No. 722,118. PATENTED MAR. 3, 1903.

LA FAYETTE W. LILES.

GRAIN DRYING MEANS.

APPLICATION FILED AUG. 7, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

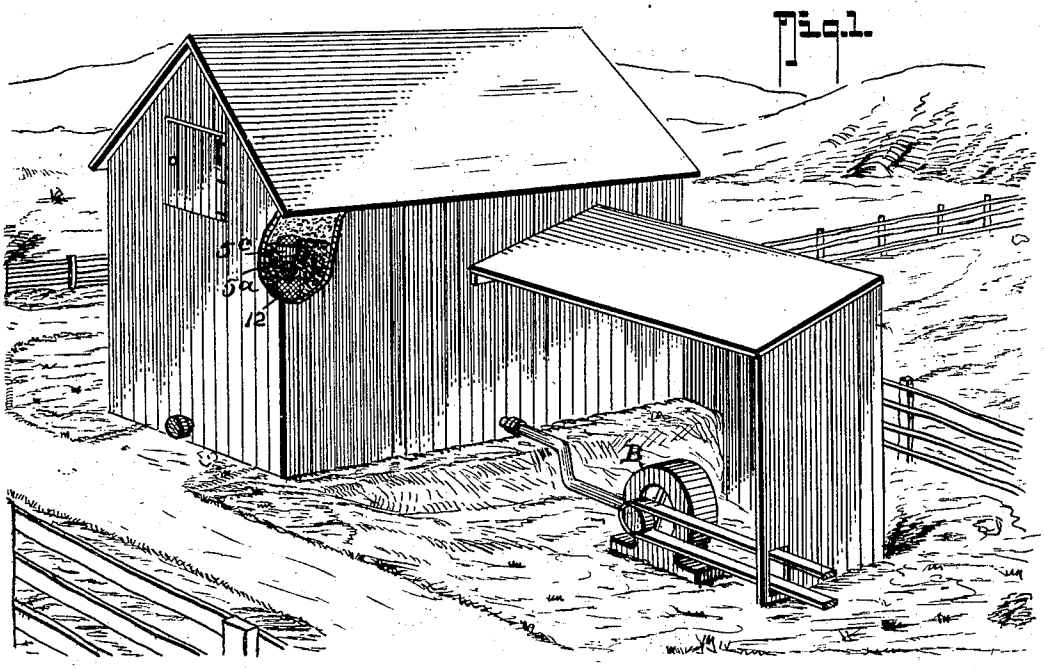


Fig. 2.

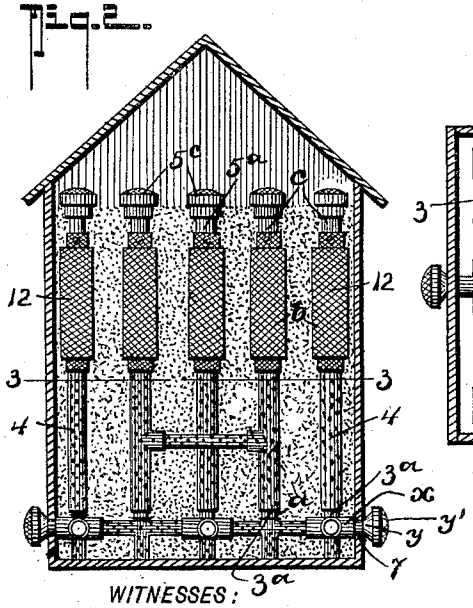
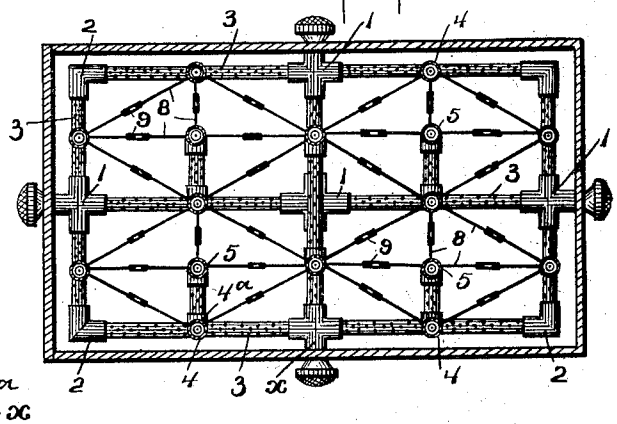


Fig. 3.



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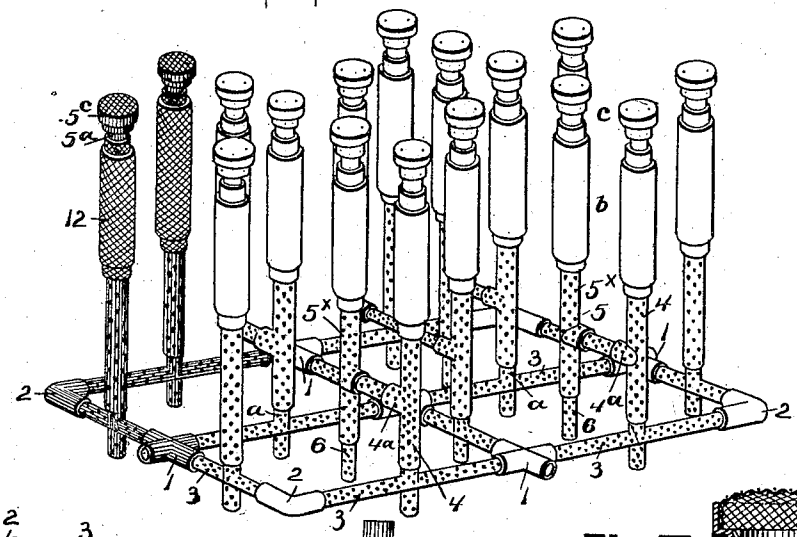
LA FAYETTE W. LILES.

GRAIN DRYING MEANS.

APPLICATION FILED AUG. 7, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.



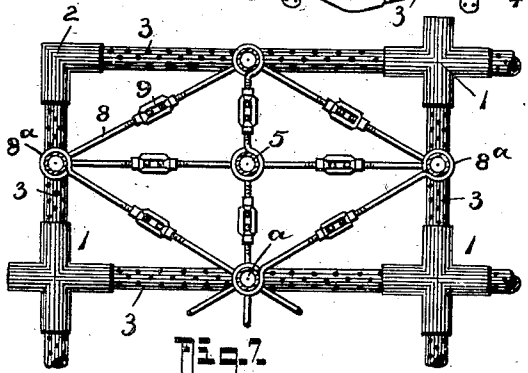


Fig. 7.

Fig. 5.

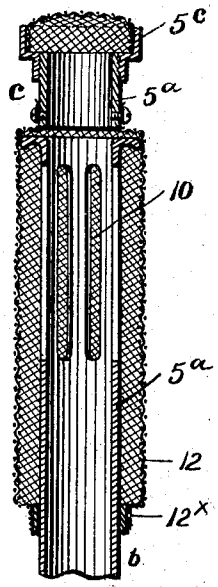
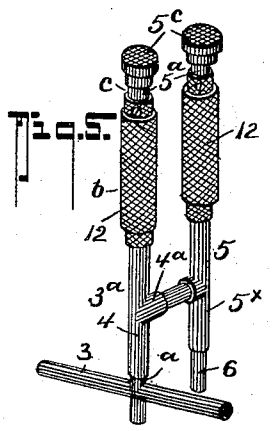


Fig. 6.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LA FAYETTE W. LILES, OF MINERALWELLS, TEXAS.

GRAIN-DRYING MEANS.

SPECIFICATION forming part of Letters Patent No. 722,118, dated March 3, 1903.

Application filed August 7, 1902. Serial No. 118,749. (No model.)

To all whom it may concern:

Be it known that I, LA FAYETTE W. LILES, residing at Mineralwells, in the county of Palo Pinto and State of Texas, have invented a new and Improved Grain-Drying Means, of which the following is a specification.

This invention relates to that type of grain-treating means utilized in granaries, store-houses, grain-cars, and other places where grain and seeds are stored in bulk for drying and cooling the grain and seeds while stored and without handling the grain and seeds; and it comprehends a novel construction and arrangement of parts for circulating air through the grain, and which parts are especially designed so that they can be readily built up within the grain-house or other storage place before the grain is placed therein and in which the said parts are correlatively arranged so they may be conveniently adjusted to suit the width, length, and height of the grain-holder and which may be removed bodily or in sections from the grain-holder, as conditions may make most desirable.

My invention also includes a peculiar co-operative arrangement of detachably-joined members, including feed portions arranged to extend over the sides and ends of the holder or grain-house for leading in the cold or hot air under atmospheric pressure or from a blower, as desired, and which also serves as a means for holding the entire internal air-circulating means locked to a fixed position within the grain bulk and in which extensible portions are also provided which serve as supporting-legs and in which all of the detachable parts can be rapidly adjusted to suit the height of the grain bulk and be maintained to their adjusted positions without the use of lock clamps, bolts, or other similar fastening means; and in its still more subordinate nature this invention consists in certain details and combinations of parts hereinafter fully described, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a view of my invention as applied for use. Fig. 2 is a cross-section of the grain holder or house with my invention applied. Fig. 3 is a horizontal section of the same on the line 3 3 of Fig. 2. Fig. 4 is a perspective view illustrating a complete set of cooling and air-conveying pipes separated from the grain house or holder. Fig. 5 is a detail view illustrating one set of sectional pipes. Fig. 6 is a vertical section of the telescopic ends of a pair of slotted pipe members and the screen-body that coöperates therewith. Fig. 7 is a detail view illustrating a preferred means for joining the pipe-sections and holding them together as a single complete removable structure.

In the practical construction my invention embodies a series of pipe-sections arranged to join with each other, and the said sections are connected to form a horizontal or base portion and a series of vertically-disposed distributing-pipes, the general arrangement of which is best shown in Figs. 2 and 3, from which it will be seen the horizontal portion includes a number of cross-unions 1 1, elbow or angle members 2 2, and a number of connecting T members 3 3, which join with the elbows 2 2 and the cross members 1 1, and the said members 3 3 are positioned so that their portions 3^a 3^a extend vertically upward.

The vertical portion 3^a of the members 3 3 consists of a number sections *a b c*, depending upon the height of the grain bulk to be cooled and dried, and the sections *a* and *b* are connected by a T-joint 4, the stem 4^a of which connects with another T member 5, the lower end $5^\times$ of which joins with the extensible pendent portion 6, which forms a leg, it being of such length as to extend below the horizontal portion of the complete distributing means to rest on the floor of the grain house or bin, and thereby form a solid brace or support for the said horizontal portion.

The upper ends of the T members 5 are provided with pipe-sections 5^a 5^a, telescopically joined with each other by means of the screen-body 12, which may be two or more, according to the height of the grain, and the upper ends of the uppermost section 5^a are closed by screw-caps 5^c to prevent the grain falling therein, and in the practical application the said upper sections 5^a are made in such lengths that the caps 5^c project in the plane above the grain bulk.

The outwardly-projecting hollow arms *x* of the central crossed union-couplings 1 1 are

arranged to extend through openings 7, provided therefor in the sides and ends of the grain bin or housing and at a point near the bottom thereof, and the outer ends of the arms x are sufficiently projected to permit of the attachment thereto of an air-funnel y, which is screened, as at y', when taking in ordinary atmosphere. Under some conditions the ordinary air-pressure is not sufficient to properly cool the grain, and when such is the case a blower B (see Fig. 1) may be connected with the projecting end of either one of the arms x.

While I can use portions of my apparatus for the purpose described, the parts thereof are more especially designed to provide a complete air-circulating structure, and when put up in a complete shape a supplemental means for rigidly holding the entire structure together is used, and which consists in rods 8 8, having loops 8^a 8^a to extend around the vertical portions of the lower T members 3 3 and joined by threaded union nuts or turnbuckles 9 9, which engage the opposing threaded ends of the rods 8 8, as shown.

All of the pipe-sections are perforated or otherwise formed with air-inlets; but to provide against any of the grain falling into the said pipes, and also provide ample means of circulation between the extensible sections, I prefer to construct the said pipes with narrow slits 10 10, (see Fig. 5,) arranged to register with each other, as shown, and to produce an air-circulating space around the said slits and at the same time prevent the grain entering the pipes I provide one of the opposing pipe ends with the supplemental screen-body 12, secured thereto and of sufficient length to project some distance beyond the opposing pipe end. One end of the screen-body 12 is solidly secured to the pipe end on which it is mounted, and the other end $12^\times$ of the screen-body is bent inward to frictionally engage the opposing pipe-section, and the latter pipe-section has its free end provided with an annular flange to frictionally engage the inner face of the screen 12, such arrangement of parts being provided to permit of a limited extension of the two opposing pipe-sections and for holding the said sections by frictional contact with the screen-body 12 to its adjusted positions without the aid of clamps or other extraneous means.

In practice the screen-bodies 12 need be used only near the center or other part of the grain bulk in which the use of the cooling or drying means is most desirable, and the remaining portions of the distributing-pipes perforated, as shown.

By arranging the several pipe-sections as stated they may be readily decreased or increased in height or laterally to suit the structure in which the grain is to be contained, and hence my construction of apparatus has the advantage of being applicable to any structure ordinarily used to hold bulk grain, the only changes required being to add or remove pipe-sections to suit the size of the grain-holder.

I am aware that grain drying and cooling means in which is included perforated pipes detachably joined and adapted to distribute the air into the grain bulk has heretofore been provided, and I make no claim for any such broad construction. My invention differentiates from what has heretofore been provided, so far as I know, in the peculiar arrangement of the several pipe-sections which form the complete structure, the adaptability of removing the same in the complete or partial form from the grain-holder, and the peculiar connection of the opposing ends of the pipe-section and the supplemental screen members for providing ample air circulation at such points where it is most desired.

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

1. The combination with a bin for holding grain; of an air-circulating means detachably supportable within the bin, comprising a horizontal portion, consisting of crossed joints, supplemental T-joints telescopically connected with the crossed joints, said T-joints each having an upwardly-extending member, vertically-extensible pipes connected with the said upwardly-extending members, said pipes and joints having air-discharging orifices, one or more of the crossed joints having a member adapted to project through the sides of the bin, and means for joining the several horizontal and vertical pipes to form a single complete removable structure, as set forth.

2. An air-circulating means for grain-bins, comprising in combination, a series of horizontally-disposed crossed unions, a series of horizontally-disposed T-joints telescopically connected with the crossed joints, and having pendent portions forming leg-supports, pipes detachably connected with the vertical members of the T-joints, said pipes each consisting of telescopic members, slitted longitudinally, a hollow screen connected to one of the said sections and adapted to fit over the adjacent end of the opposing section, said screen having its upper end held in frictional engagement with the said opposing section, the latter having an annular enlargement at its lower end to frictionally engage the inner side of the screen-body, as specified.

3. An air-circulating means for granaries, comprising a series of horizontally-disposed cross-unions, a series of vertically-disposed perforated cross-unions telescopically joined with the horizontal unions, one or more of the horizontal unions having an extension adapted to project through the sides of the bin and form the air-intakes, the pendent members of the vertically-disposed unions forming supporting-legs, extensible pipe-sections joined with the upper portions of the vertical unions, a screened cap detachably fitted in the upper end of each extensible pipe-section, said extensible pipe-sections includ-

ing opposing portions slitted longitudinally, a hollow screen fixedly secured to one of said opposing portions and adapted to project over the other opposing portion, and having a frictional bearing in the outer side of the said opposing portion, the latter having its lower end held to frictionally engage the inner face of the screen-body, all being arranged substantially as shown and for the purposes described.

LA FAYETTE W. LILES.

Witnesses:
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WM. W. HOWARD.