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HARDER, DOUGLASS, BECKER & ANTHONY.

Thrashing Machine.

No. 38,862. Patented June 9, 1863.

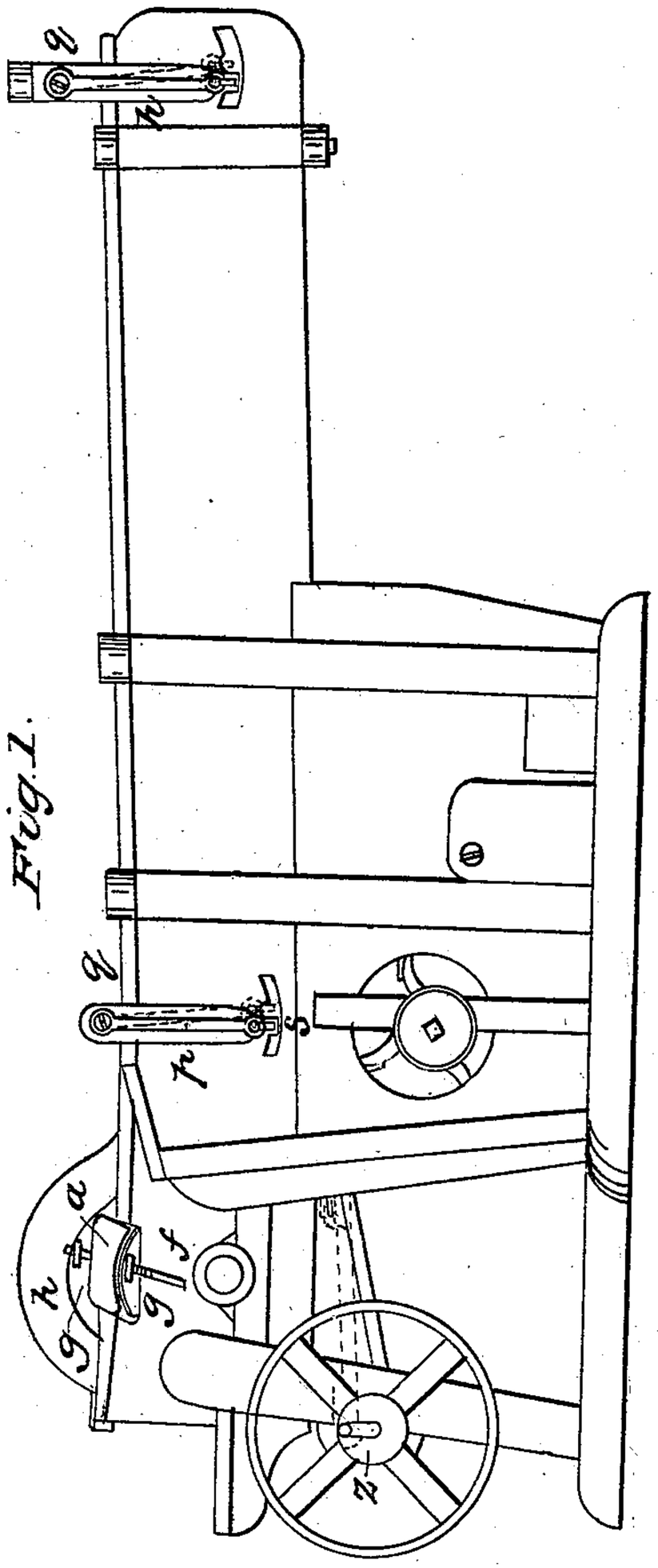

Fig. 1.

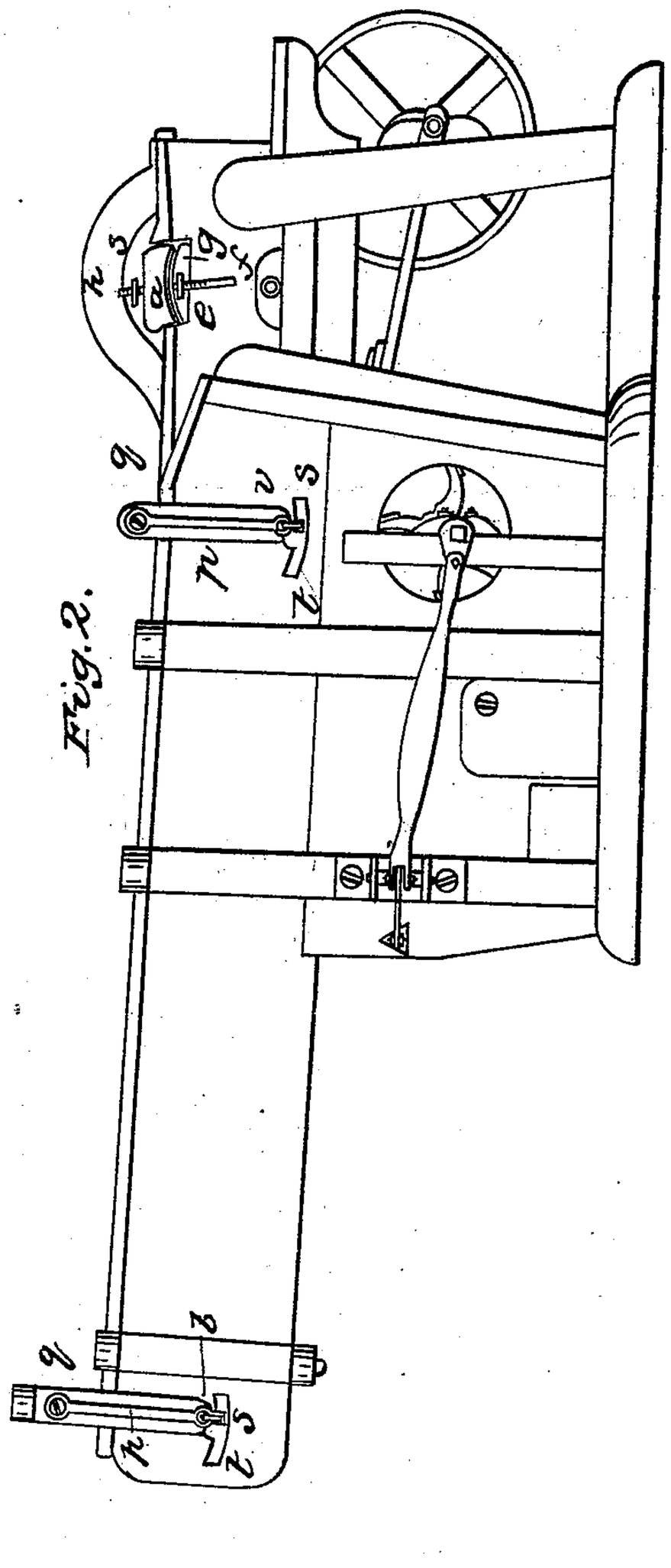

Fig. 2.

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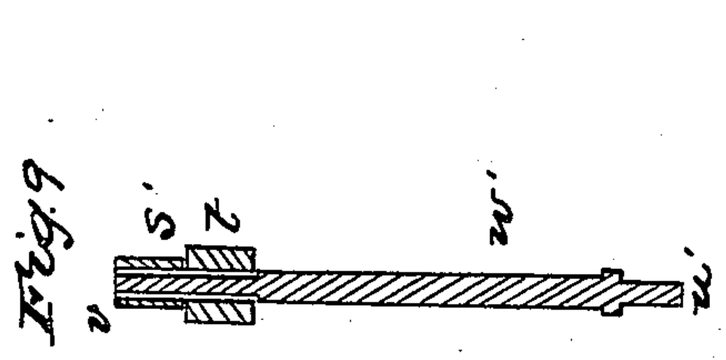

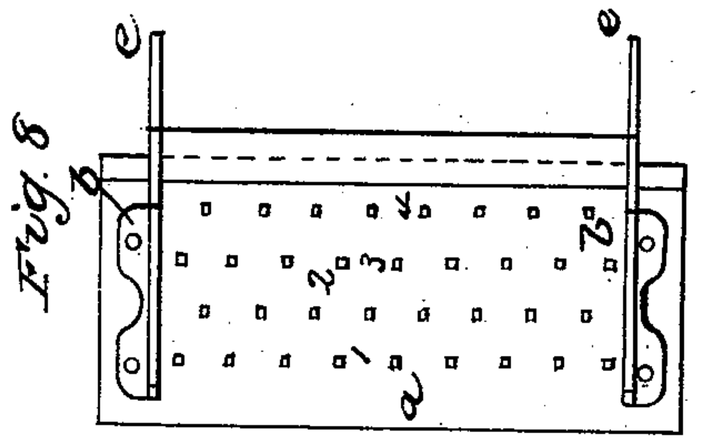

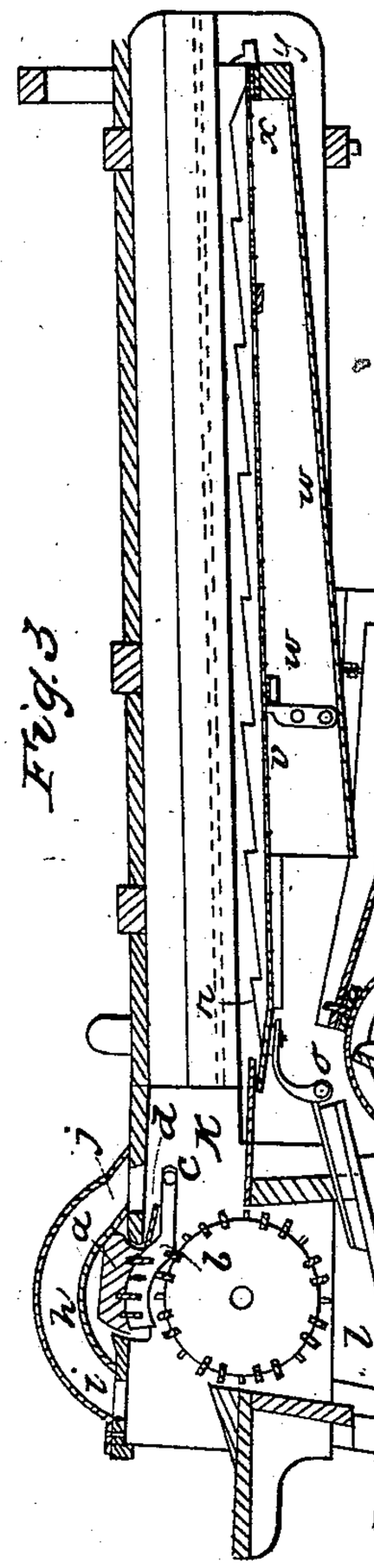

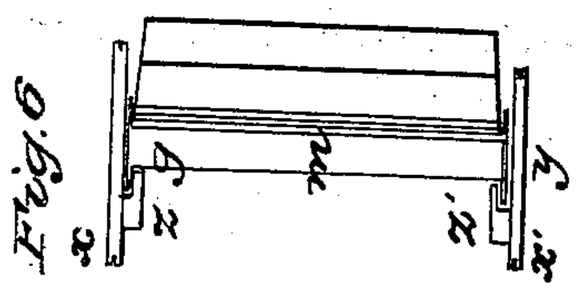

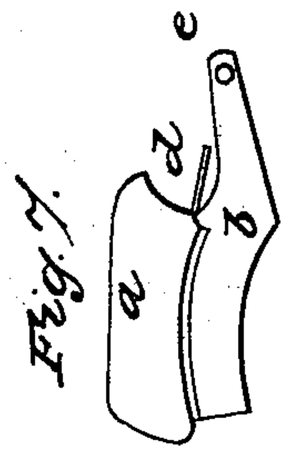

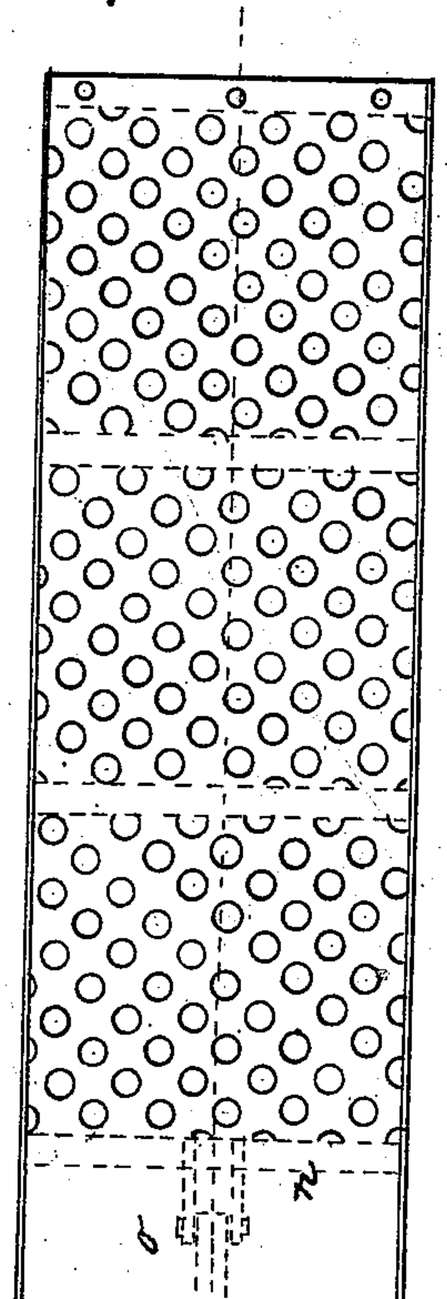

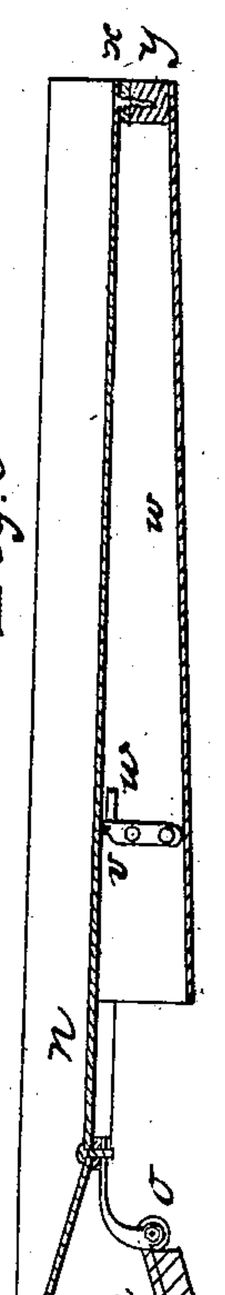

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UNITED STATES PATENT OFFICE.

MINARD HARDER, GEORGE W. DOUGLASS, AND HIRAM BECKER, OF COBLESKILL, AND DAVID ANTHONY, OF WORCESTER, NEW YORK, ASSIGNORS TO REUBEN AND MINARD HARDER.

IMPROVEMENT IN THRASHING-MACHINES.

Specification forming part of Letters Patent No. **38,862,** dated June 9, 1863.

To all whom it may concern:

Be it known that we, MINARD HARDER, GEORGE W. DOUGLASS, and HIRAM BECKER, of the town of Cobleskill, in the county of Schoharie and State of New York, and DAVID ANTHONY, of the town of Worcester, in the county of Otsego and State aforesaid, have invented certain new and useful improvements on combined thrashers and cleaners for thrashing and cleaning grain, &c.; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters and marks thereon.

Our invention relates to that class of machines whereby the grain is thrashed and cleaned by one continuous operation, but like all machines of this character any one of the several parts of our invention may be used on some other machine for a like purpose, or any one or more of these several parts may be used without the other or the remaining parts, although it is our intention to construct these machines with all the parts of our invention as is herein set forth.

The drawings forming part of this specification show a combined thrasher and cleaner having our improvements embraced in its construction, Figure 1 and Fig. 2 being side views thereof, the first showing the one side and the second the opposite side; Fig. 3 being a view by longitudinal section; Fig. 4, a top view of the separator detached from the machine; Fig. 5, a view by longitudinal section of the detached separator; Fig. 6, a view by transverse section of the separator and the sides of the box or casing thereof; Fig. 7, a side view of the "concave," with its suspending-arm detached; Fig. 8, a view of the under or inner surface of the concave, and Fig. 9 a view of the shaft detached from the machine.

In each of these figures where like parts are shown like marks and letters are used to indicate the parts.

The drawings so clearly and fully represent the several and various parts of the machine for thrashing and cleaning that it will be unnecessary to make special description of all the parts of the machine, and therefore such description will only be made of the parts or devices of the machine as are more particularly connected with our improvements.

The concave *a*, near each of its ends, is connected to arms *b*, which, as will be perceived, extend backward and are pivoted to the sides of the casing at *c*, this point *c* being therefore that on which the turning or movement is made. The concave has affixed to its back an air deflector or guide, *d*. Through each end of the concave a rod, *e*, passes, the lower end of which is attached to the side *f* of the casing, and from the upper end to some distance down the rods *e* have screw-threads, so that by jam-nuts *g g* the concave may be held at such position on the rods as may be desired.

A dust-flue, *h*, extends from an opening in the cap or cover of the mouth of the machine back to another opening in the cover at the throat or passage back of the concave and thrashing-cylinder. The dust at the mouth will therefore readily pass up through the opening *i*, through the flue *h* and opening *j*, into the throat or channel *k*, and thus be conveyed onward and away, instead of passing directly upward at the mouth and thus troubling and annoying the feeder. The guide *d* serves as a director to the dust and current of air moving along through the channel from the mouth to the throat, as also to the dust and air coming down through the opening *j*.

The advantages arising from having the dust-flue thus arranged and the concave thus suspended and controlled relate to convenience, strength, and durability. When the straw enters the concave, it being in its coarse and natural state, requires more space or room than when it has been bruised, pummeled, or softened down by the action of the teeth or spikes. By raising the concave by the means and in the manner here named the fore part of the concave where the straw enters is raised more than the rear part, and thus affords a position required by the condition of the grain; also, by this position of the concave there is allowed an easier passage of the straw, and consequently a saving of power and a more ready passage of dust than when the concave is turned up on one edge, as is done in other machines. Thus less dust is driven up or forward in the face of the feeder,

a stronger draft or current of air passes out of the back opening of the concave where the dust-flue terminates, and a stronger suction is produced at the discharge end of the flue, which the more readily carries the dust from the front or feeding part of the machine to the back or discharging end thereof. The concave does not wear out so fast, nor is it so liable to be injured by hard substances getting into it as when the one edge of the concave is exposed.

It will be seen that by raising the concave in the way here recited the front row of teeth lengthwise (marked No. 1) is raised a little the most. No. 3, being in corresponding mesh with 1, is raised somewhat less, but not so much as No. 2. No. 4, which is the corresponding row with No. 2, is raised less than either. It will also be seen that the equilibrium or ratio of mesh of the corresponding rows No. 1 and No. 3 is just equal to that of Nos. 2 and 4, which is ascertained to be of great service in thrashing clean. The advantages of the dust-flue are as great in thrashing or rubbing clover-seed, hulling rice, or cleaning cotton or flax as in thrashing and cleaning grain.

The pitman or connecting rod *l*, extending from the crank-shaft *m* to the separator *n*, is attached to the separator by a hinged joint, *o*. By this manner of connecting the pitman to the separator there is a saving of power, as it allows the pitman to work perfectly free and easy—in other words, to so operate as not to cause any strain upon the pitman or the crank, thereby requiring less power to run the crank or shaker shaft. The parts or pieces will all be more durable. In avoiding or overcoming the strain upon the pitman and crank we prevent the pitman from tearing loose or breaking at or near the place where it is fastened to the separator. The hole, also, at the other end of the pitman, through which the crank-pin runs, is made more durable, it being very liable to wear too large in a short time when there is much strain on the pitman.

The separator *n* is hung or suspended on rods *p*, the upper ends of which are pivoted to the uprights *q*, the lower ends having eyes *r*, into which the end of the rod or hook *s*, that is attached to the separator, fits, holes or curved slots *t* being in the sides of the casing for allowing the necessary movements of the hooks and the separator. By thus hanging or suspending the separator an ease of operation is acquired—the needed amount of power is lessened. It is the most efficient and perfect thing before the public for separating grain from straw, for the reason that in our peculiar way of hanging the separator when it is on its backward motion—*i. e.*, moving away from the feeder—it runs a little uphill, thereby giving the straw a toss, shaking the grain out of the straw, allowing the back end of the separator to be hung four or five inches the highest, which prevents the grain from running over, and yet, at the same time, with the tossing motion given to the straw, working it off freely up the four or five inches elevation. The suspending-rods being on the outside leaves more room within for a wider separator, and affords free access for oiling, repairs, &c. It is a cheaper and less complicated way to hang or suspend the separator.

The bottom *u* of the separator is detachable or removable. Hooks *v* on both of its sides, near its front end, fit into recesses or eyes *w* on the perforated plate of the separator. At its rear end screws *x* pass through the perforated plate and the bar *y*, which is affixed to the bottom, so that by taking out the screws *x* and slightly moving the bottom forward the hooks are moved out of the eyes and the bottom easily detached.

The advantages of a detachable or removable bottom to the separator are that by taking out the bottom we are enabled to thrash clover or any other light seeds, which cannot be done with stationary bottoms, because such light seeds and chaff will not work off the bottom, but will clog and fill up the bottom to the separator, and then compel the seed and chaff to go over the back end with the straw.

Fig. 1 of the drawings shows in red lines a certain position of the crank-arm *z* and of the suspending-rods *p* of the separator, this position of the crank-arm being one of arrangement of it in relation to the suspending-rods for a special purpose. It will be seen that the crank-arm is vertical and above its shaft, and that the suspending-rods are back of or to the right of a vertical line. This position of these rods and the crank-arm is for the purpose of giving the separator a more effective backward movement, and thus enabling it the more readily to work off the straw, the first quarter of the revolution of the crank being used for moving the separator up to its highest and most effective point, and to the end of its stroke.

By referring to Fig. 6 of the drawings it will be seen that strips of board *z'* are fastened to each wide side-board *x'* of the casing, forming a recess for and overlapping the side or side-board *y'* of the separator. These strips prevent grain and straw being driven from the cylinder or otherwise between the side-boards of the separator and the outside boards between which the separator plays, saving grain and preventing straw from getting in there and impeding the run of the machine—in other words, causing it to run heavy.

Fig. 9 shows the cylinder-shaft *w'*, having the one end *v'* extended further from the shoulder, or longer than the other end, *w'*. The advantage of having the one end longer than the other is convenience in changing from the right to the left hand, as it is called, and vice versa—*i. e.*, arranging it so as to run from either side of the horse-power. The long end of the cylinder-shaft allows the putting on of a small pulley, *s'*, on the outside of the large one, *t'*, from which small pulley a belt is run to the fan-shaft, and another belt from the opposite

end of the fan-shaft to the shoe or sieves, which two belts run the fans and sieves. The main belt from the horse-power which drives the cylinder runs on the large pulley. Now, in order to set the thrasher and cleaner on the opposite side of the horse-power, we slip off both the small and large pulleys, then put the larger one on the opposite end or short end of the shaft, and replace the small one on the long end of the shaft, thereby avoiding the necessity of changing any of the wheels which run the fans and sieves, and making it the most simple and easily changed machine from right to left hand before the public.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The "concave" suspended upon the arms *b*, and having attached to it the air-deflector or guide *d*, and the rods *e* and jam-nuts *g*, as and for the purposes herein set forth.

2. The dust-flue *h*, constructed and arranged as described.

3. The rods or bars *p*, placed outside of the casing, and connected to the sides of the separator by the eyes *r* and hooks *s*, passing through the slots *t*, in combination with the strips *z'* and side-boards *x'*, whereby the separator is moved and guided as herein described.

4. Connecting the bottom of the separator to the separator by the hooks *v*, eyes *w*, and screws *x*, so that the bottom may be easily and readily detached, as herein set forth.

This specification signed this 28th day of March, 1863.

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