

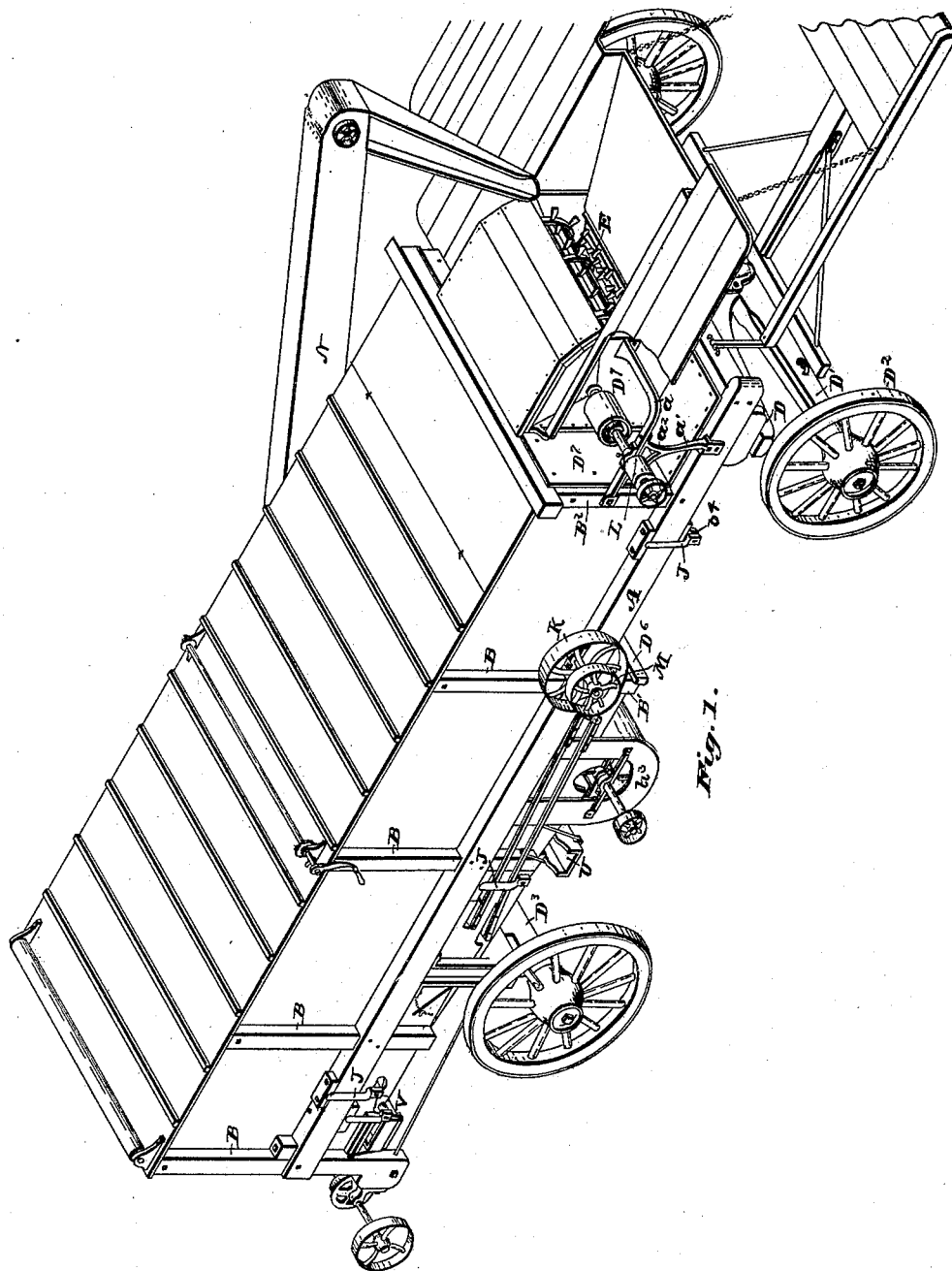
(No Model.)

5 Sheets—Sheet 1.

W. M. KOPPES.
THRASHING MACHINE.

No. 419,683.

Patented Jan. 21, 1890.



Witnesses:

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Chas. R. Miller

Inventor
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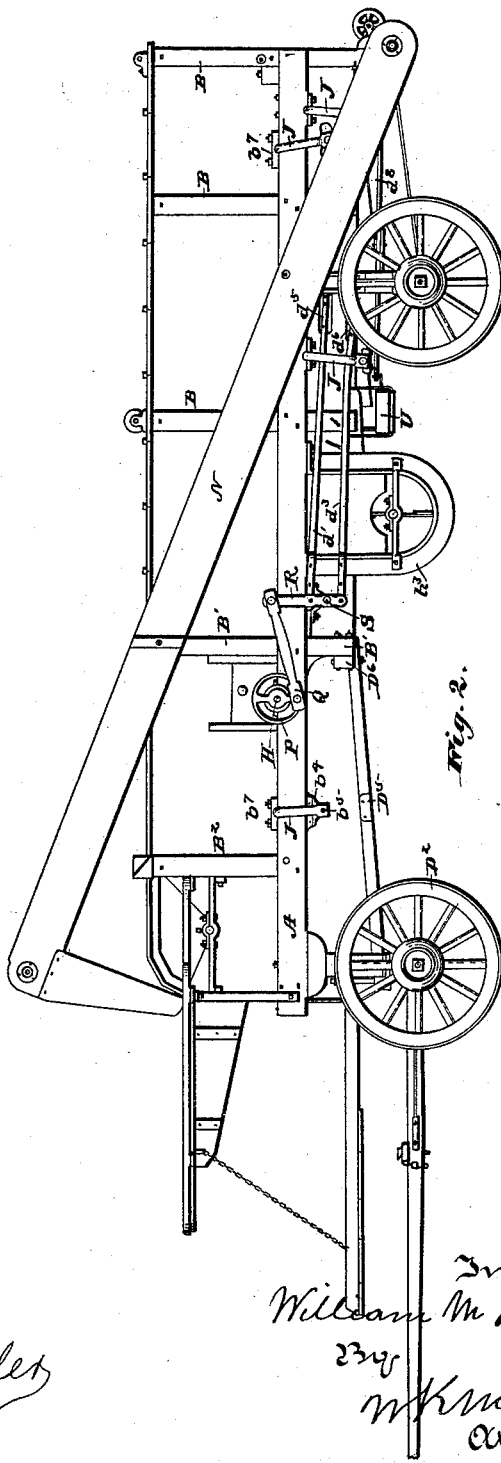
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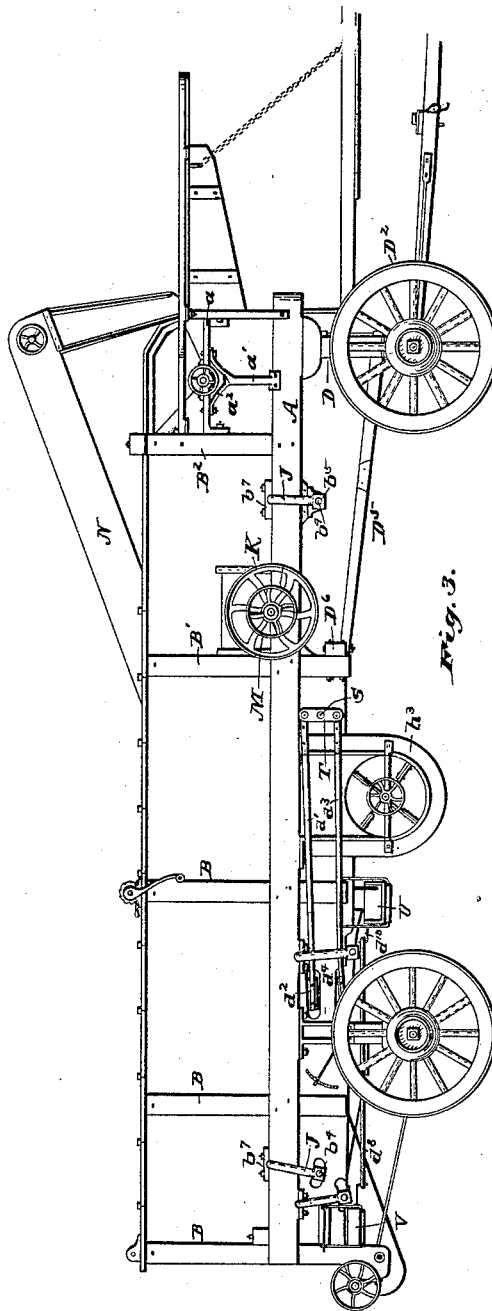
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W. M. KOPPE'S.
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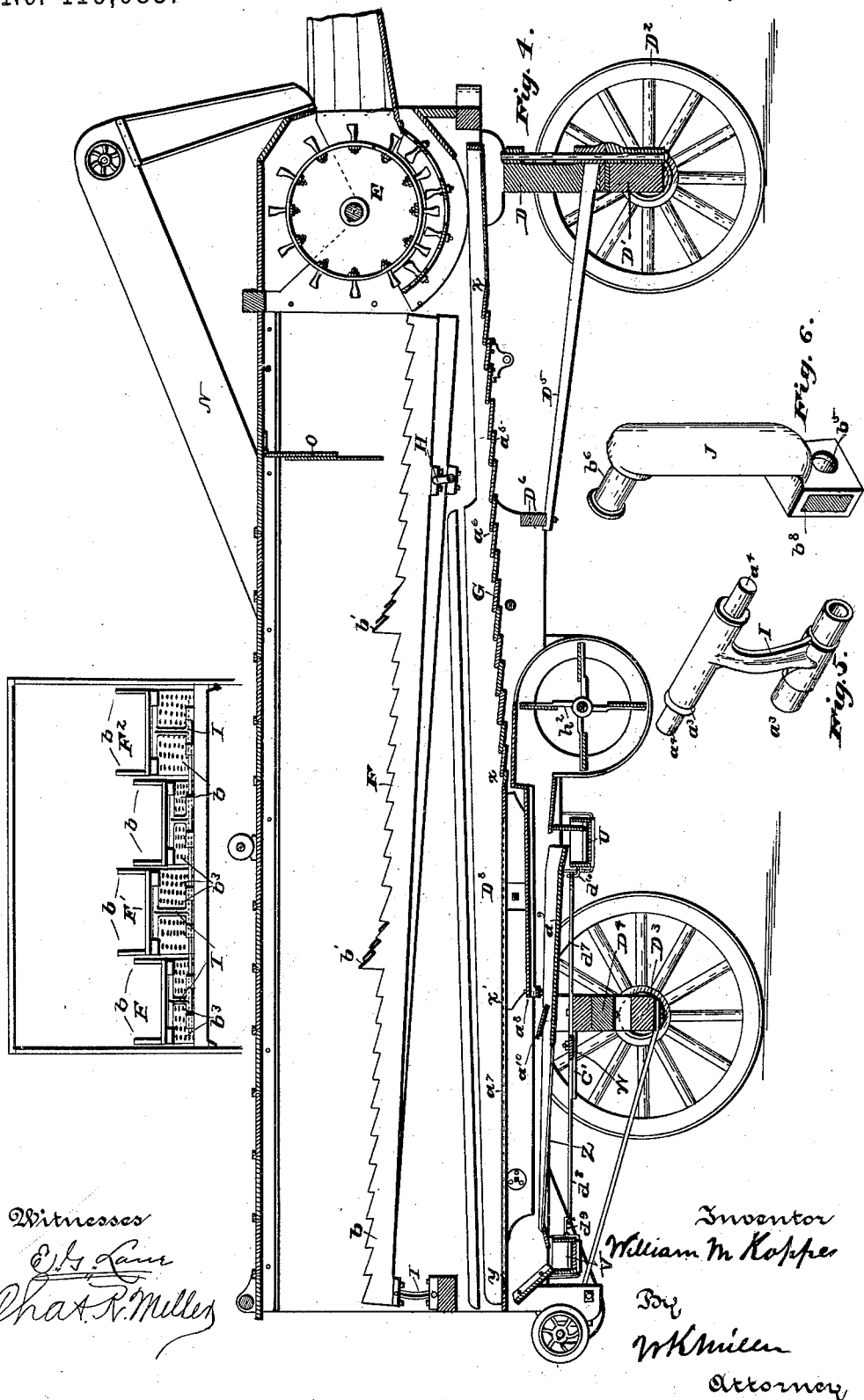
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5 Sheets—Sheet 4.

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5 Sheets—Sheet 5.

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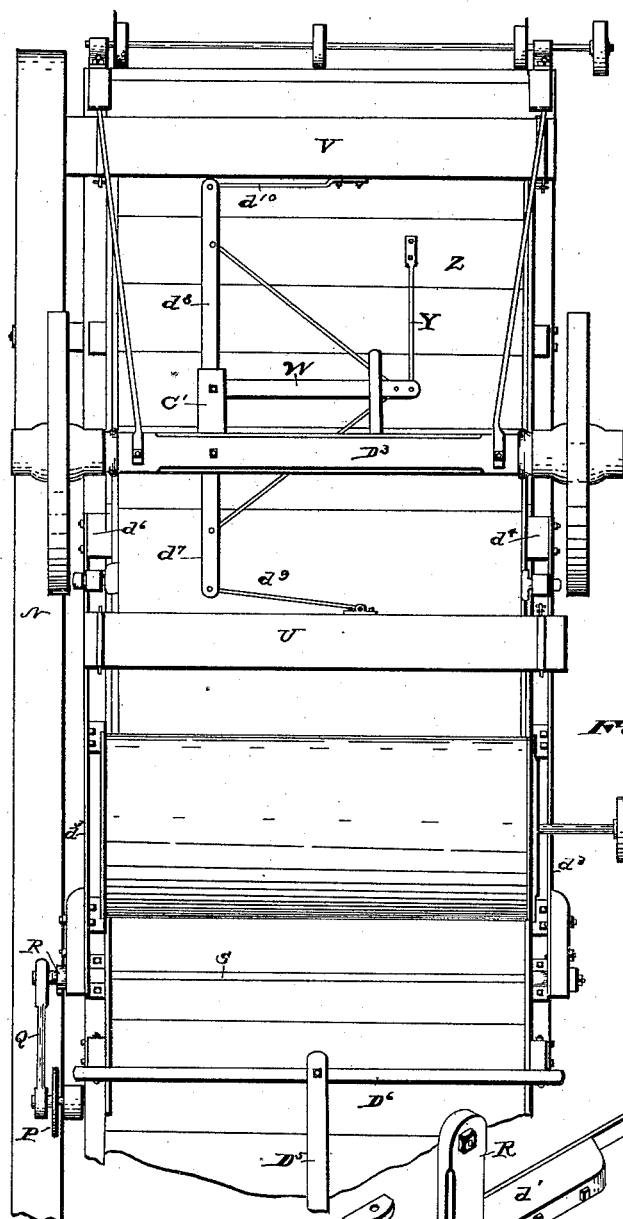


Fig. 7.

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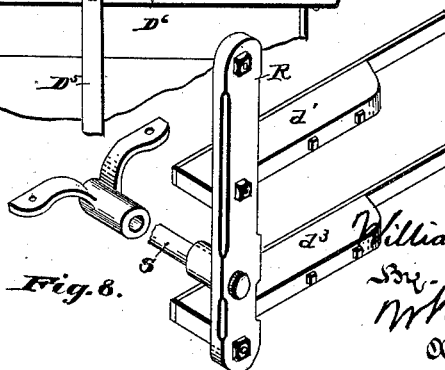


Fig. 8.

Inventor

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UNITED STATES PATENT OFFICE.

WILLIAM M. KOPPE, OF ORRVILLE, OHIO.

THRASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 419,683, dated January 21, 1890.

Application filed February 20, 1889. Serial No. 300,630. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. KOPPE, a citizen of the United States, and a resident of Orrville, county of Wayne, State of Ohio, have
5 invented a new and useful Improvement in Thrashing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

10 My invention relates to improvements in thrashing-machines, more particularly to that class of machines known as "vibrators;" and it consists in providing improved means of operating the several parts and to reduce the
15 initial cost.

With these ends in view my invention consists in certain features of construction and combination of parts, as hereinafter described, and set forth in the claims.

20 Figure 1 of the accompanying drawings is a view in perspective from left-hand front of a thrashing-machine, illustrating my invention; Fig. 2, an elevation showing right-hand side; Fig. 3, an elevation showing left-hand
25 side; Fig. 4, a vertical longitudinal sectional view showing position of parts; Fig. 5, a view in perspective of vibrator-supports; Fig. 6, a similar view of vibrator-hanger; Fig. 7, a plan from below, showing under side of a portion
30 of the machine; Fig. 8, a view comprising a hanger, vibrator-lever, and connecting-link heads in perspective; Fig. 9, a view from rear, showing the end of the machine.

Similar letters of reference indicate corresponding parts in all of the figures of the
35 drawings.

The frame of the machine is composed of stout horizontal sills A, vertical posts B B' B², and cross sills or girders C, the posts B and
40 B' projected a distance below the sills A. The body portion of the machine is inclosed by sides and deck in the usual way. The front end of said frame is secured to a bolster D, which rests upon an axle, as D', which is sup-
45 ported by carrying-wheels D². The rear portion of the frame is secured to the axle D³, supported by carrying-wheels D². The front portion of the frame is raised sufficiently high
50 by the bolster D to allow the wheels D² to be turned under the body of the machine, and to secure the bolster and machine in proper relation a reach, as D⁵, is provided, having its

front end secured to the bolster D and its rear end to a cross-girder D⁶, secured to the lower portion of the posts B'. A metal corner-plate
55 D⁷ is provided, which serves to inclose a portion of the front end of the body of the machine, as shown, and to form a portion of the end of the cylinder-casing, in which a bearing m is located, through which the cylinder-
60 shaft extends, the said corner-plate resting on and secured to that portion of the frame designated as A and B³.

The thrashing-cylinder E may be of any of the well-known and approved forms. It is sup-
65 ported on an arm a, the rear end of which is secured to the frame-post B² and extending forward and inwardly, the front end secured to the corner-iron or cylinder-casing, substantially as shown. The said arm is further sup-
70 ported by the post a', the upper end of which is bifurcated, the prongs a² secured to the arm a, one on each side of the cylinder-shaft, as shown. The lower end of the post is secured to the frame-sill A.

75 The winnowing-wheel h² is supported in a U-shaped frame h³ and inclosed in the usual way. On the end of the wheel-shaft is provided a pulley adapted for a belt engagement with a driving-pulley, by which said wheel is
80 rotated to produce the necessary blast to clean the thrashed grain.

It will be noticed that the thrashing-cylinder is shorter than the width of the separator and is housed separately and outside of the
85 body of the machine, by which arrangement the separating capacity is enlarged to a point in excess of the thrashing capacity of the cylinder, thus assuring room to spread out the thrashed straw, and by such means, as will be
90 hereinafter described, agitate the straw and cause the grain to fall therefrom to the grain-table. In this case the vibrating table F is composed of a series of narrow troughs or
95 tables F' F², having side boards as b, having serrated upper edges, and fins, as b', intermediate their ends, as shown, the bottom board of b² having perforations b³, through which the thrashed grain may fall to the vibrating grain-table G. The front ends of the
100 vibrators F are supported on an alternately-cranked shaft H, the rear ends supported on links I. The said link is made of cast metal in form substantially as that shown in Fig.

5, having two parallel pipe portions a^3 , in which pins of hard wood may be placed from time to time, as occasion may require, to form the journals a^4 .

5 The vibrating grain-table G is constructed as follows: The intervening space between the side boards D^8 is inclosed or covered a distance from x to x by overlapping bottom boards a^5 , forming steps or offsets a^6 , that
10 operate to move the grain rearwardly as the table is vibrated. In the rear portion of the bottom space, as from x to y , is placed a riddle a^7 of unusual length, in order to provide a large riddling-surface to allow of the use of a
15 smaller mesh than has been heretofore used in this position and relation to a grain-table vibrated under a vibrating separator, and as it would be impractical to distribute or control the wind-blast from the ordinary wind-wheel used for such purposes over so large a
20 surface as that of the riddle a^7 , I place in the shoe Z a grain-board a^8 , upon which the grain that passes through the meshes of the front part of the riddle from x to x will fall upon the board a^8 , the vibratory movement of which
25 will cause the grain to move rearward to the end of the board a^8 , at which point it will fall through the wind-blast from the winnowing-wheel h^2 to the return-board a^9 , thence down into the conveying-spout U out of the machine. A wind-board, as a^{10} , is placed in the
30 shoe, standing transversely to the direction of the wind, that may be turned to change the direction or deflect a portion of the wind-blast, as may be desired. It will be noticed that the board a^8 has a double purpose, that of a grain-board over which the grain is conveyed; but it also forms with the return-board a^9 a throat or passage-way by which the blast
35 of wind is carried to a point central, or thereabout, to the riddle.

The grain-table G is supported on swinging hangers J, a stud-pin b^4 , secured to the table, resting in the journal-box b^5 in the lower
45 portion of the swinging arm J. The upper portion of the arm is provided with an inwardly-projected portion, forming a journal, as b^6 , which rests in a journal-box, as b^7 , supported on the sill A. The lower portion of
50 the arm J is provided with a square open-ended socket, which has an aperture, as b^8 , (see Fig. 6,) said aperture having fixed therein a block of hard wood having a perforation corresponding with a similar perforation b^5
55 in the said socket portion of the hanger, the said block forming the bearing for the stud-pin b^4 , on which the vibrating grain-table is supported. I prefer this form and construction of journal-box, as in it is provided an inexpensive renewable journal-box formed of
60 hard wood, which I have found more desirable for this service than metal. A worn-out block is easily removed, a new one driven into the iron frame, and the journal-box
65 formed by boring through the block with a proper-sized boring-bit.

The cranked shaft H has mounted on its

left-hand end a pulley K, to have a belt engagement with a driving-pulley, as L, on the
cylinder-shaft, and a pulley, as M, is also
70 mounted on the shaft H to drive other parts of the machine. On the right-hand end of shaft H there is mounted a crank-wheel P, to which one end of pitman Q is pivotally secured, as shown. The other end in a similar
75 manner is secured to the upper portion of a vibrating lever R. Said lever is mounted on a cross-shaft S, supported in hanger, as d , secured to the under side of the main sills A, the said lever R extending a distance below
80 the shaft S, as shown in Fig. 2. On the opposite end of said shaft is mounted a cross-head T. A link, as d' , is provided, one end of which is pivotally secured to the upper
85 portion of the cross-head T, the other end to the side of the vibrator grain-table G, as shown at d^2 , Fig. 3, and a similar link d^3 , having one of its ends pivotally secured to the lower portion of the cross-head T and the other end to the side of a riddle-supporting
90 shoe Z, as shown at d^4 , Fig. 3; and on the right-hand side of the machine similar links d' and d^3 are provided, link d' having one end pivotally secured to the lever R at the point above the rock-shaft S, the other end
95 secured to the side of the grain-table G, as shown at d^5 , and link d^3 having one end pivotally secured to the lever below the shaft S, the other end secured to the shoe Z, as shown at d^6 , an aperture having been made through
100 the side boards of the machine to allow the ends of the links d' d^3 to pass through for engagement with the grain-board and shoe, as hereinafter stated.

The purpose and operation of the parts will
105 be apparent. When the cylinder is in operation, motion will be communicated to shaft H, the cranked portions of which will give to the front ends of the vibrator-tables F alternately
110 an upward and rearward, downward and forward, or rotary reciprocating movement, the rear ends of the tables being supported on and vibrated over the links I. The crank-wheel P, operating the pitman Q, will vibrate the lever R to rock the shaft S, which movement will vibrate the links d' d^3 in pairs, the upper
115 links d' vibrating the grain-table G, the lower pair d^3 vibrating the shoe Z. The driving centers may be varied, so as to give more or less throw to the vibrated parts of
120 the machine. For instance, the distance of the crank-pin on the wheel P may be placed at different points between the periphery of the wheel and the shaft, or the other end of the pitman may be placed nearer to or farther
125 from the shaft S on the lever R and the links d' d^3 placed at such a distance from the shaft S as will give the desired result. Preferably the links d^3 are placed at a point nearer to the shaft, as the shoe and riddles
130 should not be vibrated so great a distance as the grain-table G. It will be apparent that a machine thus constructed may be operated with less power and be so adjusted as to run

smoothly, all of the vibratory parts set to balance, and the liability to rack and wear greatly reduced.

To remove the thrashed grain from the machine, spouts, as U and V, are provided, the former to convey the grain into any suitable receptacle and the latter to convey the tailings into the elevator-trunk and to insure a movement of the grain and tailings along in the spouts, hereinbefore mentioned. Means to vibrate the spouts longitudinally is provided, as shown in the drawings, especially in Fig. 7, which consists of a sway-bar W, pivotally secured to an arm C' (projected from the rear bolster D⁴) at one of its end portions, to which a cross-bar is secured, forming arms d⁷ d⁸, projecting at right angles to the bar W. The grain-spout U is connected with the arm d⁷ by the link d⁹ and the spout V to the arm d⁸ by the link d¹⁰, and to operate the sway-bar W a link, as Y, is provided, one end of which is pivotally secured to the bar W, the other end secured to the bottom of the shoe Z, the vibrations of which will carry the sway-bar W forward and back, which movement will rotate the arms d⁷ d⁸ about their pivotal connection with the arm C', by means of which the spouts are vibrated transversely to the movement of the grain table and shoe.

It will be noticed that all of the machinery connected with and including the vibrating portions of the machine are secured to and supported on the heavy sills A. The advantage of this arrangement will be apparent, as not only weight but whatever jar there may be caused by the vibratory movements of the tables F and G and the shoe Z is sustained by the sill A.

The tailings deposited by the spout V into the elevator-trunk N are carried up and forward to the cylinder in the usual way, and to prevent the cylinder throwing grain through the machine an apron, as O, is suspended from the deck, as shown in Fig. 4.

Having thus fully described the nature and object of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the sill and an upright portion of the main frame located back from the end of the sill, of a corner-plate consisting of a bottom portion, an upright portion extending transversely of the machine, and an upright portion extending longitudinally of the machine, said corner-plate serving as a brace to the main frame and forming a recess for the drive-pulley, substantially as set forth.

2. The combination, with the sill and an upright portion of the main frame, of a corner-plate having a horizontal portion and upright portions disposed transversely and longitudinally of the main frame, a cylinder-shaft having a bearing in one of the upright portions of the plate, a horizontal arm projecting from the front of the longitudinal upright portion of the plate around to the outside edge of the transverse upright portion

of the plate, and a standard extending from the sill up to the horizontal arm, said arm and standard forming a support for a second bearing of the cylinder-shaft, substantially as set forth.

3. The combination, with the crank-shaft for operating the separators, the grain-table, and the shoe, of a crank on the crank-shaft outside of the separators, a vibrating bar pivotally secured to the main frame, a pitman connecting one arm of the vibrating bar with the crank on the crank-shaft, and a pair of operating rods or bars connected at one end to the grain table and shoe, respectively, and at their opposite ends to the vibrating bar, one above and the other below its pivotal connection with the main frame, substantially as set forth.

4. The combination, with the separator-operating crank-shaft provided with a crank outside the separators, the grain-table, and the shoe, of a transverse rock-shaft journaled to the main frame, vibrating bars mounted on the opposite ends of the rock-shaft, a pitman connecting one arm of one of the vibrating bars with the crank on the crank-shaft, and two sets of operating bars or rods, one set on each side of the machine, one of each set being connected at one end to the grain-table and the other of each set to the shoe, the opposite ends of the two sets being connected to the vibrating bars, those connected with the grain-table on one side of the axis of the rock-shaft and those connected with the shoe on the opposite side of said axis, substantially as set forth.

5. In combination, a thrashing-cylinder, a vibrating separator comprising a series of narrow troughs, a grain-table, and a shoe Z, a cross-shaft H, having a series of alternating cranks, to which the front portions of the narrow troughs are attached and by means of which they are vibrated alternately, a crank-wheel P, mounted on said shaft, a pitman Q, connecting said crank-wheel to a lever R, shaft S, cross-head T, and links d', one end of each link being secured to the upper portion of the cross-head T and to the lever R at a point above the shaft S, while the other ends are secured to the sides of the grain-table, and links d³, one end of which is pivotally secured to the cross-head T and the lower portion of the lever R, and the other ends secured to the sides of the shoe, substantially as set forth.

6. The combination, with a grain-table extending beneath the separators from front to rear, a fan located beneath said table, and a grain-shoe located beneath the table and extending from its rear portion near to the fan, of a supplementary grain-table forming a rearward extension of the upper portion of the fan-casing, the said supplementary table extending beneath the screen portion of the grain-table proper and forming in conjunction with the shoe a wind-throat, which carries the air-blast well toward the rear portion

of the screen in the grain-table, substantially as set forth.

7. The combination, with a grain-table extending from beneath the thrashing-cylinder rearwardly to the rear end of the separators and provided with a screen throughout about the rear half of its length, a fan located beneath the table, and a grain-shoe leading from the rear forwardly beneath the screen portion of the table, of a supplementary grain-table projecting from the fan-casing rearwardly beneath the screen portion of the table and forming in connection with the shoe a wind-throat for conveying the blast to a point beneath the rear portion of the screen, substantially as set forth.

8. The combination, with the grain-table and a fan located forwardly of the screen portion of the table, of a grain-shoe extending beneath the screen portion of the table, a tailings-spout at the rear end of the shoe, a grain-spout at the front end of the shoe, a supplementary grain-board projecting from the fan-casing rearwardly beneath the grain-screen and forming with the shoe a wind-throat, which will carry the blast to a point about midway between the front and rear of

the screen, and an adjustable deflector secured at the mouth of the wind-throat, substantially as set forth.

9. The combination, with the separators, of supporting-links having transverse sockets in their heads and removable wooden pieces held in the sockets by their engagement with the sockets, the projecting ends of the wooden pieces forming journals, substantially as set forth.

10. The combination, with the vibrating table F, of the supporting-link I, having at each end a tubular portion a^3 , and wooden pins a^4 , removably secured in said tubular portions, substantially as set forth.

11. The combination of the vibrating grain-table G, supporting-sills A, and hanger J, said hanger having at its upper end an inwardly-projected journal portion, as b^6 , and at its lower end a square open-ended socket and journal-box, substantially as set forth.

In testimony whereof I have hereunto set my hand this 29th day of January, A. D. 1889.

WILLIAM M. KOPPES.

Witnesses:

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CHAS. R. MILLER.