No. 880,891. PATENTED MAR. 3, 1908.

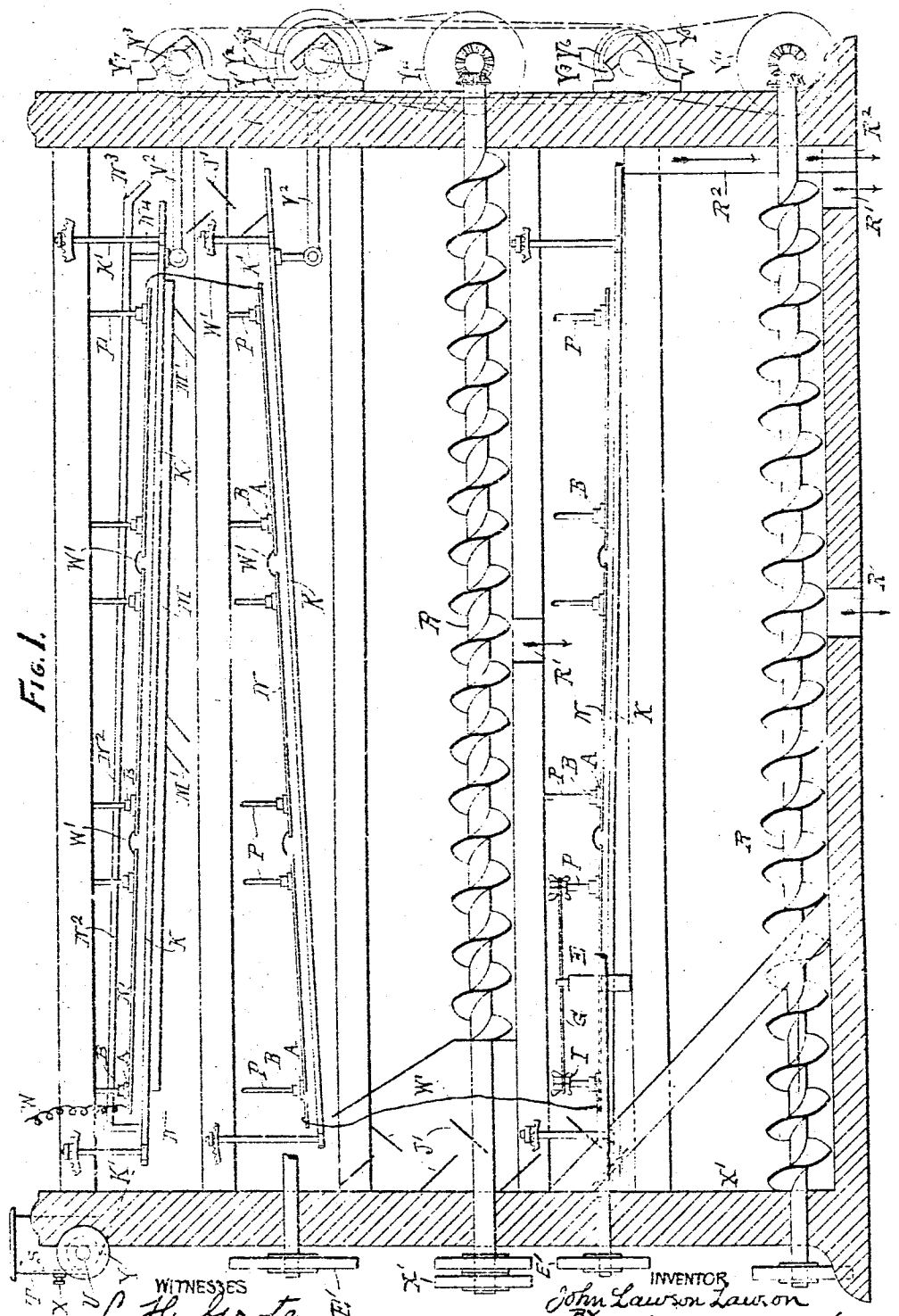
J. L. LAWSON.

ELECTRICAL PURIFICATION OF FLOUR, GRAIN, &c.

APPLICATION FILED JUNE 22, 1906.

4 SHEETS—SHEET 1.

FIG. 1.



WITNESSES

L. H. Grote

W. E. Lee

INVENTOR

John Lawson Lawson

BY

Howson and Howson

ATTORNEYS

No. 880,891. PATENTED MAR. 3, 1908.

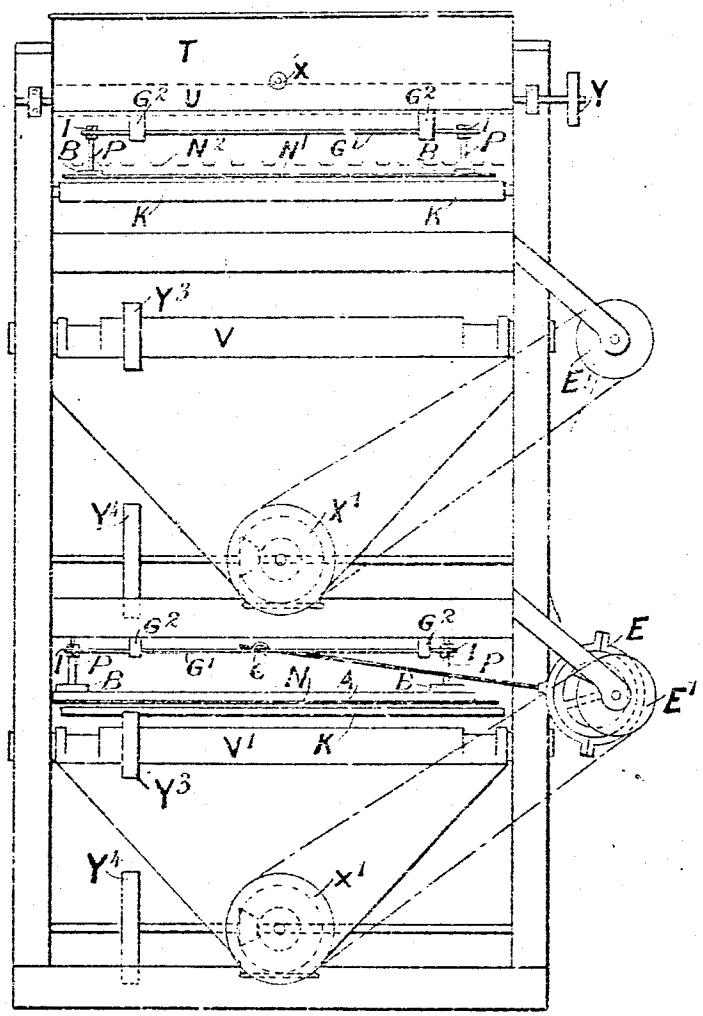
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4 SHEETS—SHEET 2.

FIG. 2.



WITNESSES

William Abbe
W. E. Keir.

INVENTOR

John Lawson Lawson
BY

Howson and Howson
ATTORNEYS

No. 880,891. PATENTED MAR. 3, 1908.

J. L. LAWSON.

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4 SHEETS—SHEET 3.

FIG. 3.

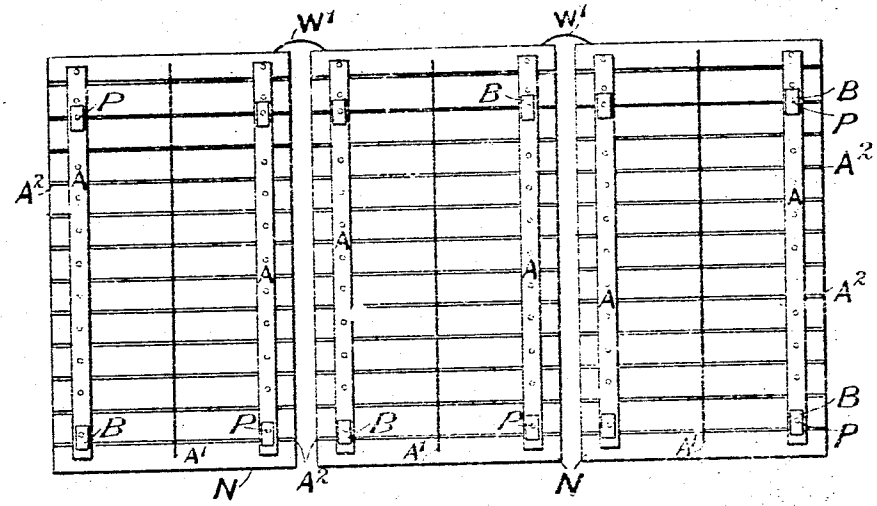
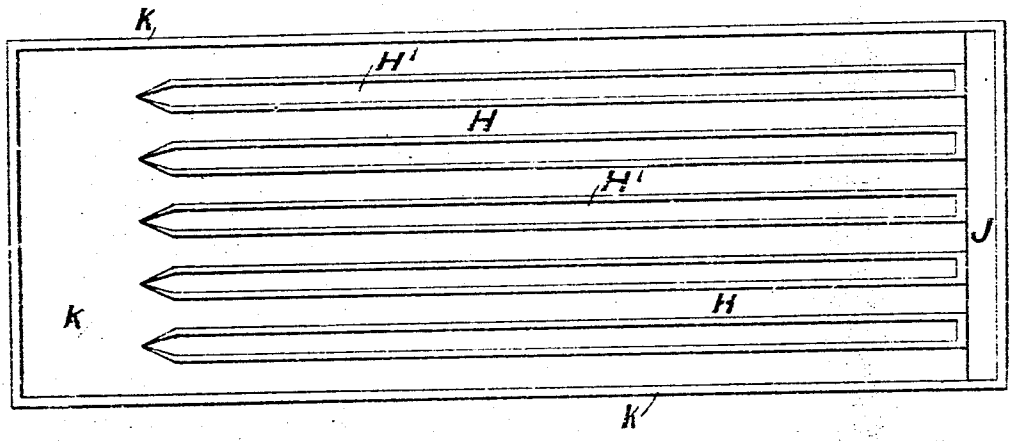


FIG. 4.



WITNESSES

William Abbe

M. E. Keir

INVENTOR

John Lawson Lawson

BY

Howson and Howson

ATTORNEYS

No. 880,891. PATENTED MAR. 3, 1908.

J. L. LAWSON.

ELECTRICAL PURIFICATION OF FLOUR, GRAIN, &c.

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4 SHEETS—SHEET 4

FIG. 5.

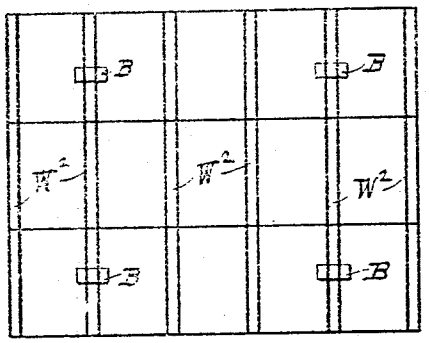


FIG. 6.

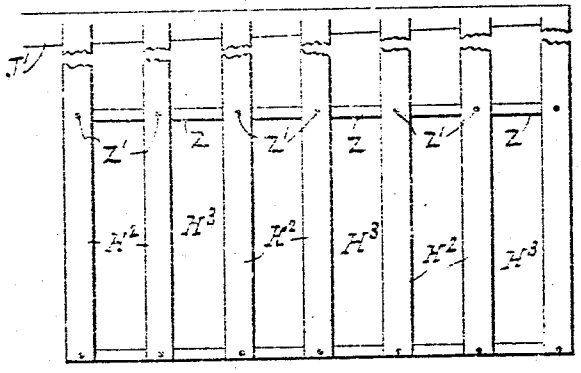
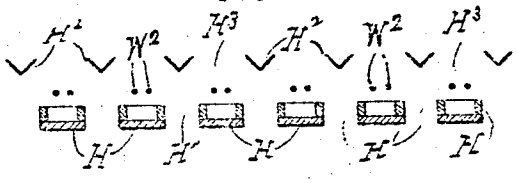


FIG. 7.



WITNESSES

Walter Abbe

Madge E. Keir

INVENTOR

John Lawson Lawson

BY

Howson and Howson

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN LAWSON LAWSON, OF LEITH, EDINBURGH, SCOTLAND.

ELECTRICAL PURIFICATION OF FLOUR, GRAIN, &c.

No. 880,891. Specification of Letters Patent. Patented March 3, 1908.

Application filed June 22, 1906. Serial No. 322,881.

To all whom it may concern:

Be it known that I, JOHN LAWSON LAWSON, a subject of the King of Great Britain and Ireland, and a resident of Leith, Edinburgh, Scotland, grain merchant, have invented a certain new and useful Improvement in the Electrical Purification of Flour, Grain, &c., of which the following is a specification.

This invention relates to the purifying of flour, grain, rice and other substances by separating the bran, chaff, fibrous matter and inferior qualities of these substances from the best material contained in them. After the material has been subjected to any form of purification at present in use, there still remain impurities equal in size and practically equal in weight to the particles of that material. It is proposed to separate these impurities from the good material by the aid of high tension electricity.

The use of high tension electricity other than frictional for purposes of purification of cereals is novel and is of a more sensitive character than any of the agents at present used for such purposes. This extra degree of sensitivity enables a better differentiation in the grades of the good material to be effected and also obviates the presence of good material in the offals.

If a metal plate be charged with high tension electricity, it possesses the power of attracting and repelling light bodies. A machine capable of taking advantage of this power of attraction and repulsion exhibited by insulated metal plates when charged with high tension electricity comes into the category of my invention. And in order that my said invention and the manner of carrying same into practice may be properly understood I have hereunto appended four sheets of explanatory drawings in which

Figure 1 is an elevation of a machine with the front frame removed as constructed to take advantage of this power of attraction and repulsion by being fitted with suitably arranged insulated metal plates charged with high tension electricity. Fig. 2 is an end view at right angles to and corresponding to Fig. 1. Fig. 3 is a detached plan view of the electrically charged plates, and Fig. 4 a similar view of the trays along which the material being treated passes. Fig. 5 is a plan view of a wire grid: Fig. 6 is a plan view of a modification: and Fig. 7 is a section of the same.

Referring to these drawings:—Three or more trays (Fig. 4) consisting of alternate narrow channels II and spaces II^1 are (K Fig. 1) given a rapid reciprocating movement by means of eccentrics as described below. Above the trays a series of electrically connected plates (Fig. 3) is made to move transversely. The impurities are attracted out of the channels (II Fig. 4) and being deflected by the transverse movement of the plates and repelled on touching these plates, are dropped through the spaces II^1 into the screws (R Fig. 1) and are discharged through the spouts R^1. The good material is not attracted and eventually flows down the discharge spout R^2 Fig. 1.

In the top section of the machine Fig. 1 a series of electrically connected wires N^1 Fig. 1 is made to take the place of the brass plates. These wires are preferably made of brass and are placed parallel to each other and to the channels of the tray K Fig. 1 beneath them. The spaces between them may vary but will not exceed one inch. Slightly above the electrified wires are placed narrow tin V shaped trays N^2 Fig. 1: these trays may also vary somewhat in their measurements but should not exceed one inch in breadth or half an inch in depth: the spaces between them will not exceed their breadth. These trays run parallel to the wooden tray and are fixed to it, thus sharing its reciprocating movement. The object of this arrangement is to hasten the removal of brainy and fluffy particles. The impurities are attracted out of the channels by the electrified wires and the heavier particles among them are dropped through the spaces in the wooden tray: the lighter particles pass between the wires and are thrown into the tin trays above them. They are carried down these trays owing to the reciprocating motion and are discharged at the spout N^3 Fig. 1. Plates or wires for purposes of attraction may be placed in various sections as desired. In Fig. 1 the top section only is shown equipped with wires and tin trays, but this could be done throughout.

Fig. 1, T denotes the feed hopper; S the sheet iron which is held against the feed roll U by the spring X, which may be tightened or relaxed by means of a screw; Y represents a pulley for driving the feed roll U; N denotes the brass electrified plates; N^1 denotes the brass electrified wires; N^2 de-

notes the tin V shaped trays which receive the bran and finally discharge it down the spout N^3; N^4 denotes the brackets which support the trays N^2: A the wood strip to which they are screwed, and B the vulcanite to insulate the hangers P from the plates. The hangers P are fixed by thumb screws I to spindles which are more clearly noticeable in Fig. 2. The cross spindle G connecting the other two spindles which move in slides is connected by a rod to the eccentric E, driven by the pulley E^1. Only one plate is shown in complete detail (lowest lefthand), but each plate has similar connections, and the three shafts driven by the pulleys E^1 run right across the machine and each drives three eccentrics viz.: one for each brass plate. If a series of wires be used instead of plates the transverse movement given by side eccentrics is not required. J^1 denotes the louver boards to take the good material down to the next tray. R denotes the screws for conveying inferior material to the discharge spout R^1. M denotes the false bottom into which impurities are repelled and eventually discharged down the spout M^1. K represents the tray pictured in Fig. 4. V represents the main driving shaft of the machine which drives the tray K by means of eccentrics on the shaft, the brasses of which are attached to the tray by a spring V^2. Y^1 denotes the main driving pulley. Y^6 drives Y^7 which drives the shaft V^3 which again drives the top tray. Y^2 drives the pulley Y^5 which drives the shaft V^1, the eccentrics of which drive the foot tray in a way similar to that above described. Y^3 drives the pulley Y^4 which drives the small cross spindle, which drives the screw R. X^1 denotes the pulley which drives the pulley E^1, driving the eccentric shaft, which drives the electrified plates as above described. W represents the main electrical connection to the source of high tension electricity. W^1 represents the smaller connections between the various plates. A larger number of trays might be put in the same frame, if they were made like the top tray K in Fig. 1, with a false bottom M, thus saving the space taken up by the screws R.

Fig. 2 represents an end view of purifier and is given to illustrate the action of the eccentrics in driving the plates. G^1 represents the spindles which move in slides G^2 and are connected by the cross spindle G as shown in Fig. 1. All other parts are lettered and described in Fig. 1. The arrangement of tin trays N^2 above the tray K is given in the top section of the machine: the electrified wires are denoted by N^2 and are stationary: all other parts are as lettered and described in Fig. 1.

Fig. 3 denotes the brass plates, denoted by N in Fig. 1. A^1 denotes a wire connecting plates, and A^2 thin strips of wood between the plates, held in position by the pressure of A upon the brass plates. No drawing is given of the brass electrified wires N^1 Fig. 1 as this would merely consist of a number of parallel straight lines close together having supports A, insulation B, connections W^1 and hangers P as in Fig. 3.

Fig. 4 denotes the tray represented by K in Fig. 1. H represents the channels down which the material flows. H^1 represents the spaces through which the impurities are repelled. J represents the space through which the material falls to the louver boards J^1 (Fig. 1). No special drawing is given of the V shaped tin trays N^2 Fig. 1 as this would consist merely of a number of parallel straight lines with a discharge spout similar to J Fig. 4. A sectional view of these is given in Fig. 2.

Fig. 5 represents the wire grid; W^2 the two parallel wires which, when the grid is in its working position, rest exactly above the center of the channels H of the wooden tray, Fig. 4. B represents the vulcanites which insulate the electrified grid from the tray to which they fasten it. There are three of these grids for each wooden tray.

Fig. 6 represents the tin channels which are placed above the electrified wires; H^2 the V-shaped tin trays; H^3 the space through which the particles are projected into the trays; Z the wooden frame to which the trays H^2 are fixed by screws Z^1; J^1 the discharge spout from the tin trays H^2. There is one tray as depicted in Fig. 6 for each wooden tray as shown in Fig. 4.

Fig. 7 is a sectional view given to illustrate the action of the combined apparatus. When the wires W^2 are electrified and material is passing down the channel H the following action takes place. The best material is not attracted, the matter second in quality is attracted gently by the wires W^2 and flung from them on either side through the spaces H^1. The very worst material is attracted so violently by the wires that it rises above them and is then repelled into the tin trays H^2. The discharge spouts of H^2 and H cannot be indicated in this drawing.

Having now described my said invention what I claim as new, and desire to secure by Letters Patent is:—

1. The method of purifying flour, grain, rice and like cereals, consisting in feeding the same in comminuted condition in a series of shallow streams slightly separated from one another, below a superposed conductor charged with high tension electricity whereby the impurities in said cereals are lifted from said streams, brought into contact with said conductor and repelled so as to fall between the streams, substantially as described.

2. The method of purifying flour, grain, rice and like cereals, consisting in feeding

the same in comminuted condition in a series of shallow streams slightly separated from one another below superposed conductors charged with high tension electricity and producing a reciprocatory movement between said conductors and streams of cereal with relation to each other, whereby the impurities in said cereals are attracted out of said streams, brought into contact with said conductors and repelled between the streams, substantially as described.

3. The method of purifying flour, grain, rice and like cereals, consisting in feeding the same in comminuted condition in a series of shallow streams slightly separated from one another, below a superposed conductor charged with high tension electricity whereby the impurities in said cereals are lifted from said streams and repelled so as to fall between the streams, substantially as described.

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

JOHN LAWSON LAWSON.

Witnesses:
GEORGE COBB,
JAMES GARDNER.