

934,026.

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APPARATUS FOR CONDITIONING GRAIN.

934,026.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed May 15, 1907. Serial No. 373,703.

To all whom it may concern:

Be it known that I, CLAUDE D. STEPHENS, 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 Apparatus for Conditioning Grain, of which the following is a specification.

My invention relates to apparatus for conditioning and improving the quality of grain by the use of bleaching fumes such as sulfur dioxide, and has for its objects; to provide an improved and simplified apparatus for carrying out the operation; to provide an apparatus in which the amount of steam supplied for making the bleaching fumes effective is accurately gaged and determined, and may be regulated precisely to suit the condition of the grain to be treated, and finally; to provide an improved apparatus wherein all the gases used are applied to the best advantage. One form of the apparatus is illustrated in the accompanying drawing, wherein—

The figure is a diagrammatic side elevation partly in cross section, showing the arrangement of the complete apparatus.

Referring to the drawing, 1 is the bin from which the grain to be treated is supplied, 2 is the trough or chute leading from the bottom of the bin 1, 3 is the treatment chamber wherein the mixture of the gases with the grain to be treated is secured, which treatment chamber is provided with the sets of rods 3' forming gratings for breaking up the mass of grain as it falls, 4 is the furnace for supplying sulfur dioxide fumes, 5 is the pipe for leading the fumes to the treatment chamber 3, 6 is a sprinkler for supplying moisture to the grain as it passes through the chute 2 when necessary, 7 is a pipe for supplying steam under high pressure, which pipe is provided with two gages 8 and 9 and the pressure reducing valve 10, 11 is a pipe leading into the pipe 5 at its upper end and having at its lower end a series of cross pipes 12 communicating with the pipe 7, each of which cross pipes is provided with a valve 13. 15 is an outlet door at the bottom of the treatment chamber 3, 16 is a screw conveyer for carrying away the treated grain, and 17 is a window for inspecting the contents of the chamber. A modified form of apparatus is shown in my co-pending application Serial No. 373,705.

In operation, grain is admitted to the

treatment chamber 3 through the trough 2, the grain being slightly dampened by means of the sprinkler 6 if necessary, and upon reaching the said treatment chamber, passes gradually therethrough, the mass being broken up retarded by the alternate series of cross rods 3' until it reaches the bottom and is discharged through the door 15 and carried away by the screw conveyer 16. The gradual passage of the grain through the treatment chamber gives opportunity for a thorough bleaching by the sulfur fumes from the furnace 4, which fumes are mixed with steam in order to make them effective in their action upon the grain by means of the steam pipe 11. The apparatus for regulating the quantity of steam supplied, constitutes an important feature of my invention. Various kinds and conditions of grain require a greater or less quantity of steam with the sulfur dioxide in order that the best results be secured, and my regulating apparatus is designed to give a variable and known quantity of steam to suit the various requirements imposed by different conditions of grain to be treated. The pressure reducing valve 10 permits of the regulation of the steam pressure in the pipe 11 to the right of such valve, which pressure is known by means of the pressure gage 9, and the cross pipes with their valves 13 provide a means for regulating the volume of steam admitted to the pipe 11. Means are thus provided for regulating not only the pressure of the steam admitted to the pipe 11 and to the treatment tank 3, but also means for regulating the volume of steam, the carrying capacity of each of the small cross pipes 12 being known. In this manner the exact quantity of steam supplied can be regulated and determined.

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 treatment chamber through which grain is adapted to be passed, a pipe 11 having one end communicating with the treatment chamber, a steam pipe 7, a series of small cross pipes 12 each of which has its opposite ends connected to the sides of the pipes 11 and 7 and each provided with a valve 13, a pressure reducing valve 10 in the pipe 7, and a gage 9 on the outlet side of valve 10, each of the said pipes being of less capacity than that of the pipes 7 and 11.

2. The combination with a treatment chamber through which grain is adapted to be passed, of a furnace and pipe for supplying sulfur dioxid fumes thereto, a steam
5 pipe leading into the sulfur dioxid pipe, a second pipe for supplying steam thereto, a plurality of small cross pipes for connecting the two pipes and each provided with a valve, a pressure reducing valve in the sec-
10 ond pipe, and a gage in such pipe interme-

diate the pressure reducing valve and the cross pipe.

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

CLAUDE D. STEPHENS.

Witnesses:

PAUL CARPENTER,
JAMES N. LORENZ.