F. WEGMANN.

MACHINE FOR CLEANING AND SEPARATING GRAIN.

No. 108,541. Patented Oct. 18, 1870.

Fig. 1.

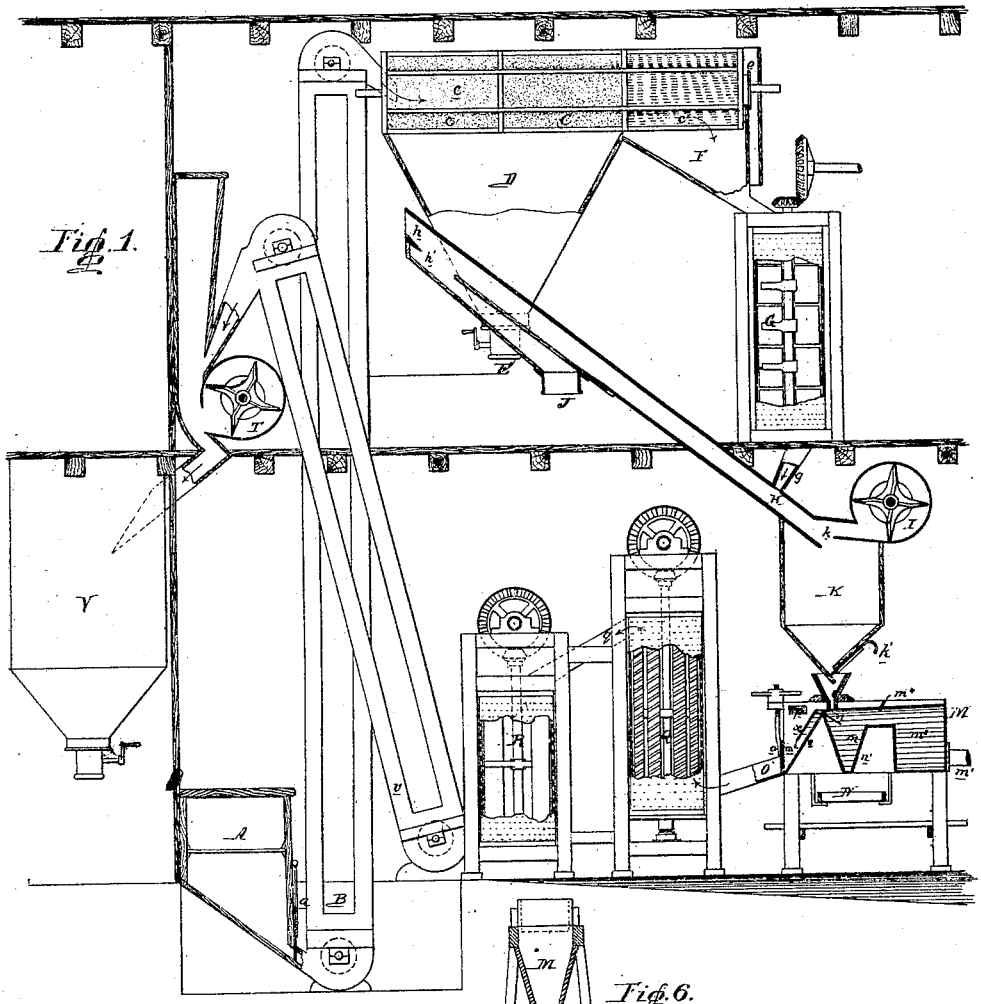


Fig. 6.

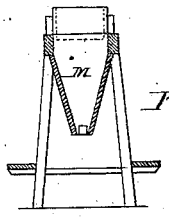


Fig. 2.

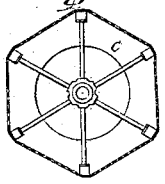


Fig. 3.

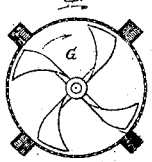
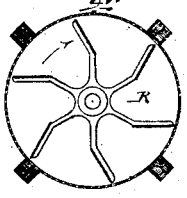


Fig. 4.

Fig. 5.



Witnesses { Wm. A. Steel. John Baker

Frederic Wegmann by his Attys Howson and Son

United States Patent Office.

FREDERIC WEGMANN, OF NAPLES, ITALY.

Letters Patent No. 108,541, dated October 18, 1870.

IMPROVEMENT IN MACHINES FOR CLEANING AND SEPARATING GRAIN.

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

I, FREDERIC WEGMANN, of Naples, in the Kingdom of Italy, have invented an Improvement in the Washing and Cleaning of Grains, and in the apparatus relating thereto, of which the following is a specification.

Nature and Object of the Invention.

My invention relates to certain improvements in what is known as the wet process of washing and cleaning grain; and

My invention consists in submitting the grain for an instant only to the action of water, instead of for a longer time, as usual, the grain thus treated being effectually cleansed and deprived of small stones, particles of earthy matter, &c., without being soaked and swelled by the water.

My invention also consists of certain apparatus for carrying out the above process, and also of devices for conducting the grain to and from the said apparatus, and for sifting and drying the grain, &c., all of which will be fully described hereafter.

Description of the Accompanying Drawing.

Figure 1 is a side elevation, partly in section, of the complete cleaning apparatus;

Figures 2, 3, 4, and 5, enlarged sectional plan views of parts of the apparatus, on the lines 1 2, 3 4, 5 6, and 7 8, fig. 1; and

Figure 6 is a transverse vertical section of another portion of the apparatus.

General Description.

In all the cleaning apparatus heretofore known, the grain has been cleaned by either a dry or wet process.

When this operation is accomplished by the dry process, it has the disadvantage, despite of all the accessories that may be employed, of not thoroughly separating the light or damaged grains, the flour obtained from grain thus treated being consequently unsound and of poor quality.

The dry process fails also to separate small stones and particles of earthy matter from the grain, so that in grinding the latter the millstones become constantly blunted, and imperfect in their operation.

The wet process consists mainly in submitting the grain to the action of water, which dissolves the earthy portions, removes light and damaged grains, and also separates the stones.

Such apparatus, however, have been used to a very limited extent, owing to their imperfect construction, the foreign matters being but partially separated, and the grain so soaked and softened by the water as to render the grinding of it unprofitable, even after it has been dried by the usual methods, since the too great dampness causes a considerable quantity of flour to adhere to, and to consequently be removed with, the bran. The flour, also, although of exceeding whiteness, is unfit for exportation or preservation, especially if made from grain with very thin hulls.

Notwithstanding the above objections, the washing process has appeared to be indispensable for certain grains of inferior quality, and I have therefore attempted to disembarrass this process of its inconveniences, as will be seen from the following description.

I have succeeded, by submitting the grain to the action of water for an instant only, in removing all the stones and foreign matter without injuring the grain, and by adding certain other accessories employed in most mills, have formed a complete system of cleansing, by means of which, not only inferior grains, but those of the most delicate kinds, may be treated, and stones, earth, light and imperfect grains, &c., be thoroughly separated from the same.

On reference to the drawing—

A represents a case, which serves to receive the grain to be cleaned, and the exit of which is regulated by means of a register, *a*.

A chain of buckets, B, conveys the grain into a horizontal revolving screen, C.

The dust and siftings fall at *c*, into a case or hopper, D, and are removed therefrom by the bagging apparatus E. The part *c'* of the screen C is of sheet metal, pierced with holes sufficiently large for the passage of the grain into the hopper F, whilst larger parts are thrown outside at *e*, and then removed.

From the hopper F the grain falls into a vertical cylinder, G, which has an outer casing of perforated sheet metal, and whose principal object is the removal of the strawy envelope remaining around some grains. This result is obtained by causing the apparatus to make two hundred revolutions a minute. From the cylinder G the grain falls into the spout or funnel *g*, and thence into the receptacle H, into which is also forced by the fan I a strong current of air, which removes the straw, dust, and all the lighter parts of the grain, and expels them through the orifice H.

The light grains fall through the opening *h'*, which may be regulated by means of a movable plate, and are received into any suitable receptacle, J.

The good grain falls through the opening *h* into the case K, which is of such capacity that in case of any derangement in the subsequent apparatus, it will receive the whole supply of grain from above, while the trap K' at its lower end is being closed and the movement of the several parts arrested.

From the case K the grain falls into the hopper L, and thence through a comparatively small opening into the compartment *m* of a case, M, which is filled with water. The quantity of water flowing through the pipe *m'* fixed to the case M, and which penetrates

into the compartment m^2, is about two hundred and twenty litres a minute.

The compartment m^3, and the plate m^4, are solely for the purpose of preventing a strong current from being produced at the surface of the water. The specific gravity is then the sole cause through which the light current of water carries the grain into the compartment m^2.

As to the earth and stones, even the smallest, they fall upon the movable plate n, and thence onto the bottom n', whence they are allowed to pass into the box N, the bottom of which is of sheet-iron pierced with holes.

When the grain is intended for kinds of flour for which no further separation is needed, the valve o, at the bottom of the compartment m^2 of the case M, is left open, the grain and the water then passing into the vessel O, the bottom of which is made of perforated sheet-iron, in order to permit the escape of the water.

If, however, the grain to be cleansed is intended for finer flours, the valve o is closed sufficiently to allow the water to rise into the case m^2, so as to overflow by the opening p, through which all the light and defective grains pass, whilst all the good remain.

An inclined partition, x, situated at a short distance from the wall c, can at will be removed, or prolonged toward its lower extremity, and serves to guide the grain and water to the bottom of the compartment m^2.

The cylinder Q is provided with a perforated outer casing, and serves to rapidly remove from the moistened grain the dampness which it contains, and to raise it to the height necessary to flow through the pipe q into a cylinder, R. This cylinder is constructed in the same manner as the cylinder Q, and both are caused to make about four hundred revolutions per minute. This speed is sufficient to remove from the grain by centrifugal force all the dampness which it contains, so that when elevated by the chain of buckets v into the reservoir V, it can be permitted to remain in the latter without undergoing any further drying.

T is a fan, or ventilator, in front of which the grain may be caused to pass before reaching the reservoir V. This ventilator, however, is not indispensable, as it only removes the hulls detached from some grains in consequence of the swelling produced by the dampness, and which are separated by the effect of friction in the cylinders.

The advantages of my invention may be enumerated as follows:

First, all the grains, by being subjected for an instant to the action of water within the vessel M, may be cleaned, and, despite their immersion, they do not retain more dampness than when they are sprinkled, as is frequently done in order to obtain a pure, light-colored flour.

Second, by the immersion of the grain, all the heavier bodies, such as stones, nails, earthy particles, &c., must be entirely separated from the same, and fall to the bottom of the compartment m, it being impossible for such heavy bodies to be carried with the grain into the compartment m^2.

Third, the waste, or siftings, which in other grain-washing machines are entirely lost, may, if desired, be wholly or in part saved with the grain, by a proper adjustment of the valve o and plates c and x of the vessel M.

Fourth, by varying the opening h' of the receptacle H, more or less light grains may be obtained, so that the grain, when once dried, may be easily improved by being run through the upper portion of the apparatus a second time.

Fifth, in consequence of the absolute separation of all the stones and other foreign matter from the grain, there will be a considerable saving in the dressing of millstones, and they may be dressed finer than usual, and thus a whiter and a superior product of flour be obtained.

Sixth, in consequence of the saving of stones, they may be dressed for all kinds of grains with the diamond, which will effect considerable economy of time and material.

As a further advantage of my invention, may be also mentioned the fact that but two men are required to attend the apparatus, one to pour the grain into the hopper, and the other to superintend the cleaning.

I wish it to be understood that I do not limit myself to the above-described arrangement of apparatus, which merely shows one way of carrying out the principle, and can be modified at will; but

I claim—

1. The method of washing grain, and of extracting stones, earthy matter, &c., from the same, substantially as herein described; that is to say, floating the grain in water, through which the heavier particles descend, and then, as soon as said particles are separated from the grain, instantly removing the latter, and drying the same.

2. The case M, having compartments m m^2 supplied with a constant stream of water, and arranged beneath a chamber for the passage of grain, in combination with a drying apparatus communicating with the said compartment m^2, and provided with a perforated screen, all substantially as and for the purpose described.

3. The said case M provided with a plate n, arranged in the compartment m, as set forth.

4. The case M, its compartments m m^2, and inclined partition x, arranged as specified.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERIC WEGMANN.

Witnesses:
E. RISNARD,
BISSON.