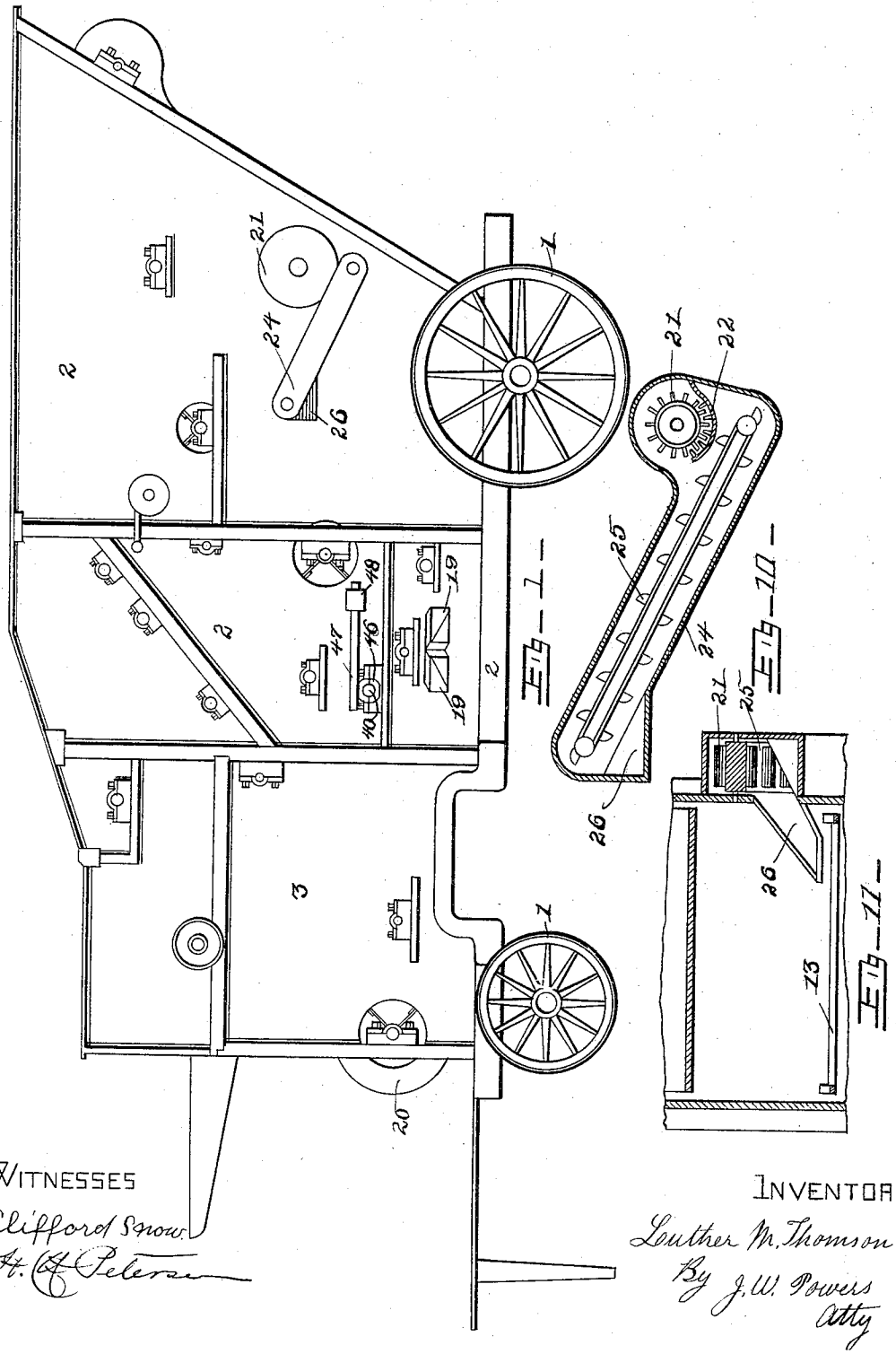
No. 767,184. PATENTED AUG. 9, 1904.

L. M. THOMSON.

THRESHING MACHINE.

APPLICATION FILED JULY 7, 1902.

NO MODEL. 4 SHEETS—SHEET 1.



WITNESSES

Clifford Snow.

H. A. Peterson

INVENTOR

Luther M. Thomson

By J. W. Powers

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NO MODEL. 4 SHEETS—SHEET 2.

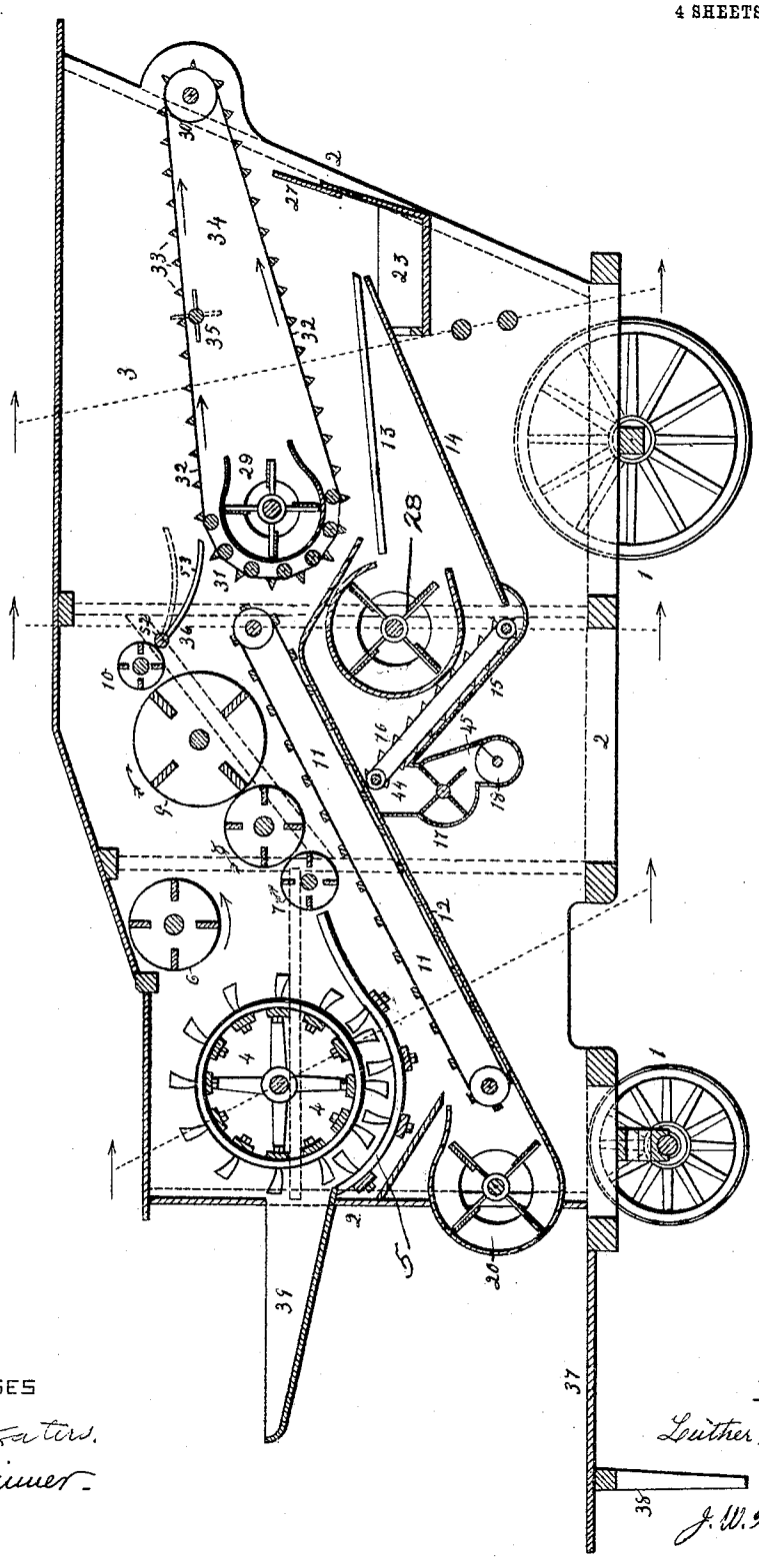

Fig. 2.

WITNESSES

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NO MODEL. 4 SHEETS—SHEET 3.

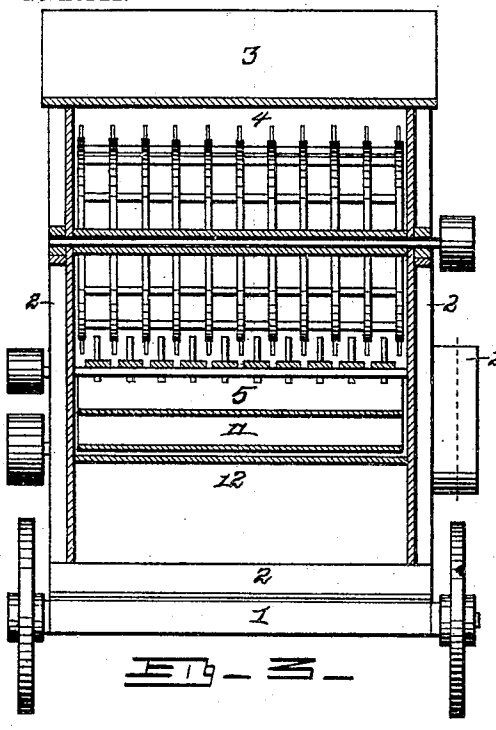

FIG. 3.

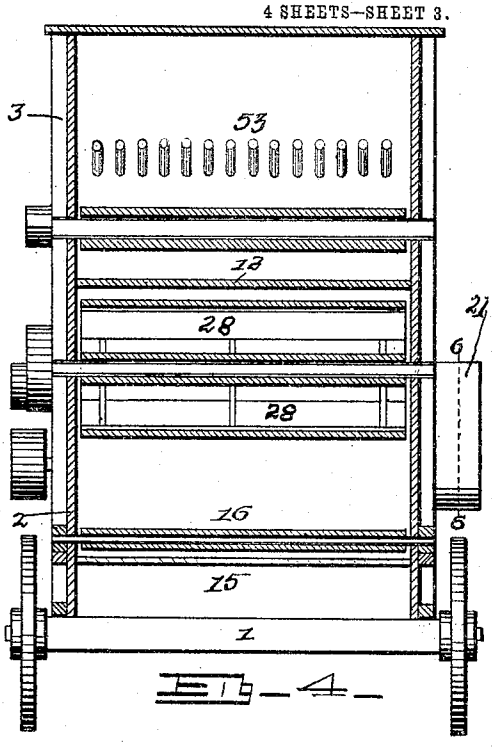

FIG. 4.

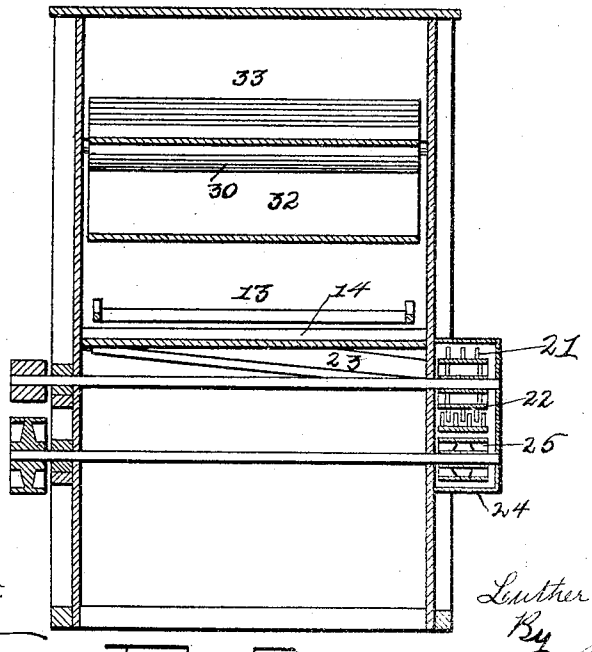

FIG. 5.

WITNESSES

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APPLICATION FILED JULY 7, 1902.

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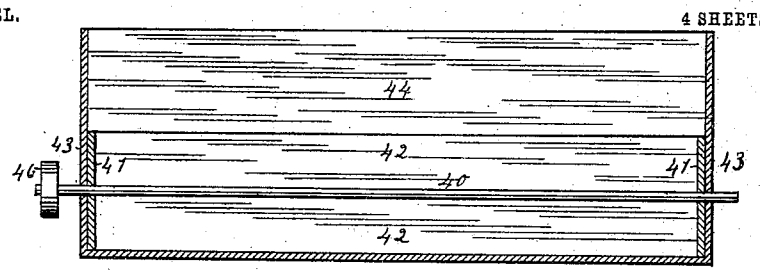

Fig. 6

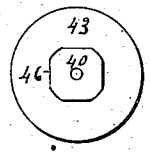

Fig. 7

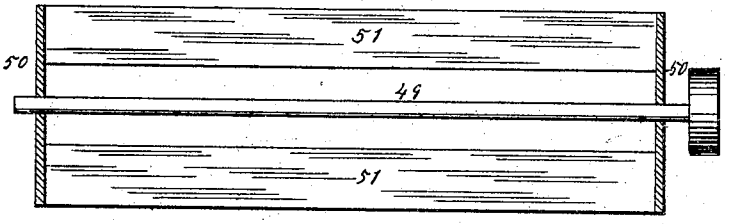

Fig. 8

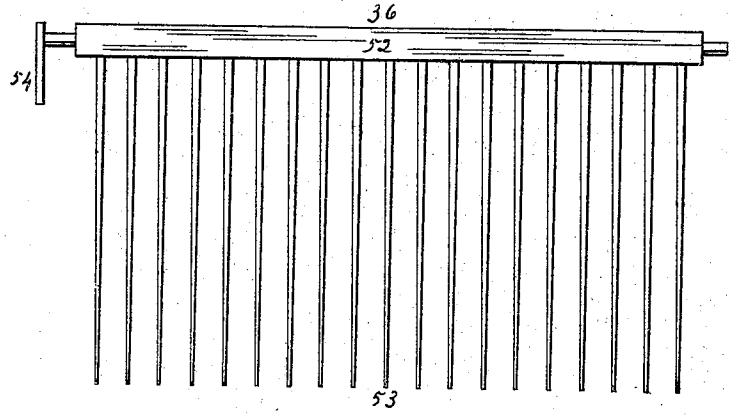

Fig. 9

WITNESSES

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INVENTOR

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By J. W. Powers
atty

No. 767,184. Patented August 9, 1904.

UNITED STATES PATENT OFFICE.

LUTHER M. THOMSON, OF ST. LOUIS PARK, MINNESOTA.

THRESHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 767,184, dated August 9, 1904.

Application filed July 7, 1902. Serial No. 114,676. (No model.)

To all whom it may concern:

Be it known that I, LUTHER M. THOMSON, a citizen of the United States, residing at St. Louis Park, county of Hennepin, and State of Minnesota, have invented certain new and useful Improvements in Grain Threshers and Separators, of which the following is a specification.

My invention relates to the threshing of grain, my object being the production of improved mechanism for that purpose.

To this end my invention consists of certain novel devices and combinations of devices herein shown and hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of my improved threshing-machine; Fig. 2, a longitudinal vertical section; Fig. 3, a vertical cross-section taken on the line 3 3; Fig. 4, another vertical cross-section taken on the line 4 4; Fig. 5, still another vertical cross-section taken on the line 5 5; and Figs. 6, 7, 8, 9, 10, and 11 details, being detached parts hereinafter described.

Similar numerals refer to similar parts throughout the several views.

A common defect of threshing-machines is their inability to effect a complete separation of the grain from the straw. This is because some of the heads will inevitably be broken from the stalks, escape the teeth of the "cylinder" and "concave," (the parts which beat the grain from the straw,) and will be thrown into the threshed straw, and it is one of the purposes of my invention to separate these fugitive heads and to send them through an auxiliary cylinder and concave, where they are threshed clean. Another common defect of threshing-machines is their inability to effect a complete separation of the grain from the straw after it has been threshed. This is because many of the grains when forcibly separated from the straw will be thrown upon the bars of the concave or other parts of the machine and will (through the law of incidence and reflection) rebound upward and into the straw from which they had just been separated and with it be carried away and (to a degree, lost, and another purpose of my invention is to recover these fugitive grains.

To these and other ends my invention consists of the device herein shown, described, and claimed, embodying the trucks 1, the frame 2, the case 3, and the incased operative mechanism.

The trucks 1, frame 2, and case 3 are not unlike those commonly used, hence need no description herein. The cylinder 4 and concave 5 are common to all threshing-machines, hence need no description. Somewhat above and to the rear of the cylinder 4 is located a straw-beater 6, which beater rotates in the direction indicated by the arrow, the purpose of which is to beat down the straw as it comes from the cylinder 4 and concave 5 and to force it onto a series of similar beaters 7, 8, 9, and 10, which last-named beaters are arranged in an upwardly-inclined order, are of different sizes, and rotate a varying speed in an opposite direction to the first-named beater 6.

The purpose of the four last-named beaters 7, 8, 9, and 10 are, first, to beat the loosened grain from the straw, and, second, to keep the straw in a loose condition for purposes which will hereinafter be set forth. The grain thus loosened and beaten from the straw falls through between the slats of the grain-conveyer 11, located in the rear of the cylinder 4 and below the straw-beaters 6, 7, 8, 9, and 10, and onto the inclined floor 12, which underlies the grain-conveyer, upon which floor it is drawn upward by the before-mentioned slats of the grain-conveyer 11 and discharged down a rearwardly-inclined portion thereof upon the sieve 13, through which it falls onto a second inclined floor 14, which floor conducts it to the lower end of the elevator-spout 15. From here it is taken upward by the conveyer 16 and discharged into the measuring device 17, from which (after it is measured) it is discharged into a conveyer 18 and thence through the spouts 19 into the bags.

Somewhat forward of and underneath the cylinder 4 and concave 5 is a partially-incased

wind-fan 20, the purpose of which is to blow the straw and chaff upward and out of the open rear end of the case 3.

Below the level of the last-named inclined floor 14, but outside of the case 3, is located a second or auxiliary cylinder 21 and its accompanying concave 22, which is of identically the same construction as the first-named cylinder and concave 4 and 5, but much smaller. Their purpose is to thresh the heads which have escaped the teeth of the first-named cylinder and concave, which heads have been separated from the straw and chaff through the operation of the straw-beaters 6, 7, 8, 9, and 10 and have been carried by the wind-blast over and off the rear end of the sieve 13.

Below the rear end of the sieve 13 is an inclined trough or chute 23, the purpose of which is to catch the before-mentioned unthreshed heads. The grain threshed from the recovered heads is taken up by an inclined spout 24 by means of the conveyer 25 and discharged into an inwardly-inclined spout 26, which spout conveys it through the side wall of the case 3 and discharges it on the sieve 13, where it mingles with the grain threshed by the first-named cylinder and concave 4 and 5.

Affixed to the rear side of the trough or chute 23 is a wind-board 27, the upper portion of which may be raised or lowered to conform to the strength of the wind-blast from the second wind-fan 28. This wind-board should be affixed at a position high enough to prevent the heads carrying grain from being blown over it. A second partially-incased wind-fan 28 is located beneath the upper (rear) end of the first-named inclined floor 12, the purpose of which is to produce an upward and rearward wind-blast through the sieve 13, which blast carries the chaff away from the threshed grain. It is this wind-blast which carries the before-mentioned unthreshed heads over and off the sieve 13 and into the underlying trough or chute 23, through which in turn they pass to the auxiliary cylinder and concave, as before described. A third partially-incased fan 29 is located directly in the rear of the grain-conveyer 11, the purpose of which (like that of the first-named wind-fan 20) is to blow the straw and chaff out through the open rear end of the case 3.

A roller 30 is journaled in the parallel side walls of the case 3 at its extreme rear end, and a system of similar rollers 31, arranged in a semicircle, are similarly journaled directly in front of the case of the last-named wind-fan 29. These rollers 30 and 31 carry belts 32, (two or more,) to which belts are affixed transverse slats 33, the whole forming a rattler or straw-carrier 34. This rattler 34 serves, in connection with the before-mentioned wind-blasts from the fans 20, 28, and 29, to carry the straw and chaff out, off, and away from the case 3.

A belt-beater 35, consisting of a shaft having radial longitudinal flanges, (preferably two,) is located directly beneath the upper or outwardly-moving portions of the belts 32, the purpose of which is to agitate the straw, thereby shaking out any loose grains therein, to toss the straw therefrom, and to keep it in condition to be acted upon by the wind-blasts.

A vibrating fork 36 is located in the rear of the train of straw-beaters 6, 7, 8, 9, and 10 and operates to agitate the straw and to toss it onto the rattler or straw-carrier 34.

A platform 37 is hinged to the front end of the case 3, which platform serves when in a horizontal position (in which position it is supported by the legs 38) for the feeder (the man feeding the machine) to stand upon.

A table 39 serves to support the bundles of grain (the sheaves) temporarily as they are tossed to the "feeder."

Fig. 6 is a longitudinal section of the measuring device 17, taken on the line 6 6, (see Fig 2;) Fig. 7, an end view thereof; Fig. 8, a side elevation of the straw-beater 6, and Fig. 9 a top view of the vibrating form 36.

The measuring device 17 consists of a shaft 40, to which is affixed two circular flanges 41, which flanges form the end pieces, and of the longitudinal flanges 42, which flanges are radial to the said shaft 40 and intermediate the said flanges 41, thus dividing the space lying between the flanges 41 into two or more compartments, each of which is designed to hold one bushel of grain. This flanged shaft 40 is incased by and revoluble within the cylinder 43, which cylinder is fashioned with an ingress-port 44, through which the grain enters it, and with the exit-port 45, through which the said grain is discharged. One end of the shaft 40 extends out through the side wall of the case 3 and is provided with a pulley 46, having as many flattened portions in its periphery as there are compartments in the measuring device, (two or more,) as herein shown. This pulley 46 serves as a stop for the revolving shaft 40, as will hereinafter be set forth. A brake-lever 47 is pivoted to the side of the case 3 at a proper point, a portion of which rests upon the flattened pulley 46. A poise or counterbalance 48 is mounted upon or suspended from the lever 47 and is longitudinally movable thereon, the purpose of which will hereinafter be disclosed.

The straw-beater 6 (shown detached in Fig. 8) consists of a shaft 49, to which is affixed two circular flanges 50, (one at each end,) between which are radial bars 51, which bars (as the shaft is revolved) beat the straw, as and for the purposes above set forth. This construction permits the wind-blast from the fan 20 to pass

through between the beating-bars. The vibrating fork 36 consists of the shaft portion 52 and the tines 53, affixed therein. One end of the shaft 52 extends out through the side wall of the case 3 and is provided with a laterally-bent portion 54, by means of which it is operated. Pivotally affixed to the outer vertical wall of the case 3 is a pulley 55, having a crank-pin 56 affixed therein, which crank-pin (when the said pulley is rotated) will contact with and actuate (rock) the laterally-bent portion 54 of the shaft 52, and thereby impart an oscillating movement to the tines 53.

The brake-lever 47 is designed to hold the grain-measuring device 17 in position until one of the compartments thereof is filled, when the weight of the grain therein will rotate the shaft 40 thereof, when the said grain will be discharged therefrom, falling into the conveyer 18, from which it is conveyed into the bags through one or the other of the spouts 19. As the shaft 40 is thus rotated the pulley 46, affixed thereon, will also be rotated, whereby the brake-lever 47 will be raised, (because of the flattened rim of the pulley 46,) the poise 43 serving to determine at what time the lever 47 may raise and the shaft 40 be permitted to revolve, thus weighing the grain.

The double spout 19 is to provide for attaching an empty bag while another is being filled, it being provided with a gate (not shown) adapted to be moved to conduct the grain into either spout and either bag.

The operation of my machine is as follows: The power being applied and the cylinder 4 having attained to its maximum speed, the bundles of grain (the sheafs) are fed into the mouth of the machine, (the opening in front of the cylinder and concave,) where they are caught by the cylinder-teeth and drawn inward and downward between the said cylinder and the concave, whereby the grain is beaten therefrom. The grain thus beaten out falls through between the transverse slats of the grain-conveyer 11 and onto the inclined floor 12, up which it is drawn by the said transverse slats thereof, from which it is discharged into the sieve 13, through which it is shaken, (the said sieve having a vibratory movement common to all threshing-machine sieves,) falling onto the inclined floor 14, down which it slides to the lower end of the elevator 15, from which it is carried upward by the conveyer 16 and discharged into the measuring device 17, and thence (after it is measured) conveyed to bags through the spouts 19. While the grain thus threshed is being conveyed to the bags in the manner above described the straw as it leaves the cylinder 4 is carried by the wind-blast from the fan 20 upward and rearward under the beater 6 and over the beaters 7, 8, 9, and 10, whereby the grain loosened by the cylinder-teeth is beaten out, falling upon the inclined floor, as above described. As the straw leaves the last-named beater 10 it is caught upon the vibrating form 36, which tosses it to the rattler 34, by means of which it is carried out of the case 3, the wind-fans 28 and 29 assisting in its flight or passage. By thus tossing the straw about and keeping it scattered the blasts from the wind-fans tend to separate the cleanly-threshed straw from the unthreshed, (the before-mentioned heads,) which unthreshed portion is turned back, rethreshed by the auxiliary cylinder and concave, and the grain therefrom secured in the manner above described.

I do not wish to confine myself to the exact construction and arrangement of the several parts herein described, for it is apparent to the minds of those skilled in the art to which my invention appertains that the mechanical construction may be changed without departing from the spirit and intent of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a threshing-machine, the combination with the cylinder and concave, of a series of graduated rotary straw-beaters, arranged in an upwardly and rearwardly order, and in alinement with the said concave, a fan mounted within a casing located below and in front of said cylinder, the said casing extending upwardly and rearwardly to form a floor, a grain-conveyer located above and parallel therewith, formed of a series of transverse slats adapted to convey the grain to an inclined sieve, a blower located at the front and slightly under the end of said screen for separating the chaff from the grain, an inclined floor located below the said screen and a conveyer for receiving the grain from said inclined floor.

2. In a threshing-machine, the combination with the cylinder and concave, of a wind-fan located below and to the front of said cylinder and within an upwardly-extending casing, said casing forming a floor, on which rides a grain-conveyer, a series of graduated rotary straw-beaters arranged above the said conveyer, a vibrating fork mounted on a shaft provided with a laterally-bent portion, a pulley having a crank-pin pivotally fixed to the outer wall of the casing for engagement with the said laterally-bent portion to rock the same, an endless apron-carrier arranged below the said vibrating fork, a beater located beneath the rattler, a wind-fan provided in the front end of said rattler, an inclined sieve and floor located beneath the same, a conveyer for receiving the grain from said inclined sieve and floor.

3. In a threshing-machine, the combination with the cylinder and concave, the graduated

rotary straw-beaters arranged above in an upwardly and rearwardly order and in alinement with said concave, a vibrating fork mounted on a shaft provided with a laterally-bent portion, a pulley having a crank-pin pivotally fixed to the outer wall of the said casing adapted to engage with the said laterally-bent portion to rock the same, an endless apron-carrier located under, and to the rear of said beaters, an inclined sieve arranged below the said endless apron-carrier, a trough or chute located below the rear end of said sieve, extending outward through the said casing, the auxiliary cylinder and auxiliary concave, a conveyer lying outside the said casing, and a spout extending from the said conveyer to the said sieve within the casing.

LUTHER M. THOMSON.

Witnesses:
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A. T. FAY.