

(No Model.)

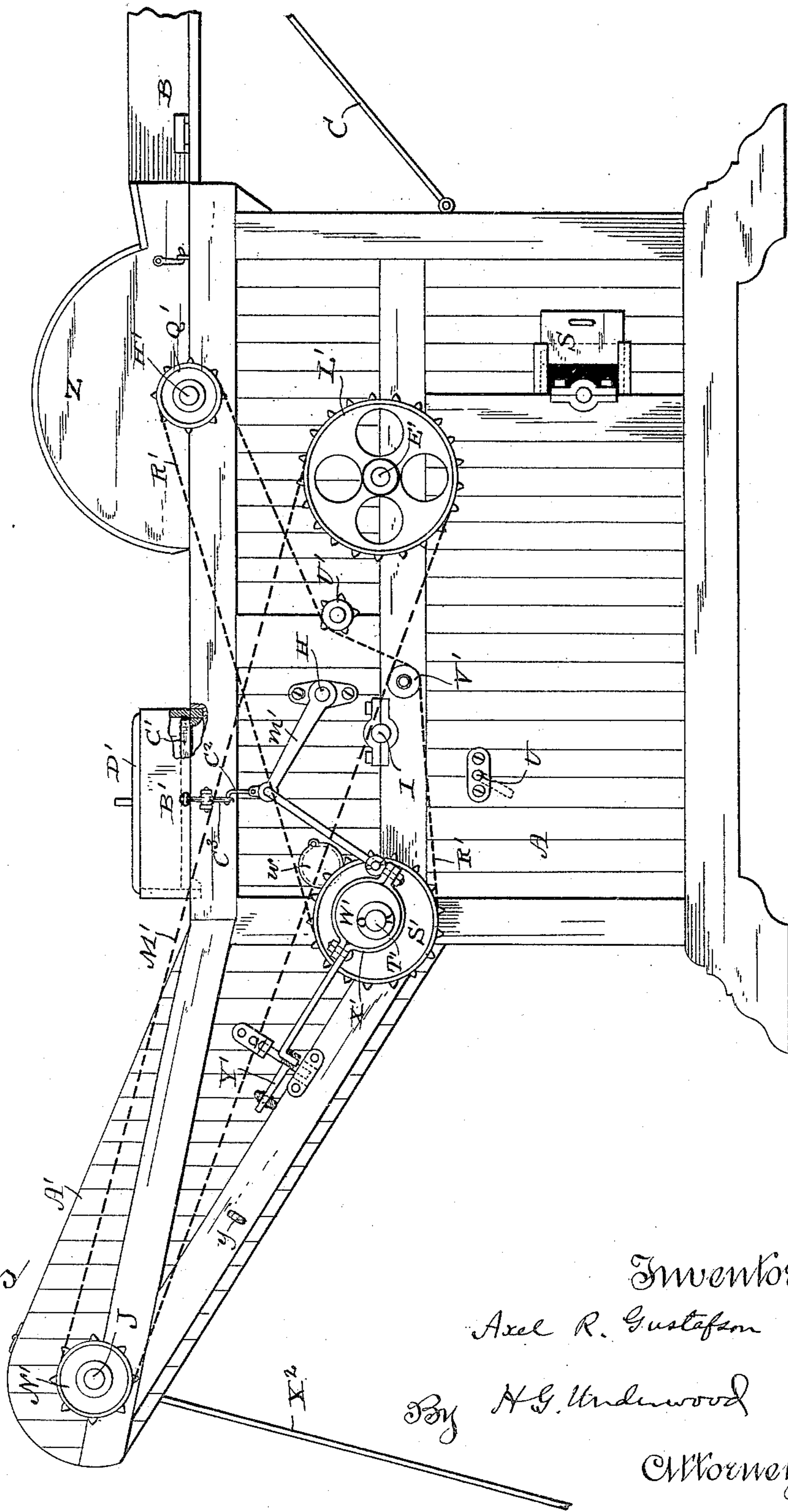
3 Sheets—Sheet 1.

A. R. GUSTAFSON.  
THRASHING MACHINE.

No. 446,644.

Patented Feb. 17, 1891.

Fig. 1.



Witnesses  
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N. E. Oliphant

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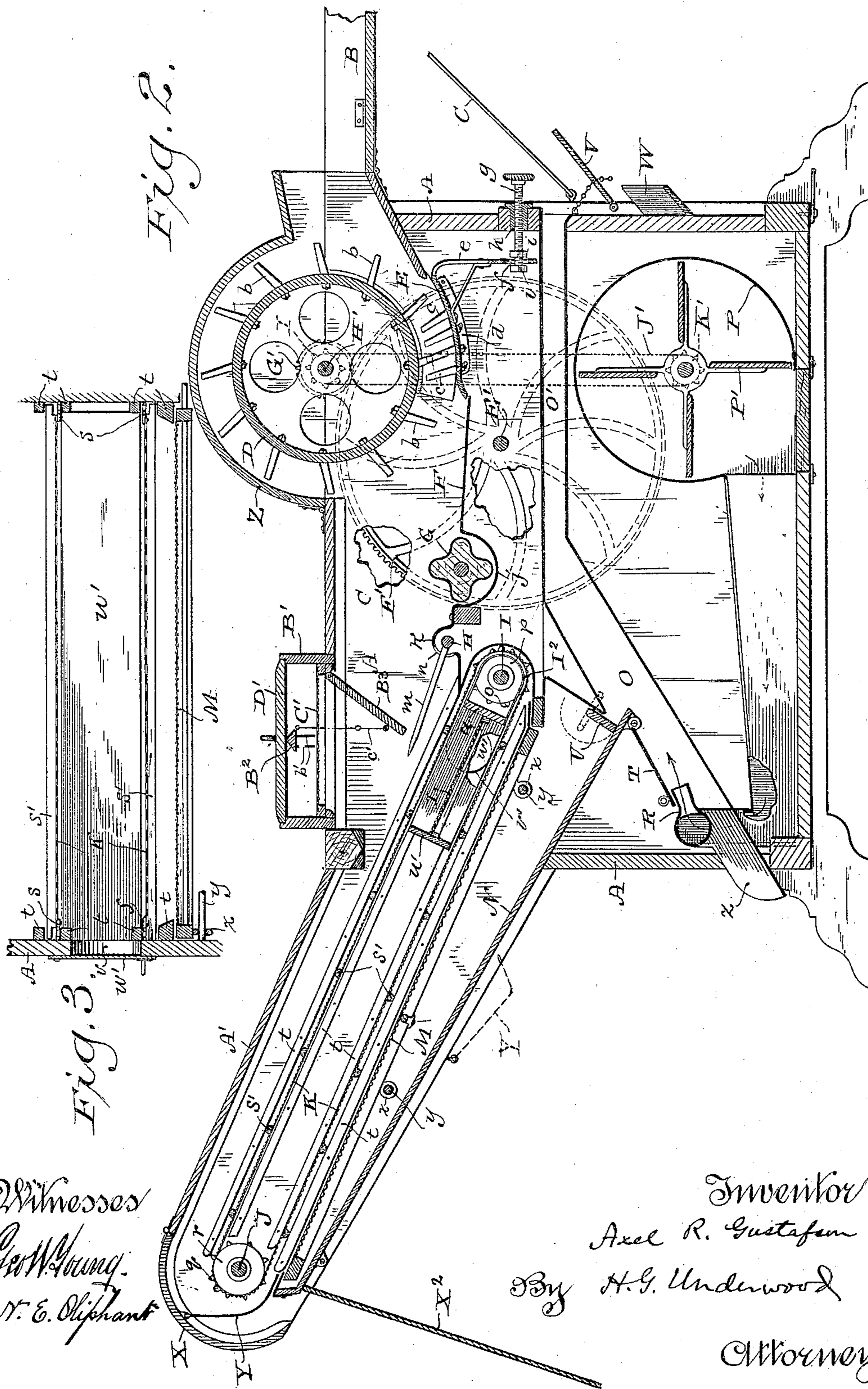
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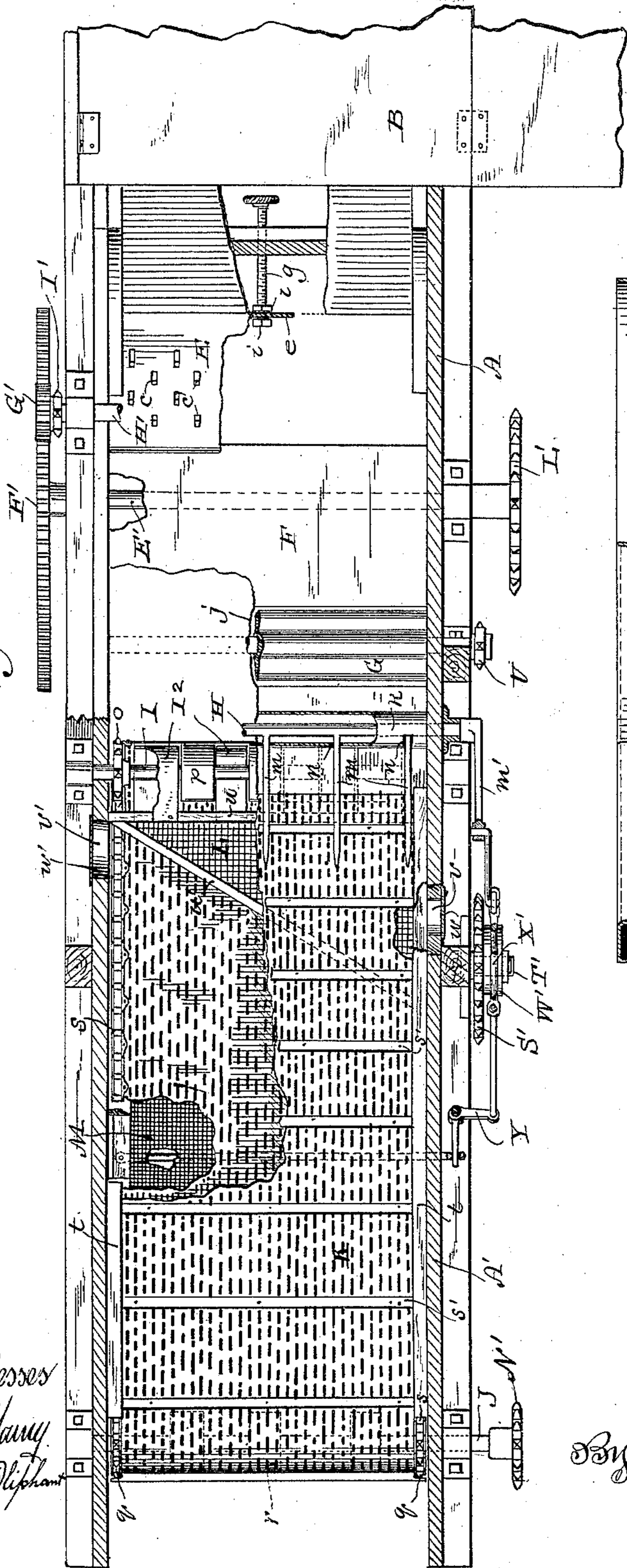
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Fig. 4.



Witnesses  
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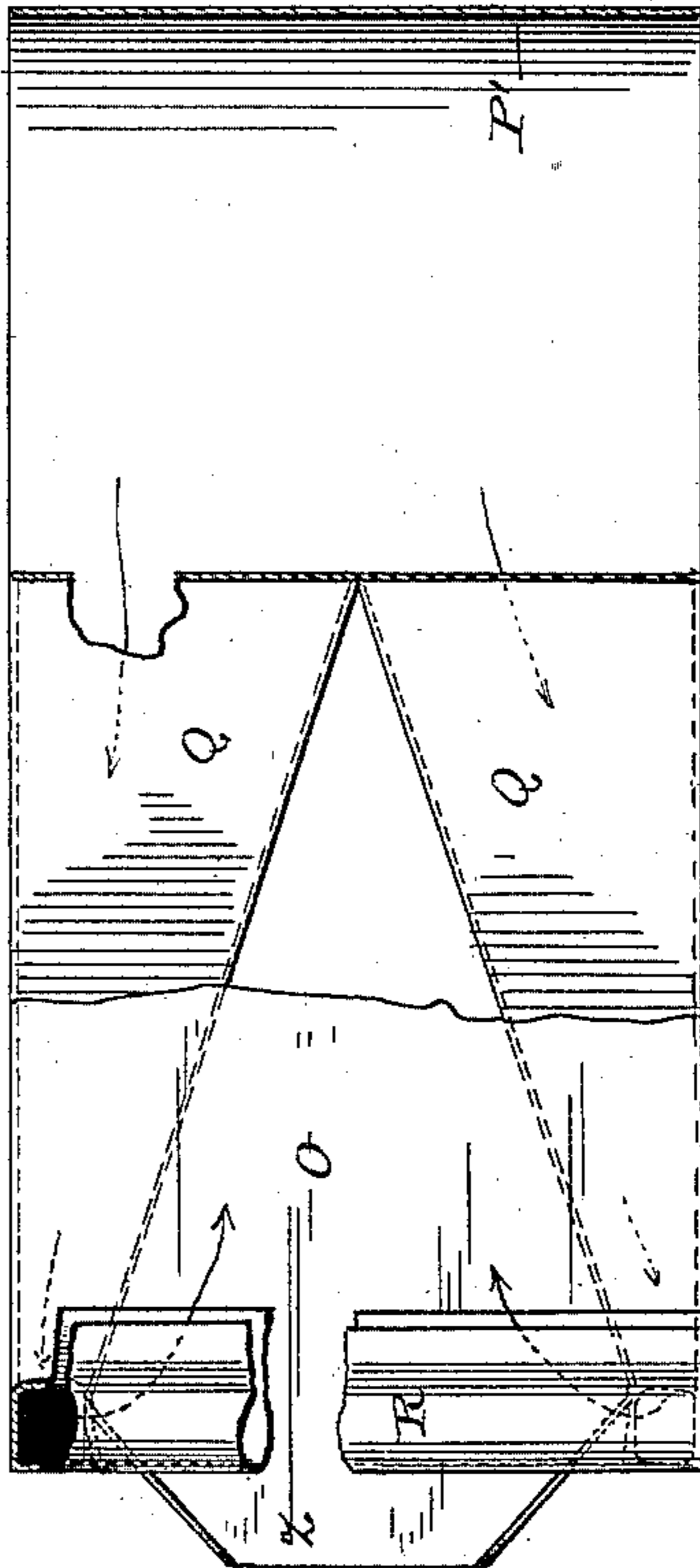


Fig. 5.

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# UNITED STATES PATENT OFFICE.

AXEL R. GUSTAFSON, OF ASHLAND, WISCONSIN, ASSIGNOR OF ONE-FOURTH  
TO WILLIAM F. ANDERSON, OF NEGAUNEE, MICHIGAN.

## THRASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 446,644, dated February 17, 1891.

Application filed April 3, 1890. Serial No. 346,428. (No model.)

*To all whom it may concern:*

Be it known that I, AXEL R. GUSTAFSON, of Ashland, in the county of Ashland, and in the State of Wisconsin, have invented certain new and useful Improvements in Thrashing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to thrashing-machines, being designed as an improvement on those set forth in my patent, No. 417,175, of December 10, 1889, and my application for patent, Serial No. 342,951, filed March 7, 1890; and it consists in certain peculiarities of construction and combination of parts to be hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a side elevation of my machine; Fig. 2, a longitudinal section of the same; Fig. 3, a detail view illustrating a straw-carrier, riddle, and a portion of the casing in cross-section, said casing being broken back to show an opening therein; Fig. 4, a horizontal section with parts broken away, and Fig. 5 a similar view of the fan-case and wind-trunk.

Referring by letter to the drawings, A represents the casing of my machine, provided at the front with a hinged feed-table B, held up in position for use by means of stay-rods C, secured to said casing, and the latter has an upper rear extension A' at an angle thereto, this extension serving to inclose certain mechanism hereinafter described.

Arranged within the casing A, adjacent to the feed-table, is the thrashing-cylinder D, provided with a series of angularly-disposed teeth *b*, arranged to pass between similar teeth *c* on a segmental plate E, the latter being supported on guides *d* upon the inner sides of said casing. The plate E is provided at its front end with a depending arm *e*, slotted at *f* to receive a screw *g*, that has a bearing *h* in the adjacent end of the casing, and said arm is retained in position with relation to the screw by means of the set-nuts *i*, thereby maintaining a positive adjustment of said plate, a variable adjustment being effected by turning said screw in its bearing.

Extending rearward from a point adjacent to the inner end of the segmental plate E is

a horizontal partition F, having a concave portion *j*, in which turns a corrugated roller G, and beneath a convex portion *k* of the partition is a transverse rod H, provided with lifting-fingers *m*, that extend through slots *n* in the latter part of said partition.

Arranged under the rear portion of the horizontal partition F is a shaft I, that carries sprocket-wheels *o* and rollers *p*, and at the rear end of the casing-extension A' is a similar shaft J, that carries sprocket-wheels *q* and rollers *r*. The sprocket-wheels *o q* engage with link belts *s*, and secured to these belts is a perforated sheet-metal apron K, that travels on the rollers *p r* and has the outside thereof provided at intervals with transverse slats *s'*, said link belts and apron constituting what will be hereinafter designated as the "straw-carrier," the latter working between guides *t* upon the inside of the casing A and the extension A' of the same. By having the apron of perforated sheet metal it is less liable to sag, while at the same time the transverse strips serve to strengthen said apron as well as to catch and carry forward the straw.

Within the straw-carrier, near its lower end, a transverse partition *u* and diagonal partition *u'* extend from side to side of the casing A, and supported on cleats upon the inner sides of these partitions is a triangular screen L. In order to have access to the space between the partitions *u u'*, one side of the casing is provided with an opening *v*, and a cover *w* for this opening is pivoted to said casing. Another opening *v'* is cut in the casing A in rear of the point where the diagonal partition *u'* approaches nearest the transverse partition *u*, and the latter opening is provided with a pivoted cover *w'*, this construction being best illustrated in Fig. 4.

Arranged below the straw-carrier and parallel therewith is a riddle M, provided with depending eyes *x*, that fit loosely on transverse rods *y*, and below this riddle is a chute N, that discharges into an inclined flue O, provided with a delivery-spout *z* at the rear end of the casing.

Like in my application above noted, a fan-case P is arranged within the casing A, and leading from the fan-case is a bifurcated

wind-trunk Q, the furcations of this wind-trunk being connected to a transverse spout R, that discharges into the flue O, the latter having a horizontal extension O', through which the blast from the fan finds its outlet at the front of the machine. The amount of air admitted to the fan-case is regulated by means of a sliding gate S, as illustrated in Fig. 1, and in order to regulate the force of the blast from the fan P' the flue O is provided with a pivoted door T, arranged just above the spout R, the flow of the thrashed material to said blast being governed by a transverse gate U, pivotally adjustable to vary the area of the opening in said flue just above the chute N.

At the front end of the machine a transverse cant-board V is pivoted to the machine-casing and adjustably supported by chains arranged below the outlet of the flue-extension O', and beneath the cant-board is a trough W.

The top of the casing-extension A' has a hinged section X at the rear end, and upon its inner side this hinged section is provided with hangers for a detachable plate Y, the latter being employed to close said end of the casing-extension when the machine is used to clean grain. When not in use, the plate Y is hung from the sides of the casing-extension A', as shown by dotted lines in Fig. 2.

The top of the casing A, in rear of the hinged portion Z thereof, that covers the cylinder D, is provided with a hopper B', having a sieve C' arranged therein, and this hopper is in turn provided with a cover D', said hopper being employed when the machine is used as a grain-chamber.

Fast on the main shaft E' of the machine is a gear-wheel F', in mesh with a pinion G' on the shaft II' of the cylinder D, and the latter shaft is provided with a sprocket-wheel I', connected by means of a link belt J' with another sprocket-wheel K' on the shaft of the fan P'. The gearing thus far described is all on one side of the machine, and on the other side of the latter a sprocket-wheel L' on the main shaft E' is connected by a link belt M' with another sprocket-wheel N' on the shaft J, the latter gearing serving to drive the straw-carrier.

A sprocket-wheel Q' on the cylinder-shaft II' is connected by a link belt R' with another sprocket-wheel S' on a stud T', projecting from the latter side of the machine. The belt R' in its travel drives a sprocket-wheel U' on the shaft of the corrugated roller G, an idler V' being arranged to offset said belt in order to accomplish the engagement just described.

The sprocket-wheel S' on the stud T' is provided with an eccentric W', and a separable ring X' on this eccentric is linked to a crank m' on the rod II, that carries the beater-arms m, and said ring is also linked to an arm of a bell-crank Y', fulcrumed to the casing-extension A' and connected to the riddle M. By the gearing just described the beater-arms m are oscillated and the riddle M vibrated.

In the operation of my machine as organized for thrashing, the material is fed in from the table B between the teeth on the cylinder D and segmental plate E and is crowded along on the horizontal partition F to be agitated by the rapid revolution of the corrugated roller G, after which it is further agitated by the action of the lifting-fingers m to dislodge the kernels of grain from their husks. Should any grain and short chaff fall through the upper side of the straw-carrier immediately under the beater-arms, the chaff will be arrested by the screen L; but the grain will continue its descent through the under side of said straw-carrier and the vibratory riddle M onto the chute N to be discharged into the flue O. As the main quantity of the grain and chaff is elevated by the straw-carrier, the former will fall through said straw-carrier and the vibratory riddle M onto the chute N, the latter conducting said grain to the flue O, where it is met by the blast from the fan P'. The blast serves to separate any dirt, chaff, or other impurities from the grain, the latter being discharged through the spout z, and said impurities passed out through the extension O' of the flue. Should any light grain be carried out by the blast, the cant-board V will deflect said grain and cause it to fall into the trough W.

In order to prevent any dirt or rubbish from being drawn in at the rear end of the machine, I provide the latter with an apron or shield X<sup>2</sup>, that depends from the under side of the casing-extension A', and this apron or shield serves also as a guide for the straw that is discharged from said machine.

To shield the shaft I from any straw that may work through the carrier, I inclose said shaft by means of a shield I<sup>2</sup>, that extends rearward from the transverse partition u within said carrier. Any chaff that may accumulate inside of the straw-carrier apron K beyond the diagonal partition u' will collect against the latter and is discharged or withdrawn through the opening v' in the casing A, and similar material accumulating on the screen L between the partitions u u' is discharged or withdrawn through the opening v in said casing.

When the machine is organized to clean grain, the plate Y is placed in position, as shown by full lines in Fig. 2, and the material fed in through the hopper B', a vibratory motion being imparted to the sieve C' by means of a link C<sup>2</sup>, connecting a bell-crank C<sup>3</sup> on said sieve with the link that connects the crank m' of the beater-rod H with the separable ring X', this construction being illustrated in Fig. 1. Either the link C<sup>2</sup> or the crank m' may be disconnected from the relative link on the separable ring X' at the will of the operator. Centrally arranged within the hopper B' is a strip B<sup>2</sup>, and depending from this strip is a series of pins b', that extend down close to the mesh of the vibratory sieve C', these pins serving as stirrers for the grain, and in

order to deflect the latter onto the straw-carrier I hinge a cant-board B<sup>3</sup> to one of the cleats that supports said sieve, this cant-board being adjustably suspended by means of a link-hanger c', whereby it may be held in or out of position for use.

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

10 1. In a thrashing-machine, the combination of a toothed cylinder, a toothed segmental plate arranged on guides in opposition to the cylinder, an arm depending from the plate and provided with the slot f, the bearing h, 15 the screw g, arranged in said bearing to extend through said slot in the arm, and the set-nuts i i, arranged on said screw to oppose said arm on opposite sides, substantially as set forth.

20 2. In a thrashing-machine, the combination of a toothed cylinder, a toothed segmental plate opposed to the cylinder, a straw-carrier, a horizontal partition extended from said plate to the straw-carrier, a corrugated roller 25 arranged in a concave portion of said partition, and an agitator having the arms thereof extended through a slotted convex portion of said partition, substantially as set forth.

30 3. In a thrashing-machine, an endless and perforated straw-carrier, a transverse and diagonal partition extended from side to side of the machine-casing within the straw-carrier, a screen supported between the partitions, and openings in said casing adjacent to 35 an end of each partition, substantially as set forth.

40 4. In a thrashing-machine, the combination of an endless and perforated straw-carrier, a chute arranged below the same, a blast-flue having an opening therein to receive the lower end of the chute, a gate for said opening, and a door that forms part of the blast-flue below said chute, substantially as set forth.

45 5. In a thrashing-machine, the combination

of the machine-casing provided with an inlet in the top for grain, a perforated endless straw-carrier, a detachable plate for closing the straw-discharge, a chute arranged below the straw-carrier, and a blast-flue provided 50 with an opening for the lower end of the chute, substantially as set forth.

6. In a thrashing-machine, the combination of the machine-casing, a perforated endless straw-carrier, a detachable plate for closing 55 the straw-discharge, a chute arranged below the straw-carrier, a blast-flue provided with an opening for the lower end of the chute, a hopper in the machine-casing above said straw-carrier, and a vibratory sieve arranged 60 within the hopper, substantially as set forth.

7. In a thrashing-machine, the combination of a perforated endless straw-carrier, a detachable plate for closing the straw-discharge, a chute arranged below the straw-carrier, a 65 blast-flue provided with an opening for the lower end of the chute, a hopper in the machine-casing above said straw-carrier, a vibratory sieve arranged within the hopper, and stirrers arranged just above the mesh of the 70 sieve, substantially as set forth.

8. In a thrashing-machine, the combination of a perforated endless straw-carrier, a detachable plate for closing the straw-discharge, a chute arranged below the straw-carrier, a 75 blast-flue provided with an opening for the lower end of the chute, a hopper in the machine-casing above said straw-carrier, a sieve arranged in the hopper, and a hinged cant-board adjustably suspended below the sieve, 80 substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Ashland, in the county of Ashland and State of Wisconsin, in the presence of two witnesses.

AXEL R. GUSTAFSON.

Witnesses:

WILLIAM L. WINDOM,  
E. H. WINDOM.