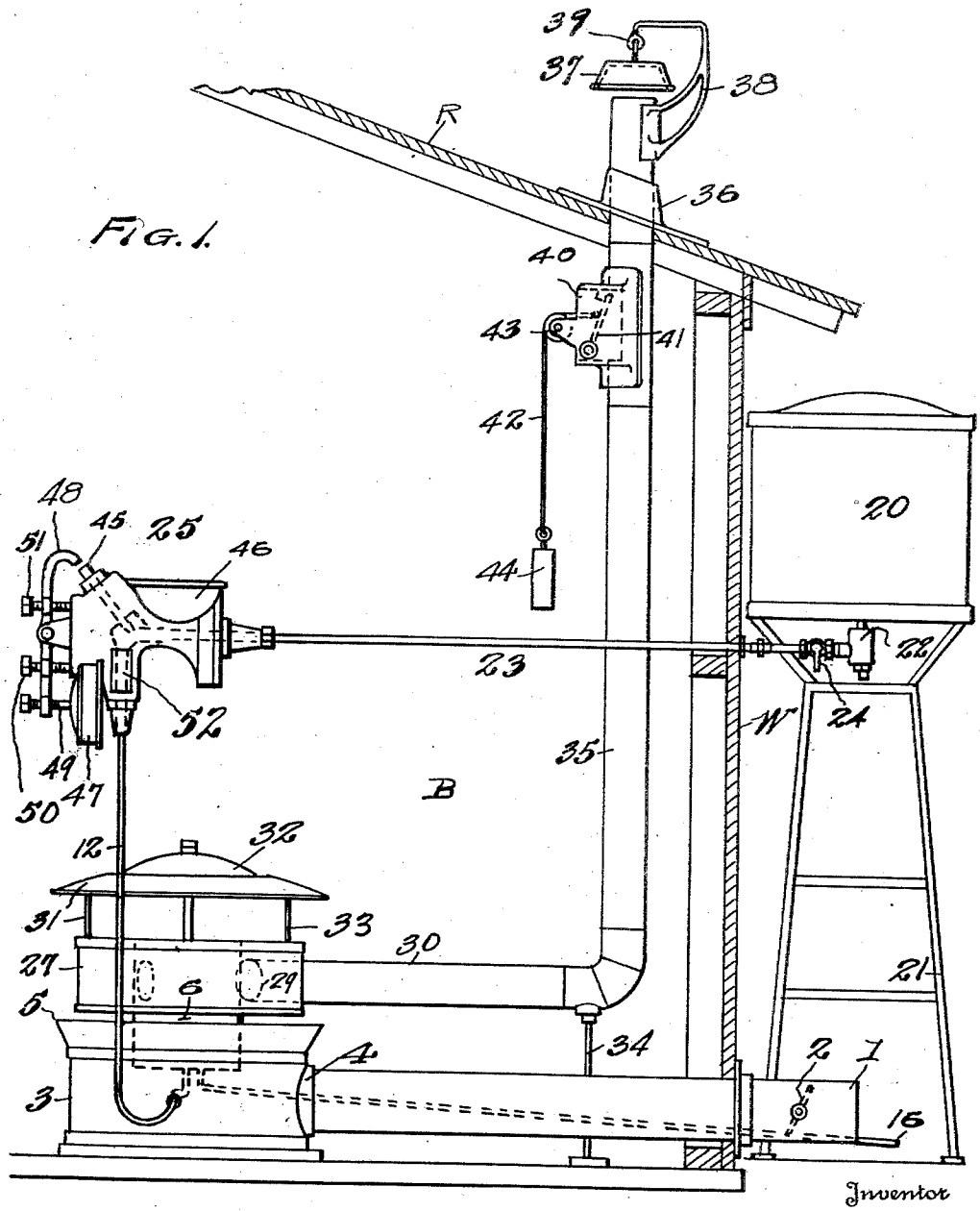
Nov. 1, 1938. W. C. ROUSE 2,134,843

TOBACCO CURING SYSTEM

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FIG. 1.



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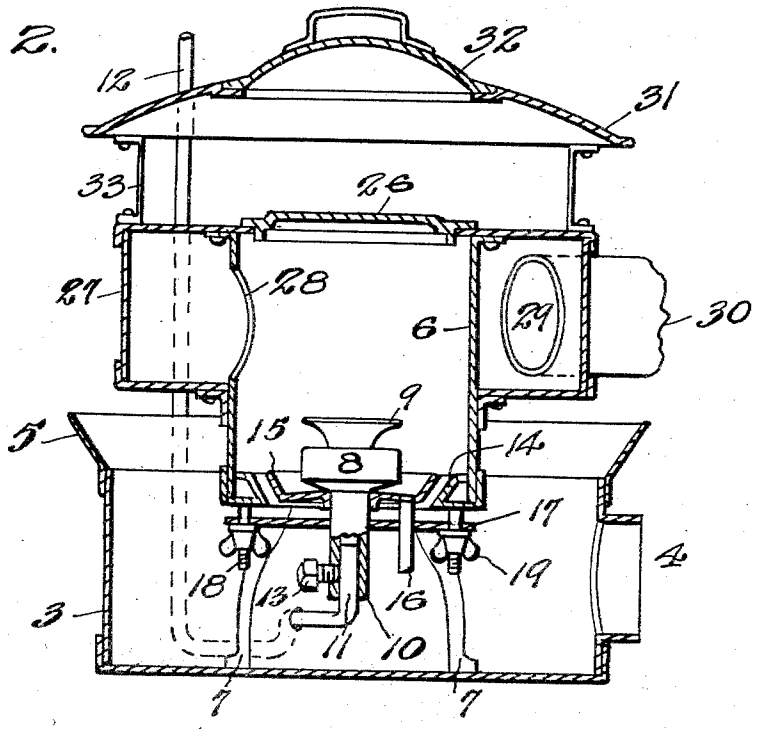
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Filed Nov. 5, 1937 2 Sheets-Sheet 2

FIG. 2.



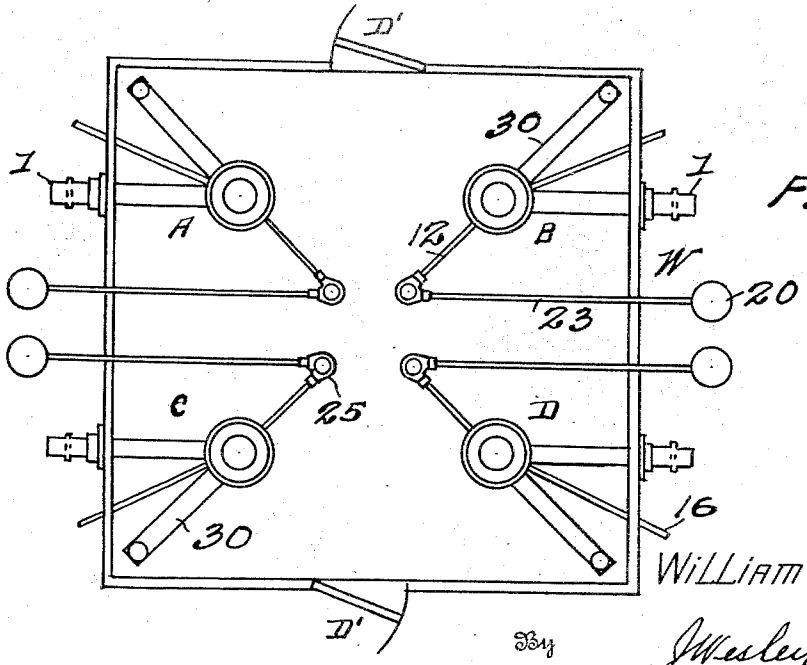


FIG. 3.

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UNITED STATES PATENT OFFICE

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TOBACCO CURING SYSTEM

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Application November 5, 1937, Serial No. 173,033

1 Claim. (Cl. 34—19)

The present invention relates to an improved tobacco curing system for use in barns and similar places where the tobacco leaves are suspended by sticks, loops, and other means for the purpose of undergoing the curing process. In carrying out the invention a suitable number of independent and separate heating units for conditioning the air within the barn are employed, and the number employed is determined by the capacity or size of the barn or curing space.

Means are provided for introducing fresh air from the atmosphere to the interior of the closed barn, for uniformly circulating the conditioned air within the barn in order that all of the batches of tobacco leaves will receive a uniform treatment, and for properly ventilating the interior of the barn to prevent accumulation of excess moisture-laden, and heated air within the barn.

Each of the air-conditioning units is equipped with adjustable and automatic means controlled by the temperature of the air within the barn for controlling the feed of fuel-oil to the heating unit in order that the temperature throughout the entire curing space may be maintained at a predetermined uniform degree, to insure uniformity in curing the tobacco, and to prevent discoloration of the tobacco.

The invention consists in certain novel combinations and arrangements of parts in the curing system as will hereinafter be more fully set forth and claimed.

In the accompanying drawings one complete example of the physical embodiment of the invention is illustrated, wherein the parts are combined and arranged according to one mode that has so far been devised for the practical application of the principles of the invention, but it will be understood that changes and alterations may be made in these exemplifying structures, within the scope of the appended claim without departing from the principles of the invention.

Figure 1 is a view in elevation showing one of the units of the sytem, and also showing a portion of the barn in section.

Figure 2 is an enlarged, detail, sectional view of one of the heaters of a unit.

Figure 3 is a diagrammatic plan view showing four of the air conditioning units uniformly distributed throughout the barn.

In order that the general arrangement and relation of parts may readily be understood I have indicated portions of a customary tobacco barn, including side walls as W, the roof as R, and two doors, as D'D'; and in Figure 3 four of the air conditioning units, indicated as A, B, C, and D, are uniformly distributed throughout the barn for circulating and uniformly distributing the conditioned air. It will be understood that one or more of the units may be employed, depending on the size and capacity of the barn, and inasmuch as each of the separate, independent, units are similar, a description of the unit B illustrated in Figure 1 will suffice for all of the units.

Each of the units includes an air heater and distributer which is supplied with fresh air from the exterior of the barn through an air pipe 1 of suitable size, having a control damper 2 for regulating the admission of fresh air from the surrounding atmosphere. The pipe 1, which extends through the wall W along the floor line of the barn conveys air currents to an open receptacle 3, preferably of cylindrical shape and fashioned with an intake port 4, and the receptacle, which is open at the top is provided with an outwardly flaring annular flange or deflector ring 5. The air receptacle is thus supplied with fresh air from the atmosphere under natural conditions, and the inflowing air-currents rise upwardly from the receptacle to be heated by radiation from the heater, and to be distributed within the interior of the barn.

As best seen in Figure 2 the heater includes an oil-burning stove located within the air receptacle, and the stove embodies an inner cylindrical drum 6 forming a combustion chamber, which is supported on suitable legs as 7, 7, within the air receptacle.

An oil burner 8 is mounted at the central base portion of the drum 6, and this burner is fashioned with a flaring flame-spreader 9 mounted above the burner to deflect the flame outwardly or laterally as it rises in the combustion chamber. At its lower end the burner is equipped with an adjusting sleeve 10 which is mounted on the upright end or nozzle 11 of the oil feed pipe 12, and by means of a set bolt 13 the burner may be fixed in properly adjusted position with relation to the combustion chamber or drum 6 for efficient operation of the stove.

Air for supporting combustion of the fuel-oil is fed to the interior of the stove through an annular space formed between the tapered open bottom or base 14 of the drum 6, and a complementary drip-pan 15, which latter has a tapered wall and is located centrally of the open base of the drum. The drip pan is mounted on the supporting sleeve 10, and this circular pan, which surrounds the lower portion of the burner, provides a safety device to catch any excess fuel-oil

should the oil for any reason accidentally drip from the burner. A drain pipe 16 is connected with the drip pan, and this pipe which extends through an adjoining wall of the barn, drains any excess oil to the ground exterior of the barn.

The adjustable drip pan 15 co-acting with the open base of the drum 6 forms an intake air space to the combustion chamber, and the quantity of air passing through this space may be regulated by means of an adjustable plate, as 17, mounted below the stove base on a suitable number of stud bolts 18 fixed to the base of the drum 6. The air regulating plate is provided with a central opening to accommodate the sleeve 10 of the burner, and it also has a smaller hole to accommodate the oil drip-pipe 16. By means of wing nuts 19 on the threaded free ends of the studs or bolts, the plate may be elevated to reduce the available supply of air, or the plate may be lowered to increase the available supply of air, thus regulating the supply of air to the burner.

The oil supply to the stove is provided from a tank 20 supported on a suitable frame 21 exterior of the barn, through a filter 22 and the supply pipe 23, the latter being provided with a cut-off valve 24. This supply pipe 23, and the feed pipe 12 to the burner communicate with a controller which automatically controls the passage of oil from the supply pipe to the feed pipe, which latter, as indicated is provided with a bend to form a trap of well known type. The controller as a whole is indicated by the number 25, and as indicated in Figure 3, the controllers for the various units of the system are disposed in locations throughout the barn in such manner as to provide a uniformity in the operations of the several heaters to insure an equalized distribution of heat from the several heaters.

Referring again to Figure 2, the inner drum 6 of the stove is provided with a removable lid 26 to give access to the interior of the drum, and upon the upper portion of the inner drum is mounted a heating drum 27 having a port 28 opening into the combustion chamber within the inner drum. This heating drum, through which the smoke and gases of combustion pass, also has an outlet port 29 to which the smoke flue 30 is connected. The inner port 28 and the outer port 29, as indicated, are located at approximately diametrical points in order that the hot gases may traverse the entire area of the annular heating drum.

Above the heating drum 27 is mounted a deflecting hood 31 having a closed central lid or cover 32, and by removal of this cover 32 and the stove lid 26 access may be had to the interior of the stove for assembling and adjusting parts, and for lighting the burner.

The deflecting hood 31 is spaced above the heating drum and supported therefrom by means of legs 33, and it will be apparent that air currents rising from the fresh-air receptacle 3 will flow in contact with the heating drum, from which heat is radiated in all directions, and the deflecting hood 31 also causes circulation of air currents heated by radiation from the top of the heating drum. In this manner the rising currents of fresh air heated by radiation from the heating drum, and currents of air passing through the space above the heating drum, are commingled and uniformly heated, and then uniformly distributed by circulation within the interior of the barn and among the batches of tobacco leaves.

The smoke flue 30 is supported in suitable manner, as by a post 34, and an upright smoke-stack 35 rises through a corner of the barn, and through its roof, passing through a saddle 36 mounted on the exterior of the roof, and sealing the opening for the stack against circulation of air.

A cowl 37 is suspended over the top of the stack by means of a suitable bracket 38 and loose joint 39, and the cowl, in addition to preventing admission of rain and downdraft to the stack, also performs the functions of a vane, actuated by wind-pressure, to hold the cowl in position to maintain the draft through the smoke-stack.

Within the interior of the barn, just below the roof, the stack is equipped with a vent-housing 40 in which is pivoted a gate or valve 41 that is balanced by means of a cord 42 passing over a pulley 43, and a weight 44 on the end of the cord balances the vent-gate or valve. The vent may be adjusted as desired to permit outlet, through the stack from the upper interior of the barn, of excess moisture-laden air or excessively heated air, and to cause circulation of air currents within the barn in maintaining a uniformity in the temperature of air within the barn.

As best seen in Figure 1, the automatic controller 25 regulates or governs the passage of oil in a thin stream or film from the supply pipe 23 to the feed pipe 12, and the latter is supplied with a controlled column of oil that is fed to the stove burner, independent of the supply of oil in the supply pipe 23. Within the controller is a suitable valve 45 that is governed or regulated by a thermostat 46, through the diaphragm or wafer 47, and the valve operating lever 48 pivotally mounted on the exterior of the controller. This lever is regulated as to its movements in relation to the valve by means of a range screw 49, and two set bolts 50, and 51, the former to set a maximum movement of the lever, and the latter to set a minimum movement of the lever, within the range determined by the position of the range screw 49, which is adjustable with relation to the wafer or diaphragm. The expansion and contraction of the wafer or diaphragm increases or diminishes the flow of oil through the controller to the stove-burner, and thereby controls the consumption of oil in the burner, as well as controlling the heat generated by the heater. The flow of oil through the controller may be observed through the glass indicated at 52, and this flow is controlled in accordance with the conditions existing in the process of curing the tobacco leaves suspended within the barn, as determined by the curer or attendant of the barn.

As thus constructed and operated it will readily be apparent that the curing system of my invention may with facility be adapted for use in a barn without necessity for material changes in the barn-structure, and installations may with convenience be made in barns of different capacities by utilizing the required number of units to effect the best results in the curing process.

The intake of fresh air from the surrounding atmosphere to the interior of the barn, which is usually closed, and the ventilation of the interior of the barn are subject to necessary changes by the curer or attendant to meet varying conditions in the progress of the treatment of the tobacco leaves.

The thermal-operated controller for the oil supply to the feed pipe of the burner may be set to operate in accordance with the varying conditions arising during the process of curing, and after having been set or adjusted, the con-

troller automatically operates to maintain an even temperature in the barn until a further change is necessary or desirable.

By the use of the present curing system, tobacco may be cured immediately after it is cut. Other advantages of the system is that a much better and finer grade of tobacco is produced, whereby the market price of the tobacco will be substantially increased.

The present method of curing tobacco comprises, in placing the tobacco in a comparatively tightly closed tobacco house, or barn, having the heating units distributed as had been set out herein. In starting the curing process, the stoves are lighted and the temperature is first raised to 95–100 degrees F. for the first thirty-six or forty hours. For the next thirty-six or forty hours the temperature is raised to approximately 125–135 degrees F., and for the remainder of the time of approximately thirty-six or forty hours the temperature is raised to approximately 165–175 degrees F. The slight variation in the temperature and heating periods is due to the type and character of the tobacco being cured.

The fact that the temperature of each heating unit is regulated by an individual thermostat adjacent the section of the tobacco house where the heating unit is located, and the incoming air is also controllable, and provides a means by which the temperature and humidity of the air within the house can be more evenly regulated. For example, there are circumstances surrounding each curing house which may cause the temperature to either raise or drop in the various sections of the house, such as a cold wind blowing against the building, or the sun may influence the temperature on a part of the building, in which case it would be necessary to burn more fuel adjacent the side of the building contacted by the cold wind, while in the section adjacent the sunny side may require a much less consumption of fuel.

As has been previously stated, control of the heat and moisture in the tobacco house are the important factors. Too high a temperature will extract the moisture within the tobacco too freely and cause the leaves to cure improperly or be stained from the sap within the stems. The temperature, however, must be kept constant and below this point. If there is a sudden drop in temperature, or an uneven temperature is allowed to exist within the house during the curing period, the tobacco will likewise be discolored, or not uniformly cured.

While I have described and illustrated a preferred form of the invention, it is understood that it is not intended that the invention shall be limited to this specific disclosure, but the scope of the invention will be best defined in the claim.

Having thus fully described the invention, what is claimed as new is:—

In a tobacco curing house, a combination with a plurality of separate individually controlled oil heating units, said heating units including a permanently closed chamber within which the oil is burned for preventing the oil fumes from entering the said house, a chimney for conveying said fumes from the said heating units to the exterior of said house, a plurality of relatively large air ducts spaced about and adjacent the floor of said house having their inlets on the exterior thereof and their outlets arranged to discharge air upwardly around said heating units, control means associated with the air ducts for regulating the discharge of air through said ducts, and means adjacent the upper portion of said house for conveying the heated air out of the upper area thereof.

WILLIAM C. ROUSE.