

No. 647,301.

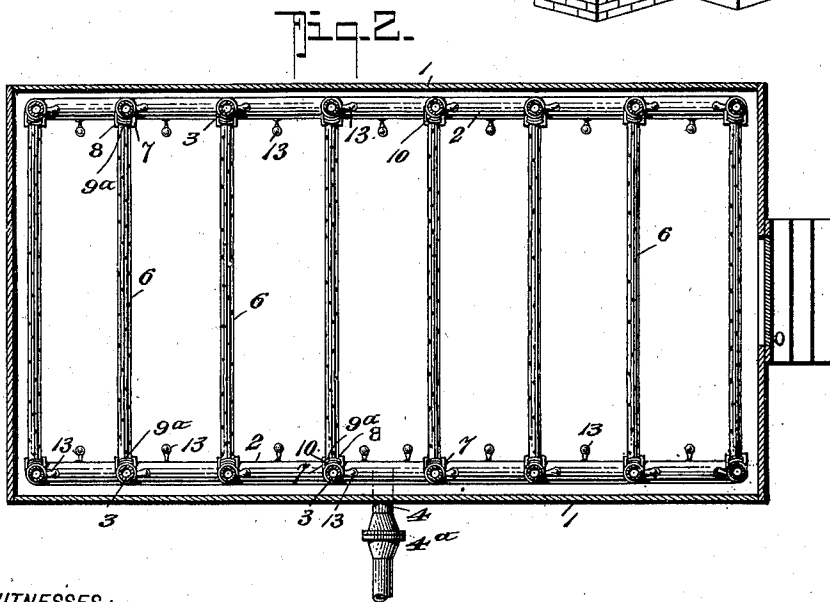
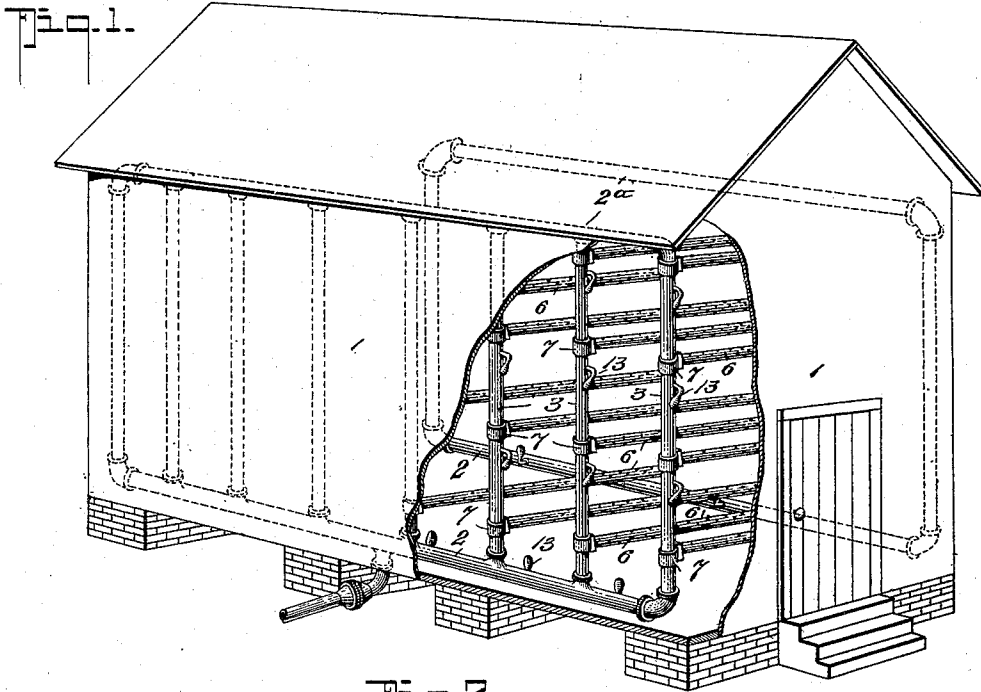
Patented Apr. 10, 1900.

J. L. HOLLINGSWORTH.
GRAIN TREATING APPARATUS.

(Application filed Aug. 28, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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GRAIN-TREATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 647,301, dated April 10, 1900.

Application filed August 28, 1899. Serial No. 728,709. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. HOLLINGSWORTH, residing at Newbern, in the county of Dyer and State of Tennessee, have invented certain new and useful Improvements in Grain-Treating Apparatus, of which the following is a specification.

This invention is in the nature of an improved means for ventilating grain, cotton-seed, lumber, fruit, and other articles perishable by reason of dampness, heat, or other causes stored in bulk either in elevators or other storehouses, on shipboard, or on cars in transit from place to place.

This invention primarily seeks to provide a simple and inexpensive system of distributing-pipes that can be conveniently applied to the ordinary farmers' storing-bins or barns and effectively operated to keep the grain or other articles to be kept in bulk in a proper condition until such time as it can be disposed of at the most advantageous price, and thereby avoid the necessity of sending it to the usual "commercial elevator," as is now usually done, and which entails on the farmer considerable trouble and expense.

My invention comprehends generally a novel construction of disseminating-pipes suitably arranged to distribute hot or cold air under pressure through the grain or other material held in bulk and having the several sections forming the complete series of valved pipes, whereby the distribution of the current can be readily and accurately controlled.

It should be stated my invention is especially intended for farmers' uses; and in connection with the discharging-pipes it comprises means having a single feed connecting with the inlet of the distributing-pipes capable of forcing hot or cold air into the bulk to be treated at the will of the operator.

In its subordinate features this invention comprehends certain novel details of construction and peculiar combination of parts, all of which will hereinafter be referred to and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a view illustrating in a general way the manner of fitting the distributing-pipes within a grain-holder or barn. Fig. 2 is a horizontal sectional plan of the same.

Fig. 3 is a diagrammatic view illustrating the distributing-pipes and the generating means for supplying hot or cold air. Fig. 4 is a diagram showing the arrangement of my invention when applied for lumber-drying. Fig. 5 is a view illustrating the same as a means for ventilating the grain in a grain-car. Figs. 6 and 7 are detail views illustrating the preferred manner of connecting the perforated pipes to the feeder-pipes. Fig. 8 is a detail vertical section of the upper end of the generator and its offtake-pipes hereinafter referred to.

In the accompanying drawings, 1 indicates a storage-house or barn, which may be any ordinary farm drying-barn and suitably arranged to hold grain, cotton-seed, fruit, or other perishable articles in bulk. Within the barn is placed what I term a "disseminator" for charging the body or bulk of material with hot or cold air, as conditions may make desirable. The disseminator comprises end sections consisting each of a horizontal base-pipe 2, an upper horizontal pipe 2^a, and a series of vertical pipes 3, that connect with the pipes 2 2^a. The base-pipe of one section has a feeder 4, that projects below the floor of the barn-house and connects with the supply-pipe 5, that forms the offtake for the hot and cold air generator presently referred to, and the said feeder 4 has a gauze diaphragm 4^a to prevent entrance of sparks or other products of combustion. The two side sections of the disseminator are connected by a series of horizontally-disposed perforated pipes 6, of which there may one, two, three, or more, as the amount of material held in bulk may justify. Thus if the grain or other article is of a depth to merely cover the floor sufficiently to come above the first series of transverse pipes only such set of pipes 6 will be sufficient, and all the air, hot or cold, disseminated will be discharged through the said set, as the other sets may be removed or, if in place, cut off from the air-supplying pipes by suitable valves, as will presently more fully appear.

One of the essential features of this invention lies in arranging the disseminating-pipes so that they can be set up in place as conditions may make necessary. For this purpose the vertical pipes 2^a have a series of equally-

spaced couplings 7, that have openings 7^a, held to register with outlets 7^c in the pipes 6 and to hold the perforated pipes in place airtight. The couplings 7 have angle-faced members 8, with which the flanges 9^a of the angle-faces of the perforated pipes engage, as clearly shown in Figs. 7 and 8, said faces being held airtight by the flexible washers 10 and the clamp-bail 11, secured to the perforated pipe and having a clamping portion adapted to engage the clamping-lip 12, made fast to the coupling member 7.

The several pipes 2 2^a 3, as also the perforated pipes, have cut-off valves 13, so arranged that the air-supply can be cut off from any of the perforated pipes desired and the discharge of air thereby governed to suit the condition of the material to be treated.

So far as described it will be readily seen that the farmer can build up the disseminator to the capacity desired by simply adding one or more series of pipes as the bulk within the storehouse increases, or, if desired, in case all the tiers of pipes are in place he can allow them to remain and cut out such as he likes by properly setting the several valves 13.

As a simple means for maintaining a forced draft in the disseminator of hot or cold air I employ a generating means, such as is illustrated in detail in Fig. 3, the same consisting of a sheet-metal body 20, having a tapering top 21, ending in an ordinary offtake 22, provided with a cut-off valve 22^a.

22^x indicates a supplemental smoke-offtake pipe connected with the top 21 at a point below the mouth of the offtake 22, and the said offtake 22^x connects with the air-outlet pipe 25^a, it also having a cut-off valve 22^y, as best shown in Fig. 8, by reference to which it will also be seen the pipe 25^a has a cut-off valve 25^b, and at a point in advance of said valve 25^b it has a valve-lateral 25^c, that discharges into the smoke-offtake 22^x, whereby to provide an injector for creating a forced draft in the supplemental offtake 22^x when desired.

23 indicates a series of air-circulating pipes coiled within the heating-chamber 20^a of the body 20, the upper end 24 of the said coils discharging into the offtake 25, that delivers the air into the feeder-pipe 5, which joins with the disseminating-pipe 4. The inlet ends of the pipe-coils 23 communicate with the air-receiving spaces 26, with which connect the feed-pipes 27 27^a, one of which, 27, joins with a force-pump or compressor 28, operated in any approved manner—for example, from the shaft of a blast-fan 50, as shown in Fig. 3—while the other pipe 27^a connects with the blast-fan, such arrangement of pipes permitting air being forced directly into the pipes 27 27^a from the fan 50 or from the fan and also the pump 28, if desired.

So far as described it will be readily seen that should it be desired to force hot air into the grain or other bulk the air can be readily heated by building a fire within the heater,

it being understood that when no fire is in the heater (generator) cold air can be fed through the pipe-coils from the compressor.

When it is desired to dry the material within the storing-house by smoke and hot air combined, the valve of the main smoke-offtake 22 is closed and the valve in the supplemental offtake 22^x is open, it being manifest that if desired the draft through the pipe 22^x can be forced by opening up the lateral 25^c.

By providing the screen diaphragm 4^a danger of sparks entering into the disseminating-pipes is reduced to the minimum.

My system of disseminating-pipes will be found especially desirable for conveying grain in cars. When so used, the car may have a suitable rack to hold the detached perforated pipe-sections, as shown. When employed for drying lumber, the disseminating-pipes are arranged at one end of the drying-kiln and connected with the offtake of the hot or cold air supplying means. When used for lumber-drying, a suction-fan is used having its inlet-pipe projected within the kiln and its exhaust-pipe curved to the opposite side of the kiln and held to discharge into an air-duct 30, having inlets discharging at a point under the disseminator, as clearly shown in Fig. 4, said pipe also having a two-way valve 31, whereby the damp air drawn off from the kiln can be discharged into the atmosphere and when desired a continuous circulation of the air within the kiln maintained.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for the purpose described; the combination with the storing house or bin, and the perforated distributing-pipes held therein, said pipes having governing-valves and having a feed-inlet extending externally of the housing or bin; of a means for generating hot air and forcing it into the feed-inlet for the distributing-pipes said means comprising a heater-body, and air-circulating pipes held therein; means for forcing compressed air through the said pipes; the heater-body having a main valved smoke-offtake and provided with a supplemental valved smoke-offtake, said supplemental offtake and the air-offtake joining with the single feed-pipe which connects with the inlet member of the distributing-pipes, said single feed-pipe having a spark-arrester diaphragm, all being arranged substantially as shown and described.

2. An improved apparatus for the purposes described, comprising a suitable housing; a set of distributing-pipes within the said housing consisting of a series of imperforated vertical pipes having outlets at predetermined points; a series of perforated pipes adapted to be detachably connected with each set of vertical pipes and joining with their outlets; adjustable means for clamping the perfo-

rated pipes in an air-tight position against the said vertical pipes, whereby any one or more of the said perforated pipes can be removed; valves mounted in the said vertical pipes, one for each individual discharge-opening thereof, and means for forcing air into the said pipes, substantially as shown and for the purposes described.

3. In an apparatus as described, the combination with the housing; of a system of disseminating-pipes, comprising side pipe-sections, having a series of vertical pipes having outlets; a series of perforated pipes adapted to detachably connect with each set of opposing vertical pipes having means for clamping the perforated pipes in an air-tight position; and valves mounted in each vertical

pipe, one for each perforated transverse pipe, as set forth.

4. In a grain-treating apparatus as described, the combination with the vertical pipes 3, having outlets 7^a, and wedge-shaped sockets 8; of the perforated pipes 16 having wedge-shaped ends 9^a, adapted to seat on and interlock with the sockets 8; and the lock-bails fitted on the pipes 6, having pendent members adapted to engage the lock-lip on the wedge-socket 8, all being arranged substantially as shown and described.

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