This invention relates to improvements in drying cabinets or chambers and pertains particularly to an improved film drying device.

In the development of films and particularly in connection with developing X-ray films, there are provided drying cabinets in which the films are suspended and through which air is circulated, and such cabinets are provided with means for catching the drippings from the films as they dry, and since it is desirable that a free circulation of air be maintained between the films and also that the drippings from one group of films be prevented from falling into another group, it has been necessary hitherto to provide single horizontally extending chambers within which to suspend the films. Because of this, drying cabinets of the type at present in use take up a considerable amount of valuable space in the laboratory which could be advantageously employed if the films could be suspended in a vertical or series so as to make it possible to employ an upright instead of a horizontal cabinet.

The present invention has for its primary object to provide a vertical film drying cabinet structure wherein groups of films may be disposed one above the other or in vertically spaced relation and be exposed to the action of a free flowing current of air and at the same time shielded or protected in such manner that the drippings from one group of films will be caught and prevented from falling onto or coming in contact with the films of an underlying group.

Another object of the invention is to provide a film drying cabinet wherein the film supporting drawers or slides are disposed one above the other each within a closed chamber, in the lower part of which chamber a means is provided for catching and retaining drippings from the film, the said chambers being so designed that air may be readily and freely circulated from one to the other, passing from the uppermost chamber downwardly through the lowermost chamber and then being returned for discharge into the atmosphere at the top of the cabinet, thus avoiding the distributing of dust or chemical powder which may be upon the floor of the laboratory and the introduction of such dust or powder into the chambers where it might spoil or damage the films during the drying process.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not to be confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Fig. 1 is a view in front elevation of a two-chamber vertical cabinet constructed in accordance with the present invention.

Fig. 2 is a view in side elevation of the same, portions of the wall being broken away.

Fig. 3 is a sectional view on an enlarged scale on the line 2—2 of Fig. 2.

Referring now more particularly to the drawing, the drier cabinet as shown in the several figures includes a front wall 1, side walls 2, a back wall 3 and top and bottom walls 4 and 5, respectively. The front wall in a two-chamber cabinet of the type here illustrated is provided with the two door openings 6, each of which is closed by a door 7, and above the uppermost door, the wall is provided with an air inlet 8.

The top wall 4 is provided with an air outlet 9 with which is connected a hood 10 which may be adjusted about a vertical axis for deflecting the discharged air in a desired direction.

At one side of the cabinet structure there is provided the exhaust air conduit 11 by the provision of the vertically extending wall 12 which is arranged in spaced parallel relation with a side wall 2 and which terminates at its lower end in spaced relation with the bottom wall 4 and at its upper end is turned to extend upwardly and forwardly, as indicated at 13, thus providing an air outlet passage or conduit which leads from the bottom of the cabinet to the top thereof and to the outlet 9. This wall extends the full depth of the cabinet from the front wall to the rear wall, extending along one side edge of the door openings. In spaced relation with the upper horizontally disposed part 13 of the air conduit wall 12 is a horizontal partition 14 which provides a motor and blower chamber 15 into which opens the air inlet 8. Upon the top of the partition 14, an electric motor 16 is located, which is operatively coupled through the medium of the driving connection 17 with the shaft 18 of a fan unit 19 for a blower 20. As shown in Fig. 2, this blower receives or takes in air from the chamber 15 and discharges it downwardly through the wall 14.

Beneath the wall 14 is a deflector wall 21 which extends from the conduit wall 12 across the major portion of the area between this conduit.
wall and the opposite side wall 2 and extending downwardly and inwardly from this opposite side wall is a deflector strip 22 which is in spaced relation with the free edge of the wall 21 leaving a relatively narrow air passageway 23 through which the air from the blower 20 passes, the deflector strip directing the air downwardly and toward the wall 12 of the air conduit.

Disposed at a level just below each of the door openings 6 is a horizontal wall 24 which extends through the full depth of the cabinet or from the front to the rear walls and which extends also from the inner wall 12 of the air conduit laterally outwardly from the opposite side wall 2, terminating short of this side wall in the upwardly directed lip 25. The top edge of the lip 25 of each of the walls 24 lies adjacent that vertical edge of the door opening which is remote from the wall 12, so that each wall 24 cooperates with the adjacent wall 12 and the front and rear walls 1 and 2 to form a drip pan 26. The lip or flanged portion 25 of each of the walls 24 is inclined toward the adjacent wall 22 and secured to this adjacent wall and extending inwardly and downwardly therefrom is an air deflector flange 27 which is spaced from and substantially parallel with the adjacent lip 25 providing the narrow air passageway 28. It will thus be seen that the cabinet is divided by the walls 24 and 21 into the two vertically spaced compartments 28, each of which compartments is accessible through a door opening 6. The lower wall 24 is spaced from the bottom wall 5 of the cabinet forming the horizontal air conduit 29 which leads into the lower end of the conduit or passageway 11, the lower air passageway 28 leading directly into this lower conduit.

Extending inwardly from each door opening and disposed at the opposite sides of the door openings are guides of a suitable character, here indicated by the numeral 30, on which may be slidably supported the drawers 31. These guides 30 are at the top of each door opening and thus when the drawers are filled with film supporting bars or rods 32, such as are commonly employed in devices of this kind, the films being shown in dotted outline and indicated by the numeral 33, the films will be suspended from the drawers directly over a pan 26. From a consideration of Fig. 3, it will be readily seen that when air is directed downwardly through the opening 23, it will be deflected toward the far side of the first or uppermost compartment 28 so as to pass down between the films suspended in the drawer 31 toward the drip basin or pan 26. It will then be deflected toward the first passage or opening 23 through which it will pass downwardly again deflected, this time by the flange 27, toward the side of the next lower compartment remote from the flange 27 and between the films suspended in the lower drawer 31. The air will then pass out through the lowermost opening 28 into the horizontal conduit 29 to flow into the vertical conduit 11 and leave the cabinet through the top hood covered opening 9. With this construction, it will be readily apparent that moisture which may drip from the films suspended in the upper chamber drawer will all be caught by the first pan 26, so that the films carried by the next lower drawer will not be injured in any manner by the moisture running off of the films lying above.

From the foregoing, it will be readily apparent that by the employment of the construction herein disclosed, a film drying cabinet may be provided having any desired number of vertically spaced or superimposed chambers within which the films may be suspended for drying without danger of the drippings from one group of film getting onto a lower group and thereby making it possible to take care of a larger number of films in a much smaller space in the laboratory than is possible with the horizontal types of driers at present in use.

What is claimed is:

1. A drier of the character described, comprising a casing having front, back, top and bottom, and side walls, means forming a chamber in the upper part of the casing having a bottom wall provided with a discharge opening, a power operated blower in said chamber having an air intake and arranged to discharge air downwardly through said bottom wall opening, means forming an air conduit vertically of the casing along one side wall thereof, means horizontally dividing the casing between said conduit and the opposite wall into upper and lower drying chambers, an outlet for the lower end of the conduit communicating with the atmosphere outside of the casing for suspending articles to be dried within the last-mentioned chambers, and said dividing means being constructed and arranged to form drip pans under the bottom articles and to guide air downwardly through the casing only adjacent to said opposite wall to the under side of the lower chamber, the conduit being open adjacent the bottom of the lower chamber to receive air from the said underside thereof.

2. A drier of the character described, comprising two chambers disposed one above the other, a bottom wall for each of said chambers having an air opening therethrough at one side of the chamber only, the wall opening of the upper chamber leading directly into the top of the lower chamber, each of said bottom walls having an upstanding flange along the edge of said opening, each bottom wall from said flange to the opposite side of the chamber forming a drip receiving pan, said bottom wall openings being disposed one above the other, means for taking air from the outside of the upper one of said chambers and discharging it downwardly therethrough from the top thereof to pass through the bottom wall opening of the upper chamber into the lower chamber, an air receiving conduit beneath the lower one of the chambers and in communication with the opening of the bottom wall thereof, an air conducting conduit leading upwardly along the sides of the chambers and discharging only to the atmosphere adjacent the top thereof and having its lower end in communication with the first conduit, and means for suspending articles in each of said chambers above that portion of the bottom wall of each chamber which constitutes the drip receiving pan.

3. A drier structure of the character described, comprising two chambers disposed one above the other, a bottom wall for each of said chambers having an air opening therethrough at one side of the chamber only, the wall opening of the upper chamber leading directly into the top of the lower chamber, each of said bottom walls having an upstanding flange along the edge of said opening, each bottom wall from said flange to the opposite side of the chamber forming a drip receiving pan, said bottom wall openings being disposed one directly above the other, means for taking air from the outside of
the upper one of said chambers and discharging it downwardly thereinto from the top thereof to pass through the bottom wall opening of the upper chamber into the lower chamber, an air receiving conduit beneath the lower one of the chambers constituting a drip pan, an air discharging conduit upwardly and laterally along the sides of the chambers and discharging only to the atmosphere adjacent the top thereof and having its lower end in communication with the first conduit, such as for suspending air films in each of said chambers above that portion of the bottom wall of each chamber which constitutes the drip receiving pan, means in the upper part of the upper one of the chambers for deflecting introduced air downwardly and laterally toward the said opposite side of the chamber, and a deflector at one side of each of said bottom wall openings which is arranged to deflect, air passing through the opening downwardly and laterally toward the said opposite side of the chamber.

5. A film drier, comprising at least two chambers arranged one above the other, a vertically extending air conduit disposed at one side of the chambers and having an inner vertical wall constituting one vertical side wall of the chambers, a solid bottom wall for each of said chambers extending from the said side wall of the conduit toward the opposite side wall of the chamber and terminating short of said opposite side wall in an upwardly directed lip, an inclined deflector secured to the said opposite side wall of the chambers in spaced relation with the adjacent bottom wall lip to form a downwardly and obliquely directed air passageway, the said passageway from the uppermost chamber leading directly into the top of the lower chamber, the said bottom wall of each air chamber from the lip thereof to the far side thereof constituting a drip pan, a conduit disposed beneath the lower chamber and in communication with said obliquely directed air passageway leading from the lower chamber and having communication with the lower end of the first conduit, each of said chambers having a covered door opening leading thereinto, means for directing air flow downwardly and obliquely across that part of the underlying bottom wall between the lip portion and the side thereof remote from the lip, and means for taking air from the outside of and discharging it downwardly into the upper chamber.

6. A film drier structure, comprising a cabinet body having top, bottom and side walls, a covered door opening formed through one of said side walls, means for introducing objects into the chamber through said door opening and supporting such objects therein, a blower supported at the top of the chamber and having an air intake opening, said top wall having a downwardly directed air inlet opening through which air is discharged from the blower into the chamber, a deflector connected with a side wall at one side of and beneath the air inlet opening of the top wall and arranged to direct air downwardly obliquely across the chamber, the said bottom wall of the chamber being in the form of a pan extending from that side wall of the chamber toward which air is directed by the said deflector and having an upturned side terminating short of the opposite side wall, an air outlet through the bottom wall of the chamber below the air inlet of the top wall, said object supporting means being located substantially at one side of the chamber within the path of air deflected downwardly and obliquely by said deflector.

7. A drier structure of the character described, comprising a chamber body having top, bottom and side walls, one of said side walls having a door covered opening there through, an object supporting frame unit insertible through said door opening horizontally into the chamber, said unit having one side wall close passing to a side wall and having the other side spaced from the opposite side wall, the bottom wall being in the form of a pan extending from the second-mentioned side wall toward and having an upturned side terminating short of the said opposite side wall to lie directly below said frame, the top and bottom walls having air inlet and air outlet openings respectively disposed adjacent the said opposite side wall one directly above the other, an air deflector connected to and extending from the said opposite side wall at one side of the said air inlet opening and arranged to direct air passing through the opening obliquely across and downwardly in the chamber, means for discharging fresh air through said inlet opening, said object supporting frame unit being located substantially at one side of the chamber within the path of air directed obliquely across and downwardly through the chamber by said deflector.

8. A drier, comprising a chamber having top, bottom and side walls, means for supporting in the chamber material to be dried, an air inlet in the top of the chamber close to one side wall, said inlet including means for directing air flow downwardly and obliquely through the
chamber toward the opposite side wall, a fan for supplying air to said inlet, an air outlet for the chamber through the bottom wall and directly beneath said inlet, and a flange bordering the air outlet upon the side thereof remote from the said one wall and extending at an upward inclination from said bottom toward the said one wall, said material supporting means being located substantially at one side of the chamber and within the path of air directed downwardly and obliquely through the chamber by said directing means.

9. A drier as set forth in claim 8 in which the said material supporting means has one side against the said opposite side wall and its other side spaced a substantial distance from the said one side wall to provide a vertical unobstructed space between the air inlet and outlet openings when material is supported in the chamber for drying.

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