(No Model.) 2 Sheets—Sheet 1.

H. N. DALTON.

THRASHING MACHINE.

No. 257,922. Patented May 16, 1882.

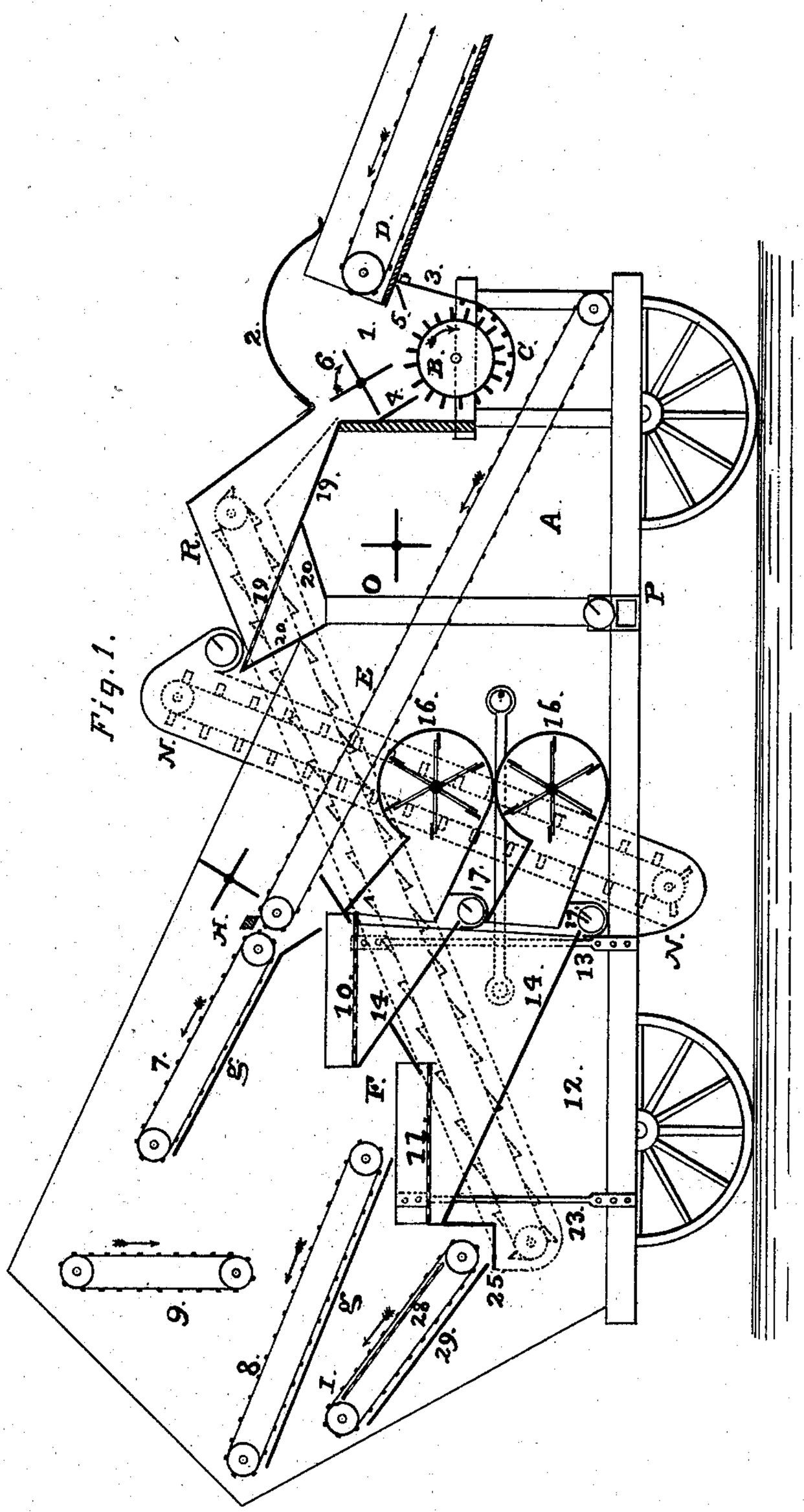

Fig. 1.

Witnesses:

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Wm. A. Blank

Inventor:

Henry N. Dalton

By his Attys., Boone & Osborn

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

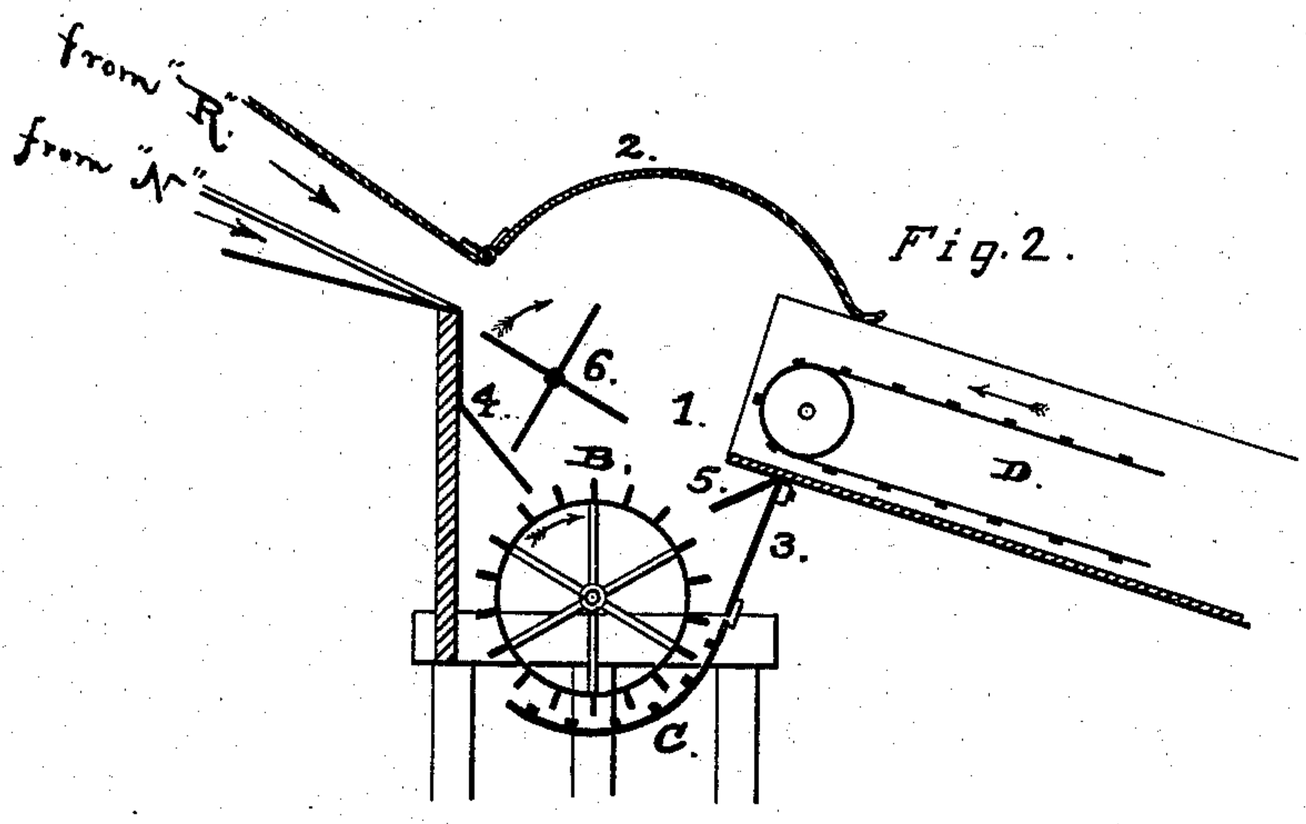


Fig. 3.

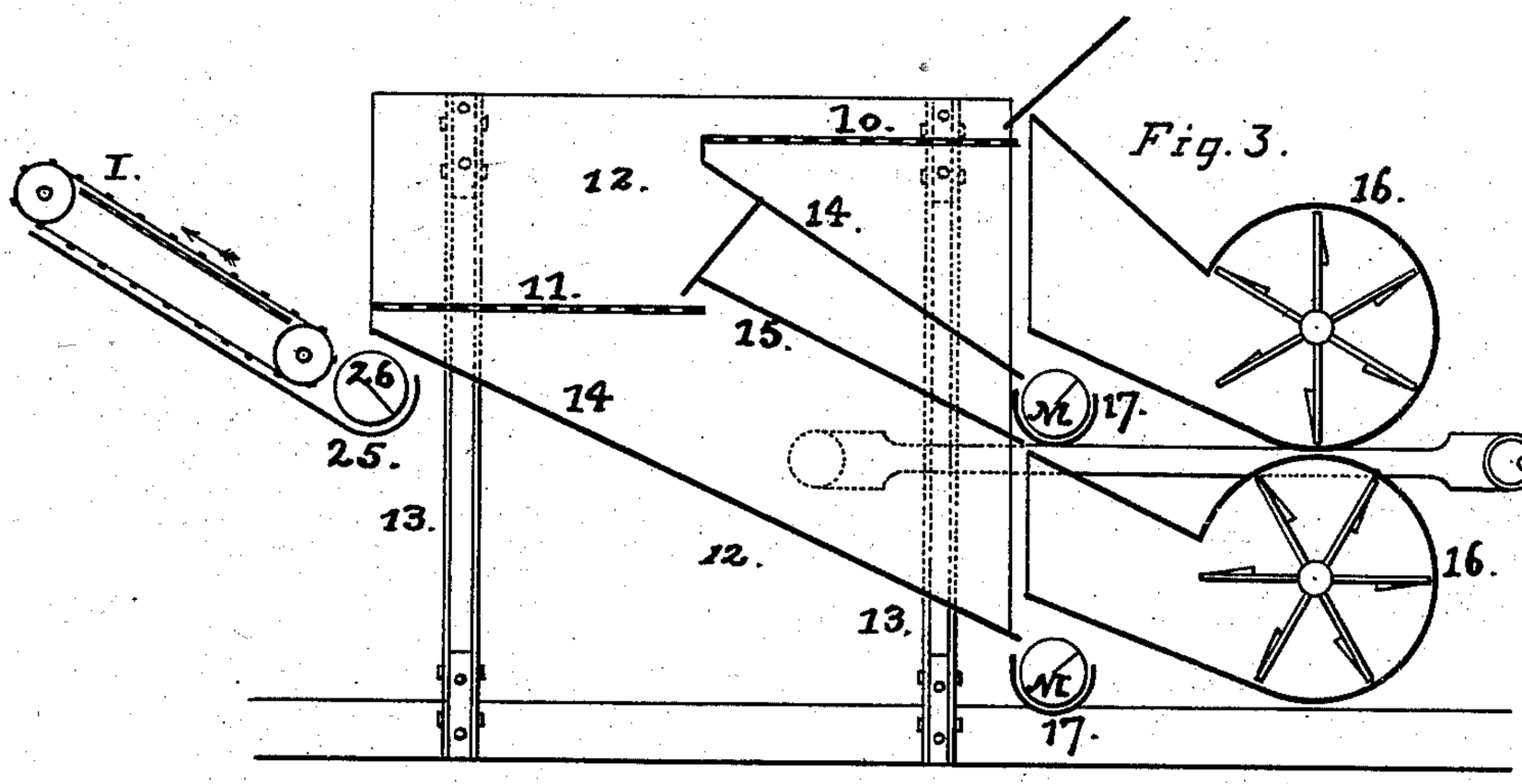
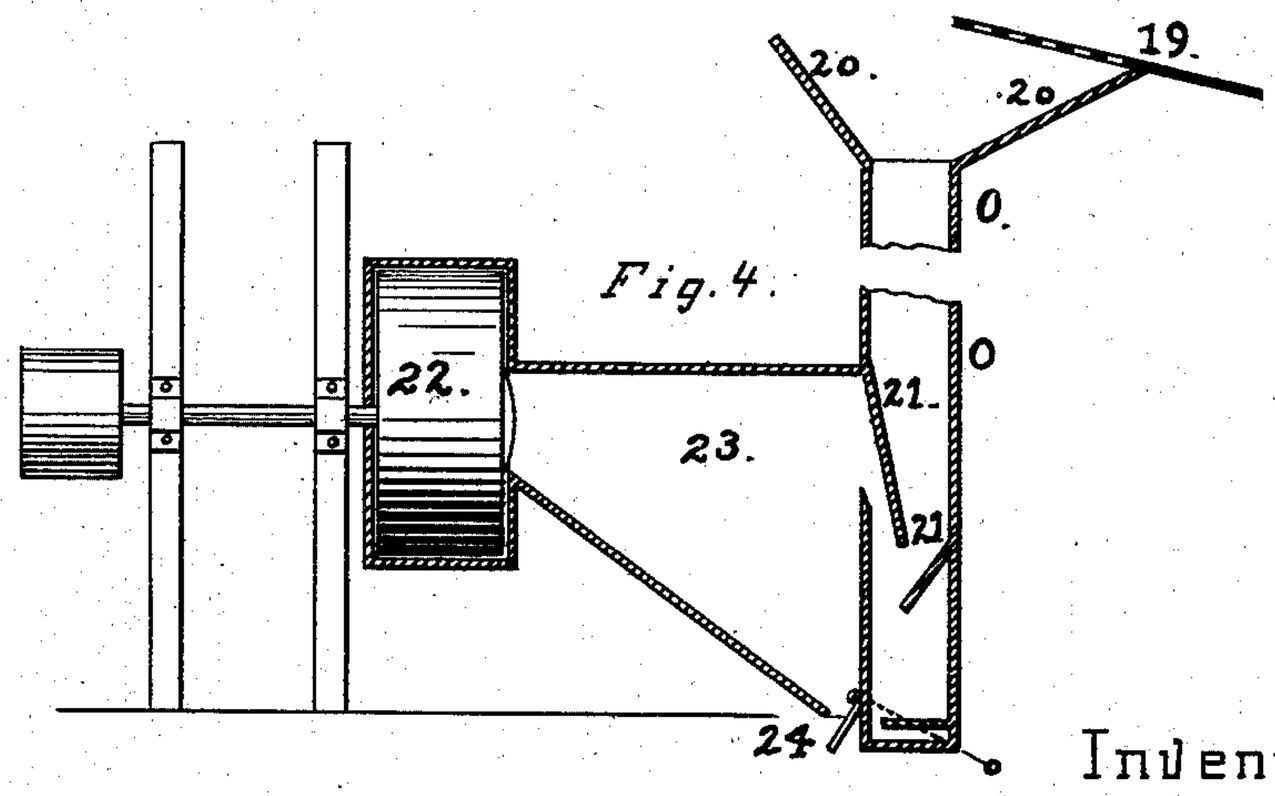


Fig. 4.



Witnesses:

W. Voit

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Inventor:

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UNITED STATES PATENT OFFICE.

HENRY N. DALTON, OF OAKLAND, CALIFORNIA.

THRASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 257,922, dated May 16, 1882.

Application filed February 14, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY N. DALTON, of Oakland, in the county of Alameda and State of California, have made and invented certain new and useful Improvements in Thrashing-Machines; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawings.

My invention relates to improvements in means for feeding or introducing and supplying grain to the cylinders of thrashing-machines; to improvements in means for separating the grain from the straw and cleaning it of foreign matter; and to improvements in means for treating or acting upon the straw and chaff refuse to recover and return grain, unthrashed heads, and partly-thrashed heads, liable to escape in the offal.

In the drawings herein referred to, Figure 1 is a vertical section through the length of the frame and parts of the thrashing-machine to which my improvements are applied. The elevators for conveying the grain to the bagging-spouts and for raising and discharging the "returns" into the cylinder are shown, for convenience of illustrating, as being upon the off side of the machine, while in practice they would be both on the near side in this view. Fig. 2 is a vertical section through the thrashing-cylinder and concave, showing the manner of forming a close chamber around the thrashing apparatus, and my improved mode of feeding and supplying the grain thereto. Fig. 3 is a vertical section through the separator, fans, and the chaff-stacker. Fig. 4 is a section through the chute or conductor leading to the bagging-spouts, showing the cleaning apparatus for treating the grain at its point of discharge into the bags.

I inclose the space around and over the thrashing-cylinder, so as to form a closed chamber, 1, into the upper part of which and over the top of the cylinder I introduce the grain; and I place and operate within this chamber a means for breaking up, loosening, and supplying the grain to the cylinder as it comes from the end of the feeder. To accomplish this I shut in the space between the sides A of the machine-frame and over the cylinder B by means of a concave top or cover, 2, and front and rear boards, plates, or partitions, 3 4. The top 2 I make detachable, or so that it can be turned back, either by hinging it at the rear or by making it to lift entirely off, like a cap, and the front plate, 3, I make removable, so that it also can be taken out and inserted when desired.

The rear plate, 4, can be fixed permanently in place, and its office is to act as a "cut-off," both to prevent the escape of grain from the chamber over the cylinder and to cut off the return of thrashed grain, which is liable to be drawn back by the cylinder from the discharge end of the concave. The front plate, 3, is a continuation of the front edge of the concave C, and it fills up the opening between the concave and the under side of the feeder D. Below the end of the feeder, where it enters and projects into the cylinder-chamber 1, I place an inclined plate, 5, which projects toward the cylinder, for the purpose of acting as a cut-off to prevent the grain from catching beneath and being drawn back by the under surface of the feeder. This cut-off 5 may be on or a part of the front plate, 3, or else fixed in place on the lower portion of the feeder end.

Within the chamber, and above the cylinder inclosed by it, I place a device for breaking up and separating the straw to be thrashed, which is operated to catch or work against the straw as it leaves the end of the feeder and throw it in a free and loose condition uniformly over and upon the cylinder and toward the concave. The means I employ for this purpose consists of the beater-shaft 6, provided with arms or blades, after the usual manner, and operated with a rapidly-rotating movement in a forward direction, or against the travel of the material entering the chamber from the feeder. The position of this beater and its rapid rotation cause it to break up and free the straw of all lumps and bunches and to bring it into a more uniformly disintegrated condition before it is caught by the cylinder and concave, and the result of this treatment, that the use of the closed chamber around the cylinder renders possible, is to produce an even distribution of the grain to be thrashed over the length of the thrashing-cylinder, and thus prevent any straining, stopping, or irregular action of the cylinder by the clogging or collection of the

grain in bunches or masses in between the concave and cylinder.

I employ an endless straw-carrier in two parts, sections, or divisions, one of which takes the straw from the grain-belt E and carries it to the rear of the machine, while the other section, placed behind and at a distance below the first section and within the machine, catches the refuse straw as it drops from the first section and throws it out at the tail of the machine upon the straw-pile. I place these two sections of endless carrier so as to obtain a perpendicular fall of some distance between the upper or discharging end of one section and the surface of the next section. The first section, 7, is placed, in the usual manner, at the rear of the end of the grain-belt; but the second section, 8, has a position below at the rear of the section 7, so that it shall receive and convey to the rear of the machine the straw that is thrown from the upper section. The fall provided for the straw is for the purpose of allowing the grain and unthrashed heads to separate and drop through the straw and through the openings in the carrier onto the inclined board or bottom *g* below the carrier, while the straw, from its lighter quality, will fall less rapidly and will be caught upon the traveling surface of the carrier. All the heavy particles thus separated from the refuse by the second section of carrier 8 are directed and introduced to the separator F by the inclined bottom board, *g*, of the carrier to receive the action of the sieve.

In some qualities of grain, and in long straw particularly, I find it to be of great advantage to employ an additional device in connection with the perpendicular fall or space between the two sections of straw-carrier to facilitate the loosening and separating of the entangled grain and heads from the body of straw. In short straw, also, it will be found desirable to use this device for producing a more certain and complete removal of grain particles and heads from the tailings. The means or device which I employ for this purpose consists of a slatted endless belt or draper, 9, placed in an upright position behind and at a distance from the discharging end of the straw-carrier 7, so as to intercept and be struck by the straw as it comes in a stream or body from the carrier, and thus the draper 9 is made to present a surface against which the straw shall impinge and be arrested in its backward movement through the space over the lower carrier, 8. A rapid movement is given to this draper 9 by means of a train of gears from the carrier-shaft 7, so that the device shall be driven at a higher speed than the carrier, the result of which is to effect a breaking up and loosening of the straw and its precipitation through the space and upon the lower carrier, 8, and thereby release the grain and heads confined and entangled therein. In short clean straw, where the separation is well performed on the grain-belt, this movement of the draper may be dispensed with and the straw be projected by the carrier 7 against the stationary draper 9, as against a fixed surface; but when working in long straw the rapid movement then given to the draper 9 will cause the slats or projections of the belt to act with a better effect upon the stream of refuse or tailings, and will thoroughly break and loosen the straw and release the particles to be recovered.

One or more beater-shafts could be substituted in place of the draper 9 to tear up and loosen the straw in its descent to the lower carrier, 8; but the slatted draper herein described has the advantages of presenting a larger surface against the movement backward of the straw, and of being used also as a stationary surface without motion to merely check and divert the direction of travel of the straw-refuse.

To separate the chaff from the principal body of grain that is discharged from the end of the grain-belt or long draper, and also to receive and act upon the "returns" or the matter recovered from the refuse or "tailings" by the upper and lower sections of straw-carrier 7 8, I employ a separator of novel construction, which I operate by means of pitman-rods and cranks or eccentrics upon a shaft of the machine in the ordinary manner. I construct this separator F with two sieves, 10 11, which I place in different planes and one behind the other, so that the first sieve, 10, has a position underneath the opening H, where the grain is discharged from the long draper to receive and act upon the principal body of grain, while the second sieve, 11, has a position behind the first sieve and on a lower level, so as to receive both the matter recovered from the refuse or tailings by the straw-carrier 8 and also the matter discharged from the surface of the first sieve by the vibrations of the separator. The two sieves are mounted in one frame and have a common vibration. They are supported upon and by the spring-rods 13 13, fixed at the upper ends to the separator-frame 12 and at the lower ends to the principal frame A.

Within the frame 12, and beneath the sieves, I secure the necessary inclines 14 and deflectors 15 for directing the wind from the blowers 16 16, and for conducting the separated grain from beneath the sieves into the auger-spouts 17 17, connecting with the elevator N.

I employ two separately-acting fans, 16 16, by which I apply a strong and concentrated current of wind under the whole surface of each sieve, and by the arrangement of one sieve below the other I am enabled to place the fans 16 in line over each other in a compact manner, so that power can be easily applied to run them together, and the wind from each fan can be brought more directly underneath and distributed to its proper sieve. I thus make the surface of the screen operative and effective at all points, and practically operative at its rear end, where, in large screens, the grain lodging at such point is frequently

discharged with the tailings by the vibrations of the separator, instead of being properly separated and directed into the grain-spouts 17.

I have found in practice that the current of wind from a fan of sufficient size to operate under the surface of a large screen has a tendency to take the most direct route and outlet through the front end of the screen, as the fan acting at or to one side of the screen does not give proper force and distribution of wind to the rear end of the screen, and therefore this imperfect operation and loss of grain in the refuse is the result.

My improved arrangement of screens and fans gives a more rapid and complete separation, and there is less amount of grain to be returned to the thrashing-cylinder. One part of the screening-surface of the sieve 10 is also adapted to receive and act separately upon the cleaner body of grain from the grain-belt, while the second part of the screen receives the matter recovered from the refuse and separates it independently of the upper screen.

The grain passed through the sieves of the separator is conveyed in the usual manner, by means of augers M and elevator N, up to the front of the machine to the chute O, that leads to the bagging-spouts P; but instead of discharging the grain directly into the chute, I cause it to pass through a cleaning operation as it enters the chute. This final screening I accomplish by placing a sieve, 19, at the front of the machine and over the top of the grain-chute O, so as to catch the grain from the end of the elevator N. I prefer to place this sieve just behind the cylinder-chamber 1, so that I can carry or extend the lower and discharging end of the sieve directly into the space over the cylinder, by which all matter retained by the screening-surface will pass and be discharged upon the top of the cylinder to be worked over again, but the clean grain will pass into the chute. Below this sieve 19 are the inclines 20, that form a hopper-like extension of the chute O, to catch and direct the grain in its passage from the sieve.

As the grain descends in the chute or conductor O it is subjected to and undergoes a purifying process or operation to extract all foul matter—such as oats, "cheat," and seeds of different kinds, that detract from the quality of the wheat and require to be removed. For this purpose I place in the interior of the chute and on opposite sides a number of inclined shelves or deflectors, 21, to change the perpendicular fall and descent of the grain into a zig-zag course, and in connection with the chute and the spaces left and provided beneath the shelves I employ an exhaust-fan, 22, and a vacuum-chamber, 23, having an aperture that opens into the chute beneath the shelves, or immediately under one of them, so that by the suction of the air through the chamber-aperture from the chute O the lighter seeds and particles will be drawn over into the chamber, while the heavier grain will descend to the bagging-spouts. The chamber 23 has an inclined bottom and a discharge-outlet controlled by a weighted valve, 24, by which the contents will be automatically discharged when a quantity has accumulated in the chamber.

The chaff-stacker I is an endless slatted belt placed behind the separator F to receive the offal from the last sieve and carry it out of the machine. For the purpose of recovering from this refuse matter any particles of grain and the unthrashed heads discharged from the sieves of the separator, the lower end of the stacker is placed just over a receiving-spout, 25, from which, by means of an auger, 26, the matter is conveyed to the elevator R, to be returned by it to the cylinder.

Beneath the upper part or backward-traveling surface of the belt I, I place a perforated plate or screen, 28, which supports the mass of matter being carried out by the belt, and also allows the heavy particles to be saved to pass down and drop upon the solid inclined bottom 29 below the stacker I. The end of this incline projects over the spout, so as to discharge into it, and thus the recovered particles are conveyed into this receptacle, to be raised by the elevator to the front of the machine.

By such construction and arrangement of parts I insure regular and uniform action of the thrashing-cylinder and prevent clogging and improper accumulation of the grain between the cylinder and concave. I provide for screening and treating the returns independently of the principal body of grain extracted by and upon the grain-belt, and for recovering a greater proportion of grain and partly-thrashed matter from the refuse.

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

1. In a thrashing-machine, the combination of the thrashing-cylinder, a closed chamber having a removable top and front plate, the feeder projecting a short distance into the chamber, a rotating beater revolved in the same direction as the motion of the thrashing-cylinder, and a fixed rear stop-plate to prevent the return of the thrashed material, substantially as set forth.

2. In a thrashing-machine, the combination of the means, substantially as described, for presenting an upright surface, 9, the straw-carrier, and the shoe or separator 11, substantially as set forth.

3. In a thrashing-machine, the combination of the endless belt or draper presenting an upright surface and having a movement in one direction, of the straw carrier 8 and the carrier 7, substantially as and for the purpose specified.

4. The combination of the sieves 10 and 11, the former being arranged above and back of the latter, so that the refuse from the former falls upon the latter, with the carrier 7 and incline *g*, for directing the heavier materials onto

the sieve 10, and the carrier 8 and incline *g*, for directing the heavier materials gathered by it upon sieve 11, substantially as set forth.

5. In a thrashing-machine, the combination, with the upright slatted endless belt or draper 9, of the separator F, having the two sieves 10 and 11, the inclines 14 and 15, receiving-spouts 17, and fans 16 16, substantially as set forth.

In witness that I claim the foregoing I have hereunto set my hand and seal.

HENRY N. DALTON. [L. S.]

Witnesses:
EDWARD E. OSBORN,
CHAS. D. WHEAT.