

(No Model.)

3 Sheets—Sheet 1.

S. R. ROGERS.
GRAIN THRESHER AND SEPARATOR.

No. 577,608.

Patented Feb. 23, 1897.

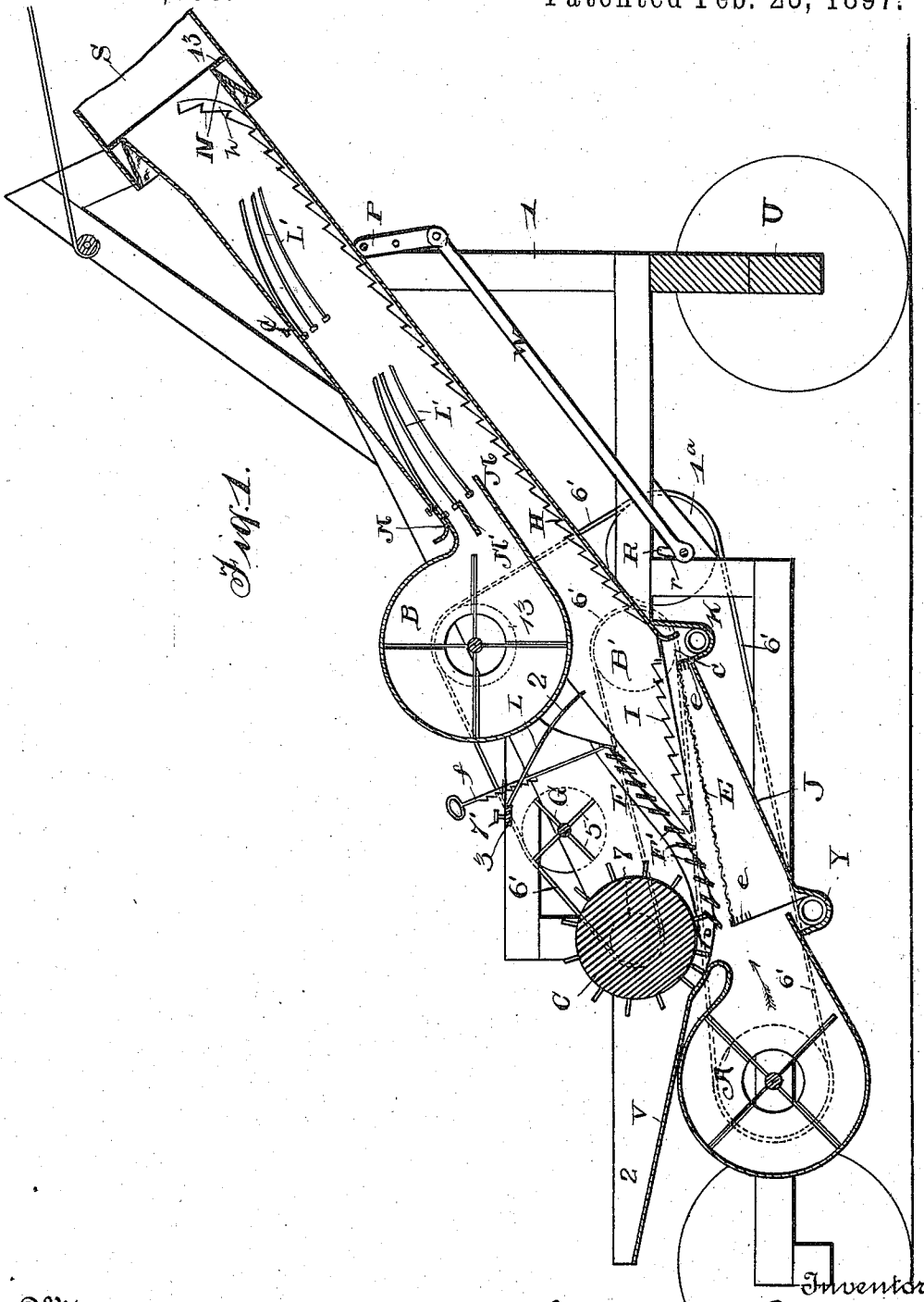


Fig. 1.

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3 Sheets—Sheet 2.

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Fig. 2.

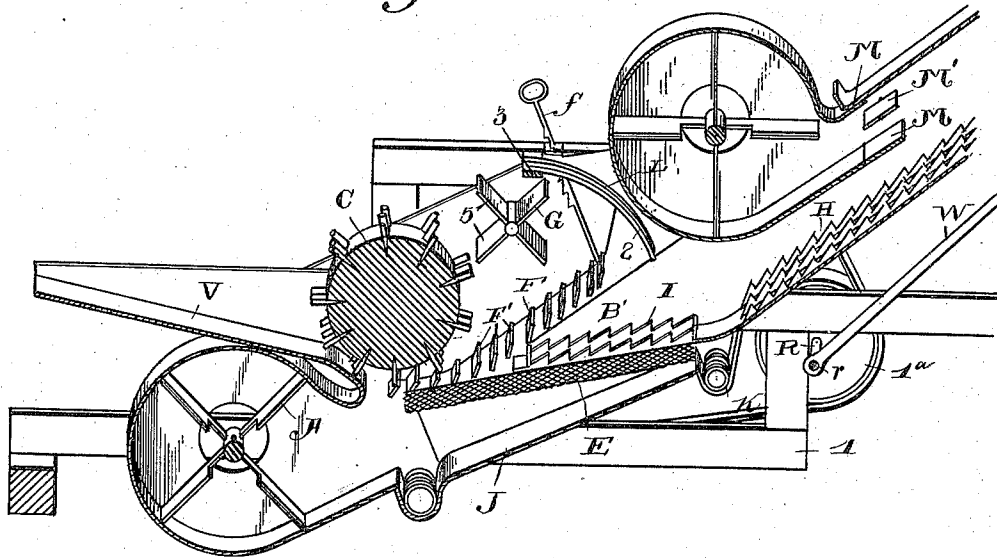


Fig. 5.

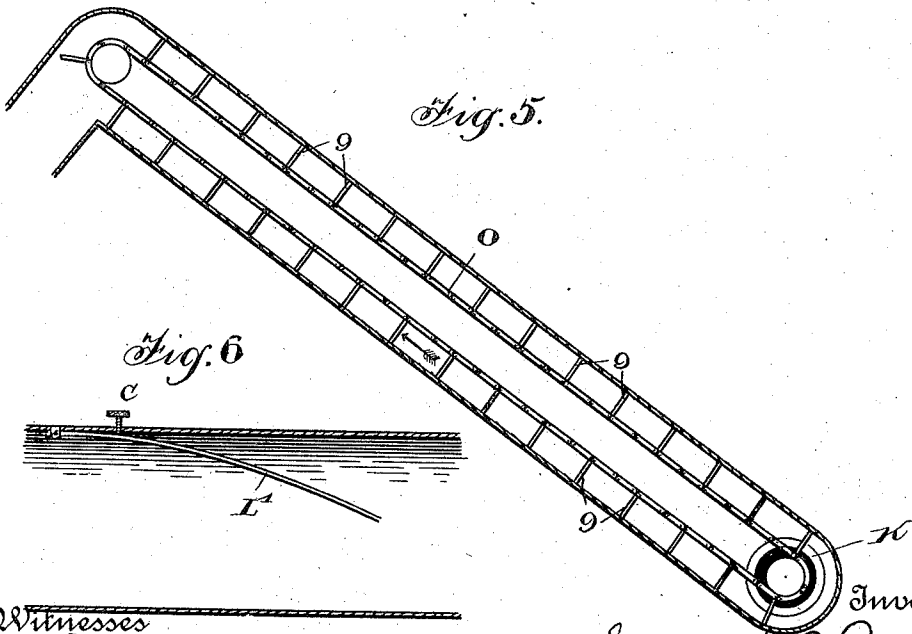
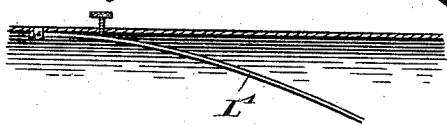


Fig. 6.



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UNITED STATES PATENT OFFICE.

SAMUEL R. ROGERS, OF BIJOU HILLS, SOUTH DAKOTA.

GRAIN THRESHER AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 577,608, dated February 23, 1897.

Application filed June 24, 1895. Serial No. 553,930. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL R. ROGERS, a citizen of the United States, residing at Bijou Hills, in the county of Brulé and State of South Dakota, have invented certain new and useful Improvements in Grain Threshers and Separators, of which the following is a specification, reference being had to the accompanying drawings, and to the reference letters and numerals marked thereon, which form a part of this specification.

My invention has relation to certain improvements in grain threshers and separators; and the object is to produce a machine for effectually separating the grain from the chaff and straw; and to this end the novelty consists in the construction, combination, and arrangement of the same, as will be hereinafter more fully described, and particularly pointed out in the claim.

In the accompanying drawings the same reference letters and numerals indicate the same parts of the invention.

Figure 1 is a longitudinal section of a threshing-machine embodying my invention. Fig. 2 is a longitudinal sectional perspective view of the front end of my threshing-machine. Fig. 3 is a longitudinal side elevation of the same. Fig. 4 is a perspective view of the "chaffer." Fig. 5 is a longitudinal section of the elevator; and Fig. 6 is a section of the straw-conveyer, showing one of the retainers.

1 designates the frame of the machine, which is supported on wheels, so that it may be drawn to the point of destination. The front fan A is so located as to permit the feed-board V to be passed in over its drum into place before the cylinder C. It is journaled in bearings on the sills of the machine and is driven by a belt 6' from a pulley 7 on one side of the machine. The blast is directed upwardly by the slants or inclines of the bottom and rear end of the shoe J, where it cleans the grain. After cleaning the grain the blast passes upward through the grate F and the slots in the chaffer I, that portion of the wind passing through the grate assisting in separating and forcing the straw back under the beater G, whence it is sent with great velocity against the first set of spring-detainers L, which latter are fixed to an adjustable bar, which can be changed to suit the condition of the grain.

These retainers turn the straw down to the fish-backs H I, where it is started up the incline by the motion of the conveyer and the blast combined.

The conveyer B' consists of the shoe J, the sieves E, the slotted projection I, which I term the "chaffer," and a set of fish-backs H. (Best illustrated in Figs. 1 and 2.) The bottom of the fish-back is serrated transversely in order to form pockets for returning the grain after it has been separated from the straw by the motion of the fish-backs. This serves to prevent the grain from being blown out with the straw and chaff, the latter two passing over the grain, which returns down the bottom of the conveyer and is delivered near the front ends of the sieves. The chaffer is supported by hangers N at its lower end, the upper end of said chaffer being supported by rocker-bars P. (Shown in Fig. 3.) The shoe J, the forward part of the conveyer, has an inclined bottom which carries the cleaned grain to the conveyer Y. The rear end of the latter has a short upward turn in it with an opening across the full width of the shoe, which permits the wind to force the tailings into the conveyer K.

The shoe is provided with brackets *e e*, which are secured to its sides to hold the sieves in place. The sides of the shoe are extensions of the straw-conveyer, and its motions are the same as those of the straw-conveyer. The vibrating sides of the conveyer Y are connected with the stationary sides of the machine by tacking strips of canvas *a* over the joint, making it comparatively wind-tight. In the sides are openings *b* (shown in dotted lines in Fig. 3) to permit the changing of the sieves for different kinds of grain. The sieves E may be of sheet metal or wire and are located in the shoe J directly under the cylinder, so that the grain, after passing through the grating or otherwise, comes directly in contact with the wind or blast, the sieves being no obstruction whatever to direct the course of the blast, as in other machines. Any grain that may be blown from the sieves must return again, either by way of the conveyer K and elevator O through the cylinder or by way of the chaffer from the straw-conveyer bottom.

The sieves E rest upon the brackets *e e*, ar-

ranged in a series above each other in the ends of the shoe, and the sieves can be raised or lowered at either end, or both ends, if desired, and placed on the upper or lower set of brackets. The grate F is made of flat bars F' of iron having spaces between them. These bars F' are hinged to the front end of the frame beneath the beater G and are adjusted by hangers f, of which there are two. This grate is made with a capacity that will permit four-fifths of all the grain to be separated here and driven to the sieves. The grate being adjustable can be brought in close contact with the beater, which, with the assistance of the force and motion supplied by the current from the fan A, will send the straw against the retainers L with such force as to disentangle all chunks or mats of straw that may have passed through the cylinder, with a sudden jerk.

The fan B is located on the upper side of the machine near the beater, and, as shown in Fig. 1, is driven by a pulley 13 from the cylinder C by the belt 6'. The throat of this fan is formed by two hinged boards M M, so that it may be opened and closed. The current of the wind may be changed to any desired direction, there also being a pivoted wind-board M' in the center of the throat of the fan to deflect the current of air at will.

The blast from this fan is sent into the bottom of the conveyer, where the blasts from the two fans join, raising the straw from the fish-backs against the retainers L', and thus it is thoroughly shaken up and parted, permitting the grain that passed over the grate in the straw to settle down through the chaff and straw to the bottom of the conveyer to be returned to the sieves over the chaffer I. After assisting the fish-backs H and blast-fan A in thus separating the last particle of grain from the straw the combined blast from the two fans A and B carries the straw, dust, and chaff before it out through the tube S over the fish-backs H, (shown in Figs. 2 and 3,) the bars of the fish-backs being sufficient to carry the straw clear of the bottom of the straw-conveyer. They slant to beneath the grate, as shown, and are nearly horizontal for a short distance, and they, together with the chaffer, serve to hold at this point any straw and prevent it from accumulating upon the sieves when there is not force enough of wind to hold the falling straw in check, (which may occur when stopping and starting the machine,) from whence they turn upward at the same angle as the bottom of the straw-conveyer.

The ends of the fish-backs H have a short turn upward at *h h*, which throws the straw into the direct course of the wind where it starts into the tube S. The notches and the rather slow motion serve to assist the retainers L' in holding the straw in check while being driven over them by the blast from the two fans. The detainer L is located between the beater G and the fan B and is composed of small spring-steel rods 2, fastened to a bar

3, and can be simultaneously raised and lowered by an adjusting-screw 7'. The remaining retainers L' are made in the same form, but are fastened separately to the oval top of the conveyer and can be turned down only by means of a set-screw *c*, provided for that purpose. They hold the straw in check, as hereinbefore described.

The beater G, located near the rear side of the cylinder, is made of wood, has four wings 5, and is driven by belt 6' from the cylinder C. It takes the straw when delivered by the cylinder and forces it, with the aid of the wind from the fan A, against the first set of retainers L, and thus assists greatly in the separation of the grain and forcing it down through the grate to the sieves. The cylinder C, located at the front end of the machine, is made of iron, as now commonly used in other threshers. It is driven by means of the pulley 7, over which the belt 6' runs.

V is the feed-board on which the grain is fed to the machine.

R is a crank-shaft. It has two cranks *r*, which drive the rocker-bars P by means of connecting-rods W W. The rocker-bars P, of which there are two, are pivoted upon a shaft which reaches across the machine, being driven from the crank-shaft R by connecting-rods W W, as hereinbefore described, and support the rear end of the grain and straw conveyer and also give it a forward-and-backward motion. The crank-shaft R is driven by a pulley 1^a and belt 6' from the cylinder C and is provided with a fly-wheel 1' to carry the cranks *r* past the dead-center, and thus reduce the vibrating of the whole machine to a minimum and materially aiding in imparting a steady motion to all of the revolving parts that are driven by means of the drive-belt.

The conveyer Y discharges the cleaned grain to one side of the machine.

The conveyer K forces the tailings, which it receives through the opening *c* in the rear end of the shoe, into the elevator O, there to be carried back to the feed-board to be re-threshed and cleaned.

The elevator O is an endless chain having wings 9 thereon and runs in a wooden box or chute and carries the waste from the rear ends of the sieves up an incline, whence it is delivered to the feed-board V.

The chaffer I is made of sheet metal, and has long slots 10, with projections 12 on their upper or outer sides all the way around them, said slots being between the fish-backs and are to permit the wind and chaff to pass up through the fish-backs.

U, Fig. 1, is the front axle and carries the front end of the machine. By this arrangement I am enabled to bring the fan A in close connection with the cylinder C.

The straw-stacker S is connected to the rear end of the vibrating conveyer by a flexible-joint connection at the extreme rear end of the separating-conveyer. The conveyer is

made round in cross-section for a short distance. I provide a flange 13 around the outside of this end piece of the conveyer and also an enlargement in the tube S for said
5 flange to vibrate in, thus causing the two to be connected by a joint that is almost absolutely free from friction and nearly wind-tight. To further tighten the joint, I provide a piece of heavy canvas, which when properly
10 applied to the joint will render it practically wind-tight.

Having thus fully described my invention, what I claim is—

15 In a grain thresher and separator, the combination with the threshing-cylinder C, the grate F immediately below the same and extending upwardly and rearwardly, retainers

L L' arranged at the rear of the grate, an inclined shoe J arranged below the grate, a chaffer I arranged above the grate, sieves E
20 arranged between the chaffer and the inclined shoe, a fan A arranged below and in advance of the cylinder C and having a throat to direct the blast upwardly through the sieve
25 and the grate into the space between the cylinder C, grate F and retainers L L', and a beater G arranged between the cylinder C and the said retainers, substantially as shown and described.

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