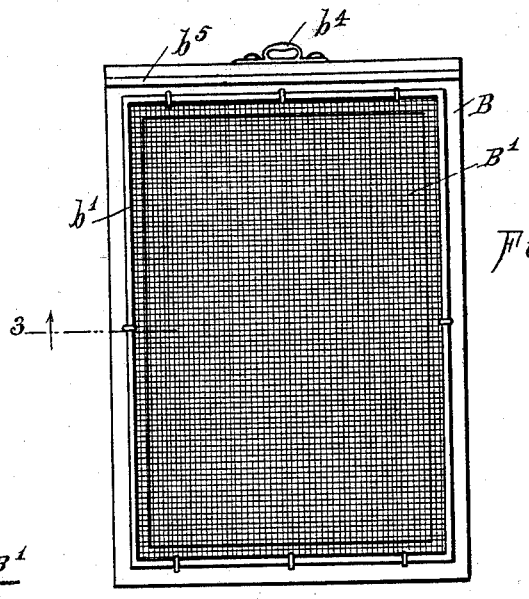
(No Model.)

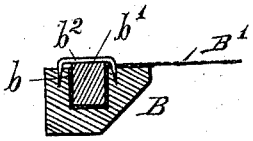
J. LA F. KING.

DUST INHIBITOR.

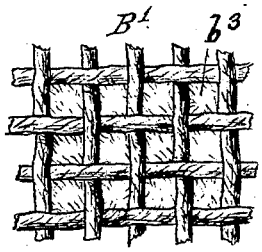
No. 522,989. Patented July 17, 1894.



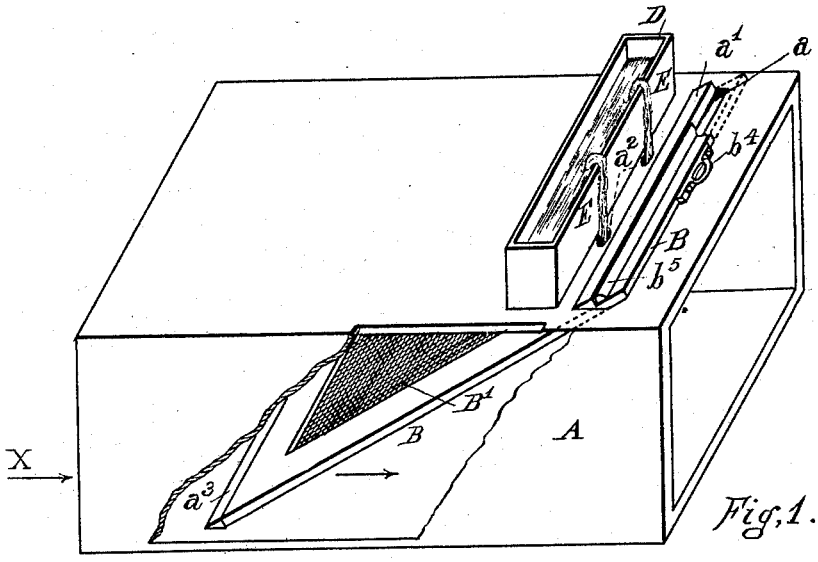
Fig, 2.



Fig, 3.



Fig, 4.



Fig, 1.

Witnesses.
Jad A. Bailey.
Henry J. Bahr.

Inventor.
James La F. King.
by N. DuBois. his Atty

UNITED STATES PATENT OFFICE.

JAMES LA F. KING, OF SPRINGFIELD, ILLINOIS.

DUST-INHIBITOR.

SPECIFICATION forming part of Letters Patent No. 522,989, dated July 17, 1894.

Application filed January 22, 1894. Serial No. 497,645. (No model.)

To all whom it may concern:

Be it known that I, JAMES LA F. KING, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a certain new and useful Dust-Inhibitor, of which the following is such a full, clear, and exact description as will enable those skilled in the art to which it pertains to make and use my said invention.

My dust inhibitor is primarily intended for use in the air ducts of hot air furnaces, but it may be used with other appliances and in other situations where it is desirable to maintain a supply of air freed from dust or to maintain a supply of moistened air, or to maintain a supply of air both moistened and freed from dust.

The purposes of my invention are to provide simple and effective means for arresting dust and separating it from the air passing through an air duct, so constructed and arranged as to be conveniently removable for the purpose of cleaning, to provide means for imparting a controllable degree of moisture to the air passing through an air duct, to provide means for connecting the dust arrester with the air duct and to provide means for connecting the moistener with the air duct.

My invention consists of certain novel features of construction and combination of mechanism shown in the annexed drawings and hereinafter fully described and specifically claimed.

In the drawings to which reference is hereby made: Figure 1 is a perspective view of the complete mechanism, a part of the top and side of the air duct being broken away so as to show the position and arrangement of the screen within the air duct, a part of the screen frame also being broken away so as to show a part of the transverse slot in the top of the air duct. Fig. 2 is an enlarged detached bottom view of the screen and shows the meshed fabric in position on the frame. Fig. 3 is an enlarged transverse section through one side of the screen frame, on the line 3 of Fig. 2, and shows the means for connecting the fabric with the frame. Fig. 4 is an enlarged detached view of a portion of the fabric and illustrates the fibers extending into the meshes between the threads of the fabric.

Similar letters indicate like parts in all the views.

The air duct A is of ordinary construction and need not be particularly described, as an air duct of any suitable and convenient form may be used. In the drawings I have shown only so much of the air duct as is necessary to illustrate the connection of the dust arrester and moistener with the air duct. The air duct is connected with the furnace and its outer end is open for the free admission of air from the outside of the building in the usual well known manner.

The dust arrester and the moistener may be placed in any suitable and convenient position on the air duct, but in practice it is found advantageous to place them near that end of the air duct which is adjacent to the furnace because in that position the water in the moistener is not liable to freeze and also because such position is the most convenient for the attendant in keeping the moistener supplied with water and in cleaning and caring for the dust arrester.

The dust arrester consists of a screen frame B on which is stretched a fabric B′ of meshed material. This frame is preferably of wood and is of suitable form and dimensions to fit within the air duct. In practice I prefer to use a rectangular air duct and a corresponding rectangular frame as shown. In the sides and ends of the frame B are channels b adapted to receive strips b' which serve to retain the fabric in place in an obvious manner. These strips are preferably secured to the frame by small staples b^2 so that the strips may be conveniently detached when it is desired to remove or replace the fabric. The fabric which I prefer to use is that commonly known as burlap or gunny sack fabric though wire cloth or other suitable fabric may be used without departing from my invention.

The burlap fabric shown in Fig. 4 is especially adapted for use in my dust arrester for the reason that the fine fibers b^3 extend into the meshes between the threads of the fabric and serve to arrest the finer particles of dust without materially obstructing the flow of air.

On the top cross piece of the frame B is a handle b^4 by means of which the screen may

be conveniently removed from or inserted in the air duct. A transverse strip b^5 secured near the top of the frame B, abuts against the meeting rail a' on top of the air duct and serves to completely close the opening a when the screen is in place in the air duct. In the top of the air duct is a transverse slot or opening a adapted to accommodate the screen frame.

The screen frame is inclined toward the outer end of the air duct and is placed in the air duct preferably in such position as to form with the bottom of the air duct an angle of about thirty degrees. I have found in practice that this inclination of the screen is best adapted to arrest the dust, and it also offers less obstruction to the air, for the reason that at this inclination a greater number of openings is presented for the passage of air than there would be if the screen were more nearly perpendicular. In other words the total superficial area of the meshes of the inclined screen within the air duct is greater than the superficial internal area of a plane vertically intersecting the duct.

If the screen is more nearly perpendicular less dirt adheres to the screen and more dirt falls to the bottom of the duct whence it cannot be conveniently moved. I have also found that by placing the screen at an inclination of say thirty degrees, the pressure of the air entering the air duct is less direct and forcible and there is therefore less vibration of the screen fabric and less tendency to force or sift dust through the fabric than there would be if the screen were more nearly perpendicular. Secured to the top of the air duct and parallel to the slot a is a meeting rail a' against which the strip b^5 abuts as already described. In the bottom of the air duct is a transverse strip a^3 against which the lower end of the screen frame abuts. Holes a^2 in the top of the air duct accommodate wicks E by means of which water is drawn from the tank D and dropped upon the screen fabric. The capacity of the screen to catch and hold dust is increased by slightly moistening the fabric and it is also desirable to impart a certain degree of moisture to the air. This I accomplish by the moistener attachment which I will now describe.

The moistener consists essentially of a vessel or tank suitable to contain water and provided with means for feeding the water from the vessel and dropping it in controllable quantity upon the fabric of the screen frame. I have shown in the drawings and prefer to use a rectangular tank D, but a tank of any other suitable form may be used. The tank contains water as shown. The wicks E, have one end inserted in the water and extend downward through the holes a^2, so that their lower ends are near or in contact with the fabric B'. The water is drawn from the tank by the capillary action of the wicks and is carried down in a constant quantity and diffused on the fabric whence it is absorbed by the air. Any desired number of wicks may be used, or siphons, or other suitable means adapted to drop and diffuse the water in controllable and predetermined quantity upon the fabric may be substituted for the wicks without departing from my invention.

The operation of the apparatus is evident from the description. The air enters the air duct in the direction indicated by the arrow X and in passing through the air duct, the dust and other extraneous matters are deposited on the fabric of the dust arrester. To clean the screen it is only necessary to withdraw the frame from the air duct, when by striking the frame against some fixed object or by lightly beating or brushing the fabric the accummulated dust may be removed. The frame may then be restored to its position in the air duct in condition for continued use. If the fabric becomes loose or broken the staples b^2 may be withdrawn, the strips b' removed and the fabric stretched or the old fabric may be removed and a new one substituted and the strip again secured to the frame, the same as before.

The dust arrester may be used either with or without the moistener attachment. When the moistener is used it is necessary to keep the tank supplied with water and to occasionally clean the wicks, in case that they become clogged, or the clogged wicks may be discarded and new ones substituted.

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

In a dust inhibitor, the combination of the screen frame having channels in its sides and ends, the meshed fabric connectible with said frame, the strips and the staples adapted to detachably connect said fabric with said screen frame, the air duct, the transverse slot in the air duct, the meeting rail parallel to said slot, said transverse strip, slot and meeting rail being adapted to movably support said screen frame in a position inclined toward the outer end of the air duct, the water tank supported on the air duct, the holes in the air duct adapted to receive wicks and the wicks passing through said holes and having their upper ends immersed in water in said tank and their lower ends resting on or contiguous to said meshed fabric, all co-operating substantially as set forth and for the purpose stated.

In witness whereof I have hereunto subscribed, at Springfield, Illinois, this 18th day of January, 1894.

JAMES LA F. KING.

Witnesses:
J. S. THOMPSON,
TAD A. BAILEY.