2 Sheets--Sheet 1.

O. K. WOOD.

Grain-Separator.

No. 160,561. Patented March 9, 1875.

Fig 1.

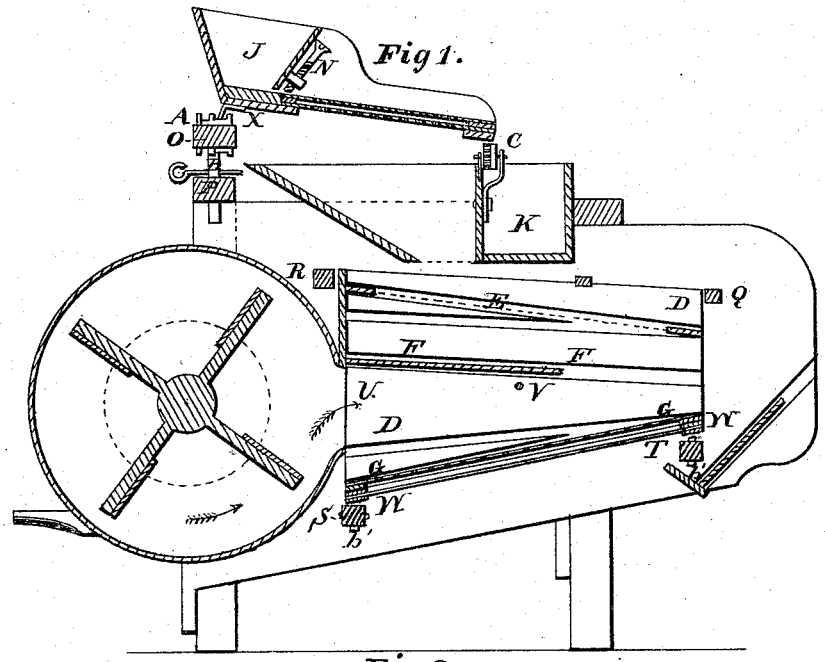
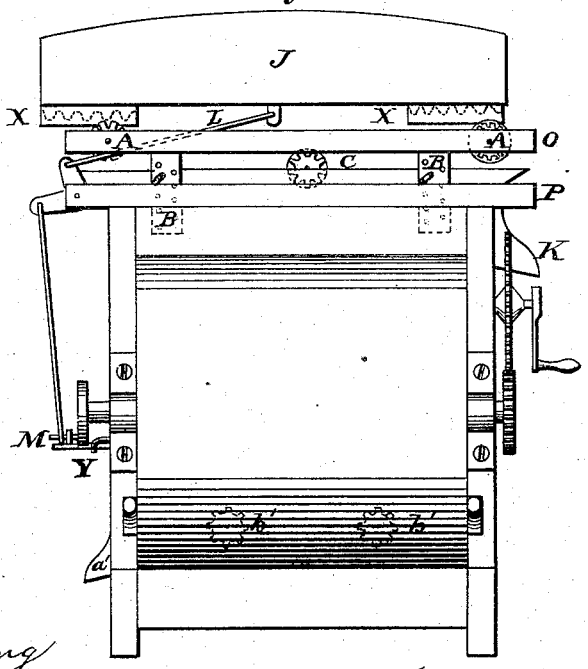


Fig 2.



Witnesses.

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

2 Sheets--Sheet 2.

O. K. WOOD.

Grain-Separator.

No. 160,561. Patented March 9, 1875.

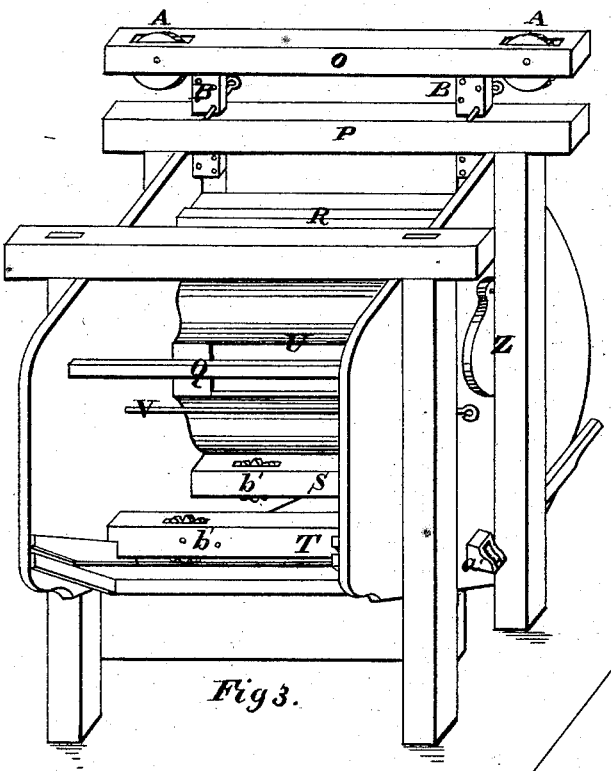
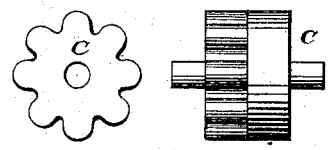
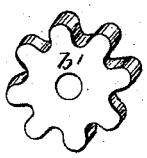
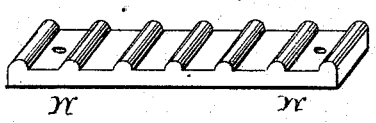
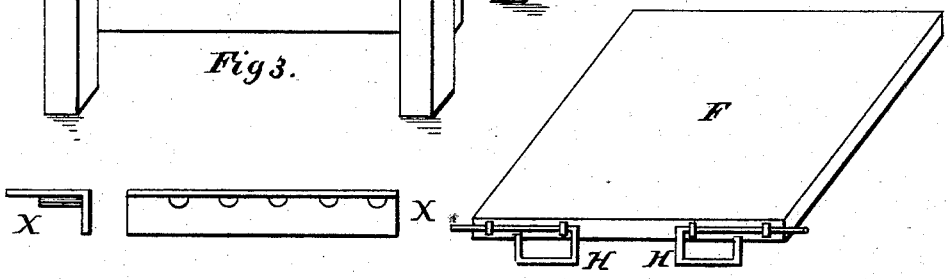


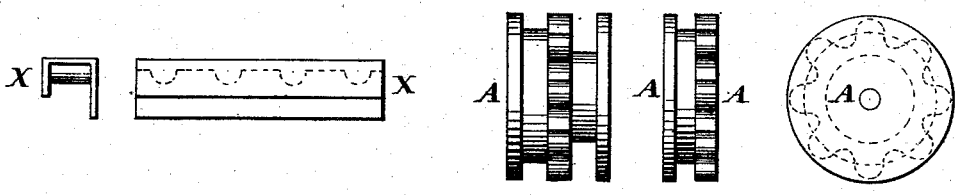
Fig 3.











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UNITED STATES PATENT OFFICE.

ORVILLE K. WOOD, OF WEST CHAZY, NEW YORK.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **160,561**, dated March 9, 1875; application filed September 1, 1873.

To all whom it may concern:

Be it known that I, ORVILLE KIMPTON WOOD, of West Chazy, in the county of Clinton and State of New York, have invented certain new and useful Improvements in a Machine for Cleaning, Separating, and Grading Grains, Seeds, Peas, and Beans; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 is a vertical longitudinal section through the center of the separator. Fig. 2 is a rear-end elevation. Fig. 3 is a front elevation with the feeder and shoe detached.

Like letters represent like parts in all of the figures.

In the accompanying drawings, J is the feeder. O O is the movable plate, in which are the combined smooth and cog rollers A A, and into which are mortised the dowels B B, which connect it with the upper plate P P of the mill. D D is the shoe, containing the screens E E and G G, the blank-board F F, and through which passes the bolt *b*, which, in connection with the guides Q and R, keep the shoe in place and regulate its motion. A A are the combined smooth and cog rollers under rear end of feeder J. E E is the upper screen in shoe. F F is the blank-board. G G is lower screen in shoe. K is spout, through which is discharged grain passing over screen in feeder J. L is rod, by which motion is given to feeder. M is crank, which gives motion to both feeder and shoe. N N is screw, by which feed is regulated. P P is top plate, through which pass the dowels B B. Q Q is guide at front end of shoe. R R is guide at rear end of shoe. S S is plate under rear end of shoe, and contains the cog-rollers upon which rest the fluted irons under rear end of shoe. T T is plate under front end of shoe. U U is opening in drum, through which the blast enters the shoe D, between the blank-board F F and the screen G G. V V is the rod or bolt, which passes through the sides of the mill and through the shoe. W W are the fluted irons under the shoe. X is the fluted iron under the feeder. Y is rod, connecting crank M with elbow, giving motion to shoe. Z is wind-gate. *a'* is spout, through which screenings are discharged. *b'* is cog-roller under shoe.

The object of the first part of my invention is to be able to give to the feeder J either a smooth or tremulous motion at will, without the necessity of changing the rollers when a change of motion is required. I obtain the required result by the use of the rollers A A, which have each two grooves, and between the grooves the roller is corrugated or cogged. When the smooth motion is desired the flanges of the fluted irons X X are placed in the front groove of the rollers A A, thus preventing the cogs on the irons X X from coming in contact with the corrugated portions of the rollers A A; then, when the feeder J is caused to move horizontally, by turning the crank of the mill, the motion of the feeder J will be smooth. When a tremulous motion to feeder is required, the flanges of the irons X X are placed in the rear groove of the rollers A A, when the cogs on the irons X X will be brought in contact with the corrugated portion of the rollers A A, and when motion is given to the feeder J its motion will be tremulous. The change of motion on front end of feeder is produced by the use of the roller C, one-half of which is smooth, and one-half cogged, the smooth portion being put to the front. When the flanges of the irons X X are in the front groove of the rollers A A the front bar across feeder J rests upon the smooth portion of the roller C; and when motion is given to feeder J the motion will be smooth, whereas when the flanges of the irons X X are placed in the rear grooves of the rollers A A the front bar of feeder will rest upon the cogged portion of roller C, and when motion is given to feeder J the motion of front end of feeder will be tremulous.

The second part of my invention consists in the use of two dowels, B B, for the purpose of elevating the rear end of feeder J, thereby securing a greater or less elevation to the screens or sieves in feeder J, by that means obtaining a much larger range of work, and a much nearer approximation to perfection of separation. The upper ends of the dowels B B are mortised into and made fast to the movable plate O O under feeder. The upper plate P P of mill has two mortises, into which the

dowels B B, respectively, enter, and in which they move freely. Each dowel is perforated by holes at different distances from the end of the dowel, in which are placed pins, which rest upon the plate P P, thus enabling me to secure any desired elevation, from a horizontal to a rear-end elevation of five inches.

The third part of my invention relates to the methods used for controlling and guiding the motion of the shoe D D, which consist, first, of the bolt or rod V, passing through the sides of the mill and through the shoe D; second, the two bars or plates, one, Q, at the front end of shoe, and one, R, at the rear end of shoe D, both bars and plates serving to prevent the shoe from getting out of place; third, two bars or plates, the one, S, under the rear end of shoe, and one, T, under front end of shoe. Each of these bars has two mortises, in which are placed the cog-rollers *b'*, the upper portion of which projects above the bars S and T and comes in contact with the fluted irons W W, which are on bottom sills of shoe D; hence, when the shoe D is moved horizontally by the action of the crank M, a quick tremulous motion is given to the shoe D, thus preventing the clogging of the screens E E and G G, and causing the grain to be much more thoroughly sifted and graded than it would be if the motion of the shoe were smooth.

The fourth part of my invention consists in making the throat or opening U in the drum of the mill so short and narrow that all of the wind produced by the fans shall be condensed into a narrow blast, and in giving the throat such a position that the thin blast passes wholly between the blank-board F F and the screen G G, thus producing a full even blast upon the grain as it passes from the blank-board F F to the screen G G.

The operation is as follows: Suppose the grain to be separated to be spring wheat, containing oats, barley, cockle, kale, and other foul seeds. The sieve placed in the feeder is a compound perforated zinc sieve, with perforations sufficiently large to admit a kernel of wheat to pass through them. The sieve E E is constructed of spring-tempered wire having an elongated mesh sufficiently wide to permit the smaller berries of wheat, the cockle, and the smaller seeds to pass through it. The screen G G is the same kind of a screen as E E, except that the mesh is less, and allows only the much shrunken grains of wheat and small seeds to pass through it. In this operation we require the smooth motion of feeder and the rear end of feeder raised two and a half inches. Therefore we place the flanges of X X in the front grooves of A A, when the front bar of the feeder will rest upon the smooth portion of the roller C. We raise the rear end of the feeder by means of the dowels B B. The grain to be separated is put into feeder J, and the feed regulated by the screws N N. By turning the crank of the mill all of the working parts are put in motion. The feeder J is caused to move on the rollers A A, and the mixture passes under the feed-gate of feeder J and upon the screen in the feeder J, and the motion being a smooth sliding one, the oats and barley, because of their greater length than the wheat, pass over the screen and are discharged through the spout K', while the wheat and smaller seeds pass through the screen in feeder J into the lower hopper of mill, and from there upon the screen E E. The shoe D D having a quick tremulous motion, caused by the fluted irons W W passing over the cog-rollers *b' b'*, all save the large and fully developed grains of wheat will pass through the screen E E, while the fully developed kernels of wheat, divested of all foul seeds, will pass over the lower end of screen E E, and will be deposited in a box placed at front end of mill, and there is thus obtained wheat absolutely clean from foul seeds, and every berry of which is perfect and fully developed, and, being sown, the quality of wheat raised will be much improved. The small wheat, cockle, and fine seeds which have passed through the screen E E fall upon the blank-board F F, and are carried by it to the upper end of screen G G, having a mesh of sufficient width to carry the second grade of wheat, but to permit the shrunken wheat and fine seeds to pass through it. The second grade of wheat passes over the lower end of screen G G, and is deposited in a box placed under the center of mill. The fine seeds and shrunken wheat pass through the screen G G and fall upon the bottom of the shoe D D, which has a hole at its lower end, which communicates with the spout *a'*, out of which the shrunken wheat and screenings are discharged.

In case I was desirous of cleaning any other kind of grain or seeds, the operation would be similar to the above described, except that I would substitute for the sieves used upon wheat such as were required for the work I was desirous of doing; also make such changes in the elevation of feeder J and character of motion as was necessary to do the required separation.

What I claim as new, and wish to secure by Letters Patent, is—

1. The combined smooth and cog rollers, having two grooves, in combination with the fluted iron X under the feeder J, for the purpose of giving either a smooth or tremulous motion to the rear end of the feeder without the necessity of changing the rollers, the parts being constructed and arranged substantially as described.

2. The rod V and the guides Q R, used to guide and direct the movement of the shoe D, made and constructed substantially as described, and used for the purpose set forth.

ORVILLE KIMPTON WOOD.

Witnesses:
L. S. DOMINY,
ANDREW F. BRANDT.