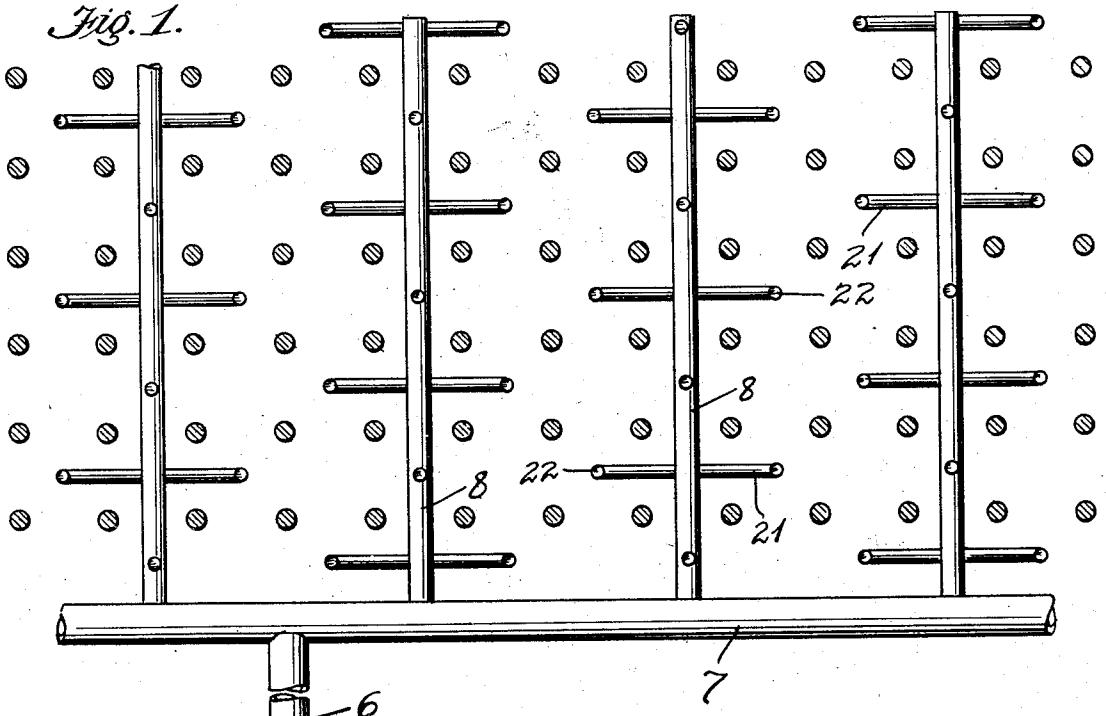
Z. T. BELL.

SMUDGING APPARATUS FOR ORCHARDS.

APPLICATION FILED MAR. 6, 1912.

1,054,897. Patented Mar. 4, 1913.

Fig. 1.



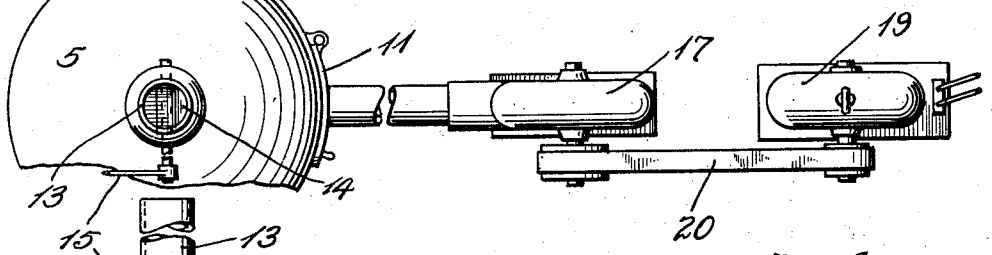


Fig. 2.

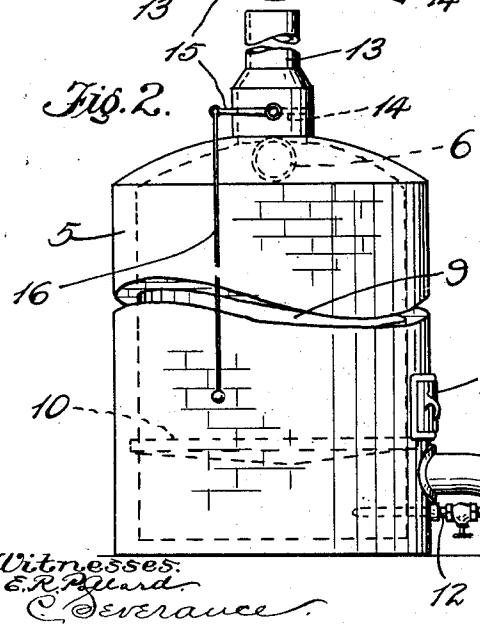


Fig. 3.

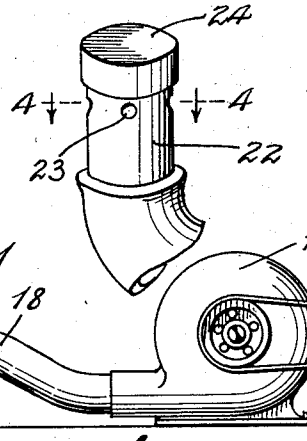
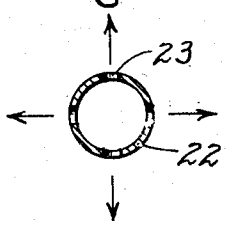


Fig. 4.



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UNITED STATES PATENT OFFICE.

ZIMRY T. BELL, OF SAN BERNARDINO, CALIFORNIA.

SMUDGING APPARATUS FOR ORCHARDS.

1,054,897. Specification of Letters Patent. Patented Mar. 4, 1913.

Application filed March 6, 1912. Serial No. 681,895.

To all whom it may concern:

Be it known that I, ZIMRY T. BELL, a citizen of the United States, residing at San Bernardino, in the county of San Bernardino and State of California, have invented new and useful Improvements in Smudging Apparatus for Orchards, of which the following is a specification.

This invention relates to improvements in smudging apparatus for orchards, and it is an object of the invention to provide a system by which warm products may be delivered among trees and plants for preventing the action of frost thereon.

It is also an object of the invention to provide an apparatus having a system of discharge pipes and a heat generating means, the apparatus being also provided with means for driving the heat products therefrom through the said system of piping for discharge among trees or plants which are to be protected from frost.

It is a further object of the invention to provide a smudging system for orchards in which products of combustion from a heater or furnace may be distributed among the trees of the orchard.

In the accompanying drawing forming a part of this specification, Figure 1 is a plan view showing the improved smudging apparatus, the extension of the pipe system thereof through an orchard being disclosed in diagrammatical form. Fig. 2 is a side elevation of a heater employed in the system and showing a blower connected therewith. Fig. 3 is an enlarged detail perspective view of a form of nozzle which may be employed in discharging the heating products within the orchard. Fig. 4 is a detail sectional view through the said nozzle taken upon the line 4—4 of Fig. 3.

The details and features of the invention will now be more particularly described, reference being had to the said drawing in which—

5 indicates a heater, 6 a discharge pipe leading therefrom, 7 a main branching from said discharge pipe, and 8 pipes leading into an orchard and among vegetation which it is desired to protect from frost.

The heater 5 may be of ordinary construction but is generally formed like the casing of a stove or furnace. If the heater is to be located outdoors it is usually made of brick and is formed with a combustion chamber 9 therein above an ordinary grate, as for instance 10, indicated in dotted lines in Fig. 2. A door 11 is provided in the event that fuel is to be placed upon the said grate. The furnace or heater is also preferably provided with an oil burner 12 extending into the same below the grate so that oil may be employed as a fuel instead of wood, coal or the like.

The upper portion of the heater is preferably contracted toward a smoke flue 13, which usually extends upwardly from the furnace from the central part of the top. The damper 14 is preferably mounted at the base of the smoke flue which is generally enlarged to receive the same as shown in Figs. 1 and 2 and a lever 15 is connected therewith, having a rod or chain 16, depending therefrom by which the damper can be operated. From a point near the top of the furnace also the discharge pipe for the heated products of combustion passes from the furnace, the preferable location of said outlet being indicated in dotted lines in Fig. 2. After starting a fire in the furnace either upon the grate with various kinds of solid fuels or at the oil burner, the damper 14 is closed, it having been opened for a short time to facilitate the starting of a fire. Upon the closing of the damper all of the heat generated within the furnace or heater and all of the products of combustion are directed through the pipe 6. To provide a means for forcing the products of combustion and heat from the furnace so that it will extend to all parts of the orchard under suitable pressure, a blower 17 is mounted adjacent to the furnace and connected therewith by a pipe 18 which is adapted to deliver the air from the blower at a point near the grate and usually below the same. Any suitable motor, as for instance an electric motor 19 may be employed for operating the blower, a belt 20 being used to connect pulleys upon the said motor and blower.

The heated products which pass from the furnace are forced under the action of the blower to pass into the main 7 and from thence into the branch pipes 8. The piping 8 is usually provided with any other desired branches as 21 so that discharge outlets or nozzles may be located in as many places as desired, throughout the plants or trees of the orchard. The pipes 8 and the similar branch pipes 21, are usually provided with upturned end portions, in which any desired

nozzles or distributing devices 22 may be mounted. A simple form of nozzle is shown as consisting of a perforated pipe section having lateral discharge openings 23 therein, the upper end of the nozzle being preferably closed by means of a cap 24.

It will be apparent that the system may be extended to cover any amount of ground and to reach any desired number of trees or plants in an orchard or garden. The heating means is properly proportioned for delivering a sufficient amount of heated products, for the raising of the temperature of the air about said trees or plants and preventing frost from injuring the same.

In smudging systems heretofore used it has been necessary to ignite materials in different burners or receptacles placed throughout the orchard, but the time required in attending to all of these different devices frequently makes it possible for frost to injure portions of an orchard or garden long before heat can be distributed through the same, or at least any great portions thereof. By the present system a fire built within the furnace, can be made to quickly and approximately at the same time, reach every portion of extended plots of land upon which orchards may be spread.

What I claim is:

A smudging system for orchards, comprising a furnace having means for burning fuels therein, the said furnace having a smoke flue and a discharge pipe, a damper in the smoke flue for cutting off the discharge therethrough, a blower adapted to deliver air under pressure into said furnace, means for operating said blower, a main connected with said discharge pipe of the furnace to receive and direct the heated products of combustion from the furnace, and branch piping extending from the main and having discharge nozzles provided therein for delivering the said heated products among the trees of the orchard simultaneously.

In witness that I claim the foregoing I have hereunto subscribed my name this 26th day of Feb., 1912.

Z. T. BELL.

Witnesses:
E. STADTMAN,
C. SEVERANCE.