G. Eichenseer.

Thrashing Mach.

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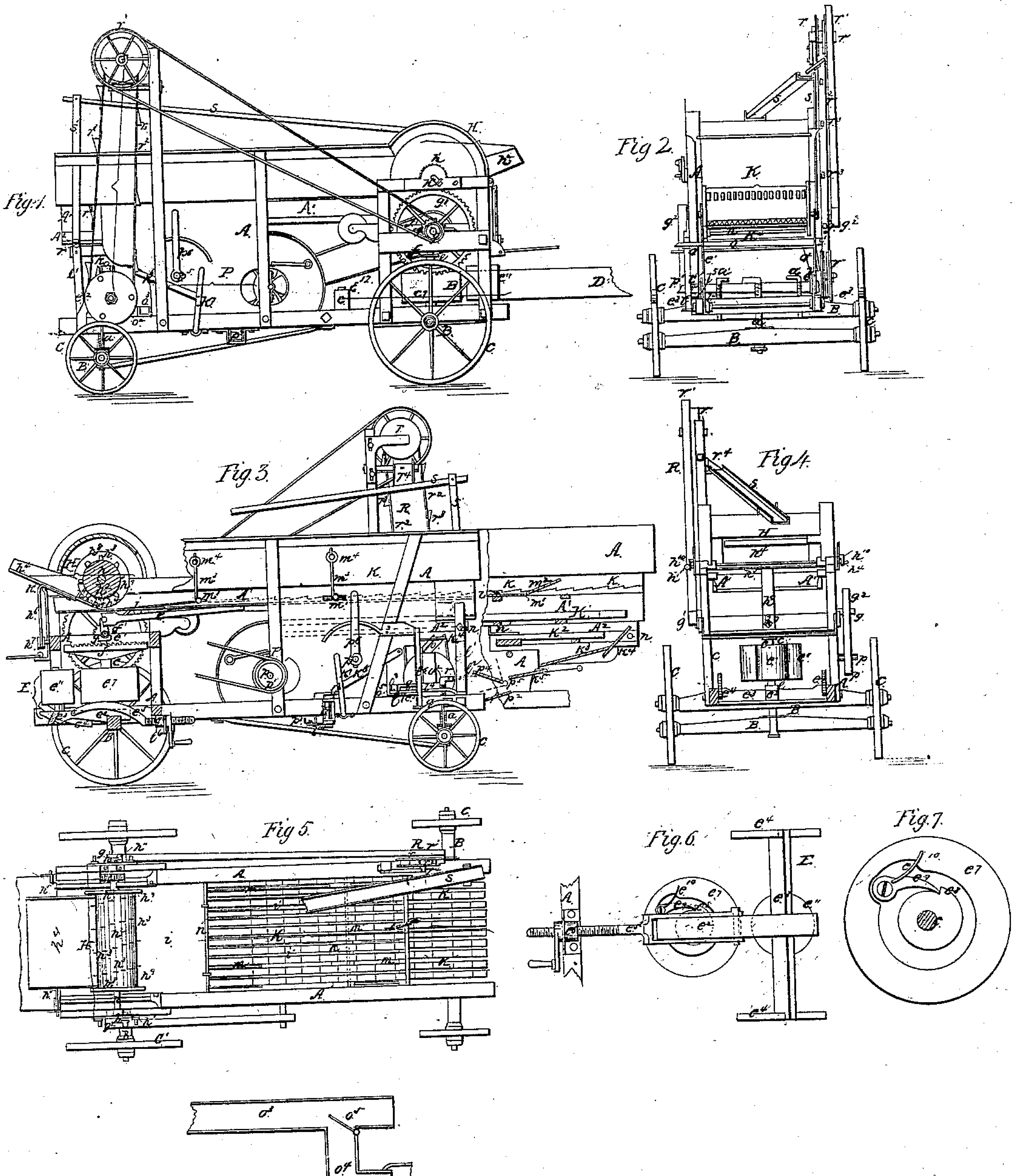

Witnesses:

Inventor:

United States Patent Office.

GEORGE EICHENSEER, OF WATERLOO, ILLINOIS.

Letters Patent No. 63,788, *dated April* 16, 1867.

IMPROVEMENT IN THRESHING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE EICHENSEER, of Waterloo, in the county of Monroe, and State of Illinois, have invented certain new and useful Improvements in Machines for Threshing and Separating Grain; and I do hereby declare that the following is a full and true description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon.

The nature of my invention is, firstly, in the construction of the forward end of my machine so that the same may be adjusted with reference to its height from the ground, and thereupon steadied in its position; secondly, in the adjustable arrangement of the driving-pulley in conformity with the position of the driving-belt; thirdly, in the adjustable arrangement of the thresher-cylinder with reference to the feed-plate; fourthly, in the adjustable arrangement of the shaking-frames; fifthly, in a drop guide-plate, for arresting and detaining grain under the action of the fan-blast; sixthly, in the arrangement of certain conduits in connection with an elevator for returning stuff not fairly threshed to the thresher-cylinder.

To enable those skilled in the arts to make and use my improved machine, I will now describe its detail construction and operation, having reference to the drawings, of which—

Figure 1 is a side elevation.

Figure 2 a front end elevation.

Figure 3 a vertical section along the line $x\ y$ of the plan.

Figure 4 a rear end elevation.

Figure 5 a top plan.

Figures 6 and 7 being bottom views of the power-pulley and connections.

I support my said thresher on the frame A, resting on axles B, bearing wheels C. One end of A is firmly secured to its underlying axle B; the other end is secured to B by a king-bolt, a. By turning this it raises the nut through which it passes in the transverse bar of A, and thus the frame A and the entire machine receive vertical adjustation. The bolts a^1, passing through A each side of a, when brought to a bearing on B, secure the machine in its position. The machine is prevented from being drawn by the power-belt in the usual manner. To transmit the driving power to my said machine I use the device marked E. The shaft hereof, shown as e, is secured at its upper end in a bearing, e^1, to a frame-piece of A, the said bearing allowing a slight vibratory motion of e. The lower end of the shaft e rests on sliding-bearing e^2, which, at one end, rests on B; at the other end it is supported by the sliding-bar e^3, the ends whereof are guided in curved ways, e^4, as shown in fig. 3. The forked screw-bar e^5 takes hold of the bearing e^2; at the other end e^5 passes the nut e^6, secured against lateral motion by the frame A. When, therefore, e^6 is turned by a proper handle, the sliding-bearing E^2 is moved, and the position of the shaft e, with reference to a vertical line, is changed. Thus the position of the pulley e^7 on e may be suited to the elevation of the driving-belt D, and to the position of the power source. In order that no damage may result from a sudden stoppage of the belt D, I arrange the projection e^8 on the shaft e. A ratchet catch or pawl, e^9, of e^7, by pressing against e^8, carries the shaft e with the pulley so long as the pulley e^7 is driven. When, however, e^7 suddenly ceases motion, the pawl e^9 leaves e^8 in the continued motion of e, as is seen from fig. 6. To the bearing-block e^2 I attach by a shaft a second pulley, e^{11}, and a third pulley, e^{12}, to the frame A. Said pulley e^{11} and e^{12} being used to wrap the belt D thereon in transportation, and e^{11} being also used as a guide-roller and tightener to the belt D when in motion. The shaft e transmits its power to the horizontal bevel-wheel f, which gears into the opposite bevel pinions f^1 actuating the shaft g. From the relative position of f and f^1, a slight vibration of the shaft e does not affect the transmission of power. The shaft g is supported in parts of the frame A, and at its outer ends carries the pulleys g^1 and g^2. One end of the shaft g also carries the gear-wheel g^3, which drives the pinion h^1 on the horizontal shaft h. The shaft h drives the threshing device H. On the shaft h is the drum h^2, studded with cutter-teeth, h^3, set in the line of a screw. The teeth h^3, in the revolution of h and h^3, pass between the similar teeth set in the feed-plate h^4, as shown in figs. 3 and 5. The feed-plate h^4 is secured in a hinged bearing, h^5; at the front end it is held by the bar h^6, and nut h^7; this nut being secured to the frame A, the feed-plate may, by its aid, be adjusted with reference to the thresher-cylinder h^2, and thus controlling the feed of unthreshed stuff. The metallic flanges h^8, at the end of h^2, turn just outside of the vertical edge of the feed-plate h^4; they act as guides to the grain, and serve as fly-

wheels. In order that the crevices between h^8 and h^4 may not choke with grain, I have placed on h^2, and contiguous to h^8, the teeth h^9, which, in the revolution of h^2, clean said crevice. To adjust the thresher-cylinder h^2 horizontally and transversely with reference to h^4, I arrange, at each end of the shaft h, the set-screws h^{10}; these screw into the bearings of h, and, by turning the crank-arms of h^{10}, and securing them in position by the set-screws h^{11}, the lateral adjustment of the shaft h and cylinder h^2 is effected. The grain passes, after being fed to the feed-plate h^4, between this plate and the thresher-cylinder in the usual manner, and on to the receiving-plate i, from which it is forced to the separating devices K. These devices act to separate the grain kernels from the straw, chaff, smut, and other impurities, and the arrangement here presented is in nowise claimed as new, but as being improved in its operation. As is usual, I employ a series of sieves; these I place in proper frames; thus the frame A^1 contains the sieves k and k^1, and A^2 contains the sieves k^2, the return feed-plate k^3, and chaff-discharge plate k^4. The frame A^1, at its forward end, rests on rolls secured in the frame A; at the rear end it is supported by rock-arms, l^1; near their lower ends these are held on rock-shaft bolts, l^2, which are fastened in the supports l^3 on the frame A. By changing the position of the bolts l^2, the length of vibrating arm from A^1 to l^3 may be varied to suit the stroke of the shaking-frame A^1. A^1 receives a reciprocating motion from the pitman l, secured by a crank to the shaft g. From the receiving-bed i the grain is sent to the first separator-sieve k; (to expedite this motion i may be secured to the frame A^1.) The sieve k is formed of longitudinal wooden slats, notched to prevent the return of grain, as shown in fig. 3. About one-half of the first part of k is bottomed by a plate, i^1, in order that the grain kernels may be properly dropped to the fan below. At the rear ends of i and i, I arrange the lifters or cleaning-fingers m on the shafts m^1. A pendulous motion is given to m by the arms m^3 secured to the shafts m^1; the arms m^3 being held in bolts, m^4, fixed in the frame A, the reciprocating motion of A^1 causes a vibration of m^3. The shafts m^1 being squared at their joints with m^3, they make the same angular motion produced in m^3, thus transmitting the same to the fingers m, whereby these lift the straw from the kernel, and otherwise act to separate the threshed materials. Such grain as does not pass over the rear end of k drops on to the sieve k^1, made similarly to k, only changed therefrom by shortening the alternate slats at the rear to prevent clogging, and ease the discharge of straw. Immediately below the rear end of A^1, I arrange the frame A^2, sustained at its forward end by rounded knobs on A, and at the rear end by a bolt-rod, n, (figs. 2 and 3,) passing through the rock-arms l^1. By the attachment here made the shaking motion of A^2 is less than that of A^1, this being so designed because the sieves of A^1 receive the coarser materials. In A^1 is, near its forward end, the guide-plate n^1, to feed the grain to the sieve k^2; this sieve is retained in A^2 by the bolt n, and rests at its forward end on a transverse piece of A^2. From k^2 the grain drops to the feed-plate k^3, also secured in A^2. At the rear of k^2, and in its framing, is secured the chaff-discharge plate k^4, as shown in fig. 3, enlarged; from this light grain drops to the conduit o below. Operating in connection with the devices just described is the fan device P; of this the fan-shaft p is driven by the pulley p^1, and belt from the pulley g^2, before mentioned. In the manner usual the rotation of fans here causes an air-current toward the shaking-sieves k, k^1, and k^2. To render the action more effective, the check feed-plate k^3 is arranged under the sieve k^2; the grain kernels dropping on k^3 roll towards the fan draught; thus the grain is thoroughly cleansed from chaff, this being blown towards the chaff-discharge k^4, and to the conduit o. From k^3 the grain drops to the drop guide-plate k^5, which is guided in the frame A, and may be adjusted in position by rods k^6, and the hand-levers k^7. From k^5 the grain is dropped to wire sieve p^2; this delivers the grain to the conduit p^3, from whence it is drawn off at will. To guide the air blown from the fan p, I arrange the vane p^4, supported on the shaft p^5 in the frame A. To turn the vane p^4, use the handles p^6. Thus by properly using the handles p^6 and k^7 to adjust the vane p^4 and drop guide-plate k^5, the action of the machine is suited to kinds of impurity and weight of grain acted upon. To aid the discharge of grain from the sieve p^2, this receives a shaking motion in a lateral direction. This I arrange by extending an arm to receive the rod l^4, acting on the lever l^5, supported on A. l^5 also receives the rod l^7, operating the lever l^8, and the rock-shaft l^9, as shown in fig. 3. Below the frame A a lever, l^{10}, supports the conduit p^3, connected by a hook-bolt with p^2. The reciprocating motion transmitted to p^3 is therefore also given to the sieve p^2, as stated. The lighter stuff, as was stated, is delivered from the separator sieves to the chaff-discharge plate k^4, and to the conduit o; at one end this is supported by an arm, o^1, on the vertical rock-shaft l^6, (fig. 3;) at its other end it rests on the frame A. The vibratory motion imparted to o by its connection with l^6 delivers the grain to a box, o^2. The heavier impurities, such as smut, fall into the conduit o^3, which, at its higher end, rests on an arm, q^4, connecting with the shaft l^6, and communicating to o^3 a shaking motion. The forward end of o^3 rests on the frame A. Here o^3 connects with a conduit, o^4. Within o^4 a door, o^5, is arranged, so that the connection between o^3 and o^4 can be closed. This is done when the stuff delivered by o^3 is worthless. When o^5 is opened, the stuff will pass through o^4 to the spout q, and to the elevator to be again operated upon. Similarly the pipe o^2 discharges the unthreshed grain from o to the spout q. From the spout q the unthreshed and otherwise valuable material is, by the elevator device R, raised to the conduit s, and by it delivered upon the feed-plate h^4, to again pass the thresher and separator. Said elevator device is composed as follows: The usually metal pulleys r, flanged at edges and open at their centres, receive the band r^2; to this the buckets r^3 are riveted so as to open on the inner surface; thus any grain dropping from the bucket will be caught by the band and following buckets. The upper-pulley r has connected with it the belt-pulley r^1 driven by the belt from the pulley g^1, formerly described. At the highest point of ascent the buckets r^3 discharge upon the plate r^3, from whence grain rolls to the conduit. This conduit receives a reciprocating motion by its support upon a bar, s^1, connected with the upper end of the arm l^1, thus aiding the passage of grain down s.

Having thus fully described my said machine and its operation, what I claim, is—

1. The combination of the screw-bolts a and a^1, substantially as and for the purpose set forth.

2. The combination of the shaft e, its bearing-block e^2, and sliding-bar e^3, the ways e^4, with the screw-bar e^5, and handle-nut e^6, all acting substantially as and for the purpose set forth.

3. The combination of the pulleys e^{11} and e^{12}, for packing the driving-band D, substantially as and for the purpose set forth.

4. The cutter-teeth h^9, for cleansing the crevices between the flanges h^8 and the feed-plate h^4, as set forth.

5. The application of the drop guide-plate k^5, as set forth.

6. The combination of the conduits o^3 and o^4 with the door o^5, substantially as and for the purposes set forth.

7, The combination of a feed-plate, h^4, arranged for vertical adjustments, with the thresher-cylinder h^2, arranged for lateral horizontal adjustments, substantially as set forth.

8. The combination of the separators k^6, k^1, and k^2, with the return-feed plate k^3, chaff-discharge plate k^4, and guide drop-plate k^5, all with the air-currents adjusted and directed by the vane p^4, substantially as set forth.

In witness whereof I have hereunto set my hand this twenty-fifth of August, 1866, in presence of the witnesses also subscribing hereto.

GEORGE EICHENSEER.

Witnesses:

GEO. P. HERTHEL, Jr.

M. RANDOLPH.