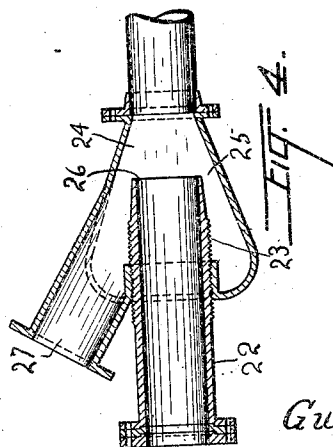
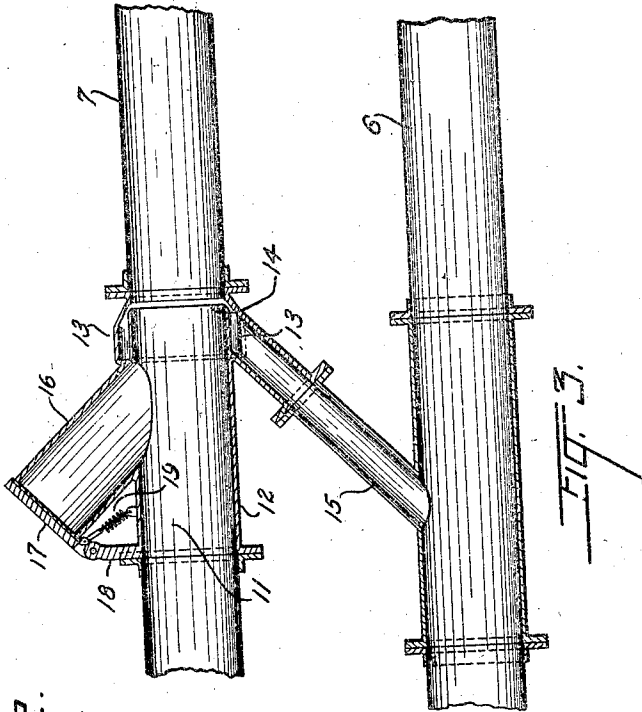
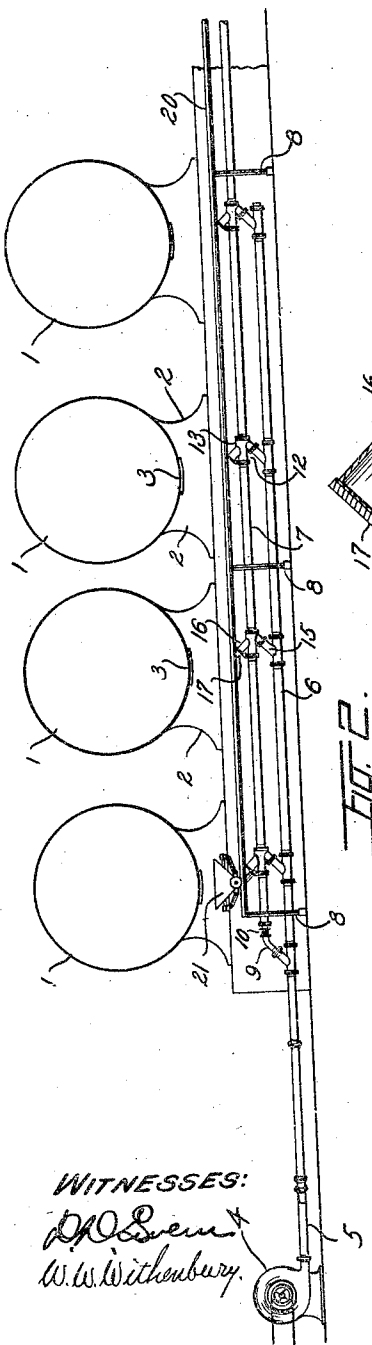


1,053,412.

G. E. LOB.
PNEUMATIC CONVEYER.
APPLICATION FILED SEPT. 15, 1909.

Patented Feb. 18, 1913.
2 SHEETS-SHEET 2.

1,053,412.



WITNESSES:

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PNEUMATIC CONVEYER.

1,053,412.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed September 15, 1909. Serial No. 517,770.

To all whom it may concern:

Be it known that I, GUIDO E. LOB, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Pneumatic Conveyers, of which the following is a complete specification.

This invention relates to improvements in pneumatic conveyers, and more particularly to a pneumatic conveyer adapted to handle malt and other grain.

Heretofore it has been customary to conduct the germinated or growing grain, commonly known as "green malt", from the ventilating tanks to the kiln room by means of mechanical conveyers, such as cup, screw or belt conveyers, and wherever such systems are employed there is always a greater or less amount of malt left in the conveyer troughs after each batch of grain is handled. A considerable portion of the malt thus left has been mashed in the conveyer and adheres to the belt or screw and to the trough. The malt thus left, which contains a large percentage of moisture, invariably sours or molds and if not thoroughly cleaned from the troughs before the next batch is run through it tends to injure the entire batch. Furthermore such conveyers do not get proper ventilation, and owing to the moisture in the grain they tend to become sour or musty if proper attention is not given them, with the result that a large percentage of samples analyzed in the laboratory show traces of mold.

The objects of this invention are to provide a pneumatic conveyer adapted particularly for carrying wet or damp malt or other grains, and which is so constructed that the grain cannot lodge therein and become soured; to provide a conveyer adapted to be kept in a thoroughly dry condition so as not to contaminate the malt; and to provide a conveyer of cheap and simple construction adapted to rapidly convey the malt to a place of deposit with a minimum amount of wear on the operating mechanism.

A specific construction embodying said

invention is illustrated in the accompanying drawings, in which:

Figure 1 is a fragmentary, plan view of a conveying system embodying this invention. Fig. 2 is a section taken on line A—A of Fig. 1. Fig. 3 is an enlarged side elevation of one of the conveying pipes and air mains with their connections. Fig. 4 is a fragmentary, longitudinal section of the conveyer pipe with a modified form of injector.

In the construction shown in said drawings, the ventilating drums 1 are supported upon suitable foundations or supports 2, and each is provided with an outlet gate or door 3 in the bottom for the malt. As shown there are two batteries of said drums though any desired number may be employed.

A blower 4 of any preferred construction has an air main or pipe 5 leading from the exhaust port thereof and is provided with branch mains 6 leading to the different batteries, and which preferably extend beneath the drums 1 and are closed at their forward ends. A conveyer pipe 7 also extends beneath the drums of each battery and is parallel with the air main 6. Said pipes and mains are supported, one above the other, upon brackets or standards 8 which extend above the pipes, and the rear end of each conveyer pipe 7 is connected with the adjacent air main 6 by means of a pipe connection 9, which extends upwardly and forwardly from the main 6 at an angle of approximately 45 degrees, and is provided with a gate valve 10 by means of which the passage of air from the main 6 into the forward end of the conveyer pipe 7 may be controlled.

A plurality of injectors 11 are connected in the conveyer pipe 7, one beneath each drum. Each of said injectors, as shown more clearly in Fig. 3, has a body 12 of the same cross-sectional shape and size as the pipe 7, so that when connected therewith it provides a uniform passage through the conveyer. Encircling said body is an annular pocket or chamber 13 which opens at its forward end into the body through the annular slot or opening 14 which is directed

forwardly at an angle of approximately 45 degrees. An air feed pipe 15 leads forwardly from the air main 6 and opens into the pocket 13, and the air blast conducted therethrough and through the pocket into the pipe 7 is directed forwardly of said pipe 7. A grain receiving spout or pipe 16 opens into the body 12 preferably at a point rearwardly of the pocket 13 and at a forwardly directed angle to the pipe 7. The outer end of said spout 16 is adapted to be closed, when not in use, by means of a lid 17 which is hinged on an ear or bracket 18 carried on the body 12, and a spring 19 is attached at one end to said lid and at its other end to the body forwardly of said ear and acts normally to hold the lid closed.

Carried on the tops of the brackets or standards 8 are the track rails 20 which extend parallel with the conveyer pipe 7. Mounted to travel on said track is the hopper 21, the outlet spout of which is adapted to fit closely in the receiving spouts 16 and to deliver malt or other grain thereto from the drums.

In the construction shown in Fig. 4, the conveyer pipe 7 is provided with an adjustable injector by means of which the amount and force of the air entering the conveyer pipe may be regulated. Said injector comprises a body 22, having a threaded portion 23 on which is adjustably secured the conical pocket 24, which surrounds the inner end of said body. By adjusting said pocket longitudinally of the body the space 25 between the end 26 of said body and the sides of said pocket is restricted or enlarged to regulate the passage of air. With this construction the grain enters the conveyer pipe at any point back of the injector and the air enters through pipe 27 which opens into said pocket.

The operation of the construction shown is as follows: The hopper is set beneath the drum from which it is desired to take malt. The lid of the adjacent receiving spout 16 is opened and the hopper is connected in said receiving spout. The lids of the other receiving spouts remain closed. Air is then forced through the air main 6 and it enters the injectors forwardly of the receiving spouts. The forward travel of the air tends to create a vacuum at the rear of each injector and thereby acts to suck the malt from the hopper into the conveying pipe and carry it forwardly therethrough to the place of deposit. The air from each injector also acts to drive the malt ahead of it forwardly through the pipe. If desired to also apply air at the rear of the malt received in the first injector the gate valve 10 may be opened to permit air to pass from the main into the rear end of the pipe 7. Owing to the for-

wardly inclined openings from the pockets 13 to the bodies 12 the malt cannot lodge in the conveyer and the conveyer will be thoroughly cleared of malt and dried by the air blast, thereby keeping it sweet and clean.

Obviously more than one hopper may be used for each battery of drums if desired so that malt may be simultaneously conveyed from several drums, and obviously also many details of the construction and arrangement may be varied without departing from the scope of this invention.

I claim:

1. A pneumatic conveyer comprising an air pipe, means for forcing air through said pipe, a conveying pipe parallel with said air pipe, each pipe having a section therein, and each section having a branch opening at an angle therefrom, said branches being connected together to form a continuous connection between the two pipes, a conical pocket surrounding and extending beyond the end of one of said sections and into which said connection opens, said pocket being adapted to converge the air current from all points circumferentially of the section, a receiving spout opening into the section at the rear of the pocket, a bracket on said section, a cover hinged to the bracket and adapted to close the spout, and a spring acting normally to hold the cover in closed position.

2. A pneumatic conveyer, comprising an air pipe a blower adapted to force air through the pipe, a conveyer pipe having a valved connection at one end with the air pipe and extending parallel with the air pipe, said conveyer pipe having a break therein, an annular pocket surrounding said break and connecting the two parts of the pipe, said pocket having a forwardly tapering end, a feed pipe leading at a forwardly directed angle from the air pipe and opening into said pocket, and a forwardly directed spout opening at an angle less than a right angle into the conveyer pipe at the rear of said pocket.

3. A pneumatic conveyer, comprising an air pipe, a blower connected to one end of the air pipe and adapted to force air there-through, a conveyer pipe connected at one end to the air pipe and extending parallel to the air pipe, a valve in the connection between the conveyer pipe and the air pipe, a plurality of injector bodies of the same diameter as the conveyer pipe and each connected at one end to the conveyer pipe, an annular pocket on each body surrounding the other end of the body and tapering forwardly therefrom and connected to the pipe, a feed pipe extending rearwardly from the bottom of said pocket and opening into the air pipe, a forwardly inclined spout opening into the body at the rear of said pocket,

a bracket on the body at the rear of said spout, a cover for the spout hinged to said bracket, and a spring connected to said cover and extending forwardly and connected to the body and adapted to automatically close the cover and prevent air entering the spout.

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

GUIDO E. LOB.

Witnesses:

W. W. WITHEBURY,
F. O. WITHEBURY.