July 4, 1939. L. E. NELSON ET AL 2,165,148

FROST PREVENTING MACHINE

Filed July 30, 1937 3 Sheets-Sheet 1

Fig. 1.

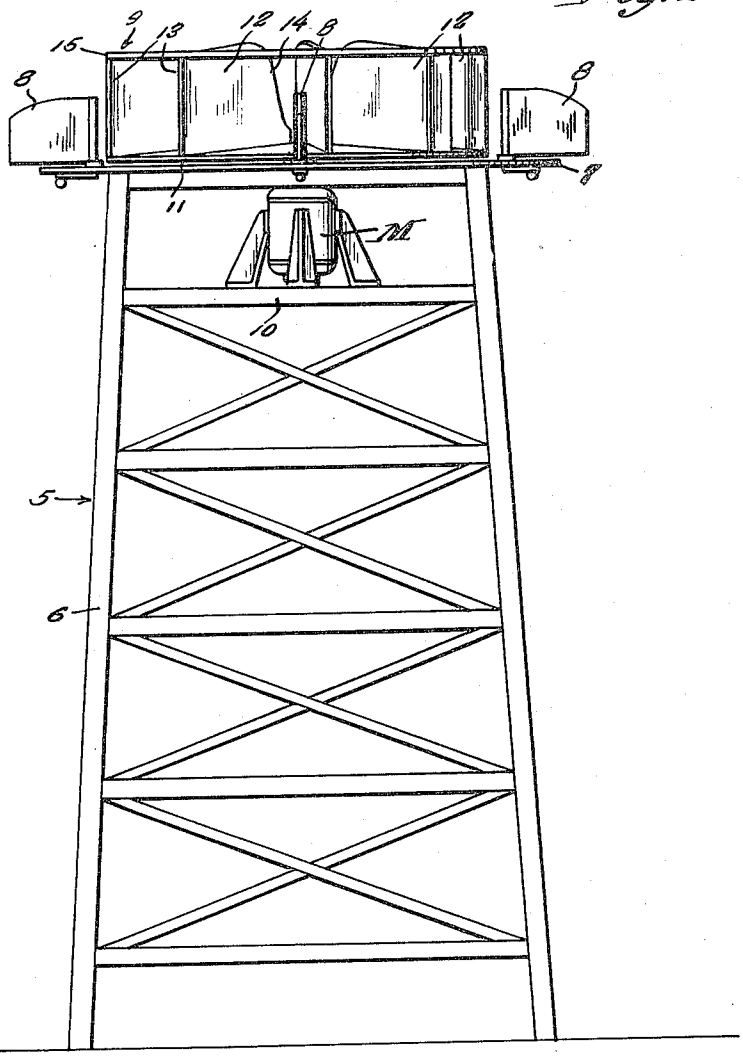


Fig. 4.

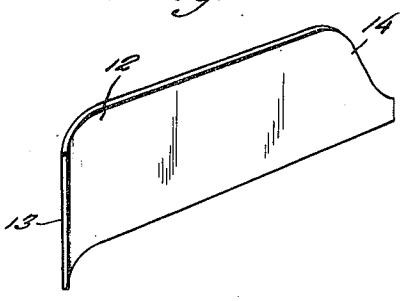
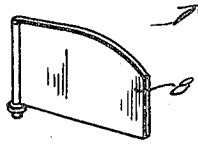


Fig. 5.



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FROST PREVENTING MACHINE

Filed July 30, 1937 3 Sheets-Sheet 2

Fig. 2.

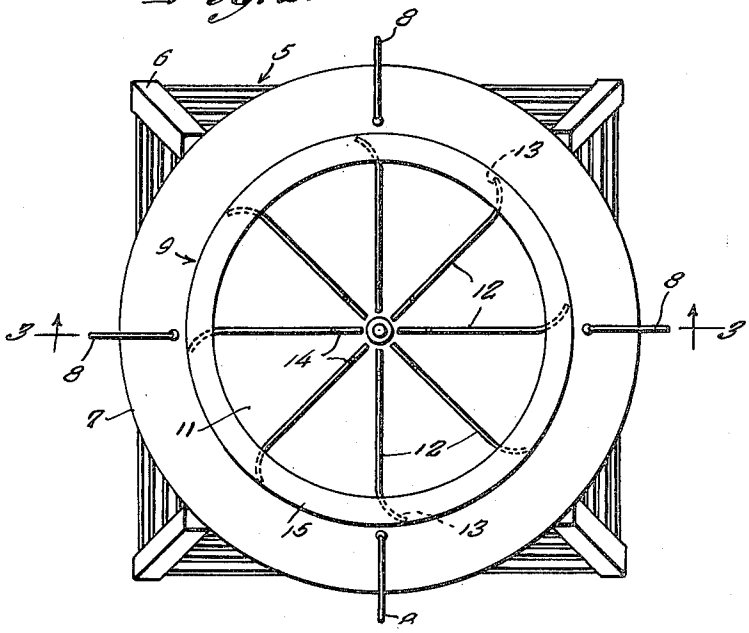
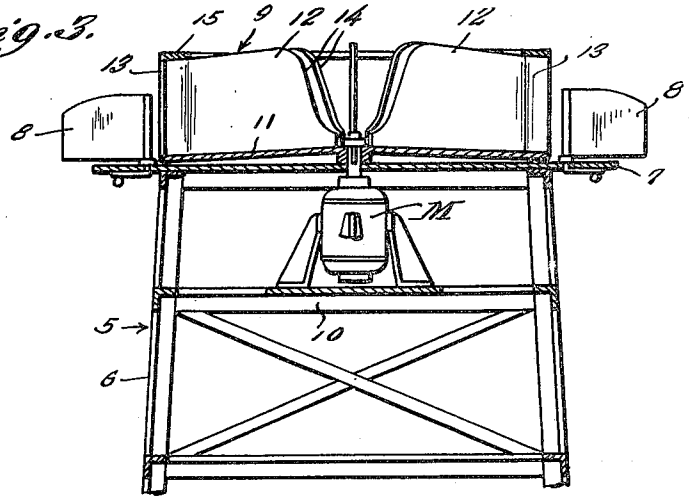


Fig. 3.



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Filed July 30, 1937 3 Sheets-Sheet 3

Fig. 6.

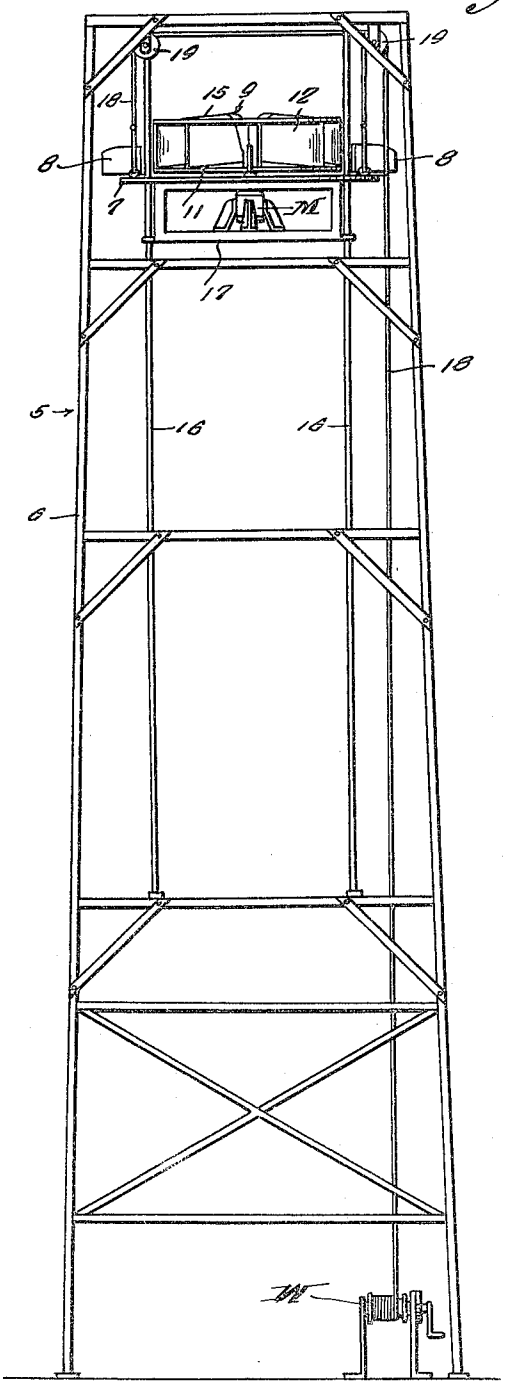
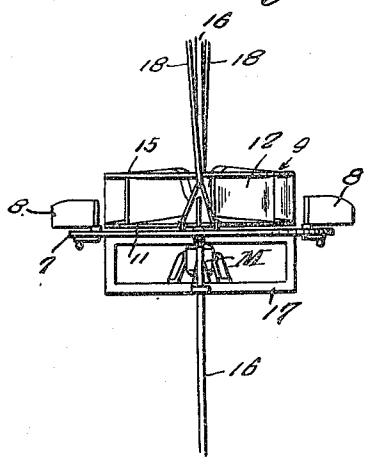


Fig. 7.



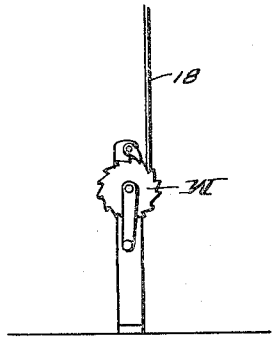


Fig. 8.

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UNITED STATES PATENT OFFICE

2,165,148

FROST PREVENTING MACHINE

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Application July 30, 1937, Serial No. 156,600

5 Claims. (Cl. 47—2)

This invention relates to wind machines and more particularly to frost preventing machines.

The primary object of this invention resides in the provision of a frost preventing machine adapted to be disposed in orchards, citrus fruit groves and on farms so as to prevent chilled air from settling within the orchards, etc.

Another object of this invention resides in the provision of a frost preventing machine adapted to direct warm air from above the ceiling of the lower stratum of air in an orchard, etc., and distribute it about the orchard so as to prevent chilled air from settling therein and damaging the fruit by frost.

A further object of this invention resides in the provision of a frost preventing machine of such construction that warm air from the upper stratum over an orchard, etc., can be directed into an orchard at various predetermined horizontal angles relative to the normal flow thereof.

A still further object of this invention resides in the provision of a frost preventing machine adapted to draw warm air from the upper stratum above an orchard, etc., and expel it therefrom in all directions about the orchard at the same time.

In addition to the aforesaid objects this invention resides in the provision of a frost preventing machine of such construction that the air impeller thereof can be adjusted perpendicularly to operate at various heights above the ground so as to function within or in close proximity to the upper stratum of air.

Among the many objects of this invention is the particular construction of the air impeller and operation thereof.

Aside from the foregoing objects of this invention is the provision of adjustable means for controlling the excursion of currents of air from the air impeller.

Among the many objects of this invention is the provision of a frost preventing machine adapted to be erected in multiplicity in an orchard and adjusted relative to the contour of the land, so as to dispose the air impellers thereof within or in close proximity to the upper stratum of air.

With these and other objects in view this invention resides in certain novel features of construction and arrangement of elements to be hereinafter set forth in the specification, illustrated in the accompanying drawings and more particularly pointed out in the appended claims and, while this disclosure depicts our present conception of the invention the right is reserved to resort to such changes in construction and arrangement of elements as come within the scope of the claims.

In the accompanying drawings forming a part of this application:

Fig. 1 is a side view of a frost preventing machine as constructed in accordance with this invention.

Fig. 2 is a plan view thereof.

Fig. 3 is a vertical sectional view of the upper portion of the machine approximately on line 3—3 of Fig. 2.

Fig. 4 is a detail perspective view of an impeller blade per se.

Fig. 5 is a similar view of one of the rudder blades.

Fig. 6 is a side view of a modified form of the frost preventing machine.

Fig. 7 is a detail side view of the adjustable impeller and adjuncts thereto.

Fig. 8 is a detail side view of the windlass therefor.

In the present illustration of this invention the numeral 5 designates, in general, a frost preventing machine which consists of a suitable tower 6, preferably of skeleton construction, on the top of which is secured a stationary platform 7 having a series of perpendicularly disposed rudder blades 8 journaled thereon for tangential adjustment relative to the radii extending from the center of the platform or axial point of an air impeller 9 rotatably mounted thereon and operated by an electric motor M or other suitable source of power. Said motor M is preferably mounted beneath the platform 7 on a cross beam or base 10 secured to the tower and has its shaft S splined to the air impeller by any suitable means. The stationary platform is also adjustable horizontally to conform to the altitude of the orchard, thus in case one portion of the grove is higher than the other the stationary platform can be adqusted to force the air to higher or lower levels.

The air impeller 9 consists of a substantially conical base-plate 11 to which is rigidly secured a plurality of blades 12 having their outer extremities 13 deflected or curved in the opposite direction of rotation of the air impeller so as to create a vacuum to draw the air downwardly and their inner ends 14 diverging outwardly from the base-plate 11 to form a pocket for entrance of the air at the center of the impeller, said diverging ends of the blades are preferably directed on compound curved lines.

In order to stabilize the blades of the air impeller an annular band or plate 15 is secured on

the upper edges thereof adjacent the outer extremities of the same end, through the instrumentality of this band 15, means are provided to direct the air currents outwardly past the rudder blades.

In the modified form illustrated by Figs. 6, 7 and 8, the tower 6 is provided with suitable guide rods or rails 16 to accommodate a vertically adjustable frame 17 adapted to support the air impeller mechanism heretofore referred to and, in order to raise and lower the air impeller mechanism, cables 18 are fastened to the platform 7, trained over sheaves 19 and secured to a suitable windlass W. Through the instrumentality of this structure the impeller mechanism can be adjusted to various heights so as to operate successfully regardless of elevation of the ceiling of the lower stratum of air.

With this invention fully set forth it is manifest that means are provided to prevent frost from settling in orchards, etc., and, through the simplicity of the structure involved, positive operation is assured at the minimum cost.

Having thus described our invention what we claim and desire to protect by Letters Patent is:

1. A frost preventing machine of the character set forth the combination of, a tower, a horizontally disposed platform rigidly secured to the top of the tower, a horizontally rotatable air impeller disposed above the platform and having its periphery inset from the periphery of the platform, adjustable rudder blades adjustably secured by a vertical pivot to the platform adjacent the periphery of the air impeller, and a motor rigidly mounted below the platform with its shaft connected to the air impeller.

2. A frost preventing machine of the character set forth the combination of, a tower, guide rods extending vertically in the tower, a frame slidably mounted on the guide rods, a horizontally disposed platform rigidly secured to the frame, a motor secured to the frame under the platform and having its shaft extending upwardly through the platform, an air impeller splined to the shaft of the motor above the platform, the periphery of the impeller being inset with respect to the periphery of the platform, rudder blades adjustably journaled on the platform about the periphery of the impeller, sheaves suspended from the tower above the platform, cables trained over the sheaves with their free ends secured to the platform, and a windlass connected to the opposite ends of the cables.

3. A frost preventing machine of the character described comprising, a tower, a horizontally disposed platform rigidly secured to the top thereof, a motor rigidly secured to the tower and having its shaft projecting upwardly through the platform, a substantially conical base-plate splined to the motor shaft, radially disposed blades secured to the base-plate and having their outer ends deflected and edges of their inner ends diverging upwardly from the center of the base-plate, an annular band secured to the blades over their outer ends, said base plate having its periphery inset from the periphery of the platform, rudder blades journaled on the platform in close proximity to the periphery of the base-plate, and adjusting means connected to the rudder blades.

4. A frost preventing device of the character described comprising a tower, a platform at the top of said tower having marginal portions projecting from sides of the tower, means for securing the platform to the tower, a motor carried by said tower under said platform with its shaft projecting upwardly through the platform centrally thereof, an impeller of less diameter than said platform carried by the upper portion of said motor shaft above the platform with its periphery spaced from the periphery of said platform, and rudders disposed over the marginal portions of the platform projecting from sides of the tower at their inner ends mounted by vertical pivots for movement to adjusted positions.

5. A frost preventing device of the character described comprising a tower, a platform at the top of said tower, a support located adjacent the upper end of said tower under said platform, a motor carried by said support and disposed vertically with its shaft projecting upwardly through said platform, an impeller carried by the projecting upper end portion of the motor shaft and located over the platform, said impeller having radiating blades shaped to draw air downwardly at the center of the impeller and discharge the air horizontally from the periphery thereof, the periphery of the impeller being inset with respect to the periphery of the platform, and rudders extending horizontally between the impeller and the periphery of said platform and pivotally mounted at their inner ends for movement about vertical pivots to adjusted positions in angular relation to radii of the impeller.

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