July 20, 1954 H. A. PIXLER 2,683,940

GRAIN DRYING APPARATUS

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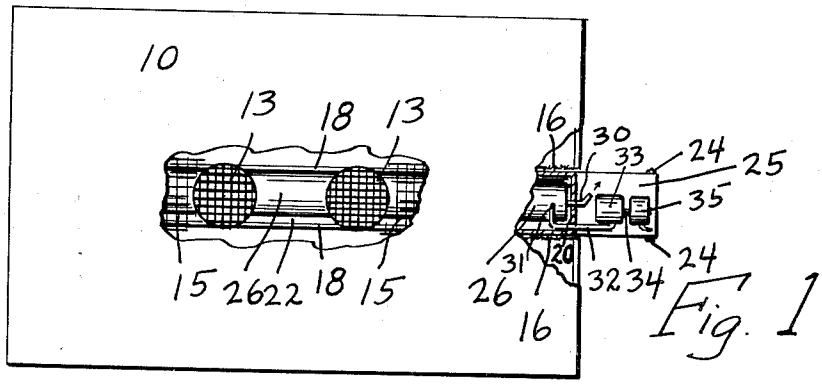


Fig. 1

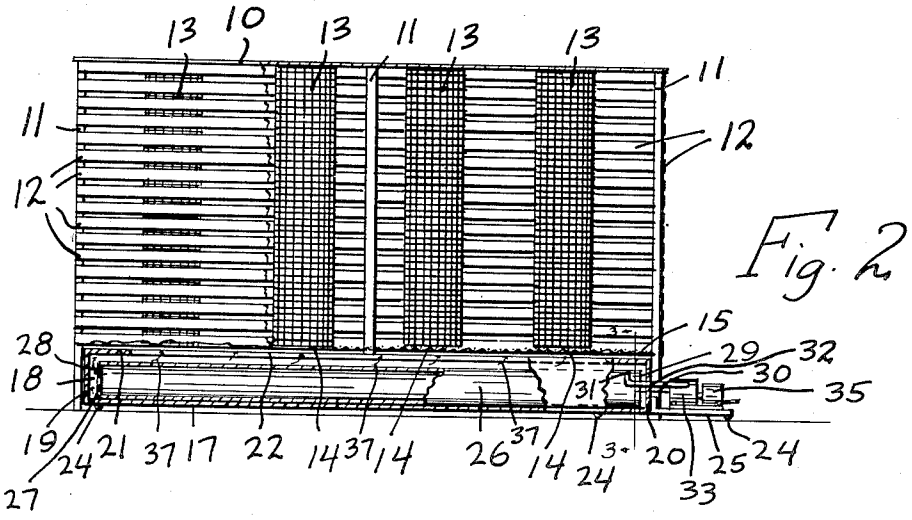


Fig. 2

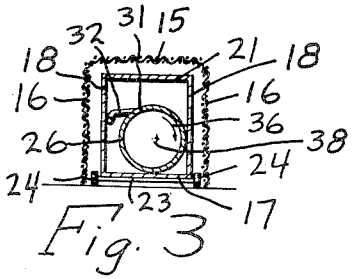


Fig. 3

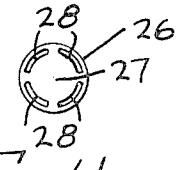


Fig. 4

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GRAIN DRYING APPARATUS

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2 Claims. (Cl. 34—232)

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My invention relates to a grain drying apparatus.

An object of my invention is to provide a drying apparatus for grain or similar products in which heat is supplied by the use of a cylindrical tube with air pressure being supplied to the tube, and with such pressure being applied tangentially thereto to thereby create heat, which heat passes from the tube structure as a medium for drying the grain.

A further object of my invention is to provide such a structure which by its nature will be accommodated readily to grain drying bins.

A further object of my invention is to provide a portable structure for the above entitled purpose which can be moved from one bin to another.

With these and other objects in view, my invention consists in the construction, arrangement, and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of my invention as used in one type of grain bin with portions thereof being taken in section,

Figure 2 is a side elevation of the grain bin with the major portions thereof, however, being taken in section,

Figure 3 is an enlarged sectional detail taken along the lines 3—3 of Figure 2, and

Figure 4 is an end view of the tubular arrangement.

My invention contemplates a simple heating arrangement which will provide means for drying grain in grain bins and the like, and to provide the important means of supplying such heat with a complete absence of flame, which flame would be dangerous to handle in such bins.

My invention also contemplates the provision of a steadily applied heat for the purpose intended.

I have used the character 10 to designate the flat roof of a corn or other bin, the character 11 indicating a series of vertically positioned posts to which posts are attached the spaced horizontal slats 12, and I further used the character 13 to indicate a series of equally spaced cylindrical tubes made of heavy mesh wire, or which can be of other constructions, the grain being stored within the bin and surrounding the cylindrical members 13, these members extending to the top wall 10, and which members, however, are open at their lower portions 14.

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The storage bins usually include a substantially U-shaped wire mesh framework member having the top portion 15 and the sides 16 which rest upon the ground, this member extending practically the entire length of the grain bin.

I further provide a lengthened rectangular casing having the bottom wall 17, side walls 18 and end walls 19 and 20, and an upper wall 21 having the lengthened opening at 22, which opening at 22 will therefore communicate with the grain in the bin as well as to the hollow cylindrical mesh members 13. Attached to the casing wall 17 are the stationary shaft members 23 upon which are journalled the small rollers 24, and attached to the end wall 20 is a platform 25. Resting upon the bottom wall 17 of the rectangular casing is a cylindrical tube 26 having an end wall 27 in which are arranged a series of peripherally located slots 28, the tube 26 having a further end wall 29, and communicating with the end wall 29 and centrally thereof is the tube 30, and communicating with the periphery of the tube 26 at 31 is a pipe 32 which passes to the air compressor 33 which is driven by means of the shaft 34 which shaft is driven by means of the electric motor or other type of motor 35, the compressor and motor resting upon the platform 25.

The tube of this construction follows generally the construction of a well-known scientific principle wherein when a gas under pressure, such as air, is directed into a lengthened tube, and wherein such air is directed tangentially, the result will be a stream of heated air passing out of one end of the tube and cold air out of the other. This type of tube and apparatus is illustrated in the patent to Ranque, Number 1,952,281, issued March 27, 1934, under the title, "Method and Apparatus for Obtaining from a Fluid Under Pressure Two Currents of Fluids at Different Temperatures." It will be noted that the compressed air passing from the compressor 33 which passes in the direction of the arrow 36 (see Figure 3) will form a continuous helical stream of air rapidly rotating within the tube at the outer periphery thereof, the theory generally being that the friction of the air within the tube will cause a certain amount of heat to be generated within the air, there also being further reasons for this heat being generated, which heat, therefore, will pass out of the peripherally arranged end openings 28 and thence in the direction of the various arrows 37 upwardly into the cylindrical mesh members 13, and through the portion 15 into the grain, thereby drying the grain with a complete

absence of flame, such grain not usually requiring too much heat, and which drying need not be accomplished too quickly.

According to the theory of this tube, the cold air will pass generally in a smaller helical form as indicated by the arrow **38** centrally of the tube, and will pass in the opposite direction through the tube **30** and out of the tube **30** as indicated by the arrow in Figure 1.

In the theory of this type of tube, a stream of air is separated into two streams of different temperatures, this tube also being developed by Hilsch.

These heat generating tubes are being experimented with, and it appears as though they will gradually be developed to a point where fairly high temperatures will be achieved.

It will now be noted that the unit can be placed in the members **15** and **16** as desired, and can be rolled out of the bin and placed in other bins, and all that is required for the unit is sufficient power to operate the compressor.

It will now be seen that I have provided the various advantages set forth in the objects of my invention with various other advantages being readily apparent.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. In combination with a grain bin, a drying apparatus for the same comprising a box-like lengthened housing for insertion into said grain bin, a tubular member in said housing, a pipe communicating with said tubular member tangentially to the inner surface thereof, means for passing compressed air into the said tubular member through said pipe whereby heated air will be generated in said tubular member for drying grain in said bin, said housing having an upper opening communicating with the grain in said bin to dry the same, said tubular member having end ducts therein for passing heated air into said upper opening, said tubular member having a further duct communicating exteriorly of said bin to provide exhaustion of cool air exteriorly of said bin.

2. In combination with a grain bin, a drying apparatus for the same comprising a box-like lengthened housing for insertion into said grain bin, a tubular member in said housing, a pipe communicating with said tubular member tangentially to the inner surface thereof, means for passing compressed air into the said tubular member through said pipe whereby heated air will be generated in said tubular member for drying grain in said bin, said housing having an upper opening communicating with the grain in said bin to dry the same, said tubular member having end ducts therein for passing heated air into said upper opening, said tubular member having a further duct communicating exteriorly of said bin to provide exhaustion of cool air exteriorly of said bin, said housing including rollers journaled thereto for providing portability to said housing whereby the same can be removed or inserted beneath said grain bin.

References Cited in the file of this patent

UNITED STATES PATENTS

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1,952,281	Ranque	Mar. 27, 1934