

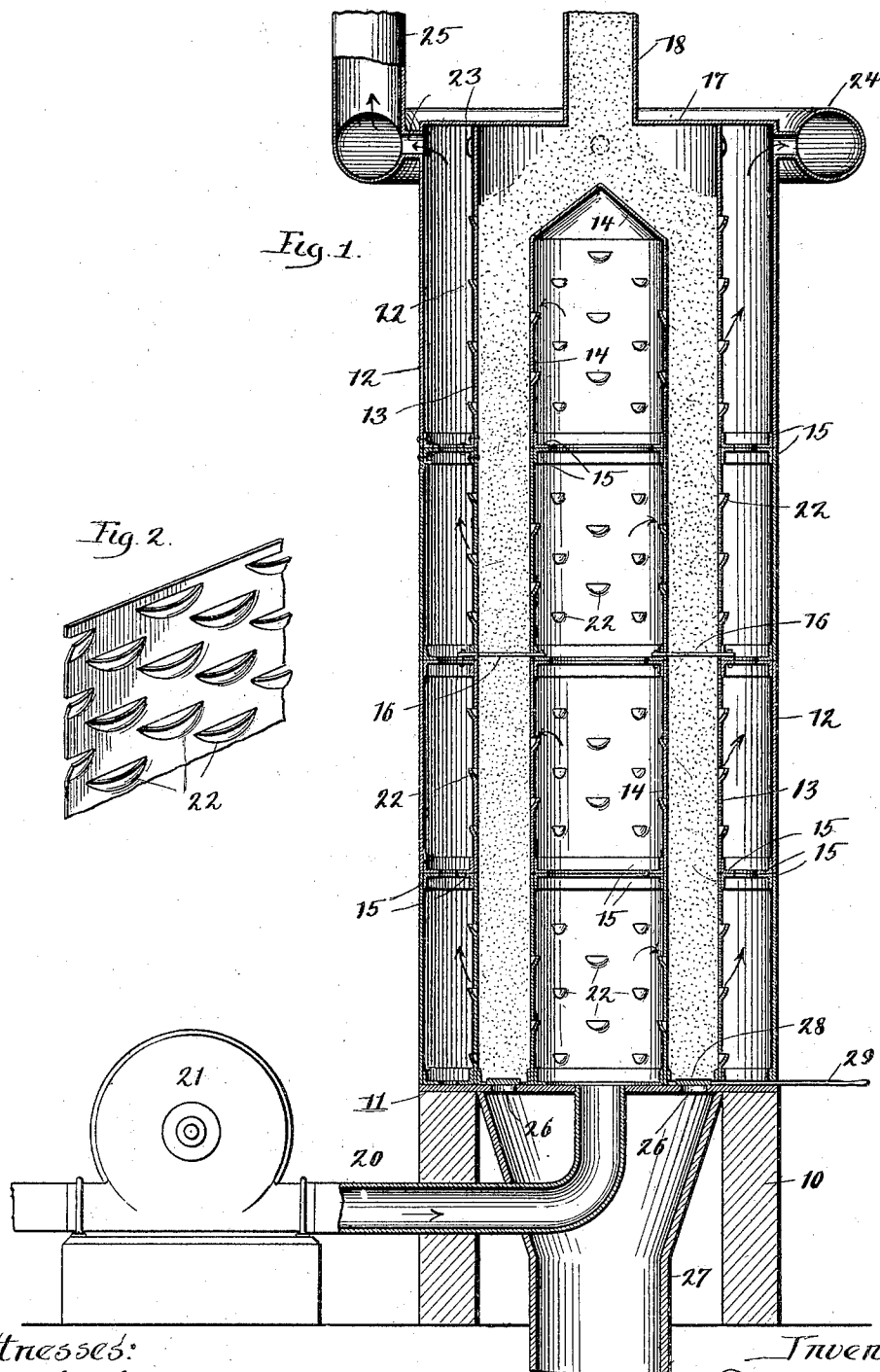
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Patented Jan. 14, 1902.

W. TWEEDALE & W. L. HARVEY.
APPARATUS FOR DRYING GRAIN.

(Application filed Mar. 29, 1901.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM TWEEDALE AND WILLIAM L. HARVEY, OF CHICAGO, ILLINOIS.

APPARATUS FOR DRYING GRAIN.

SPECIFICATION forming part of Letters Patent No. 691,209, dated January 14, 1902.

Application filed March 29, 1901. Serial No. 53,387. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM TWEEDALE and WILLIAM L. HARVEY, residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Drying Grain, of which we declare the following to be a full, clear, and exact description.

The present invention has for its object to improve the construction of the apparatus for drying grain described and claimed in Letters Patent of the United States granted to us, No. 638,429, dated December 5, 1899, whereby the cost of manufacture is diminished and the efficiency of the apparatus considerably increased.

The invention consists in the features hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claim.

Figure 1 is a view in central vertical section through a drying apparatus of our improved construction. Fig. 2 is an enlarged detail view of a section of the ported walls.

The previous construction comprised inner and outer vertical walls of metal having openings therein, with an intermediate space for the reception of the grain or other material to be dried, together with means for directing a blast of hot air transversely through the openings in the walls and the grain-inter-space. Upwardly-extending guards were secured to the cylindrical walls over the openings to prevent the passage of the grain there-through.

In the improved construction the walls are provided with ports struck up laterally from the body of the sheet metal and having upwardly-facing openings. By this means we dispense with the necessity for the employment of the guards secured to the walls, thus reducing the cost of manufacture and permitting the use of much thinner metal, whereby the conductivity of the walls and the efficiency of the apparatus are materially increased.

Upon a suitable foundation 10 is placed a metal base 11, preferably of thick boiler-plate. Three concentric vertical cylinders or walls 12, 13, and 14 are mounted upon the base B. The walls are preferably constructed of sheet-metal sections braced by hooped

angle-irons 15, the laterally-extending flanges of which furnish convenient means for riveting the sections together. Suitable brace-rods 16 may be employed where desired, connecting the hooped angle-irons 15. The space between the outer wall or cylinder 12 and the intermediate wall 13 is closed at the upper end by the top plate 17, from the center of which rises the grain-delivery spout 18. The inner cylinder 14 is closed at its upper end by a cover-plate 19, preferably of conical shape, to uniformly distribute the grain as it enters the interspace formed between the cylinders 13 and 14. Into the bottom of the inner cylinder, through the base 11, opens a hot-air-delivery pipe or passage 20, through which hot air will be forced by a suitable blower 21.

The inner and intermediate cylinders 13 and 14 are constructed of thin sheet metal, from the body of which small sector-shaped portions are laterally stamped or struck up by a suitable die to form laterally-projecting ports 22 of peculiar formation, which are staggered and placed closely together, as shown in Fig. 2. In Fig. 1 some of the ports are omitted for the sake of clearness. The ports project outwardly upon the cylinder 13 and inwardly upon the cylinder 14, (see Fig. 1,) and the openings thereof face upwardly and are arranged in transverse horizontal planes, so that the grain is effectively prevented from passing therethrough.

The air is forced transversely through the ported walls and intermediate grain-space and escapes through the short pipes 23 into the bustle-pipe 24, and thence to the discharge 25, as indicated by arrows in Fig. 1.

The base 11 is provided with a series of discharge-openings 26, opening into the grain-space and through which the grain escapes to a suitable hopper 27. These openings are controlled by annular grid-valve 28, which is in the ordinary manner provided with openings to register to a greater or less extent with the openings 26. An externally-projecting handle 29 is provided to manipulate the valve. Any other suitable form of valve may of course be used to regulate the passage of grain through the drier, and thereby control the extent of time to which it is subjected to the hot gases.

In the use of the apparatus grain to be dried is delivered to the spout 18 and fills the annular space between the walls 13 and 14. A blast of hot air is then forced by the blower 5 21 through the inlet-passage 20 to the inner cylinder. From thence it will pass transversely through the ported walls or cylinders 13 and 14 and the intermediate grain-space into the annular conducting-chamber formed 10 by the cylinder or wall 12, from which it will finally be discharged through pipes 23, bustle-pipe 24, and outlet 25. The body of grain is not only subjected to the heat of the air passing through it, but also the heat conducted 15 from the hot air through the walls of the cylinders 13 and 14. By constructing these walls of sheet metal formed with the peculiarly-shaped stamped-up ports we do away with the necessity of securing guards formed of separate pieces of metal over openings in the 20 walls, as in the old apparatus. This permits the use of much thinner sheet-metal walls, and the amount of heat conducted there-through to the grain is thus considerably increased. In this construction, moreover, the 25 ports may be staggered and overlapped, as shown in Fig. 2, so as to be placed more closely together than in the prior construction, and all parts of the body of grain will be more thoroughly subjected to the traversing currents of hot air, while at the same time the upwardly-facing openings of the ports 22 may be made sufficiently large to permit the free passage of the air without danger of the escape of the grain through the walls of the cylinders. It is obvious, too, that the cost of

construction is considerably diminished by forming the walls of thin sheet-iron having the peculiar-shaped ports struck or stamped up in the body of the metal. 40

The apparatus is designed particularly for drying grain and the like, but may be used with equal effectiveness for cooling grain. Also changes may obviously be made in the construction of the apparatus without departure 45 from the essentials of the invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

A drying apparatus comprising inner, intermediate and outer walls separated to form 50 corresponding spaces and chambers, the inner and outer spaces or chambers being for hot air or the like while the intermediate space or chamber is for the reception of the material to be dried; said inner and intermediate 55 walls being formed of sheet metal having plain opposing faces (*i. e.*, without offsets) to permit a free passage of the material to be dried and having ports stamped from the body of 60 the metal whereof said walls are formed, the offset metal forming said ports lying entirely upon the sides of said walls away from their opposing faces and the tops of said offset metal portions terminating at approximately 65 the top lines of the openings in said walls.

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