

Nov. 24, 1925.

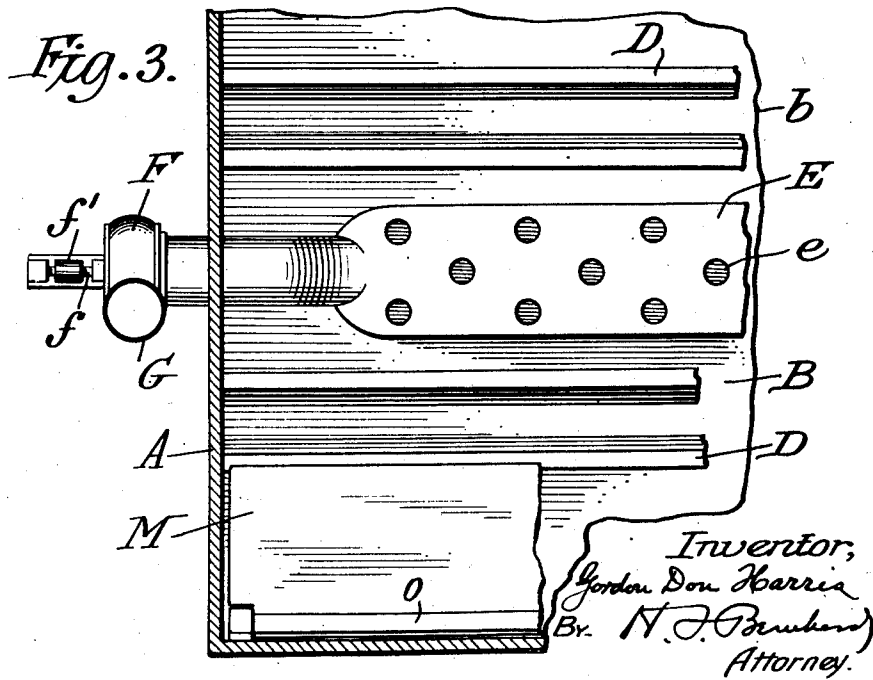
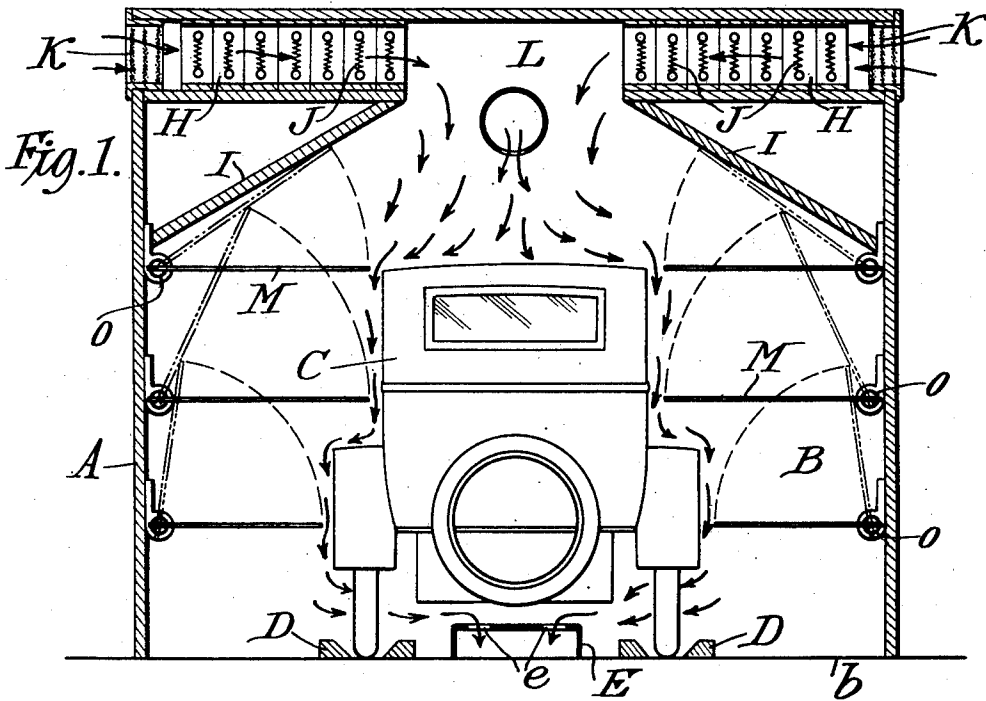
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G. D. HARRIS

DRYING APPARATUS

Filed March 31, 1921

2 Sheets-Sheet 1



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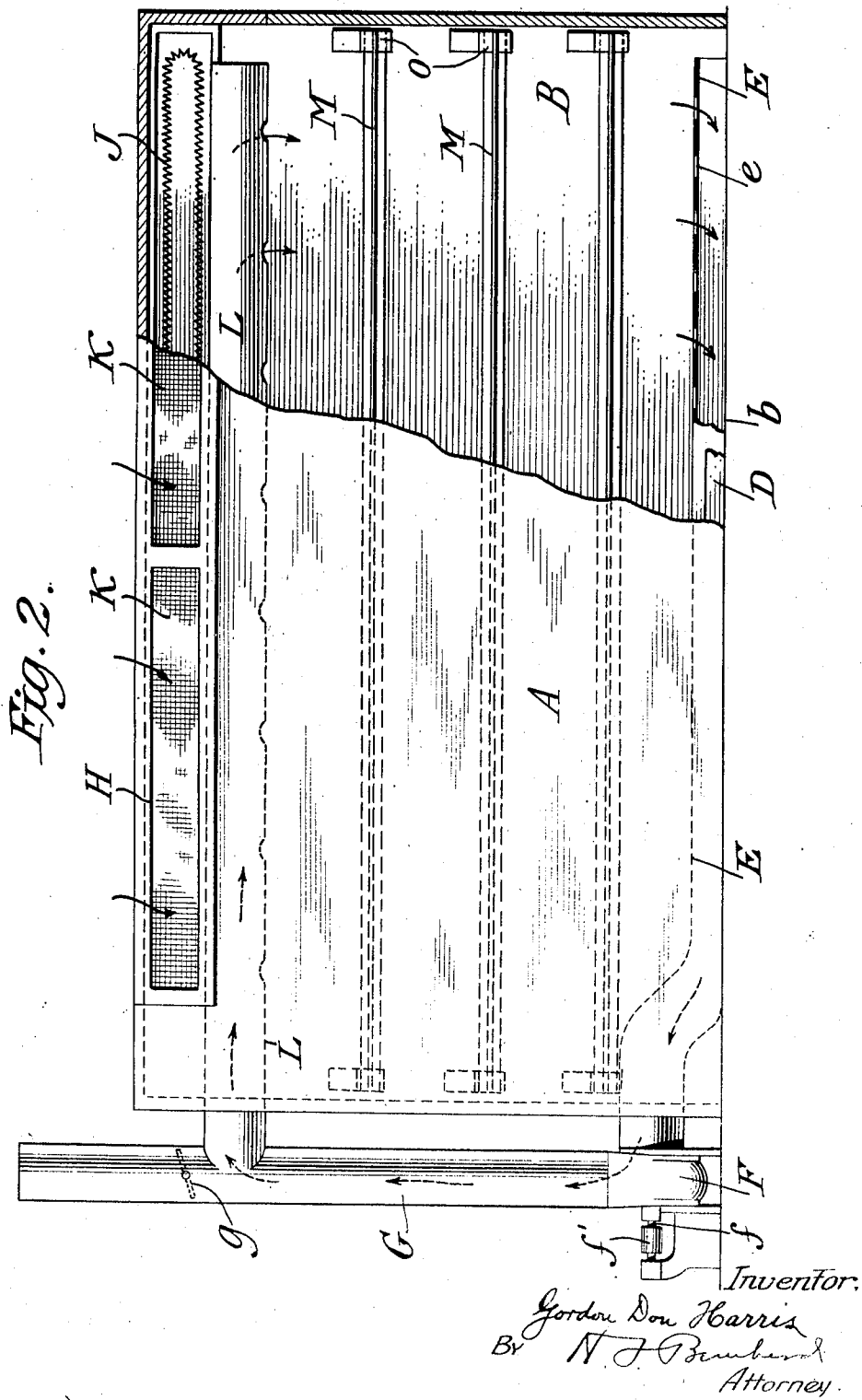
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DRYING APPARATUS

Filed March 31, 1921

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

GORDON DON HARRIS, OF ISLIP, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE INDUSTRIAL DRYER CORPORATION, OF STAMFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

DRYING APPARATUS.

Application filed March 31, 1921. Serial No. 457,250.

To all whom it may concern:

Be it known that I, GORDON DON HARRIS, a citizen of the United States, residing at Islip, county of Suffolk, and State of New York, have invented a certain new and useful Drying Apparatus, of which the following is a specification.

This invention pertains to an apparatus wherein an automobile, or any other machine or structure, may be positioned for the purpose of performing useful work thereon, such as oxidizing coatings applied thereto or of drying the same.

According to this invention, I provide a chamber within which the apparatus or structure as an entirety may be positioned, and within this chamber is circulated a gaseous medium under such conditions of temperature, humidity and fresh air control as to, at least approximately, attain ideal drying, oxidizing or setting conditions.

The interior construction of the chamber is such that a workman is able to move freely around the apparatus or structure, and to have unobstructed access thereto for the performance of work thereon, such as the application of a coating or coatings thereto, but during the oxidizing or setting operation the chamber is closed except for the circulation of the drying atmosphere therein, the same being directed into the required contact with the surfaces of the structure under treatment.

In a practical embodiment of the invention, the floor of the chamber is constructed with work locating means in the form of curbing for determining the position to be occupied by an automobile, and intermediate said curbing is an eduction flue by which the drying atmosphere is conducted beneath the automobile and to an exhaustor.

Within the upper part of the chamber is a return flue extending over the position to be occupied by the automobile, said return flue being connected with said exhaustor, and said flue being provided with outlets so that the drying atmosphere may be recirculated to attain a desired condition of humidity suitable for the performance of the treatment to be accorded to the coatings applied to the automobile.

The drying atmosphere is replenished by the inflow of fresh atmospheric air induced

to flow into the chamber by the circulation impelled by the action of the exhaustor, such inflowing fresh air being heated to a proper temperature by the action of coils which are supplied with a heating medium of a desired character, such for example as electric coils affording resistance to the flow of an electric current. Preferably, the inflowing fresh air is not only heated to a desired temperature, but it is filtered to exclude the admission of dust to the surface of the automobile.

During the operation of oxidizing the coatings on the automobile, the returning air from the elevated duct, and the inflowing air from the fresh air ducts, are directed by baffles toward the sides of the automobile. Said baffles are hung within the chamber to occupy a co-operative relation to the structure under treatment, but these baffles may be shifted at will to an inoperative position relatively to the structure in order that they do not interfere with the freedom of access to said structure by the workman.

Although I have referred particularly to the oxidizing of coatings on automobiles, it will be understood that the apparatus may be used for washing and drying automobiles in garages where large numbers of cars are stored; and, further, that said apparatus may also be used for the treatment of structures other than automobiles, such as pianos, or other forms of apparatus.

Other functions and advantages of the invention will appear from the following description taken in connection with the drawings, wherein—

Figure 1 is a vertical cross section through my apparatus illustrating an automobile positioned therein for the performance of work thereon.

Figure 2 is a side elevation partly broken away and shown in longitudinal section.

Figure 3 is a plan view partly broken away and shown in horizontal section through a portion of the apparatus.

The housing A is of any approved construction, producing a chamber B within which the structure to be treated, such as an automobile C, is adapted to be positioned so as to provide for the circulation of an oxidizing or drying atmosphere in accordance with this invention.

The position of the structure to be treated is determined by the provision on the floor *b* of a plurality of curbings *D D*, the same being composed of cement or other material suitable for the purpose. As shown, the opposing faces of the curbs are beveled for directing the wheels of the automobile when the latter is run into or out of the housing, suitable doors being provided in the end or ends of the housing for this purpose.

E is an eduction flue or duct extending horizontally within the chamber *B*, preferably on the floor *b* thereof, and intermediate the curbings *D D*. Said flue is or may be composed of metal, provided with ports *e* for the flow of the drying or oxidizing atmosphere from the chamber *B*. The flue extends through a wall of the housing, and it is connected with the intake of a blower or exhauster *F*, from which leads a stack or uptake *G*, said blower being shown as having a fan shaft *f* provided with a belt pulley *f'*.

In the upper part of the chamber are provided fresh air ducts *H, H*, beneath which are permanent baffles *I I*, the latter being inclined relatively to the fresh air ducts and the side walls of the housing, see Figure 1. Said fresh air ducts are open to the outside air and to the upper part of chamber *B*, and within said ducts are appropriate heaters, such as the coils *J*. Said coils are shown as resistance coils for an electric current whereby the coils afford means for heating the inflowing fresh air to a desired temperature, but obviously other forms of heaters may be substituted for the electric resistance coils. Across the intake to the fresh air ducts are filters *K*, composed usually of fabric through which the fresh air flows whereby the inflowing air is filtered in order to eliminate dust and foreign material from the surfaces of the automobile during the drying thereof.

L is a return flue or duct extending horizontally within the chamber, said duct being intermediate the fresh air ducts *H, H*, and over the position to be occupied by the automobile. Said duct is connected with the stack or uptake *G*, see Figure 2, and if desired a damper is provided in said uptake (see dotted lines at *g*), whereby the atmosphere flowing out of the duct *E* may be returned by exhauster *F* and stack *G* to the return duct *L*, the lower surface of which duct is provided with ports *m* for directing the recirculated atmosphere upon the top part of the automobile.

M M are movable baffles positioned within the chamber at the respective sides thereof, said baffles being hung or pivoted at *o* upon the opposite side walls of the housing. During the operation of oxidizing the coatings applied to the automobile, the baffles are

turned to occupy the horizontal positions extending toward the automobile, and in practice said baffles direct the circulating atmosphere into contact with the automobile. When the workmen are engaged in the performance of work upon the automobile, such as applying a coating thereto, or washing the car, the baffles are turned upwardly to the dotted line positions in Figure 1, thus disposing the movable baffles out of the way of the workmen; but during the oxidizing or drying operations, the baffles occupy substantially the positions shown, for directing the circulating atmosphere into contact with the surfaces of the car, as shown by the arrows in Figure 1.

The operation will be apparent from the foregoing description, but may be summarized as follows:—The car *C* is run between the curbings *D* to occupy position over the eduction flue *E* and beneath return duct *L*, the doors are closed to chamber *B*, and exhauster *E* started. The suction created in chamber *B* by the action of the exhauster draws the atmosphere downwardly within the chamber, so as to set up a circulation along the sides and below the automobile, the atmosphere flowing into duct *E* through ports *e*, thence to the stack *G*, and some of it is returned by duct *L* to the upper portion of chamber *B*. The downward circulation thus set up in the chamber induces the inflow of fresh atmospheric air by way of flues *H H*, the inflowing fresh air being heated and filtered, and such air mixes with the recirculated atmosphere discharged through flue *L*, whereby the returning moist air from duct *L* and the inflowing fresh air through ducts *H* are mixed to attain a drying atmosphere conditioned as to temperature and humidity for the performance of the oxidizing or drying operation under what may be regarded as ideal conditions of service.

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

1. In an apparatus such as described, a chamber provided at the floor thereof with means for locating an object, recirculating means for effecting the positive recirculation of an oxidizing or drying atmosphere, including an eduction flue positioned adjacent the object locating means and a return flue positioned for feeding said recirculated atmosphere downwardly upon said object, and means separate from the recirculating means for feeding atmospheric air directly to said chamber, the inflow of such fresh atmospheric air to the chamber being independent of the circulation within the chamber of the oxidizing or drying atmosphere by said recirculating means.

2. In an apparatus such as described, a chamber provided at the floor thereof with

a plurality of object locating means, an eduction flue extending lengthwise of the chamber and intermediate said object locating means to insure the flow of an atmosphere beneath an object located by said locating means, a return flue extending longitudinally with respect to the chamber for directing said atmosphere downwardly upon an object positioned by said locating means, a positively operating recirculating device the intake of which is connected to the eduction flue and the outlet of which is connected with the return flue, and means separate from said flues and the recirculating device for feeding atmospheric air directly to said chamber, whereby the inflow of atmospheric air to the chamber is independent of the flow therein of the atmosphere recirculated by said flues and the recirculating device.

3. In an apparatus such as described, a chamber provided at the floor thereof with object locating means, baffles mounted within the chamber for movement relatively to the plane of the object locating means, said baffles being movable within the chamber for enlarging the space surrounding the object under treatment and being positioned at will for operative relation to said object whereby a drying or oxidizing atmosphere may be directed to flow into contact with said object, and recirculating means for effecting the positive recirculation of said atmosphere, operable for blowing said atmosphere downwardly upon the object and for exhausting said atmosphere below said object.

4. In an apparatus such as described, a chamber, a plurality of baffles hung within the chamber at the respective sides of the space to be occupied by an object under treatment, said baffles being foldable into out of service positions for enlarging the space surrounding the object and being shiftable at will into operative positions relatively to said object, and recirculating mechanism for effecting the positive recirculation of an oxidizing or drying atmosphere, including means for directing such atmosphere downwardly upon the object and means for exhausting such atmosphere from below said object.

5. In an apparatus such as described, a chamber, an exhaust flue and a return flue extending longitudinally with respect to said chamber, said flues being spaced relatively to each other for the introduction between them of an object to be treated, a positively operating recirculating means connected with said flues to recirculate a drying or oxidizing atmosphere within said chamber, and means separate from said flues and the recirculating device for feeding fresh air directly to the chamber, the fresh atmospheric air flowing into said chamber

independently of the atmosphere recirculated by said flues and the recirculating means.

6. In an apparatus such as described, a chamber, an exhaust flue and a return flue extending longitudinally with respect to said chamber and positioned substantially centrally with respect thereto, a positively operating recirculating device the intake of which is connected with the exhaust flue and the outlet of which is connected with the return flue, said device and the specified flues operating to recirculate a drying or oxidizing atmosphere within said chamber, and a plurality of fresh air flues separate from the aforesaid flues and operable for feeding fresh atmospheric air directly to said chamber independently of the atmosphere flowing therein by the co-operation of said recirculating device with the eduction flue and the return flue.

7. In an apparatus such as described, an eduction flue and a return flue in co-operative relation to said chamber, a circulating device connected with said eduction flue and the return flue for effecting in a positive manner the recirculation of a drying or oxidizing atmosphere within said chamber, and means separate from said recirculating means and flues for feeding fresh atmospheric air directly to said chamber, whereby atmospheric air is supplied to the chamber independently of the flow of the atmosphere therein under the influence of said recirculating means.

8. In an apparatus such as described, an eduction flue and a return flue in co-operative relation to said chamber, a circulating device connected with said eduction flue and the return flue for effecting in a positive manner the recirculation of a drying or oxidizing atmosphere within said chamber, means separate from said recirculating means and flues for feeding fresh atmospheric air directly to said chamber, and means for warming the inflowing fresh atmospheric air.

9. In an apparatus such as described, a chamber, an eduction flue and a return flue in co-operative relation to said chamber, a circulating device connected with said eduction flue and the return flue for effecting the recirculation of a drying or oxidizing atmosphere within said chamber, means separate from said recirculating means and flues for feeding fresh atmospheric air directly to said chamber, and means for warming and filtering the fresh atmospheric air supplied to said chamber independently of the flow therein of the recirculated atmosphere.

10. In an apparatus such as described, a chamber, a return flue and an eduction flue in communication with said chamber for feeding a drying or oxidizing atmosphere

downwardly within the chamber, a recirculating device connected with said flues for recirculating said atmosphere, and a plurality of fresh air ducts separate from said return flue and the eduction flue, said fresh air ducts having their discharge ends opening into the chamber adjacent the return flue whereby the downflow of the atmosphere from said return flue induces the inflow to the chamber of fresh atmospheric air.

11. In an apparatus such as described, a chamber, a flue positioned for discharging a drying or oxidizing atmosphere downwardly within said chamber, a circulating device the intake of which exhausts said atmosphere from the chamber and operating to deliver the atmosphere through said flue, and a fresh air duct separate from said flue, the outlet of said duct discharging fresh atmospheric air directly into the chamber and adjacent the first mentioned flue so that the downflow of the atmosphere within the chamber induces the inflow to said chamber of fresh atmospheric air through said duct.

12. In an apparatus such as described, a chamber, a flue positioned for discharging a drying or oxidizing atmosphere downwardly within said chamber, a circulating device the intake of which exhausts said atmosphere from the chamber and operating to deliver the atmosphere through said flue, and a plurality of fresh air ducts the outlets of which feed fresh atmospheric air directly to said chamber at points adjacent to said flue, said fresh air ducts being separate from the flue, and means within the fresh air ducts for warming and filtering the fresh atmospheric air the inflow of which to the chamber is induced by the downflow of the recirculated atmosphere.

13. In an apparatus such as described, a chamber, a flue positioned for discharging a drying or oxidizing atmosphere downward-

ly within said chamber, a circulating device the intake of which exhausts said atmosphere from the chamber and operating to deliver the atmosphere through said flue, a plurality of fixed baffles inclined relatively to the flue, a plurality of fresh air ducts above the inclined baffles and opening into the chamber adjacent the flue for the ingress of the recirculated atmosphere, and movable baffles hung within the chamber below said inclined baffles, said movable baffles being shiftable into out of service positions relatively to the space within the chamber to be occupied by the object under treatment.

14. In an apparatus such as described, a chamber, recirculating means including a flue for discharging a drying or oxidizing atmosphere downwardly within said chamber, a plurality of fresh air ducts the outlet ends of which open into the chamber adjacent said flue for feeding to said chamber fresh atmospheric air independently of the downflow of the recirculated atmosphere, and means co-operable with said ducts for warming the fresh air flowing therethrough into the chamber.

15. In an apparatus such as described, a chamber, recirculating means including a flue for discharging a drying or oxidizing atmosphere downwardly within said chamber, a plurality of fresh air ducts the outlet ends of which open into the chamber adjacent said flue for feeding to said chamber fresh atmospheric air independently of the downflow of the recirculated atmosphere, means within said fresh air ducts for filtering the fresh atmospheric air supplied to said chamber, and heating means for said air flowing within the ducts.

In testimony whereof I have hereto signed my name this 29th day of March, 1921.

GORDON DON HARRIS.