Feb. 20, 1940. J. E. MITCHELL 2,191,146

RADIATOR FOR HEATING A FORCED DRAFT OF AIR

Filed Jan. 24, 1939 2 Sheets-Sheet 1

Fig. 1.

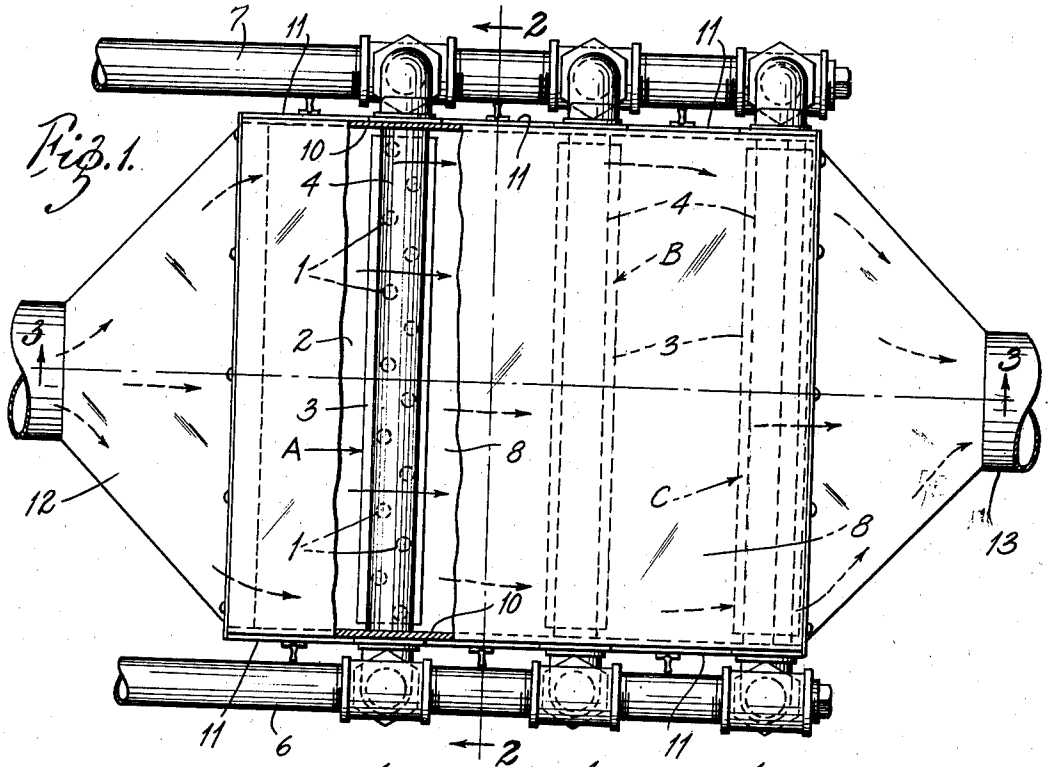
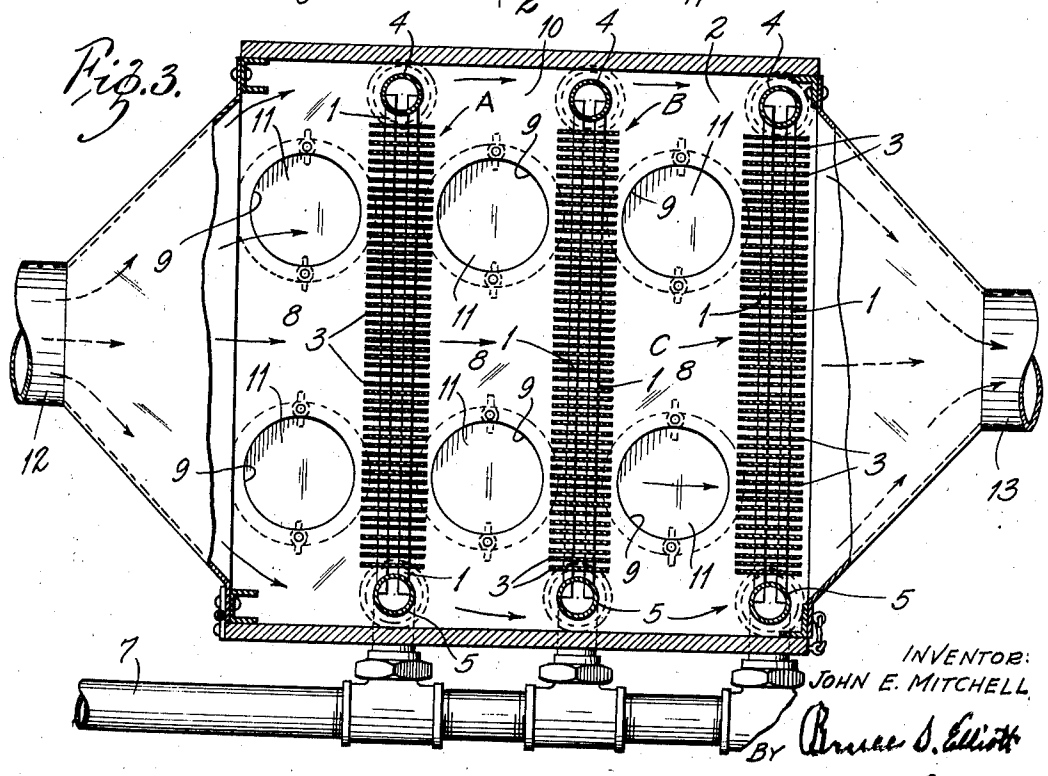


Fig. 3.



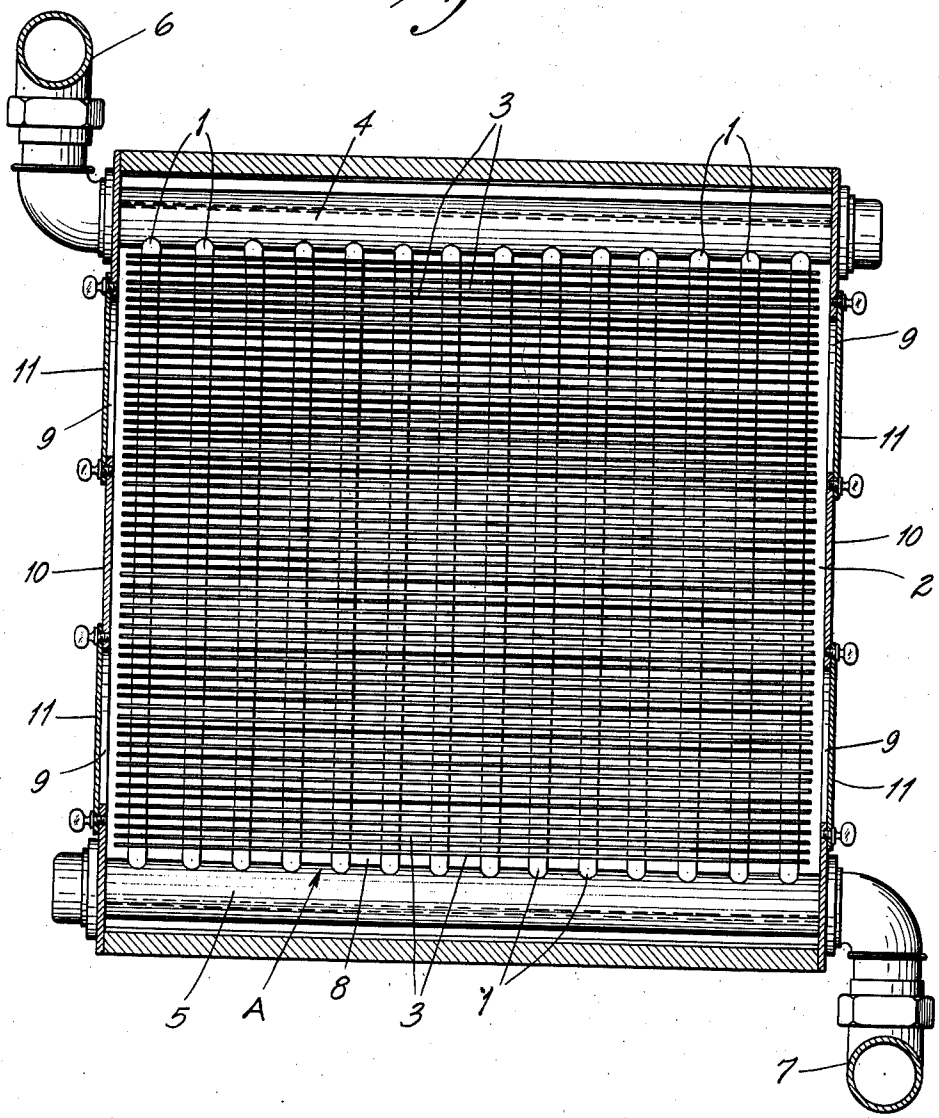
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Fig. 2.



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2,191,146

RADIATOR FOR HEATING A FORCED DRAFT OF AIR

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Application January 24, 1939, Serial No. 252,613

2 Claims. (Cl. 257—136)

The general object of this invention is to provide a novel construction of radiator for use particularly, in heating a forced draft of air to be employed in drying or conditioning seed cotton, and which is so constructed and arranged that it may be readily cleaned, and accumulated lint removed from the heating units thereof without dismantling the radiator or interfering with the operation thereof.

The radiators heretofore used for this purpose have separate heating coils or units, each unit comprising vertical tubes connected at the tops and bottoms to horizontal headers, each tube having circular radiating fins secured to and extending laterally from the tubes to increase the radiating surface, and two or more of such units being mounted within a casing provided with suitable air inlet and outlet openings.

The objection to using this type of radiator in a cotton gin is that the radiating fins form wedge-shaped spaces between adjacent rows of tubes that accumulate lint, and such accumulations rapidly impair the heating efficiency of the radiator. These accumulations of lint become wedged in so tightly that it is not possible to remove them, or clean the radiator, without removing the separate units from the casing, or separating them from each other, and blowing out the accumulations of lint with steam or compressed air, which is not only very expensive, but involves considerable loss of time in the operation of the plant, besides causing pronounced variation in results between the times the heating units are cleaned.

My invention is characterized by the provision of heating units of such construction that any accumulation of lint on the radiating surfaces of the units may be quickly and easily removed, and to this end consists, in part, in the provision of spaces between the units in the chamber inclosing them, and providing the walls of the chamber with openings into, or at the end of, the spaces through which any accumulation of lint may be quickly removed by hand without loss of time or without even stopping the flow of air being heated.

My invention consists further in the provision of parallel, transverse radiating plates, through and in contact with which all the tubes of a unit extend, which plates are arranged in vertical series from the top to the bottom of each unit, and the spaces between which are sufficiently wide to permit ordinary dust and dirt to readily pass through with the air, so that the units are, to a large extent, self-cleansing in operation.

The invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a plan view of my improved radiator, showing three heating units spaced apart within the chamber provided by the casing of the machine;

Fig. 2 is a cross-section, taken on the line 2—2 of Fig. 1 and viewed in the direction of the arrows; and

Fig. 3 is a longitudinal section, taken on the line 3—3 of Fig. 1 and viewed in the direction of the arrows.

Referring now to the drawings, each of the heating units, indicated, respectively, by the letters A, B and C, is shown to comprise heating tubes 1 extending vertically from the upper to the lower portion of an inclosed chamber 2, said tubes extending through and in contact with separated, parallel radiating plates 3 extending horizontally across chamber 2, and the upper and lower ends of the tubes terminating, respectively, in cross headers 4 and 5, which project through the side walls of the chamber, the upper header 4 being connected with piping 6 supplying steam under pressure, and the lower headers 5 being connected with piping 7 for draining the water of condensation.

The heating units A, B and C extend transversely of chamber 2 from side to side thereof in parallel relation, and are spaced far enough apart to provide spaces 8, and communicating with these spaces at each end are clean-out openings 9 provided in the side walls 10 of the casing, which openings are normally closed by removable covers 11. When the covers are removed, the interior of the radiator may be readily cleaned, and any lint lodging on the edges of the radiating plates 3, between which the air being heated is forced, may be quickly removed. The radiating plates are parallel and continuous, and the spaces between them are wide enough to permit ordinary dust and dirt to readily pass through with the air, so that it is only lint forced through the chamber by the air currents that lodges on the edges of the radiating plates, and which can be easily and quickly removed through the openings 9 by the use of an ordinary brush and without the necessity of even discontinuing the flow of air through the radiator.

My improved construction of radiator not only effects a great saving in time by making it unnecessary to take the radiator apart to clean it, but since it involves no inconvenience to clean the radiator, or the heating units, as often as neces-

sary, it insures continuous, uniform results without any let-down in efficiency of the radiator.

In operation, the current of air to be heated is forced by a fan in the usual way into the inlet 12, whence it moves, as indicated by the arrows, between the vertical heating tubes and the spaces between the radiating plates of each unit, and is discharged through the outlet pipe 13 to a machine, or plurality of machines in which the cotton is being agitated where, through its contact with the cotton fibers, it absorbs the excess moisture from the cotton.

I have shown three clean-out openings arranged at each end of the respective spaces 8, and at points corresponding to the top, center and bottom of each heating unit, and the openings at one side being located diametrically opposite the corresponding openings at the opposite side, as appears in Fig. 1. It will be clear, therefore, that by cleaning each heating unit in stages, first through the top openings, then through the center openings, and finally through the bottom openings, and replacing the covers on the openings after each stage of operation, the cleaning operation, including the removal of lint, can be effected without interfering with the normal operation, as such cleaning operations can be performed very rapidly.

I claim:

1. A radiator for use in cotton gins for heating a forced draft of air carrying lint comprising a casing having a front inlet for the air and a rear outlet for the heated air, and independent heating units mounted in said casing in the path of the air current and spaced apart front to rear of the casing to provide transverse intervening working spaces, each of said units having radiating plates extending transversely of the casing, and the side walls of said casing next to which the radiating plates terminate having an opening at each end of a working space adjacent said heating units to give access to said spaces for cleaning the radiating plates, and a removable closure for each opening.

2. A radiator for use in cotton gins for heating a forced draft of air carrying lint comprising a casing having a front inlet for the air and a rear outlet for the heated air, independent heating units mounted in said casing in the path of the air current and spaced apart from front to rear of the casing to provide transverse intervening working spaces, each of said units having spaced, parallel, radiating plates extending transversely of the casing and the side walls of said casing next to which radiating plates terminate having a vertical series of openings at each end of a working space to give access to said spaces to permit a wire brush, or the like, to be drawn lengthwise of the radiating plates for cleaning the same, and a removable closure for each opening.

JOHN E. MITCHELL.