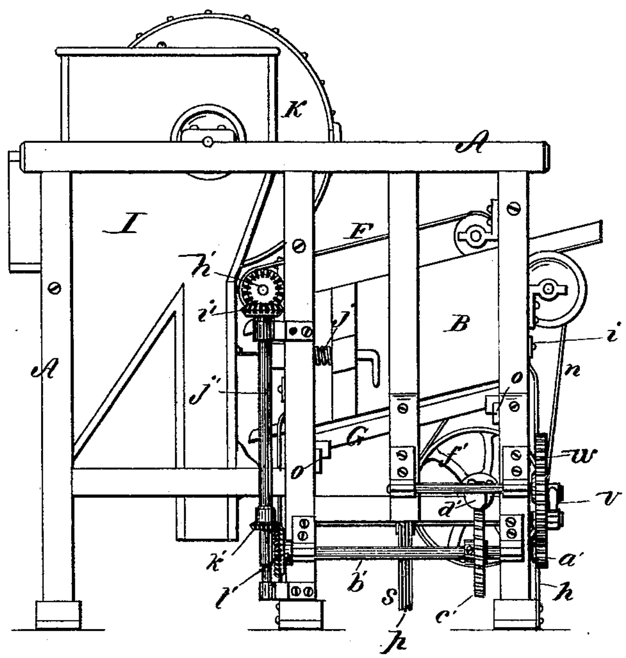
2 Sheets—Sheet 1.

G. MONTAGUE.

MACHINE FOR SEPARATING AND CLEANING WHEAT.

No. 186,041. Patented Jan. 9, 1877.

Fig. 1.



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2 Sheets—Sheet 2.

G. MONTAGUE.

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Fig. 2.

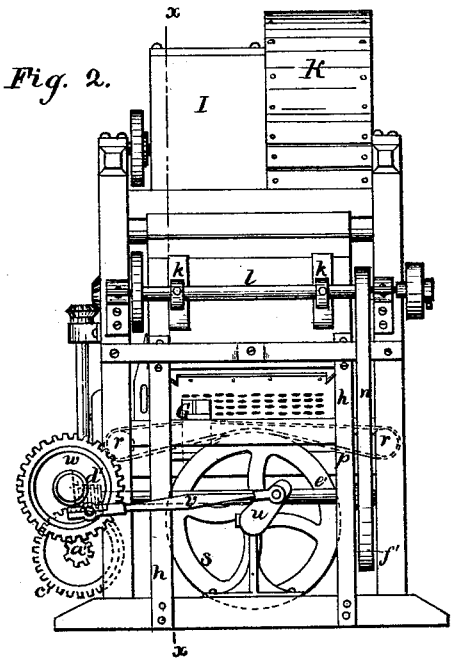
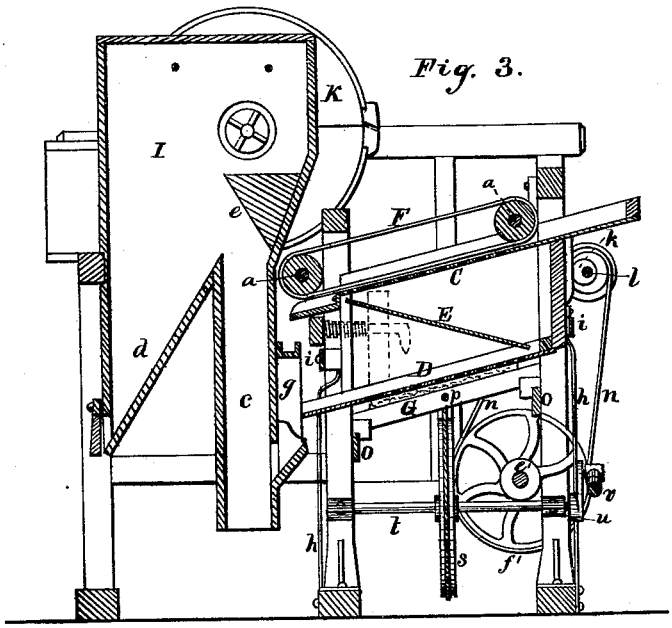


Fig. 3.



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UNITED STATES PATENT OFFICE.

GURDON MONTAGUE, OF GENEVA, WISCONSIN.

IMPROVEMENT IN MACHINES FOR SEPARATING AND CLEANING WHEAT.

Specification forming part of Letters Patent No. **186,041**, dated January 9, 1877; application filed July 17, 1876.

To all whom it may concern:

Be it known that I, GURDON MONTAGUE, of Geneva, in the county of Walworth, State of Wisconsin, have invented certain new and useful Improvements in Grain-Separators, of which the following is a specification:

My invention consists in combining, with a reciprocating screen, an endless belt or apron arranged to move continuously in one direction over and in close proximity to the upper surface of the screen; and, also, in combining, with a screen adapted for separating wheat from smaller impurities, a reciprocating scraper arranged to travel over the under surface of the screen, and force upward out of the meshes or openings thereof the small grain which may chance to lodge therein, and which would otherwise find their way through the screen with the impurities.

In constructing my machine I arrange the upper and coarser screen in an inclined position, and, by means of any suitable mechanism, give it a rapid and continuous reciprocation in the direction of its length. Immediately above and lengthwise of the screen I arrange, on two supporting-rolls, an endless apron, the under face of which lies parallel with and in close proximity to the upper surface of the screen, and by means of any suitable devices I give the under face of the apron a continuous movement from the head toward the tail of the screen.

It will be at once perceived that by combining the continuously-advancing apron with the reciprocating screen, the proximate faces of the two are caused to move alternately in the same and in opposite directions. The pressure of the apron upon the straw, sticks, oats, and other foreign matters longer than the wheat, holds the same down flatly upon the face of the screen, so that they pass over its surface and off at the tail, instead of falling through the meshes or openings, which are made of such size that they permit the wheat to fall through sidewise, but compel the longer grain, &c., to turn up endwise in order to pass through. The movement of the screen and the apron in opposite directions serves to expedite the passage of the wheat through the meshes, to draw back and loosen such straws, sticks, &c., as may chance to lodge at their ends in the meshes or openings, and, in other respects, to improve the action of the parts, and insure a thorough and rapid separation of the wheat from the impurities.

I am aware that it is old to employ a moving endless apron traveling constantly in one direction, in combination with a stationary screen, and I therefore make no claim thereto; but, in practice, I find that greatly-improved results are attained by giving the screen a reciprocating and the apron a continuous movement, and it is to this combination only that I lay claim.

The second feature of my invention consists in combining, with a reciprocating screen adapted to separate wheat from smaller impurities, a reciprocating scraper arranged to travel to and fro over the under surface of the screen, and force upward out of the meshes those small grains or kernels of wheat which may chance to lodge therein, and which, if undisturbed, would eventually be worked down, by the shaking of the screen, endwise through the meshes.

In practice great difficulty is experienced in separating the small wheat with the large from the impurities ordinarily contained therein, for the reason that when the meshes are made of sufficient size to pass the impurities, the small wheat will often lodge at one end therein, and finally work down through. By using my scraper or rubber under the screen, it is caused to act against the lodged grain, which generally protrudes slightly below the surface of the screen, and force the same upward again out of the meshes, so that it will ride down on the surface with the coarse grain.

I am aware that it is old to combine with a bolting-cloth screen, through which an ascending current of air passes, a brush to remove from its under surface the particles adhering thereto and held thereupon by the air; but it will be seen that my arrangement differs therefrom both in action and in effect, my scraper being designed to force the material upward and keep it upon the upper surface of the screen, while in the other case the

brush serves to remove the material which has already passed through the cloth and cause it to fall therefrom.

In the accompanying drawings, Figure 1 represents a side elevation of a machine having my improvements embodied therein; Fig. 2, an end elevation of the same; Fig. 3, a longitudinal vertical section of the same.

A represents the frame of the machine, and B a shoe or shaker arranged to reciprocate endwise therein, and provided with two parallel inclined screens, C and D, the former and upper having holes or meshes of such size that the wheat can fall freely through, while the latter is of such fineness as to retain the grain on its surface and pass it over the tail. E represents an inclined board mounted in the shoe or shaker between the two screens, and serving to conduct the wheat and small impurities which fall through the screen C to the head of screen D.

The shoe or shaker, in which the screens are rigidly secured, receives its reciprocating motion from eccentrics *k*, acting against its head and pushing it in one direction, and spiral springs *j*, acting against its foot and pushing it in the opposite direction.

F represents an endless apron, mounted on rolls *a*, in close proximity to the upper surface of the screen C, and arranged to travel continuously downward toward the foot of the screen.

G represents a longitudinal transversely-reciprocating scraper, sustained at its ends on guides O, and arranged to travel over the under surface of the lower screen D.

The shoe-operating eccentrics *k* are mounted upon a shaft, *l*, at the head of the machine, as shown, said shaft being provided with two pulleys—one to receive a driving-belt, and the other to receive a belt for transmitting motion to all the other working parts of the machine.

The scraper D receives its motion from a belt, *p*, passing around pulleys *r*, and attached to a wheel, *s*, the shaft of which latter receives a rocking motion from a crank, *u*, attached to its end, and operated by means of a pitman connected with a crank-pin on a wheel, *w*. The wheel *w* is operated by a pinion, *a'*, mounted on a shaft, *b'*, which is provided with a worm-wheel, *c'*, actuated by a worm, *d'*, on a transverse shaft, *e'*, which latter is provided with a pulley, *f'*, and driven by a belt, *n*, passing from said pulley to one of the pulleys on the eccentric shaft *l*, before mentioned. The shaft *b'* is also provided with a bevel-pinion, *l'*, driving a pinion, *k'*, on a vertical shaft, *j'*, which latter, by a pinion, *i'*, gearing into a pinion, *h'*, on one of the rolls *a*, drives the endless apron, as shown.

I represents a chamber connecting with an exhaust-fan, K, and provided with a vertical suction-tube, *c*, into the side of which the grain is delivered by the lower screen D. A chamber or pocket, *d*, is arranged at one side of the tube *c*, and a deflector, *e*, arranged at the upper end of said tube, to direct the grain into the pocket, the chaff and other light matters being carried off through the fan. While it is preferred to operate the shoe, the apron, and the scraper by the devices above described, it is obvious that other devices may be employed.

Having thus described my invention, what I claim is—

1. The combination, in a grain-separator, of a reciprocating inclined screen and a continuously-moving apron, arranged to pass over the surface of the screen toward its tail, substantially as shown and described.

2. In a grain-separating machine, the combination of a reciprocating screen adapted to separate wheat from smaller grains and impurities, and a scraper arranged to travel upon the under surface of said screen, for the purpose of forcing upward and keeping on the surface of the screen the small grain which may chance to lodge in its meshes or openings.

3. The combination, in a grain-separating machine, of a reciprocating shoe, B, containing the coarse screen C, the fine screen D, and the inclined board E, with the endless apron F and the scraper G, arranged to operate as described, whereby the grain is separated successively from the coarse and the fine impurities, and delivered in a pure state.

GURDON MONTAGUE.

Witnesses:
JAMES SIMMONS,
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