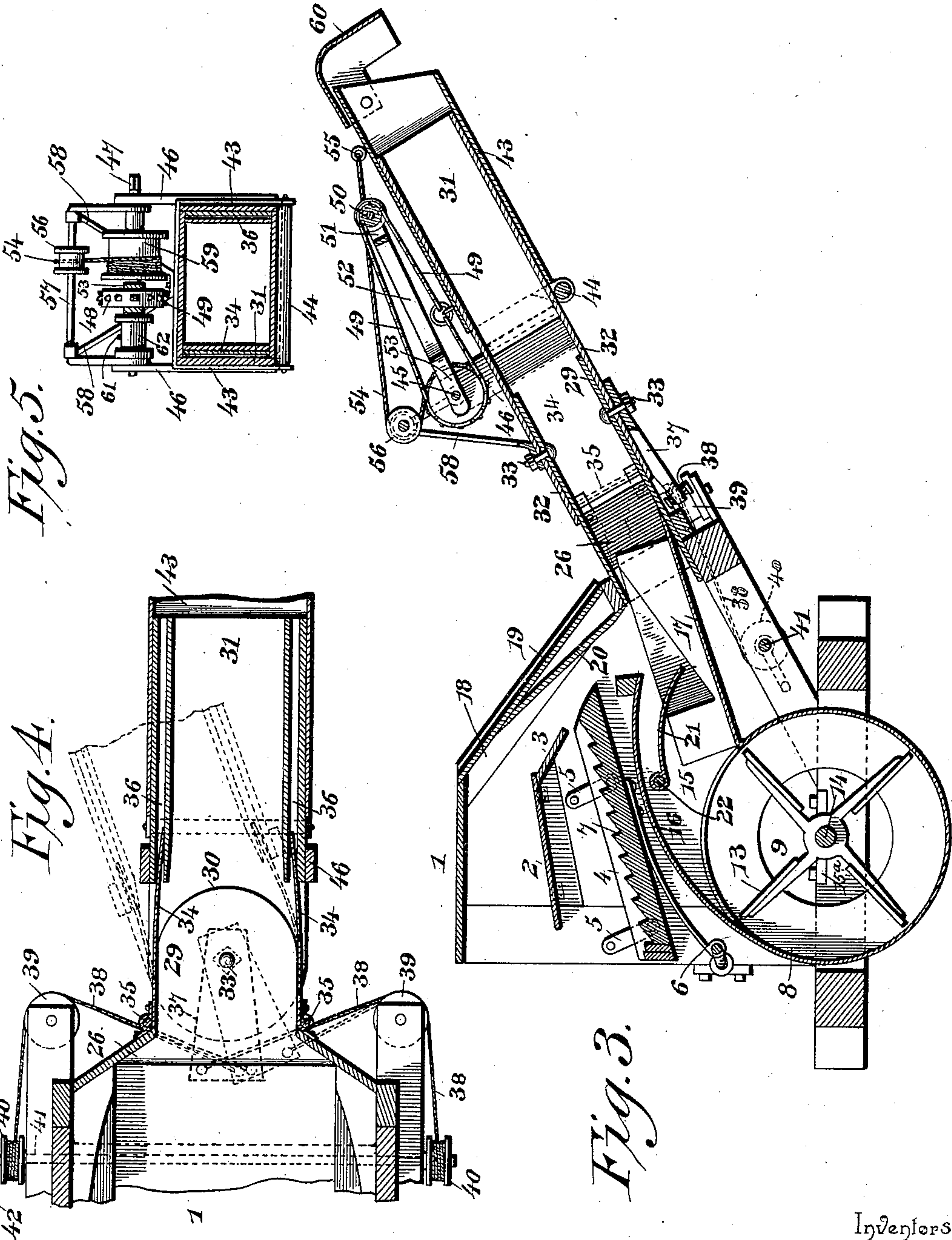


Fig. 5.

Fig. 4.

Fig. 3.

Inventors

Samuel D. Felsing

By their Attorneys, Elias Gustafson

CA Snow & Co.

Witnesses

Jas. H. McLaughlin  
S. P. McLaughlin



# UNITED STATES PATENT OFFICE.

SAMUEL D. FELSING AND ELIAS G. GUSTAFSON, OF MAPLE BAY,  
MINNESOTA.

## PNEUMATIC-STRAW-STACKER ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 593,995, dated November 23, 1897.

Application filed March 12, 1897. Serial No. 627,158. (No model.)

*To all whom it may concern:*

Be it known that we, SAMUEL D. FELSING and ELIAS G. GUSTAFSON, citizens of the United States, residing at Maple Bay, in the county of Polk and State of Minnesota, have invented a new and useful Pneumatic-Straw-Stacker Attachment, of which the following is a specification.

This invention relates to pneumatic-straw-stacker attachments for threshing-machines; and it has for its object to provide a new and useful attachment of this character, the parts of which are so arranged as to entirely obviate the dropping or delivery of the straw into the fan-casing with a consequent threshing out of the grain not entirely threshed by the cylinder of the threshing-machine.

The invention also contemplates a novel manner of mounting the stacking-tube to permit the ready removal thereof from the threshing-machine, while at the same time providing means for evenly distributing the straw onto the stack.

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 of the rear portion of a threshing-machine equipped with a straw-stacker attachment constructed in accordance with this invention. Fig. 2 is a top plan view of the construction illustrated in Fig. 1. Fig. 3 is a vertical longitudinal sectional view thereof. Fig. 4 is a longitudinal sectional view on the line 4 4 of Fig. 1. Fig. 5 is a vertical cross-sectional view on the line 5 5 of Fig. 1.

Referring to the accompanying drawings, the numeral 1 designates the rear portion of the casing of an ordinary threshing-machine, accommodating therein the straw-rack 2, the rear end portion of which is fitted with a downwardly-inclined cant-board 3, which serves to deflect the straw downward as it leaves the rear end of the rack, and below the rack 2 is located a vibrating chaff-board 4, suspended within the casing 1 by swinging supporting-links 5, pivoted to the inner sides of the casing. The said inclined swinging or vibrating chaff-board 4 has a suitable operating connection 6 therewith to provide for mov-

ing the same longitudinally of the threshing-machine below the straw-rack, and said chaff-board is provided with a rifled bottom portion 7, which catches the chaff as it falls from the sieves of the rack and works the same outward, so as to discharge it, together with the straw, into the blast of the fan or blower used in connection with the stacker attachment.

Mounted transversely within the rear end portion of the threshing-machine casing 1 below the chaff-board 4 is the cylindrical fan-casing 8, having inlet-eyes 9 at its ends communicating with the draft-openings 10, formed in opposite sides of the casing 1 in alignment with the fan-casing and covered and uncovered by the sliding draft-doors 11, the opposite end edges of which work in suitable vertical guides 12, arranged at the sides of the threshing-machine casing. The said sliding doors 11 are provided at their upper edges with the finger-flanges 12<sup>a</sup> to permit of the same being readily raised and lowered to control the supply of air to the rotary fan 13 within the fan-casing 8, as the requirements of the work may demand. The rotary fan 13 within the fan-casing is of an ordinary construction and is mounted on the rotary-fan shaft 14, extending longitudinally through the casing and having its opposite shaft extremities mounted in suitable bearing-boxes 15<sup>a</sup> at the sides of the casing, said fan-shaft 14 being designed to have suitable belt connections therewith to provide for imparting a positive rotary motion to the fan 13, which impels a blast of air through the blast-spout 15 of the fan-casing 8.

The blast-spout 15 of the fan-casing is extended from the upper side of the fan-casing 8 approximately tangential thereto, and is disposed rearwardly at an inclination to provide for properly directing the blast of air into the stacking attachment for the straw. The upper side 16 of the rearwardly-extending inclined blast-spout 15 is preferably curved to insure the proper deflection of the air as it leaves the fan-casing, while the lower side 17 of the blast-spout is longer than said upper side 16, so as to provide said spout with an open top portion directly beyond the outer end of the upper curved side 16, which open top portion of the blast-spout receives the straw and chaff as it is delivered from the rear ends of the straw-rack and the chaff-board. Directly beyond the said rear ends of



the straw-rack and chaff-board. the thrasher-casing 1 has formed therein an obliquely-disposed opening 18, over which is fitted a removable door 19, carrying at its inner side an off-  
 5 standing deflecting-board 20, lying directly opposite the rear ends of the straw-rack and chaff-board and serving to deflect the straw and chaff downward directly into the blast-spout and onto the lower extended side 17  
 10 thereof. To provide for properly regulating the blast which is discharged through the blast-spout 15, an adjustable wind-board 21 is employed. This wind-board 21 is arranged to work directly within the spout 15 and is  
 15 fitted at its upper edge to a transverse rock-shaft 22, extending transversely across the spout and provided at one end exterior to the thrasher-casing with a crank-arm 23, which is manipulated to provide for swinging the  
 20 board 21 to open or close more or less of the passage through the said blast-spout as may be required by the quantity of material to be elevated and discharged onto the stack.

Immediately below the lower edge of the  
 25 door-opening 18, formed in the rear top end of the thrasher-casing 1, the latter is formed with squared seats 24 in its opposite sides to receive therein the inner rectangular side 25 of the detachable flared air-trunk 26. The inner rec-  
 30 tangular side 25 of the air-trunk 26 is of a length equaling the entire width of the casing 1 and the blast-spout 15 of the fan-casing, so as to receive the entire blast of the fan, and said air-trunk is detachably secured with-  
 35 in the seats 24, provided therefor, preferably, by means of the fastening-hooks 27, pivoted to opposite ends of the inner side portion 25 of the trunk and detachably engaging the eyes or keepers 28, fitted to opposite sides of the  
 40 thrasher-casing, and it will be observed that by releasing the hooks 27 the trunk 26 and the parts connected therewith may be readily removed whenever necessary or desired.

The detachable flared air-trunk 26 when  
 45 fastened in position is supported at an inclination corresponding approximately to the inclination of the blast-spout 15, and the lower extended side 17 of the blast-spout extends within the lower side portion of the trunk 26  
 50 to insure the straw and chaff being blown directly into the trunk as it falls onto said lower extended side 17. The trunk 26, by reason of its flared form, is necessarily somewhat of a triangular shape, and is provided at its outer  
 55 contracted side with a discharge-neck 29, the upper and lower sides of which neck are formed with rounded outer ends 30, designed for a purpose to be presently explained. The offstanding discharge-neck 29 of the air-trunk  
 60 pivotally supports thereon the inclined oscillatory or laterally-swinging stacking-tube 31, which stacking-tube is provided at its inner lower end with the upper and lower extension-plates 32, between which are disposed  
 65 the upper and lower sides of the discharge-neck 29, and the upper and lower extension-plates 32 are respectively pivoted to the up-

per and lower sides of the neck 29 by means of the pivot-bolts 33, which are preferably  
 disposed concentric with the rounded ends 70 30 of the upper and lower sides of the neck 29. In connection with the pivotal joint between the stacking-tube and the stationary detachable air-trunk there is employed a pair of oppositely-located flexible closure-plates 75 34, which are arranged, respectively, at opposite sides of the neck 29 and lying in the space between the upper and lower extensions 32 of the stacking-tube. The flexible closure-plates 34 are preferably made of thin plates 80 of metal and are hinged at their inner ends by means of the hinges 35 to the trunk 26 at the inner end of the neck 25 thereof. The free ends of the plates 34 loosely extend into the side recesses 36, formed at opposite inner 85 sides of the stacking-tube 1 to provide for a positive connection between this tube and the plates 34, whereby the latter will be carried with the tube as the same is adjusted or oscillated in a lateral direction for the purpose 90 of distributing the straw on the stack.

It will be observed in connection with Fig. 4 of the drawings that as the stacking-tube is oscillated laterally in either direction the flexible closure-plates 34 will bear on the 95 rounded ends 30 of the neck 29, as the stacking-tube carries the free ends of the plates therewith, thereby always preserving the proper shape of the plates and maintaining a sufficiently air-tight closure at the point of 100 connection between the stacking-tube and the air-trunk, irrespective of the adjusted position of the stacking-tube.

The laterally-oscillatory stacking-tube 31 has fitted to its lower side and at the inner 105 end thereof an adjusting-arm 37, to which arm is connected one end of the oppositely-extending adjusting-cables 38. The adjusting-cables 38 extend in opposite directions from the arm 37 and pass around the guide- 110 pulleys 39, mounted in suitable bearings at opposite sides of the thrasher-casing below the air-trunk 26, and the ends of the cables 38, opposite their connection with the arm 37, are respectively reversely wound on the op- 115 positely-located winding-spools 40, mounted on the opposite extremities of the adjusting-shaft 41. The adjusting-shaft 41 extends transversely across the thrasher-casing and carries at one end a crank-handle 42 for op- 120 erating the same, and it will be observed that by reason of the reverse winding of the oppositely-extending cables 38 a turning of the shaft 41 in either direction will provide for a lateral oscillation or swing of the stacking- 125 tube 21 in either direction.

The outer end portion of the stacking-tube 21 accommodates for movement thereon an outer sliding-sleeve section 43, which sleeve- 130 section 43 has fitted to the inner lower edge thereof a transverse antifriction-roller 44, which bears against the lower side of the tube 31 and facilitates the free movement of the sleeve-section on the tube, the adjustment of



said sleeve-section 43 providing for lengthening or shortening the stacking-tube, according to the height of the stack. To provide for adjusting the outer sliding-sleeve section 43 of the stacking-tube, a windlass-shaft 45 is arranged transversely above the tube 31 near its lower end, and is mounted in the bearing-straps 46, fitted to opposite sides of the tube 31 and extending above the same. The windlass-shaft 45 is provided at one end with a squared portion 47 for the reception of a crank-handle or the like, and has fitted thereon intermediate its ends a chain-wheel 48, over which passes an endless adjusting-chain 49, the lower portion of which chain is connected with the upper side of the sleeve-section 43 near the lower end of the latter, so that a movement of the chain 49 in either direction will provide for a corresponding adjustment of said sleeve-section. The endless adjusting-chain 49 is maintained in the proper stretched position over the sliding-sleeve section 43 by means of an idler-pulley 50, mounted in the upper bifurcated end 51 of the bearing-arm 52, lying above the stacking-tube and its sleeve-section 43 and fitted at its lower end to the windlass-shaft 45, the lower end of said arm 52 being bifurcated, as at 53, to straddle the chain-wheel 48.

To supplement the chain 49, there is employed a single adjusting-cable 54, fastened at one end, as at 55, to the sleeve-section 43 and passing around an idler or guide pulley 56, mounted on the upper horizontal bar of an inverted-U-shaped supporting-bracket 57, supported by the shaft 45, and braced in an upright position by means of a suitable brace 58, extending therefrom to the upper side of the tube 31, where it is fastened, preferably, by means of the uppermost pivot-bolt 33. The lower portion of the cable 54 below the pulley 56 winds and unwinds on a spool 59, which assists in drawing the sleeve-section 43 downward, and in connection with this sleeve-section is employed a deflecting-hood 60. The deflecting-hood 60 is pivotally mounted on the outer end of the sleeve-section 43, and is raised and lowered by means of an adjusting-rope 61, extending rearwardly therefrom and serving to adjust the same to any desired position to provide for the proper deflection of the straw onto the stack. The rope 61 preferably passes over a pulley 62, mounted on the shaft 45 at one side of the chain-wheel 48.

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. In a pneumatic straw-stacker, the combination with a threshing-machine casing, of an air-trunk detachably fastened to the rear end of said casing and provided with a dis-

charge-neck, a stacking-tube connected with said discharge-neck, a blast-fan casing provided with a rearwardly-extending blast-spout communicating with the interior of the threshing-machine casing, and having a straight lower side extended to a point directly within said air-trunk, and a curved upper side shorter than and arched over said lower side to provide for deflecting the air-currents into the straw as it falls into the blast-spout, a wind-board arranged within said blast-spout, and the rotary fan, substantially as set forth.

2. In a pneumatic straw-stacker, a stationary flared air-trunk adapted to be detachably fastened at the rear end of a threshing-machine casing and provided at its outer contracted side with a discharge-neck, an inclined stacking-tube provided at its inner lower end with upper and lower extension-plates pivotally bolted to and receiving therebetween the upper and lower sides of said discharge-neck, a pair of opposite flexible closure-plates hinged at their inner ends to the air-trunk at the inner end of the neck thereof and having their free ends loosely engaging with opposite inner sides of the stacking-tube, said closure-plates lying at opposite sides of said discharge-neck between the extension-plates of the stacking-tube, and means for laterally oscillating the stacking-tube on its pivot, substantially as set forth.

3. In a pneumatic straw-stacker, the combination of an inclined stacking-tube, an outer slidable sleeve-section working on the outer end portion of said tube and carrying at its inner lower edge an antifriction-roller, bearing against the under side of the inner section of the tube a windlass-shaft supported transversely above the lower portion of the stacking-tube, a chain-wheel fitted on the windlass-shaft intermediate its ends, a bearing-arm fitted at one end to the windlass-shaft and extended outwardly and upwardly from the latter, said arm carrying at its opposite end above said sleeve-section an idler-pulley, an endless adjusting-chain working over said chain-wheel and idler-pulley and having its lower portion between the wheel and the pulley connected with said sleeve-section, a winding-spool fitted on the windlass-shaft at one side of the chain-wheel, a single adjusting-cable fastened at one end to the sleeve-section and winding and unwinding at its other end on said spool, and a suitably-adjusted deflecting-hood pivotally mounted on the outer end of said slidable sleeve-section, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

SAMUEL D. FELSING.  
ELIAS G. GUSTAFSON.

Witnesses:

NORMAN HANSON,  
HANS PAULSEND.