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C. A. WRIGHT.
GRAIN CLEANER.

APPLICATION FILED JULY 16, 1906.

2 SHEETS—SHEET 1.

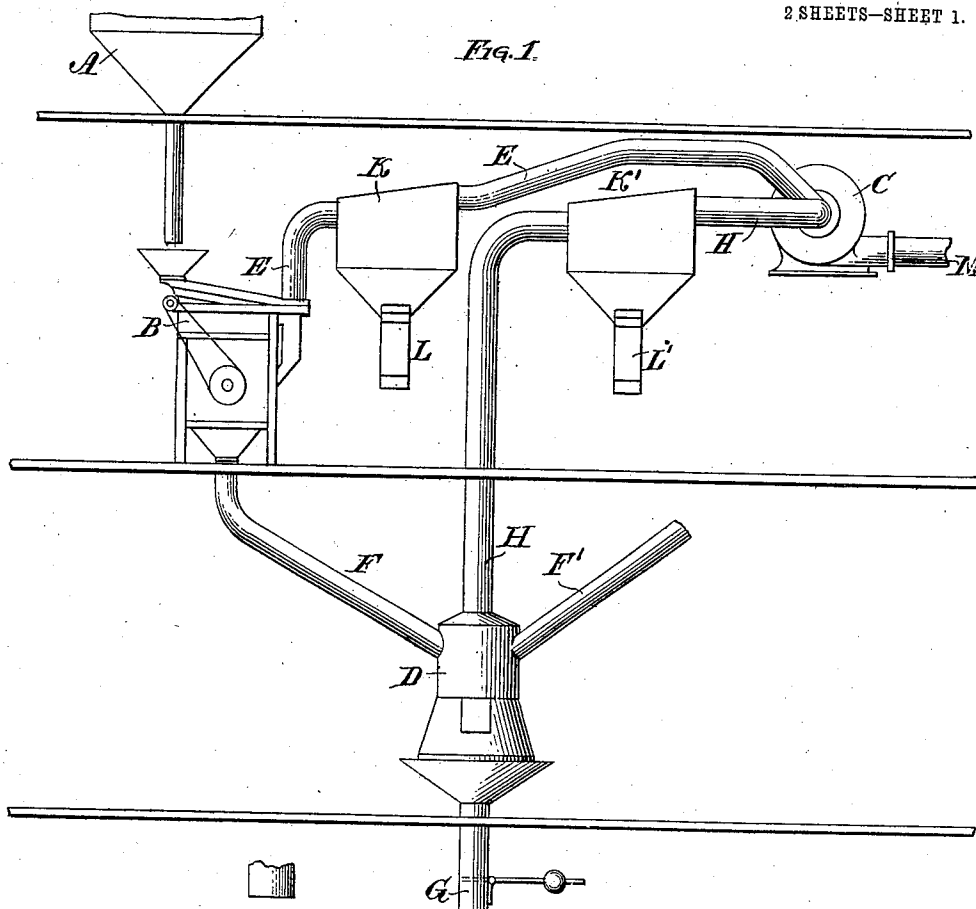


Fig. 4.

WITNESSES
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CHARLES ALLON WRIGHT, OF CHICAGO, ILLINOIS.

GRAIN-CLEANER.

No. 884,551.

Specification of Letters Patent.

Patented April 14, 1908.

Application filed July 16, 1906. Serial No. 326,353.

To all whom it may concern:

Be it known that I, CHARLES ALLON WRIGHT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain-Cleaners, of which the following is a specification.

My invention relates to grain cleaners, and has for its objects; to provide a simple and convenient arrangement whereby the grain will be thoroughly cleaned; to provide an arrangement whereby all those portions of the refuse which are of value may be collected and saved; to provide a system in which a single fan accomplishes all the work effectively and economically; to provide a separator in which the flow of grain upon the spreader may be easily controlled; to provide a separator in which all the air drawn therethrough is made effective for cleaning purposes; and to provide a spreader adapted to agitate the grain as it passes thereover and thereby more effectively expose the chaff and impurities to the blast of air. These and other objects are accomplished by my invention one form of which is illustrated in the accompanying drawings in which:

Figure 1 is a diagrammatic side elevation showing the general arrangement of the various parts of the apparatus,

Figure 2 is a longitudinal section through the center of my separator,

Figure 3 is a transverse sectional view of a modified form of spreader, and

Figure 4 is a longitudinal section through the clipper, showing the heater drum and other of the operating parts.

Referring first to Figure 1 which illustrates the general arrangement of my apparatus, A indicates the bin from which the unclean grain is to be drawn and conducted through the apparatus for cleansing, B is the threshing device or clipper as it is termed, which may be of any approved type, into which the unclean grain is first led, and which serves to loosen the hulls and other extraneous foreign matter from the grain, C is the fan for carrying away the impurities, and D is the separator to be described more particularly hereinafter, and which is designed to perform the final cleaning operation. Leading from the clipper B are two pipes, E and F. The pipe E to which the loose chaff and other foreign matter is conducted by means of air passages in the clipper leads to the fan C and is designed to carry off the bulk of the chaff and

other foreign matter loosened from the grain in the clipper B, while the pipe F leads from the lower part of the clipper and is designed to conduct the partially cleaned grain to the separator where any remaining chaff and dirt is finally separated and the cleansed grain is discharged through the spout G at the bottom of the separator. Leading from the top of the separator D, is the pipe H which runs to the fan C and conducts away all of the chaff and dirt removed from the grain in the separator D. Located in the pipes E and H respectively are the expansion chambers K and K' provided at the bottom with the traps or collectors L and L'. These expansion chambers are in effect, settling chambers, and the heavier parts of the refuse matter passing through the pipes E and H, settle to the bottom of such chambers and collect in the traps L and L' from which it may be removed at any desired intervals. The heavier portions of the refuse matter which are collected in the traps L and L' are of considerable value, and may include such elements as mustard seed, timothy seed, and chaff of various kinds, which can be used for certain purposes. The very light refuse which moves continuously through the pipes to the fan C is practically all dirt, and is exhausted out of the opening M in the fan. A second pipe F' may be connected to another clipper if so desired.

It will be apparent from the foregoing that my arrangement provides for the saving of everything of value in the grain and furthermore, a single fan operates the whole system, rendering the arrangement economical and simple. It will also be apparent that by my arrangement, a double separation is secured, and that the bulk of impurities in the grain passes out through the pipe E, thereby relieving the separator C of a large part of the work which would otherwise come to it, thus allowing such separator C to more effectively and thoroughly clean the grain.

In Figure 2, I have shown in detail my preferred form of separator. As there shown, 1 is the hood, 2 is the hopper, 3 is the spreader, 4 is the spout for delivering grain upon the point of the spreader, and G is the spout for delivering the grain from the separator. The top of the separator casing is connected with the fan C by means of the pipe H, heretofore referred to, and the grain is conducted to the spout 4 through the pipes

F and F'. The lower edges of the hood 1 are spaced slightly above the edges of the hopper 2 for the admission of air, which air passes between such edges and up between the spreader 3 and the hood 1 and then through the pipe H. The flow of grain through the separator is controlled by means of the sleeve 6 which is mounted upon the spout 4 and is controlled by means of the rack and pinion 7, 8, the lower end of the rack being fastened to the sleeve 6. By means of this arrangement, the amount of space between the sleeve and the top of the spreader may be easily regulated, and the quantity of grain passing through the separator adjusted to suit the conditions. The discharge spout G is provided with a controlling gate 9 pivoted at 10 and normally held in closed position by reason of the counterweight 11. When a sufficient amount of grain is collected in the hopper 2, the weight thereof overbalances the weight 11, opening the gate and permitting the hopper to discharge. This construction constitutes an important feature of my invention, as the gate prevents the air from entering the casing through the spout G, and causes all the air used in the casing, to pass in at the opening between the hood 1 and the hopper 2. This is desirable, as the air which passes through the space between the hood and the hopper gives better cleaning results than where the blast of air passes through the falling sheet of grain from below, as would be the case if air were admitted through the outer spout G. By regulating the distance of the sleeve 6 above the spreader C, so that the falling grain completely fills the space, and by the use of the gate 9, it will be apparent that all the air used in the separator, will gain admission through the space between the hood and the hopper, and that there will be no flow of air either through the spout G or through the pipes F, F'.

Another feature of my invention resides in the interrupted surface, indicated on the spreader 3. Instead of making this surface perfectly smooth, as has been done, I provide at intervals thereon, projections in the form of steps 12 as indicated in Figure 2, or in the form of the upturned plate 13, as indicated in the modification shown in Figure 3. The sheet of grain flowing over these projections, is agitated, and the surface thereof is exposed more effectively through the blast of air whereby a greater cleaning effect is procured than where a smooth spreader surface is used. Other forms of projections than the ones shown may of course be used, it being only necessary that the surface of the spreader be made irregular in order to agitate the surface of grain, and my invention comprehends broadly the use of any sort of projections on the surface of the spreader to

produce this result. It will also be noted as regards the gate 9, that my invention is not necessarily confined to the particular form of gate or the particular means whereby it may be discharged automatically at intervals, as it will be clear that many different forms of automatic gates might be applied, and furthermore the gate need not necessarily be automatic.

Having thus described my invention and illustrated its use, what I claim as new and desire, to secure by Letters Patent, is the following:

1. In combination, a clipper, a grain separator located therebelow and having a pipe connection with the clipper whereby the heavy portions of the grain are fed by gravity to the separator, a fan, a suction pipe connection from the fan to the clipper for removing the lighter parts of the grain, and a second suction pipe connection from the fan to the separator for removing the lighter parts of the grain from the separator.

2. In combination, a clipper, a grain separator located therebelow and having a pipe connection with the clipper whereby the heavy portions of the grain are fed by gravity to the separator, a fan, a suction pipe connection from the fan to the clipper for removing the lighter parts of the grain, a second suction pipe connection from the fan to the separator for removing the lighter parts of the grain from the separator, and an expansion chamber having a trap connected to the suction pipe.

3. In combination, a clipper, a grain separator located therebelow and having a pipe connection with the clipper whereby the heavy portions of the grain are fed by gravity to the separator, a fan, a suction pipe connection from the fan to the clipper for removing the lighter parts of the grain, a second suction pipe connection from the fan to the separator for removing the lighter parts of the grain from the separator, and expansion chambers having traps connected to each of the suction pipes.

4. In combination, a spreader comprising upwardly converging inclined surfaces provided with projections for agitating the grain as it flows thereover, a casing thereabove a distance sufficient to provide space for a sheet of grain and an air passage over the grain, means for supplying grain to the top of the spreader, and means for passing a current of air between the surface of the grain and the casing.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

CHARLES ALLON WRIGHT.

In the presence of—

PAUL CARPENTER,
JAMES NICHOLAS LORENZ.