July 4, 1939. A. S. KELLNER 2,165,057

AIR CONDITIONED SMOKEHOUSE

Filed April 27, 1938 3 Sheets-Sheet 1

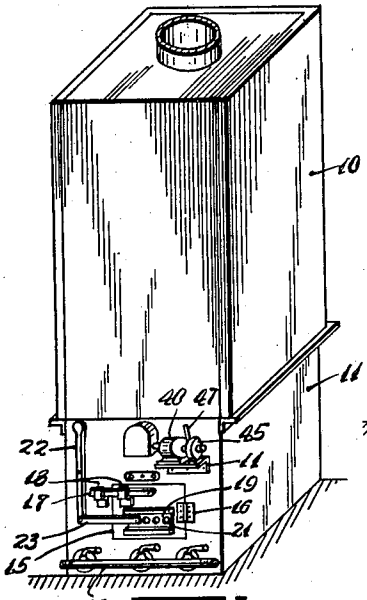


Fig. 1.

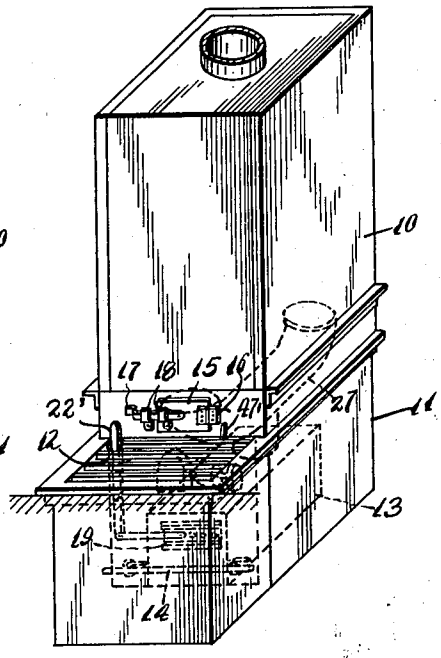


Fig. 2.

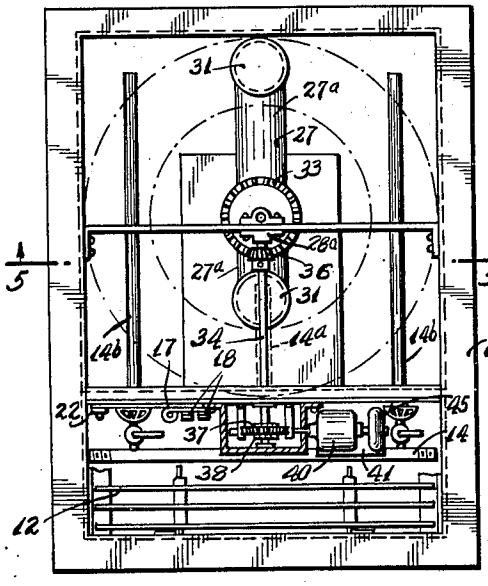


Fig. 3.

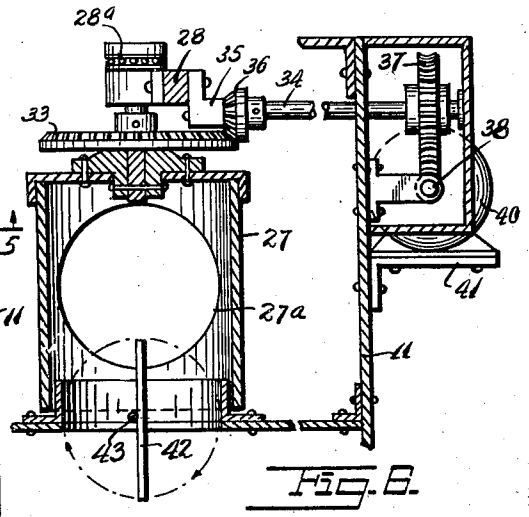


Fig. 8.

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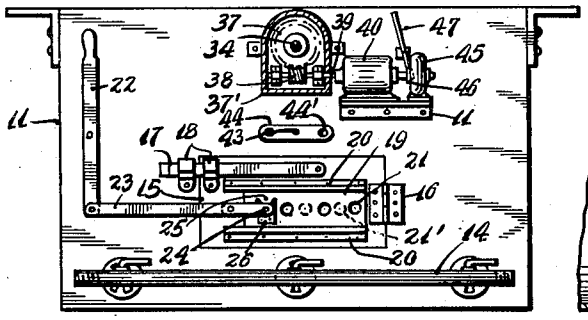


Fig. 4.

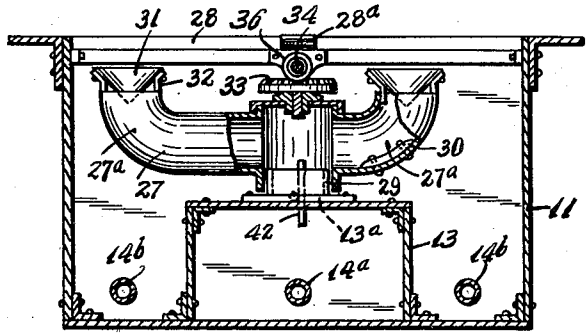


Fig. 5.

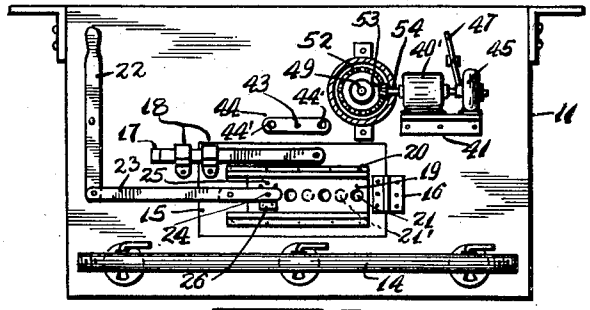


Fig. 7.

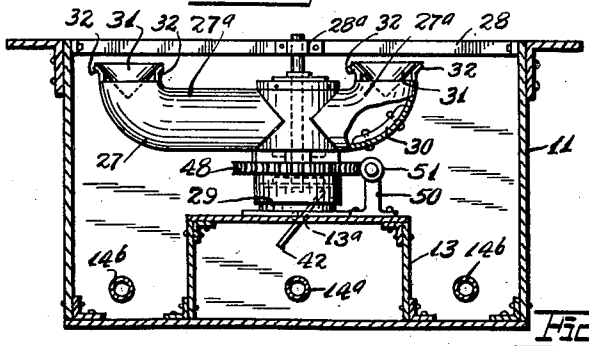


Fig. 8.

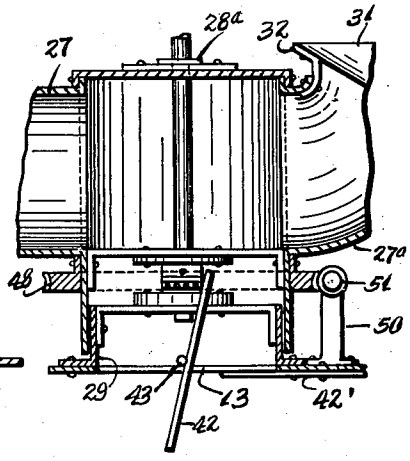


Fig. 9.

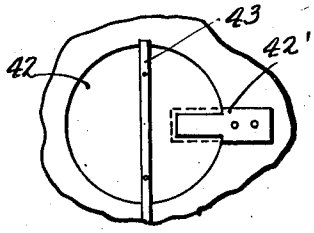


Fig. 10.

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AIR CONDITIONED SMOKEHOUSE

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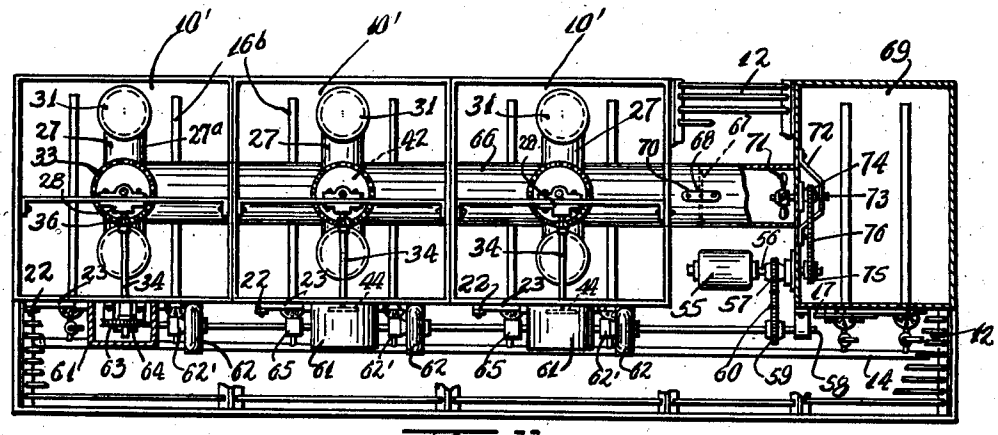


Fig. 11.

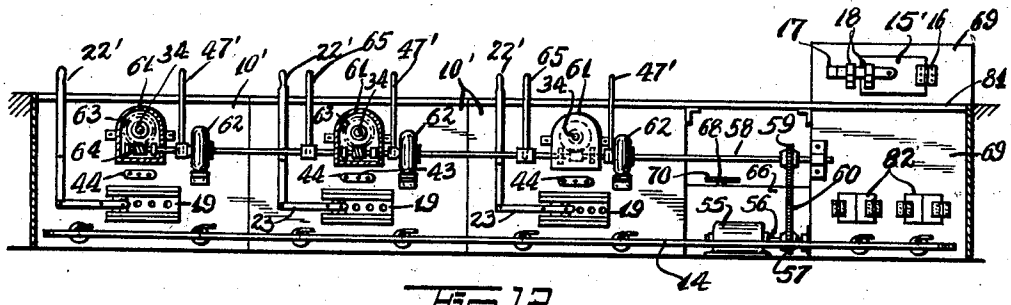


Fig. 12.

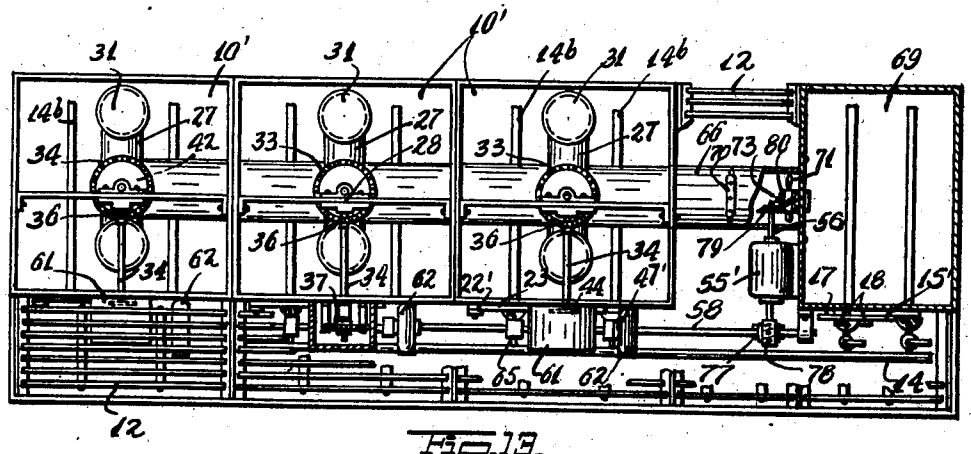


Fig. 13.

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UNITED STATES PATENT OFFICE

2,165,057

AIR CONDITIONED SMOKEHOUSE

Alexander S. Kellner, New York, N. Y.

Application April 27, 1938, Serial No. 204,606

4 Claims. (Cl. 99—259)

This invention relates to new and useful improvements in an air conditioned smoke house.

More specifically, the invention proposes the construction of an air conditioned smoke house for smoking meats and similar foods which is constructed to be capable of directing smoke more evenly throughout the entire capacity of the house for smoking the meats evenly on all sides.

Still further it is proposed to so construct the revolving mechanism for distributing the smoke so that the capacity of the house need not be increased and still permit it to have the same holding capacity.

Still further it is proposed to so construct the smoke house that no heat need be lost when the door is opened for the purpose of shifting the position of the meats, and thus obtain more even smoking.

Still further it is proposed to characterize the revolving air conditioned smoke house by a hollow body for location beneath the conventional smoke house and which is provided with a smoke chamber having a hollow arm rotatively supported thereon and which is adapted to be revolved for evenly distributing the smoke throughout the entire interior of the smoke house.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

Fig. 1 is a perspective view of a smoke house constructed according to this invention.

Fig. 2 is a view similar to Fig. 1 illustrating a modification of the air conditioning equipment.

Fg. 3 is a horizontal sectional view of Fig. 2 taken at the base of the smoke house.

Fig. 4 is a front elevational view of a portion of Fig. 1.

Fig. 5 is a sectional view on the line 5—5 of Fig. 3.

Fig. 6 is an enlarged detailed view of the revolving mechanism per se.

Fig. 7 is a view similar to Fig. 4 illustrating a further modification of the invention.

Fig. 8 is a view similar to Fig. 5 but illustrating the modification of the invention shown in Fig. 7.

Fig. 9 is a vertical sectional view of a portion of Fig. 8.

Fig. 10 is a plan view of the valve shown in Fig. 9.

Fig. 11 is a plan view illustrating a plurality of smoke houses constructed according to this invention.

Fig. 12 is a front view of Fig. 11.

Fig. 13 is a view similar to Fig. 11 but illustrating another application of the invention.

The air conditioned smoke house comprises a hollow body for location beneath a smoke house 10. The smoke house is of conventional construction and no details thereof will be given in this specification as it forms no part of the invention. The smoke chamber 11 which is located beneath the smoke house 10 may be located within an iron pit as shown in Fig. 2, or it may rest directly upon the floor supporting the smoke house 10. A portion of the mechanism for affecting the air conditioning of the smoke house is located on the outer wall of the hollow body 11. The hollow body 11 may be formed with an extension as shown in Fig. 2 for the purpose of covering the same. This extension may be covered upon its top side by means of a grate 12 hingedly supported upon the front wall of the extension for permitting the grate to be moved to a position in which it will be extended away from the open side so as to permit the air conditioning mechanism to be lubricated.

A smoke chamber 13 is located within the hollow body 11 and rests directly upon the bottom of the iron pit thereof and is adapted to have combustible materials placed therein which are capable of producing a dense smoke when burning. A gas supply 14 is provided and is connected by means of a branch line 14a with the interior of the smoke chmber 13 for assisting in producing the smoke. Branch lines 14b extend to the interior of the hollow body 11 (see Fig. 5) for supplying heat to the interior of the smoke house 11 for assisting in the smoking process.

A draft control is provided for the smoke chamber 13 and consists of a door 15 which is hingedly supported at one of its ends by means of a hinge 16 upon the front wall of the smoke chamber. A lock element 17 is pivotally supported at one of its ends upon the door 15 and is adapted to be engaged into brackets 18 one of which is attached to the door 15, and the other of which is attached to the front wall of the smoke chamber 13. When the lock element 17 is engaged into the brackets 18 the door 15 is in a position in which it closes the front opening of the smoke chamber. The draft mechanism is applied directly to the door 15 and consists of a plate 19 slidably supported in tracks 20 securely attached to the front face of the door 15. Openings 21 are formed in the plate 19 and complementary openings 21' are formed in the front face of the door 15. The openings

21 are adapted to be aligned with the openings 21' for permitting the air to pass therethrough to provide a draft for assisting in burning of the combustible material placed into the smoke chamber 13.

A means is provided for aligning and disaligning the openings 21 and 21' and consists of a handle 22 which is fixedly mounted intermediate of its ends upon a portion of the hollow body 11 and which is pivotally connected at its bottom end with a horizontal connecting rod 23. The free end of the connecting rod is bifurcated and has a pin 24 extending between the arms thereof. This pin 24 is adapted to be engaged into a U-shaped slot 25 formed in a bracket 26 securely attached to the front face of the plate 19. When the pin 24 is engaged in the U-shaped slot 25 and the handle 22 is pivoted, the position of the plate 19 will be shifted for aligning and disaligning the openings 21 and 21'. When it is desired to open the door 15 the horizontal connecting rod 23 is moved out of the way by disengaging the pin 24 from the U-shaped slot 25 and pivoting the same to a position in which the door 19 is free to be moved open.

A hollow arm 27 is rotatively supported above the smoke chamber 13 and is adapted to move against the bottom of the smoke house and has discharge openings for evenly distributing the smoke throughout the entire smoke house for evenly smoking the meats placed therein. A supporting rod 28 is fixedly attached across the width of the hollow body 11 and is formed at its center with a bearing 28a for rotatively suspending the arm 27 above the smoke chamber 13. The smoke chamber is formed at its top with an opening 13a and an extension member 29 is mounted on the top wall of the smoke chamber 13 and extends around the opening 13a and into a complementary bottom opening formed on the bottom face of the arm 27. The arm 27 may be of a single or multiple construction, and the arms 27a thereof are of different lengths for evenly distributing the smoke throughout the smoke house 10.

A weight 30 is attached to a portion of the shorter of the two arms and is adapted to counter-balance the weight of the longer arm for causing the arm 27 to be evenly suspended from the support rod 28. Cone shaped caps 31 are normally inverted and have their apexes inserted into the open end of the arms and are fixedly held in position by means of brackets 32. These cone shaped caps are adapted to function as containers for catching the grease which drops from the meats and for breaking up the column of smoke emanating from the arm 27a for assisting the arms in more evenly distributing the smoke.

A means is provided for rotating the arm 27 and comprises a large bevel gear 33 which is fixedly attached to that portion of the arm 27 which rotatively engages the bearing 28a. A shaft 34 is normally supported at one of its ends in a bearing 35 formed on the support rod 28 adjacent the bearing 28a. This rod 34 extends through the front wall of the hollow body 11. The inner end of the rod 34 is formed with a small bevel pinion 36 which engages the large bevel gear 33. At its front end the rod 34 is formed with a large gear 37 which engages a complementary worm gear 38 which is fixed to the extended shaft 39 of a motor 40. The motor 40 is fixedly supported upon a bracket 41 attached to the front face of the hollow body 11. When the motor 40 is turning over the rotations therefrom will be transmitted to the large bevel gear 33 through the medium of the shaft 34 and its associated parts for causing the arm 27 to evenly distribute the smoke throughout the smoke house 10.

A butterfly valve 42 is pivotally supported upon the top wall of the smoke chamber 13 and is adapted to be extended across the opening 13a for preventing the smoke from entering the arm 27 when it is so desired. When it is believed that the meats contained within the smoke house have been sufficiently smoked and it is desired to stop the smoke from entering the arm 27, the butterfly valve may be rotated to a position in which it will close the opening 13a. The shaft 43 which rotatively supports the butterfly valve 42 extends through the front wall of the hollow body 11 and is formed at its front end with a handle 44 by which it may be rotated for controlling the position of the valve 42. The handle is provided with openings 44' for turning the same with a suitable tool.

A means is provided for driving the smoke out of the smoke house when the butterfly valve 42 is in its closed position and comprises a blower 45 which is supported upon the bracket 41 adjacent the motor 40 which is directly connected with the iron pit 11 for pumping fresh air into the smoke house after the butterfly valve 42 has been closed. This blower 45 is connected to the other end of the shaft 39 of the motor 40 and a clutch mechanism 46 is interposed between the blower 45 and the motor 40 for controlling the operation of the same. A handle 47 is pivotally supported intermediate of its ends and engages the clutch mechanism 46 for engaging and disengaging the same to cause the blower 45 to operate when desired.

If desired a suitable crank mechanism may be supplied in place of the motor 40 for rotating the arm 27 and the blower 45.

The operation of this device is as follows:—

The meats to be smoked are placed within the smoke house 10 and the door 15 of the smoke chamber 13 is opened and suitable combustible material is placed therein and the gas burners 14a and 14b are lit. The burner 14a will assist the combustible material in producing the smoke, and the burner 14b will supply heat to the smoke house 10 for assisting in the smoking process. After the combustible material has started to burn the plate 19 is shifted to align the openings 21 and 21' to the desired degree for providing a sufficient draft to the combustible material for keeping it burning.

The motor 40 is then rotated and the rotations therefrom will be transmitted to the large gear 33 through the medium of the rod 34 and its associated parts for causing the arm 27 to rotate. Smoke emanating from the smoke chamber 13 through the opening 13a will pass through the arms 27a and into the smoke house 10. From the arm 27a the smoke will be evenly distributed throughout the interior of the smoke house 10 for evenly and consistently smoking the meats. The cone shaped caps 31 will act to catch the greases dropping from the meats and break up the column of smoke coming from the arms 27 to assist the revolving motion in properly distributing the same.

After the meats have been properly smoked the handle 44 is rotated into the proper direction for closing the butterfly valve 42 to prevent the smoke from emanating from the smoke

chamber 13. The handle 47 is then pivoted to close the clutch 46 and cause the blower 45 to operate. This blower will drive the smoke from the smoke house and fill the same with fresh air so that the operator may enter the smoke house for removing the meats if they have been properly smoked.

According to the modification shown in Figs. 7, 8 and 9 and 10, a slightly different means is provided for revolving the arm 27, but in other respects this form of the invention is similar to that previously described.

This new mechanism for revolving the arm 27 comprises a large ring gear 48 which is fixedly attached to a downwardly extending portion formed on the arm 27 and which engages over the upwardly extending portion 29 attached to the top of the smoke chamber 13. A rod 49 is rotatively supported at its inner end upon a bracket 50 attached to the top wall of the smoke chamber 13. At its inner end the rod 50 is formed with a worm gear 51 which engages the ring gear 48. At its outer end the rod 49 is formed with a large bevel gear 52 which meshes with a complementary bevel gear 53 fixedly attached to the extended shaft 54 of a motor 40'. This motor 40' is supported upon a bracket 41 attached to the front face of the hollow body 11. When the motor 40' is rotated its rotations will be transmitted to the ring gear 48 through the rod 49 and its associated mechanism for rotating the arm 27 to evenly distribute the smoke throughout the smoke house 10.

According to the modification shown in Figs. 11 and 12 a plurality of smoke houses 10' are arranged one adjacent the other and each of the smoke houses is provided with an air conditioning mechanism. A single motor 55 is provided for controlling the operation of each of the air conditioning mechanisms.

The shaft 56 of the motor 55 extends from one end thereof and a sprocket 57 is fixedly attached to the shaft 56. A long shaft 58 extends across the entire length of the smoke houses 10' and is provided at its end adjacent the motor 55 with a sprocket 59. A chain 60 engages the sprockets 57 and 59 for transmitting the rotations of the motor 55 to the shaft 58. The front of each of the hollow bodies mounted beneath the smoke houses 10' is formed with a gear box 61, a blower 62 and a blower control clutch 62'. The gear box is formed with a large gear 63 which meshes with a worm 64 attached to the shaft 58 for transmitting the rotations of the motor 55 to the arm 27 located within the hollow body for rotating the same.

The shaft 58 is constructed from a plurality of separate sections. Clutches 65 are provided between the adjacent ends of the shaft sections and when these clutches are engaged, the entire shaft 58 will rotate for rotating each of the arms located at the bottom of the smoke houses 10'. The smoke houses 10' are formed with a conveying pipe 66 for carrying the smoke into each of the smoke houses 10'. A butterfly valve 42 is located within the conveying pipe 66 at the point of connection between the pipe and the separate smoke chambers for controlling the column of smoke supplied thereto.

The smoke houses 10' and a smoke chamber 69 are positioned in the ground and the control members are covered by a suitable grating 12 through which the control levers 22', 47' and 65 project above the grating 12 so that they may be manipulated above the said grating, similar to the control levers illustrated in Fig. 2.

A portion of smoke chamber 69 is above the floor line 81 and the door 15' for feeding the smoke chamber 69 is also above the floor line. In addition to the upper door 15', additional doors 82 are provided for smoke chamber 69, in the iron pit.

A master valve 67 is mounted on a transverse rod 68 in the pipe 66, between the first smoke house 10' and a smoke chamber 69. This butterfly valve 67 is controlled by a suitable handle 70 to control the supply of smoke into each of the houses 10'. At the one end, the conveying pipe 66 is provided with a mechanism for drawing the smoke from the smoke chamber 69.

This latter mechanism comprises a blower 71 which is rotatively supported in a bracket 72 by means of a shaft 73. A sprocket 74 is fixedly attached to the shaft 73 and a similar sprocket 75 is fixed to the extended end of the motor shaft 56. A chain 76 extends between the sprockets 74 and 75 for rotating the fan 71 to blow the smoke into the smoke houses 10' when the butterfly valves 42 are in their open position. In other respects this form of the invention is similar to the previous form.

According to the modification shown in Fig. 13 the motor 55' is directly connected to the suction fan 71 and the shaft 58 for rotating these members. This is accomplished by arranging the motor 55' with its shaft 56 extending at right angles to the shaft 73 of the fan 71 and at right angles to the shaft 58. Coacting gears 77 and 78 are provided for rotating the shaft 58. Coacting gears 79 and 80 are provided for rotating the fan 71. In other respects this form of the invention is similar to that disclosed relative to Fig. 11.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:—

1. An air conditioned smoke house, comprising a hollow body for location beneath a smoke house, a smoke chamber within said body, a gas supply to said hollow body and to said smoke chamber, a door to give access to said smoke chamber, a draft control for said smoke chamber, a hollow arm rotatively supported above said smoke chamber to move across the bottom of said smoke house and having a discharge opening for the smoke, a connection for the passage of smoke from said smoke chamber into said hollow arm, a valve for controlling the passage of smoke through said hollow arm, and means for rotating said hollow arm, said hollow arm being of a multiple construction and each of its arms being of a different length for evenly distributing said smoke.

2. An air conditioned smoke house, comprising a hollow body for location beneath a smoke house, a smoke chamber within said body, a gas supply to said hollow body and to said smoke chamber, a door to give access to said smoke chamber, a draft control for said smoke chamber, a hollow arm rotatively supported above said smoke chamber to move across the bottom of said smoke house and having a discharge opening for the smoke, a connection for the passage of smoke from said smoke chamber into said hollow arm, a valve for controlling the passage of smoke

through said hollow arm, and means for rotating said hollow arm, said hollow arm being of a multiple construction and each of its arms being of a different length for evenly distributing said smoke, said arm being rotatively supported at the bottom of said smoke house and at the center thereof, and means for counter-balancing said arm to compensate for the weight of the longer arms.

3. An air conditioned smoke house, comprising a hollow body for location beneath a smoke house, a smoke chamber within said body, a gas supply to said hollow body and to said smoke chamber, a door to give access to said smoke chamber, a draft control for said smoke chamber, a hollow arm rotatively supported above said smoke chamber to move across the bottom of said smoke house and having a discharge opening for the smoke, a connection for the passage of smoke from said smoke chamber into said hollow arm, a valve for controlling the passage of smoke through said hollow arm, and means for rotating said hollow arm, said connection between said arm and said smoke chamber comprising an opening formed in the top wall of said smoke chamber, an extension attached to said top wall and extending around said opening, a complementary extension formed on the bottom of said arm and engaging over the other of said extensions for conveying said smoke from said smoke chamber to said arm, said means for controlling the passage of smoke through said hollow arm comprising a butterfly valve rotatively supported across said opening in said smoke chamber, a means on the front of said hollow body for rotating said butterfly valve for opening and closing the same, means for driving the smoke from said smoke house when said butterfly valve is in the closed position, said means comprising a motor, a blower connected with said motor and directly with said smoke chamber for blowing the smoke from said smoke chamber, and a clutch mechanism inserted between said blower and said motor for controlling the operation of said blower.

4. An air conditioned smoke house, comprising a hollow body for location beneath a smoke house, a smoke chamber within said body, a hollow arm rotatively supported above said smoke chamber to move across the bottom of said smoke house and having a discharge opening for said smoke, and means for rotating said arm, said arm being of a multiple construction consisting of a long arm and a weighted short arm for evenly distributing the smoke throughout the entire inside of said smoke house.

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