2 Sheets--Sheet 1.

A. JOHNSTON.

Thrashing-Machine.

No. 164,178. Patented June 8, 1875.

Fig 2.

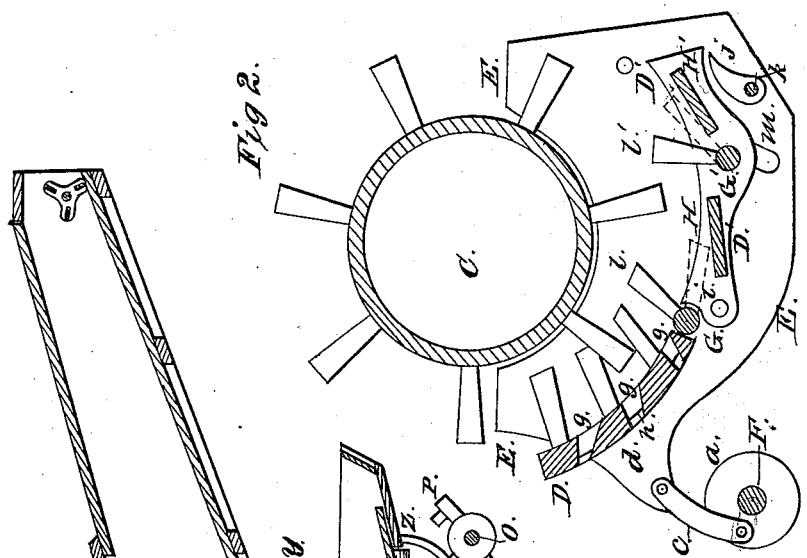
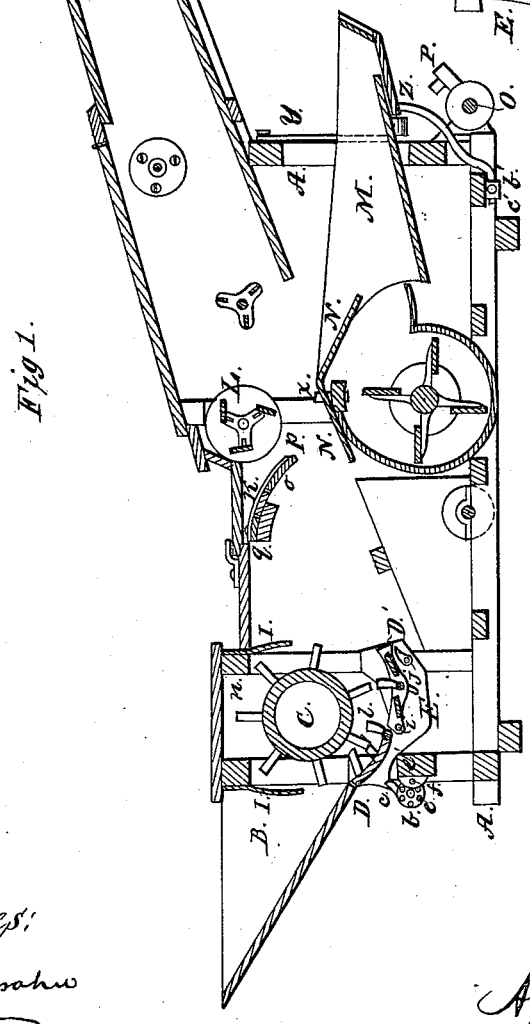


Fig 1.



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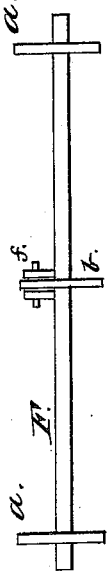

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Inventor:

Arthur Johnston

per R. F. Osgood Atty

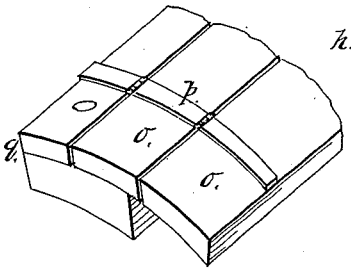
2 Sheets--Sheet 2.

A. JOHNSTON.

Thrashing-Machine.

No. 164,178. Patented June 8, 1875.

Fig 4.



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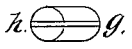


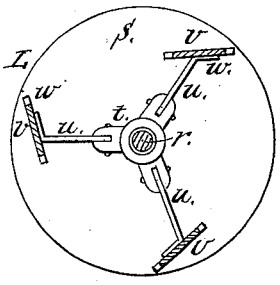


Fig 6.

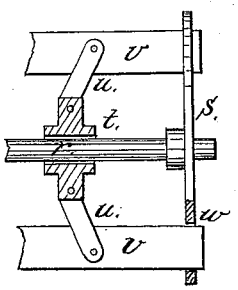


Fig 7.

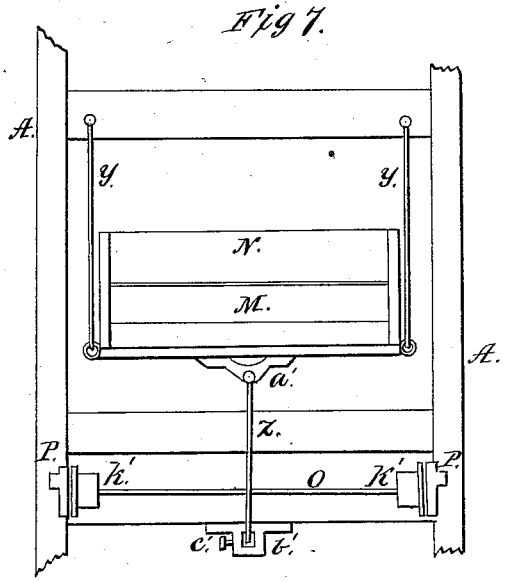


Fig 8.

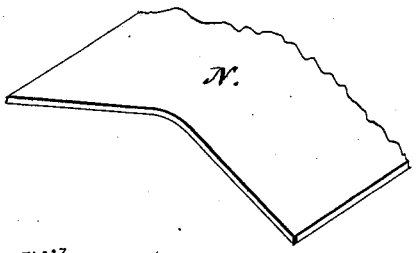
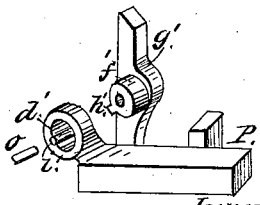


Fig 9.



Witnesses:
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Inventor:
Arthur Johnston
per R. F. Asgood Atty.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

ARTHUR JOHNSTON, OF LOCKPORT, NEW YORK.

IMPROVEMENT IN THRASHING-MACHINES.

Specification forming part of Letters Patent No. **164,178**, dated June 8, 1875; application filed July 29, 1874.

To all whom it may concern:

Be it known that I, ARTHUR JOHNSTON, of Lockport, in the county of Niagara and State of New York, 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 of the construction and operation of the same.

My invention consists of a thrashing-machine, constructed, arranged, and operating as hereinafter described.

In the drawings, Figure 1 is a longitudinal vertical section. Fig. 2 is a detached view of the concave; Fig. 3, a detached view of the shaft, gage, wheel, and crank-wheels, for adjusting the concave; Fig. 4, a detached view of the sectional brake-board. Fig. 5 is a view of one of the division-plates in perforations of the concave. Fig. 6 is a detached view of the beak; Fig. 7, a detached end view of the shoe and its hangers, &c.; Fig. 8, a view of the shield for the shoe; Fig. 9, a detached view of the stacker-arms.

A represents the frame and casing, which may be of any ordinary construction. B is the hopper, into which the grain in the straw is fed. C is the cylinder, which is armed with teeth in the ordinary manner. D is the fixed, and D′ the swinging, parts constituting the concave. These parts are attached to end plates E E in a manner similar to that shown in my patent of January 14, 1873, so that they may be adjusted vertically to suit the kinds or conditions of the grain which is to be thrashed. The plates are connected as follows: F is a shaft resting in suitable bearings of the frame. On this are two crank-wheels, *a a*, at the ends, and a gage-wheel, *b*, between them. Toggles or connecting-rods *c c* connect the crank-wheels *a a* with lugs or projections *d d* of the plates E.

It will be seen that by turning the shaft F in one direction or the other, the plates E, and consequently the concave D D′, will be adjusted higher or lower.

The gage-wheel *b* has a series of holes, *e e*, near its periphery, and its rim runs within a bearing, *f*, which also has a single hole, *e′*. A wooden pin is inserted through the bearing and one of the holes of the gage-wheel, to hold the shaft in place. If any unusual strain comes upon the concave, from the passage of a stone or other obstruction through, the wooden pin will break, and consequently release the concave, and prevent destructive breakage. This arrangement forms one feature in my invention.

The part D of the concave is simply fixed in the plates E E, and has the usual teeth intermatching with those of the cylinder, for producing the thrashing. Directly behind the teeth are holes *g g* through the concave, to allow passage of the grain, as in my patent aforesaid. These holes are inclined backward, and are made elongated at their bottoms. In the center of each opening, and across the longitudinal axis, are cast diaphragms, or division plates *h h*, Fig. 5, the object of which is to prevent the passage of wheat-heads, &c., while no impediment is presented to the grain. This it accomplishes by dividing each hole in two parts, lying in that direction that allows an easy entrance of the grain, but obstructs larger bodies.

The section D′ of the concave is pivoted at *i* so to swing up and down, and thereby produce more or less friction, according to the requirements or conditions of the grain to be thrashed. It is adjusted up and down at the swinging end by cams *j j* on a shaft, *k*, which is operated from the outside. G is a shaft situated between the contiguous sides of the sections D D′. It extends across the machine and has a single row of teeth, *l l*, similar to those of the stationary part of the concave. G′ is a similar shaft resting in the section D′, and having also a single row of teeth, *l′ l′*. The plates E E have slots *m m*, concentric with the pivot *i*, in which slots the shaft G′ rests, and adjust up and down with the swinging section D′. Both of these shafts G G′ are made to turn on their axes, so that when they are not in use the teeth can lie flat and below the line of the teeth of the cylinder, as shown by the dotted lines, Fig. 2. H H′ are bars attached to the swinging section, and extending across from end to end. They serve as beds for the teeth *l l′* to rest upon when turned down. Their rear or inner edges are raised nearly or quite level with the upper surface of the concave, thus standing in an inclined direction, like the slats of a window-blind, the object being to carry off straw and chaff with-

out impediment, while the grain passes easily through.

The swinging section D′ can be turned up or down, as necessity may require, to produce more or less friction on the material in passing through. The shafts G G′ can also be turned up or down, thereby presenting a greater or less number of the teeth in the concave. In heavy thrashing, a larger number of teeth are required, and in easy thrashing a smaller number. This arrangement of the shafts and teeth obviates the necessity of changing of the concave to suit the thrashing.

I I are shields or dust-arresters arranged on opposite sides of the cylinder, and so arranged as to inclose a dead-space, *n*, above it, as shown. The front shield inclines inward, so that its lower edge comes near the teeth of the cylinder. The object of this arrangement is to prevent the dust being carried by the cylinder and blown out into the face of the operator. By being confined in the dead-space the dust takes the motion of the cylinder, and is blown out in the rear beneath and away from the operator.

K is a brake-board hung in the rear of the cylinder, for the purpose of preventing the straw being thrown back too far as it escapes from the cylinder. It consists of two sections, *o o*, connected, by flexible or strap hinges *p p*, to a cross-piece, *q*. Each of these boards has an independent movement, and the object is to adapt them to a light or heavy body of straw. If light, the lower section only rises and falls; if heavy, both sections rise and fall. They do not obstruct the passage of the straw, but allow it to pass without rolling.

The single brake-board now in use is too heavy and cumbersome to allow the proper passage of a light body of straw.

L is a beater in the rear of the brake-board. It consists of a shaft, *r*, to which are attached two heads, *s s*. Two hubs, *t t*, are located inside the heads, one of which is stationary, while the other one is movable endwise, on the shaft, and is secured by a set-screw. Toggles *u u* connect with arms of the hubs at one end, and with the beaters *v v* at the other end, being pivoted, as shown in Fig. 6. The ends of the beaters rest in slots *w w* of the heads. As the movable hub *t* is slid endwise on its shaft the toggles are thrown out or in, and the beaters correspondingly expanded or contracted.

For long straw the diameter of the heater is lessened; for short straw, it is enlarged.

The arms *v v* are set at an angle oblique to the radius of the beater, so as to drive the grain downward and forward. The slots *w w* keep the beater-arms in position at all times while allowing the adjustment above described.

M is the shoe hung at the front or inner end upon a pivot, *x*, in the usual way. At the rear it is suspended by two hangers, *y y*, which allow a cross shaking motion. In the rear of the shoe is also a spring, *z*, pivoted at *a′*, to a bearing of the frame. The spring extends downward, and passes through a slotted bearing, *b′*, in which it is secured by a set-screw, *c′*. This set-screw allows proper adjustment of the spring, to give ease and freedom to the shoe in its vibrations, and to compensate for wear. The spring itself reacts against the vibrations of the shoe and brings it to place. The side hangers *y y* are hung near the bottom of the shoe, to give more length of oscillation and keep the shoe more level in its vibrations.

N is a shield over the inner end of the shoe. Ordinarily there is a square board at that point which comes directly under the pulleys that carry the grain-belt, and accumulates much refuse, and is difficult to clear. I place at this point the shield N, which is of angular form, so as to throw the refuse off and prevent accumulation of the same. It also forms a continuation of the top of the fan-case, projecting downward to such an extent as to give proper direction to the blast to act upon the grain upon the screen.

O is the shaft at the rear of the machine, which drives the straw-stacker. P P are the arms on the shaft, to which the stacker-frame is attached, being so connected that the arms can turn vertically to accommodate the angle of the stacker. The eyes *d′ d′* of these arms rest on journals *f′ f′* of bearings *g′ g′*, which hold the shaft. The journals have lugs or feathers *h′ h′*, and the eyes have corresponding grooves *i′ i′*. In one position the slots can slip over the lugs, and then, when the arms are turned down, the lugs hold the arms in place and prevent inward movement, acting as stops to the arms.

The object of this arrangement is, first, to remove the bearings of the arms from the shaft, which is done by resting them on the stationary journals *f′ f′*; and, second, to prevent thrust of the arms against the pulleys *k′ k′*, which is accomplished by the lugs *h′ h′* forming stops to the end movement of the arms, as before described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the fixed toothed segment D and swinging segment D′, having the transverse bars H H′, arranged as described, of the shafts G G′, having the teeth *l*, and adapted to be rotated for depressing the teeth, and causing them to bear upon and be supported by the bars H H′, in the manner and for the object and purpose described.

2. The combination, with the end plates E E, of the shaft F, toggle-arms C C, crank-wheels *a*, gage-wheel *b*, with its series of holes, and bearings *f*, with its pin, substantially as and for the purpose described.

3. The beater L, consisting of the stationary and movable hubs *t t*, toggles *u u*, and beater-arms *v v*, resting in slots *w w* of the heads, all

combined and arranged for operation substantially as and for the purpose described.

4. The combination of the shaft O, arms P, provided with eyes *d*, grooves *i*, with the fixed journals *f' f'*, having lugs *h*, substantially as set forth, and for the purpose described.

5. The concave section D, having the inclined holes *g*, provided with the division-plates *h* at their bottom, substantially as and for the purpose described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ARTHUR JOHNSTON.

Witnesses:
N. P. CURRIER,
CARRIE A. CURRIER.