(No Model.) 2 Sheets—Sheet 1.

A. J. WISE.

THRASHING MACHINE.

No. 379,191. Patented Mar. 6, 1888.

FIG. 1.

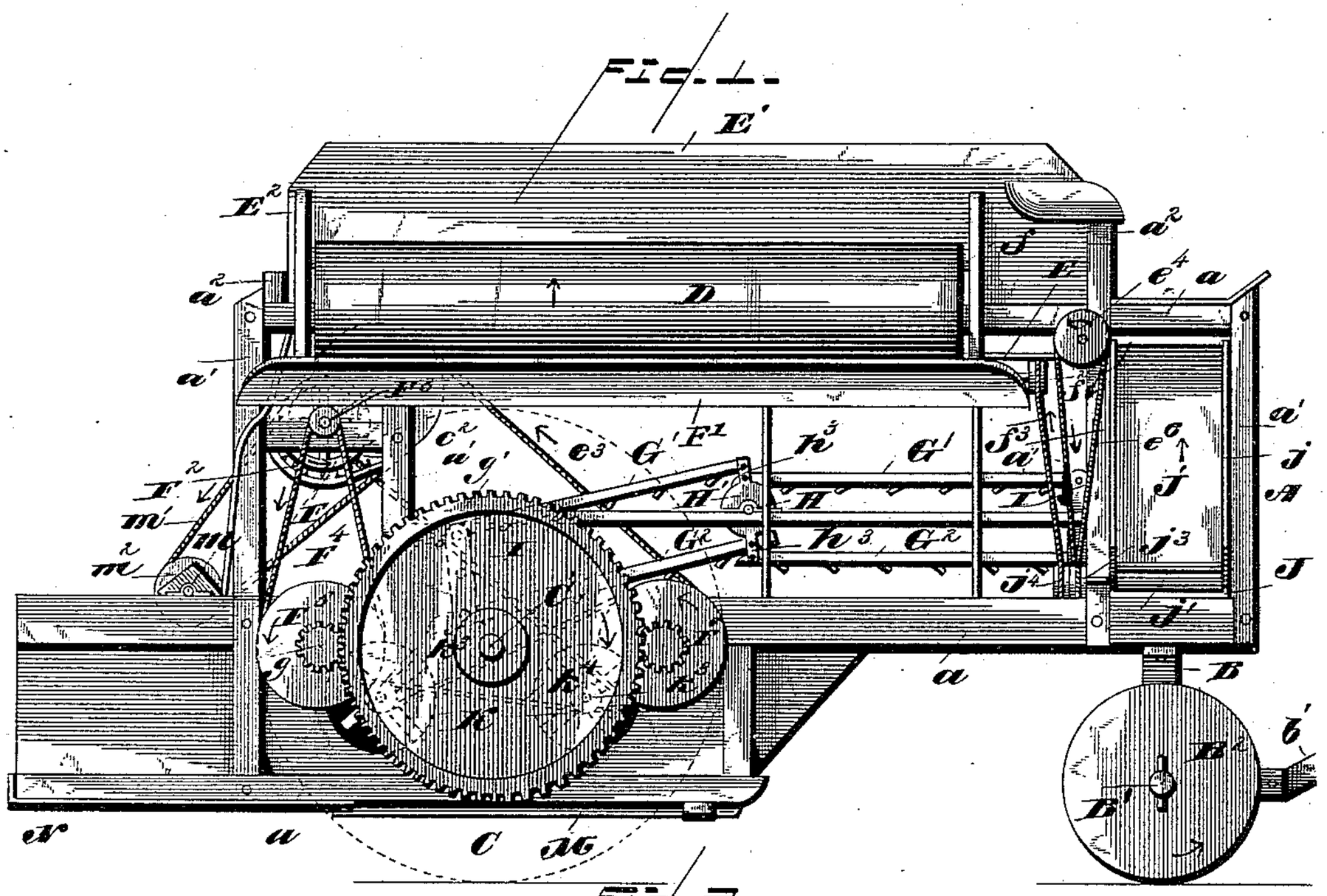

FIG. 2.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

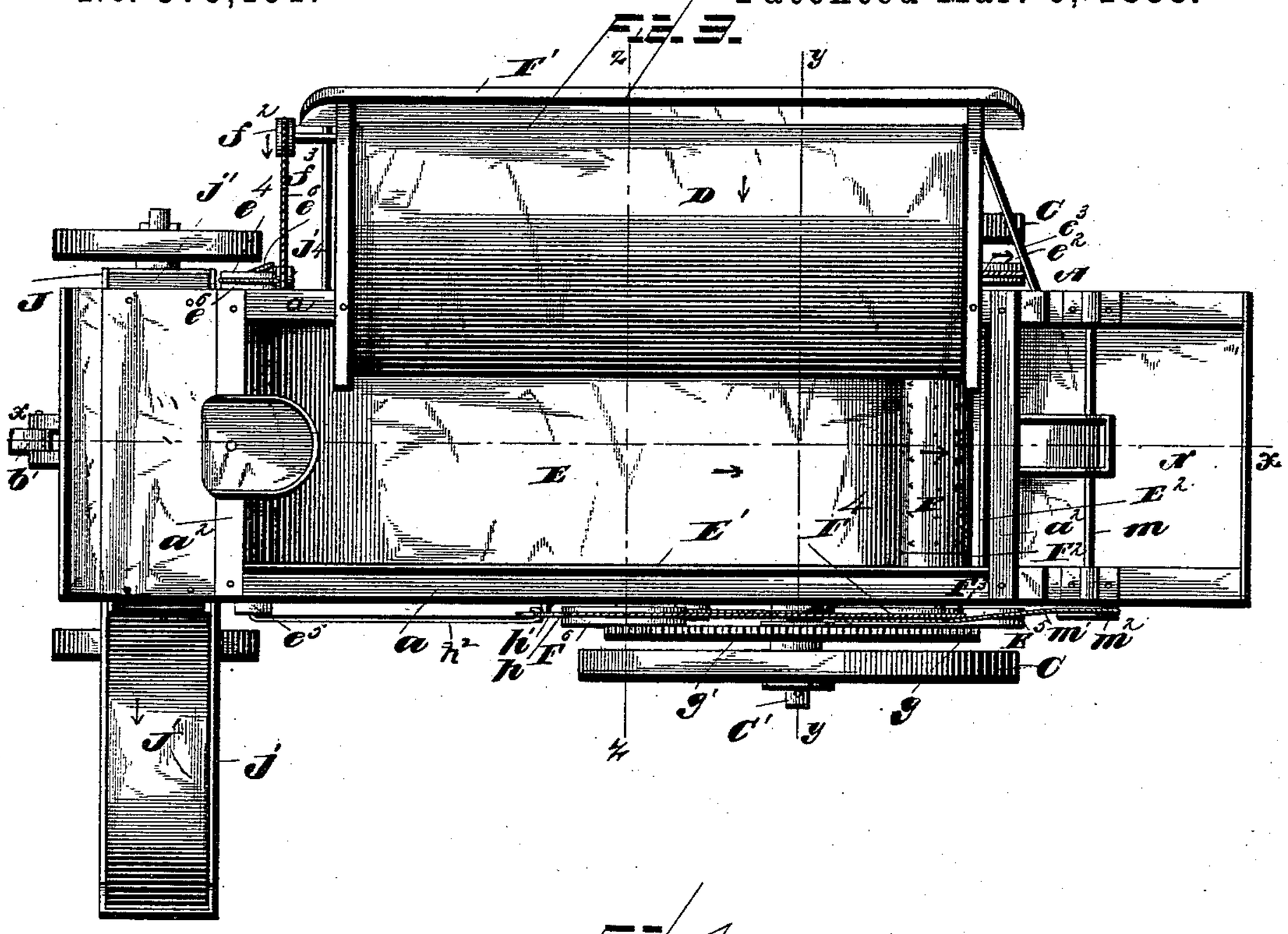
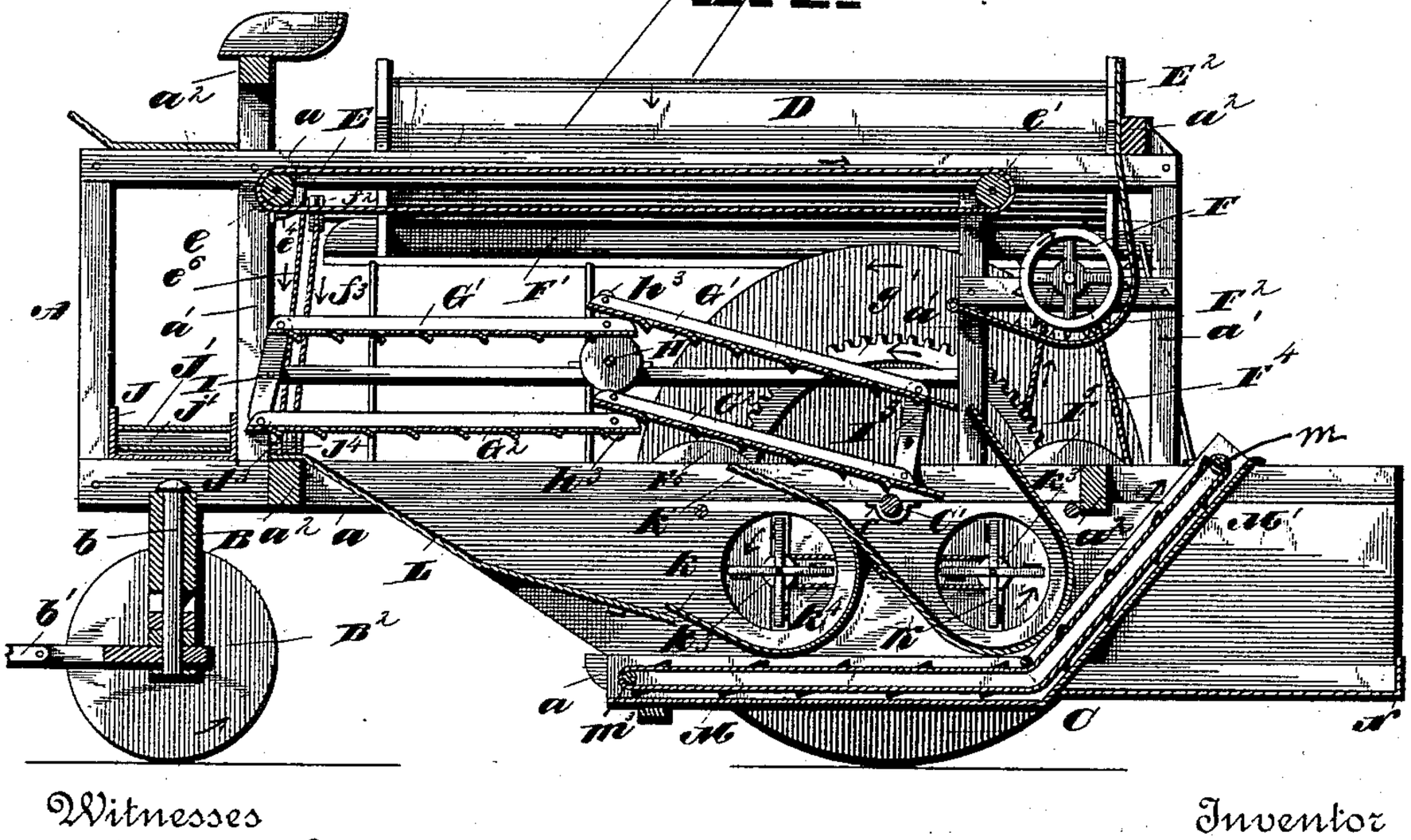


FIG. 4.



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UNITED STATES PATENT OFFICE.

ANDREW J. WISE, OF COTTONWOOD, CALIFORNIA, ASSIGNOR OF FIVE-SIXTHS TO PLEASANT D. LOGAN, REUBEN R. WISE, AND EBENEZER J. WISE, ALL OF SAME PLACE.

THRASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 379,191, dated March 6, 1888.

Application filed November 23, 1886. Serial No. 219,672. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. WISE, a citizen of the United States, residing at Cottonwood, in the county of Shasta and State of California, have invented new and useful Improvements in Thrashing-Machines, of which the following is a specification.

My invention relates to improvements in traveling thrashing-machines; and it consists in the peculiar combination of devices and the novel construction and arrangement of the various parts, substantially as hereinafter fully described, and specifically pointed out in the claims.

The object of my invention is to construct a traveling thrashing-machine provided with an improved mechanism for cleaning the grain.

The drawings hereto annexed illustrate a traveling thrashing-machine embodying my present invention, in which—

Figure 1 is an elevation taken from one side of the machine, and Fig. 2 is a like view taken from the opposite side of the machine. Fig. 3 is a top plan view thereof, and Fig. 4 is a vertical central longitudinal sectional view on the line *x x* of Fig. 3.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates the main carrying-frame of my improved thrashing-machine, which comprises the upper, lower, and intermediate sills *a*, the uprights *a'*, and the transverse sills a^2, connecting the horizontal sills, the whole being very securely and firmly secured together by bolts or in any other suitable manner. The upper and intermediate horizontal sills *a a* are arranged parallel with each other and of the same length; but the lower horizontal sills *a* are arranged so that their front ends do not extend to the front of the machine and so that their rear ends extend in rear of or beyond the machine, as clearly shown, the rear ends of the intermediate sills being extended rearwardly of the machine and terminating in the plane of the lower sills, for a purpose presently described.

The front carrying-wheels, B^2, are journaled on the extremities of an axle, B', to which the draft-tongue *b'* is connected and which is secured by a king-bolt, *b*, to a bolster, B, rigidly affixed to the lower front portion of the main carrying-frame. By the arrangement shown and described the front axle is free to turn beneath the main frame to make a short turn.

C designates the driving-wheels for the rear axle, C', of the machine, which is arranged transversely across the same and journaled or fixed in suitable bearings, *c*, on the under side of the intermediate horizontal beams of the frame, as shown in Fig. 4. The said driving-wheels are of considerably larger diameter than the front wheels and constitute the driving-wheels of the machine, from which the motive power for the various mechanisms is derived. The motion of these driving-wheels is communicated by intermediate gearing to the various carriers, the thrashing-cylinder, and the shaking screens, in order to separate and clear the grain from the straw, chaff, and other impurities, all as will be more fully hereinafter described.

An inclined traveling belt, D, is arranged above the side of the machine and conveys the grain deposited thereon by the heading-machine, which precedes the thrasher over the field, onto a horizontal traveling belt, E, which carries the grain to the rear end of the apparatus and delivers it to the thrashing-cylinder F, from whence it passes to the shaking screens or sieves, the peculiar construction and arrangement of which parts I will now proceed to describe more fully.

The inclined primary traveling belt D passes over and is supported by horizontal rollers *f f''*, Figs. 1 and 2, which are arranged parallel with and at a suitable distance from each other, and these rollers are journaled at their extremities in a supplemental inclined frame, F', which is suitably secured to the upper framework of the machine. The lower horizontal roller, *f''*, of the said belt or carrier has a driving-pulley, f^2, affixed at one end, which is thereby positively driven by a belt, f^3, so that the carrier or belt will move upwardly to deliver its contents onto the horizontal traveling belt E.

The horizontal belt E is arranged between the upper side sills of the main frame and in

a position to receive the grain from the inclined belt D. This horizontal belt E is supported by rollers *e e'*, which are journaled in suitable bearings in the main frame.

The shaft of the roller located at the rear end of the main carrying-frame is extended at one end beyond the main frame, and has a driving-pulley, e^2, rigidly affixed thereon, which is rotated positively by a belt, e^3, which derives its motion by intermediate gearing from the main driving-wheels of the machine. The motion of the horizontal traveling belt or carrier E rotates the front roller, *e*, which is provided at one end with a pulley, e^4, and at its other end with a crank or eccentric disk, e^5, for a purpose presently described, and a belt, e^6, is passed over the pulley e^4 to transmit the motion thereof to a straw-discharging belt at the front end of the machine.

A shield, E', is provided on the side of the machine opposite to the belt D, to prevent the grain passing over the side of the machine.

The belt E delivers the grain from its rear end onto the cylinder F, and a guard or shield, E^2, is provided to prevent the grain being thrown from the rear end of the machine.

The thrashing-cylinder and concave are arranged below and in rear of the rear end of the belt E to receive the grain therefrom.

The shaft of the cylinder is journaled in suitable bearings in the main frame of the machine, and at the extremities of the said shaft are affixed belt-pulleys F^3, over which pass suitable belts, F^4, which are driven by larger pulleys, F^5, that are arranged upon suitable shafts which are journaled in bearings on the intermediate horizontal sills of the main carrying-frame. These shafts are each provided with gear-pinions *g*, which rotate therewith and mesh with larger gear-wheels, *g'*, which are rigidly affixed to the inner sides of the large driving-wheels C, whereby, when the driving-wheels are rotated, the pinions gearing therewith are likewise actuated and rotate the pulleys and the belts, which in turn revolve the shaft and thrashing-cylinder. Two of these large belt-pulleys F^6 are arranged on each side of the machine and, being geared to the gear-wheels *g'*, are actuated simultaneously thereby, one pulley of each pair being provided for the proper rotation of the thrashing-cylinder, to which they are geared by intermediate belts, as hereinbefore described, while the other pulley of one pair is belted to the shafts of the rotary fans to rotate the latter. The remaining pulley of the other pair receives the belt e^3 of the roller *e*, that actuates the horizontal traveling belt or carrier E, as will be very readily understood.

The screens or sieves are arranged immediately in front of the thrashing-cylinder to receive the grain, chaff, straw, and other matter therefrom. These screens are arranged in pairs—an upper pair of screens, G', and a lower pair, G^2. The front screens of each pair are arranged in a horizontal position and parallel with each other, and the rear screen of each pair is arranged at an angle or slightly-inclined position to the front horizontal screen, as shown in Fig. 4 of the drawings.

The horizontal screens are arranged to move in horizontal planes and parallel with each other, and the inclined screens are adapted to reciprocate, and thereby to convey the chaff and straw that have been separated from the grain by the thrashing-cylinder upwardly and toward the front end of the machine, where it is discharged by a belt, to be presently described.

H designates a horizontal shaft which is arranged transversely across the machine between the upper and lower screens thereof, and at the point where the horizontal and inclined screens meet, as shown more clearly in Fig. 4 of the drawings. This shaft is journaled in suitable bearings that are affixed to the main carrying frame of the machine, and it is free to rock or oscillate therein. At the ends the shaft has disks *h*, rigidly affixed thereto, so as to move therewith, each disk being provided with a crank arm or pin, *h'*, to which is pivotally connected the rear end of a connecting-rod, h^2, which in turn is pivotally connected to the disk e^5 of the front roller, *e*, of the traveling belt E, whereby, when the front roller is rotated, the motion thereof will be communicated to the rock-shaft to oscillate the latter by the crank-disks e^5 and *h* and the connecting-rod h^2, as will be very readily understood. On the inner sides of the frame the rock-shaft is provided with a pair of crank or eccentric disks, H', as shown in Fig. 1, which rotate or move therewith, and each disk is provided with projecting arms or pins h^3 at diametrically-opposite points in its periphery, thus providing four crank arms or pins, which are moved or actuated simultaneously with the rocking motion of the shaft H. The crank-pins of said disks are located at the points where the four screens meet, and the inner meeting ends of the said screens are pivotally connected to the crank arms or pins, so that the screens are given a vibrating or shaking motion with the rock-shaft, and they are thereby also more securely upheld or supported in their proper relative positions.

The inner ends of the inclined screens are connected to the crank arms or pins at points above the plane where the rear ends of the horizontal screens are connected to the said crank-arms, whereby the elevated front ends of the inclined screens are arranged above the contiguous ends of the horizontal screens, and are thereby adapted to more effectively discharge the straw, chaff, grain, &c., upon the horizontal screens. The outer ends of the said vibrating screens are supported by means of vertically-disposed oscillating bars or rods I, which are arranged at opposite sides of the screens. The screens are pivotally connected to the extremities of these vertical oscillating bars or rods, so as to be supported thereby, and the bars or rods are pivotally connected centrally to the main supporting-frame of the machine. Thus it will be seen that when the

screens are vibrated by motion from the rock-shaft H the vertical bars or rods are oscillated or turned on their pivots and the proper movement is insured to the screens, while at the same time they are very securely supported in their proper relative positions.

It will be observed that the ends of the screens are attached to the arms of the disks, the disks being thus left intact and with their strength unimpaired. The greatest strain exerted upon disks by the screens in their vibrations will be applied to the same at their pivotal points. By my construction the greatest expanse of material is provided at this point, thus strengthening what has heretofore proved the weak point and providing a construction which is less liable to snapping and breakage than the ordinary rocking arm.

From the foregoing it will be seen that the screens of each pair are always maintained in a parallel position and are simultaneously operated in contrary directions.

When the grain, chaff, straw, &c., are discharged from the thrashing-cylinder and concave upon the upper inclined screen, the heavier particles of grain fall through the perforations or mesh of the upper inclined screens upon the lower screens, and through the latter into a suitable trough, while the straw and chaff are conveyed by the upper inclined screen onto the upper horizontal screen, the forward and upward movements of the upper screens carrying the straw and chaff toward the front end of the machine, where they are discharged, the lighter chaff that passes through the upper screens with the heavier particles of grain being blown toward the front of the machine along with the straw and other impurities by means of fans or blowers K, presently described.

A transverse trough, J, is provided at the front end of the machine below the screens, and has an upwardly-inclined section, *j*, which extends laterally from the main frame. An endless belt, J′, in this trough receives the straw and chaff from the screens and conveys them from the machine. This belt passes over rollers j' j^2, journaled in opposite ends of the trough, and the roller j' is provided with a pulley, j^3, which receives motion from the roller *e* of the belt E by means of the belt e^6. The roller j' is also provided with a pulley, j^4, over which the belt f^3 passes, thereby actuating the belt D. The fans K are of any suitable construction and are arranged beneath and adjacent to the screens in suitable shells, *k k′*, which direct the blast onto the screens.

L is an inclined bottom which directs the grain falling from the screens onto a belt, M, which carries the same to the rear of the machine and discharges it into a bag supported on a platform, N.

This being the construction of my invention, the operation thereof is as follows: The machine is drawn across the field by animals connected to the draft-tongue in the ordinary manner, and the rear driving-wheels are rotated by frictional contact with the ground to set the various parts of the machine in motion. The "header" discharges the grain upon the inclined primary carrier, which delivers it to the secondary horizontal carrier, from whence it is discharged onto the thrashing cylinder. The grain is separated from the straw and chaff in the cylinder and expelled by the latter upon the upper screen. The straw and chaff are carried to the front end of the machine by the upper screens and delivered onto the straw-carrying belt or carrier J′, from whence they are discharged from the machine, and the heavier particles of grain fall or drop by gravity through the upper screens upon the lower screens, where the lighter impurities and chaff which have passed through the upper screens with the grain are blown toward the front end of the machine by the fans. The cleaned grain falls through the lower screens upon the inclined partition, and from thence it is delivered into the trough M and conveyed to the rear end of the machine by the endless belt or carrier M′, working therein, the grain being discharged into a sack or receptacle upon the platform N.

The entire operations are carried on automatically without the attention of the driver, and as the machine is being drawn across the field, thus dispensing with the expensive engines for running the various parts of the machine.

Changes in the form and proportion of parts of the apparatus herein shown and described as an embodiment of my invention can be made without departing from the principle or sacrificing the advantages thereof.

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

1. In a traveling thrashing-machine, the combination of the rotary cylinder, the concave therefor, the vibrating screens arranged in pairs and operating simultaneously, one screen of each pair being arranged in an inclined position and the other screen of the pair being disposed in a horizontal position, the said upper and lower screens being arranged parallel with each other, the shaft H, and the disks *h*, mounted on the said shaft and having arms connected to the said screens, substantially as described.

2. In a thrashing-machine, the combination, with the screens G′ G^2 in the lower portion of the machine, of the rock-shaft H, the disks *h*, mounted on said shaft and formed with arms to which the screens are attached, the roller *e* in the upper front portion of the machine, disk e^5, mounted on said roller, and connecting-rod h^2, pivotally attached at its opposite ends to the disk e^5 and the arms of the disks *h*, substantially as described.

3. The combination of the frame, the parallel horizontal screens, the inclined screens arranged at one end of the horizontal screens and overlapping the same, the disks *h*, formed with arms, and the rock-shaft arranged be-

tween the contiguous ends of the said horizontal and inclined screens and connected therewith by the arms of the disks *h* to actuate the same simultaneously, substantially as described, and for the purpose specified.

4. The combination of the frame, the parallel upper and lower screens, each having the horizontal and inclined sections, the oscillating links or bars pivotally connected to the frame and to the outer ends of said screens, the rock-shaft pivoted to the frame intermediate of the meeting ends of the horizontal and inclined sections of the screens, and arms on each side of said pivots connected to the ends of the screens, substantially as described.

5. The combination of the frame, the upper and lower screens, each having the horizontal and inclined sections, one overlapping the other at their contiguous ends, the rock-shaft, the disks secured on said rock-shaft and provided with crank-arms, to which the contiguous ends of the screens are connected, and the pivoted bars or rods I, to which the outer ends of the screens are pivoted, substantially as described, and for the purposes specified.

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

ANDREW J. WISE.

Witnesses:

WM. EDWARDS,

ALVIN A. COFFEY, Jr.