

Nov. 22, 1932.

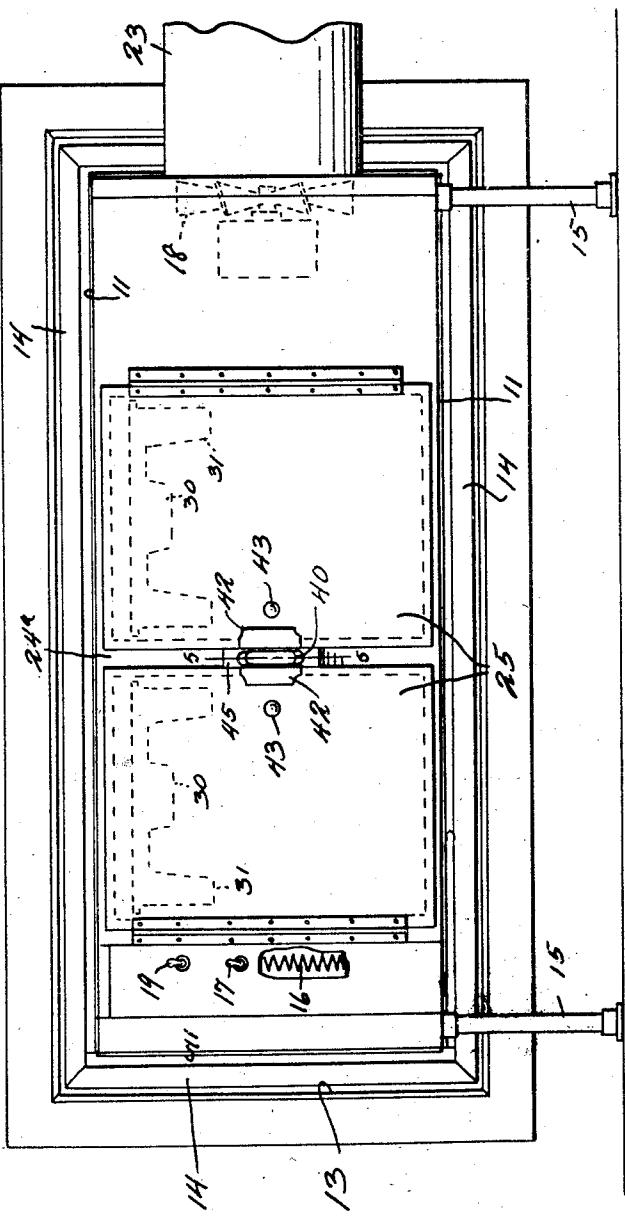
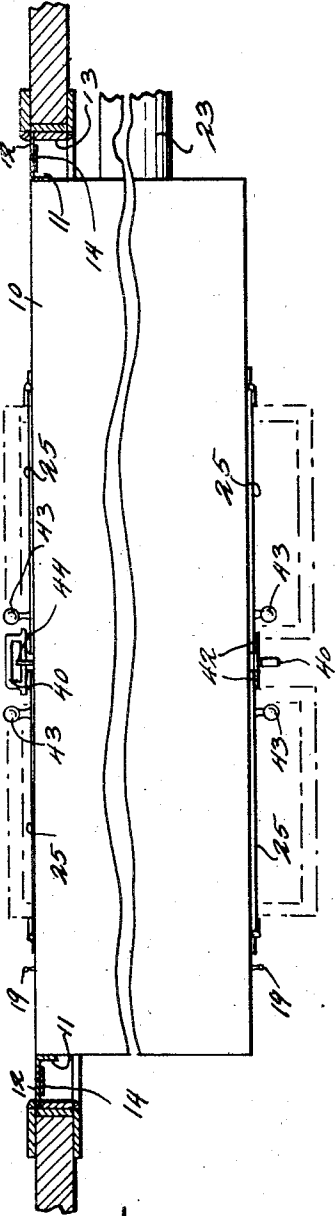
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1,888,947

PHOTOGRAPHIC FILM DRIER

Filed Nov. 29, 1930

3 Sheets-Sheet 1



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Nov. 22, 1932.

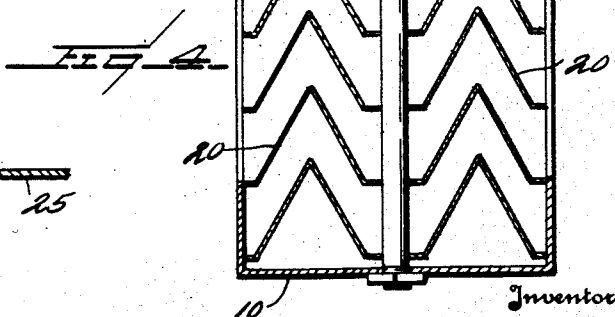
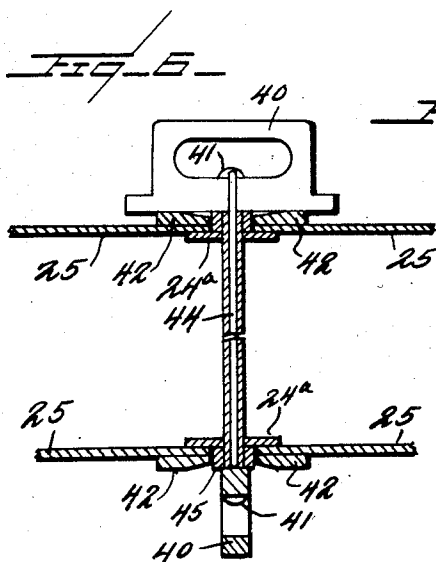
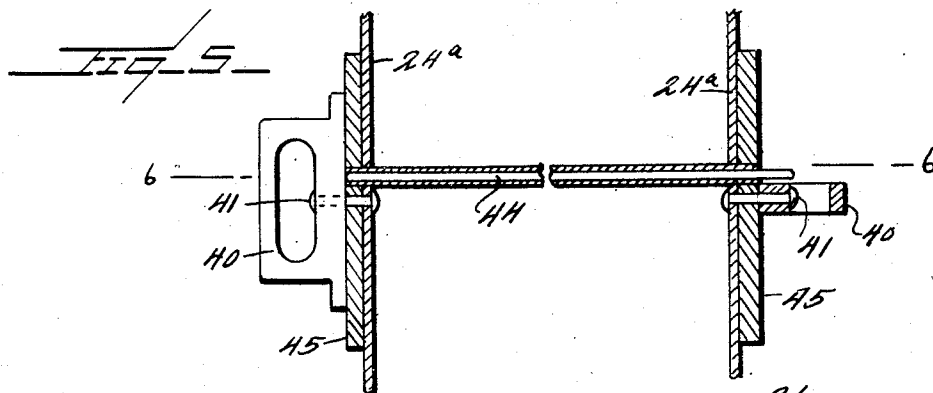
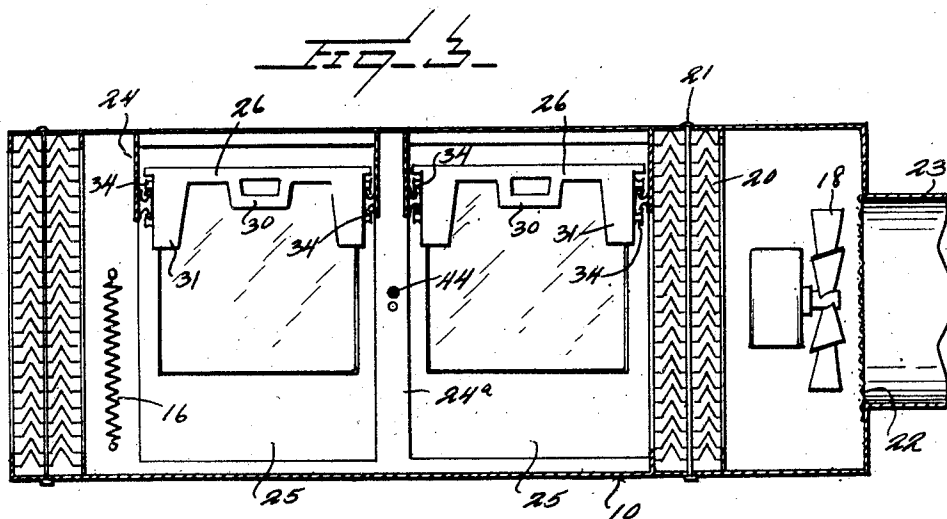
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PHOTOGRAPHIC FILM DRIER

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3 Sheets-Sheet 2



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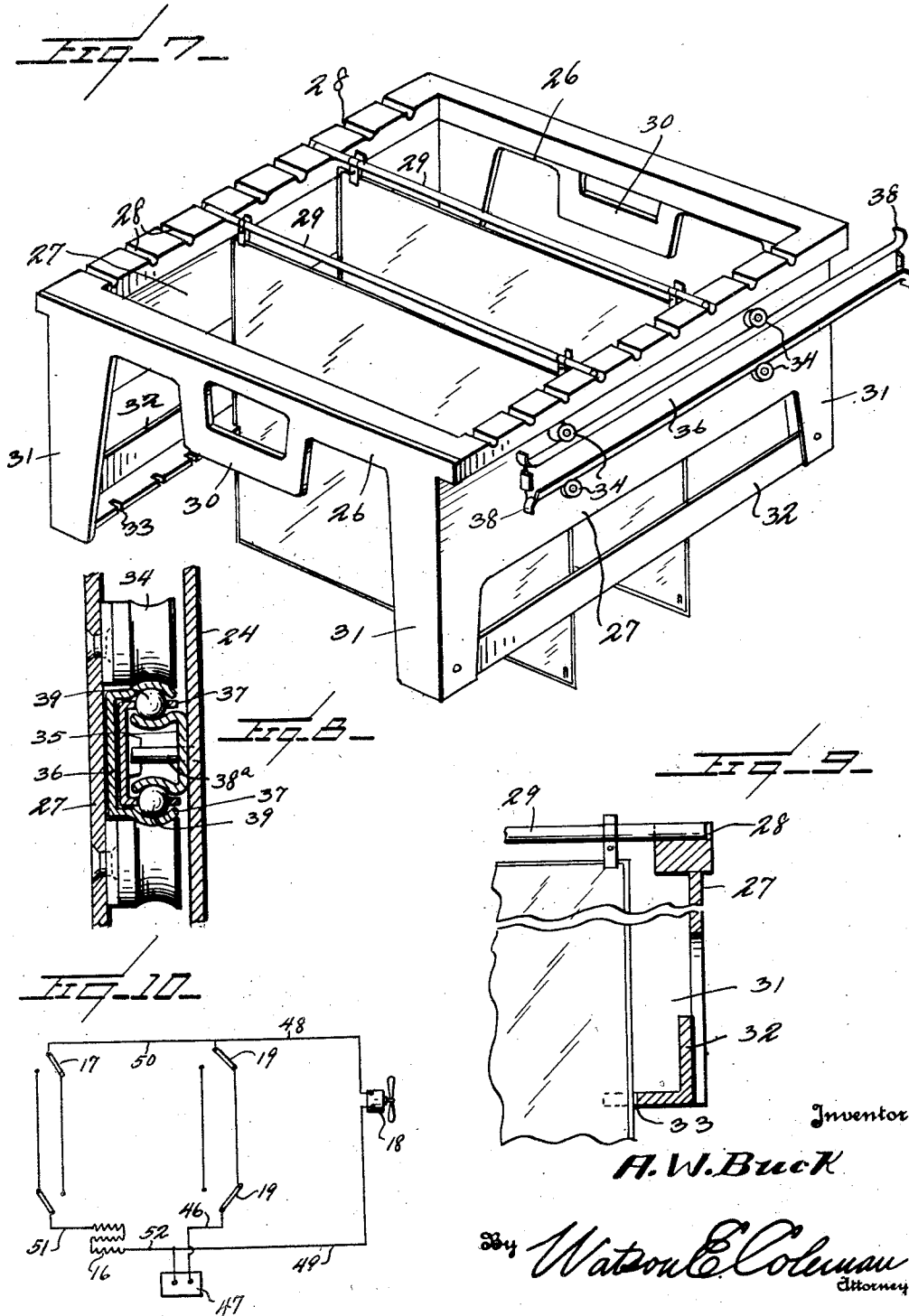
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PHOTOGRAPHIC FILM DRIER
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1,888,947

3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

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PHOTOGRAPHIC FILM DRIER

Application filed November 29, 1930. Serial No. 499,098.

This invention relates to driers for use in drying photographic film and particularly for film driers designed to be used in connection with a dark room. The general object of this invention is to provide a drier comprising a casing having means for supporting a series of photographic films therein while drying, the casing being provided with means whereby air may be positively drawn through the drier and provide means whereby this air may be heated prior to its entrance into the drier and discharged if desired exteriorly of the room in which the drier is mounted.

A further and very important object is to provide a drier of this character which is adapted to be mounted at one side in the wall of a dark room, the drier having doors on opposite sides, one set of doors opening into the dark room and another set of doors opening into a lighted room, and provide film carriers slidably mounted within the casing so that the slides may be withdrawn or partially withdrawn through either set of doors and either into the dark room or into the lighted room.

A further object in this connection is to provide means for preventing the doors of the casing opening into the dark room from being opened when the doors of the casing opening into the lighted room have been opened and vice versa to thus prevent any possibility of the light entering the dark room through the open door or doors of the drier casing and in this connection to provide latching devices on opposite sides of the casing which cannot be shifted to release a door or doors on this side of the casing unless a locking pin which extends entirely through the casing has been shifted inward into a position to obstruct the release of the latch on the other side of the door.

A further object is to so support the film carriers or racks within the casing that they may be easily shifted outward in either direction, either into the lighted room or into the dark room, depending upon which door is opened to permit the insertion and removal of the films and to permit the ready removal of

any one film which is necessary to be examined.

With this construction, it is not necessary that a doctor, in order to see as soon as possible an X-ray film, should go into the dark room, get the film out, identify it, and then carry it into the lighted room for observation, but he can withdraw the film immediately from the rack into a lighted room where he can readily identify the film and readily remove it for observation without in any way affecting or interfering with the work being done in the dark room.

It is one of the objects of my invention to provide a film drier which will permit this to be done.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is an elevation of a film drier constructed in accordance with my invention;

Figure 2 is a top plan view of the film drier showing the wall in section;

Figure 3 is a vertical section through the film drier showing the heating means and the fan diagrammatically, the film supporting racks being in elevation;

Figure 4 is an enlarged sectional view on a vertical plane through the baffles;

Figure 5 is an enlarged fragmentary section from front to rear on the line 5—5 of Figure 1;

Figure 6 is a section on the line 6—6 of Figure 5;

Figure 7 is a perspective view of the rack and one of the slides;

Figure 8 is an enlarged vertical section through a track for supporting the slide, through the slide and through a portion of the film supporting rack;

Figure 9 is a fragmentary vertical section through one end of the film supporting rack.

Figure 10 is a diagram of the wiring and switches whereby the fan and heater are connected or disconnected from a source of energy.

Referring to these drawings, 10 designates generally a metallic casing of any suitable construction open at opposite ends and fitted

into a wall so that one side of the casing is flush with the inner face of the wall which we will assume to be the wall of a dark room. As illustrated, the casing has applied to it an angle iron 11 adjacent to or flush with the inner wall of the casing, and a wall plate 12 extends outward from the wall of the opening 13 within which the casing is located. This wall plate 12 is overlapped by a wing plate 14 which overlaps the angle iron 12. These parts may be connected together in any suitable manner and engaged with the wall in any suitable manner.

Of course, I do not wish to be limited to this method of mounting the drier in place in the wall. The drier is supported on two legs 15 or in any other suitable manner. Enclosed within the drier at one end thereof, is an electrical heating element 16 of any suitable character and controlled by a heater switch 17. Disposed on the opposite end of the casing is a fan 18 operated by any suitable electric motor, this fan being controlled by a fan switch 19 mounted above the heater switch 17 for convenience. By this means, either the heating element is turned on and the fan also turned on or the fan turned on and the heating element left inoperative or both cut off. As a matter of actual practice, the heating element is never turned on without the fan being turned on, but it is often desirable to cause a current of cooled air instead of a current of heated air to pass through the drier in order to dry the films, and in that case, of course, the heating element is not turned on.

In order to prevent the admission of light to the open ends of the casing 10, I provide at opposite ends of the casing a light locked ventilator consisting of a plurality of horizontally disposed corrugated baffle plates 20 as illustrated in Figure 4 which may be held together in any suitable manner as for instance by the vertical bolts 21. These baffle plates are disposed at the fan end of the drier between the interior of the drier casing and the fan. The end of the drier casing immediately adjacent the fan is formed with an opening 22 and from this opening preferably a duct 23 leads and this duct may discharge either into the room itself or preferably exteriorly of the room so that the moist air drawn from the interior of the drier casing will not be caused to circulate there-through again.

I do not wish to be limited to the use of baffle plates between the fan and the interior of the casing as where a duct 23 is used, this may be so formed as to entirely block any entrance of light.

The casing is divided into a number of compartments by partitions 24 extending downward a short distance from the top of the casing and the front and the rear of the casing are provided with metallic doors 25

which are hinged to the outer and inner walls of the casing and which when open give access to the interior of any one compartment. Each compartment is, therefore, open at its front and rear but each compartment is normally closed at its front and rear by the doors 25. Each compartment is large enough for the support of maximum sized films. Each compartment has slidably mounted therein a carriage or rack carrying a plurality of rods having clips engaging the films so that the films are hung from these racks in the several compartments. Each rack is approximately rectangular in plan view and formed with the end walls 26 and the side walls 27. The end and side walls define, therefore, a rectangular opening. The top edges of the side walls are formed with transversely extending grooves 28 for the reception of rods 29 having clips of any suitable character by which the films are supported on the rack. These rods and films, of course, are readily removable from the rack. The front wall 26 is formed to provide a medially disposed handle 30 and on each side of this handle, the front and rear walls are extended downward as at 31. The lower ends of the front and rear walls are connected by longitudinally extending angle irons 32 the horizontal flanges of which are notched or cut out at 33 so that a depending film has its lateral edges disposed within the notches 33 and thus the films are kept from coming in contact with each other which, of course, would otherwise ruin the films, these notches 33, being disposed immediately beneath notches 28. For slidably supporting the racks, I mount on the side walls 27 of each rack the forward and rear pairs of anti-friction rollers 34. Mounted on walls 24 are the opposed U-shaped track members 35 and slidably mounted between the rollers 34 are the sliding strips 36 whose upper and lower margins are bent over at 37 to constitute curved flanges embracing the tracks 35 as shown in Figure 8. The slides 36 slide on tracks 35 and rollers 37 roll on these slides 36. The extremities of slides 36 are upwardly bent at 38 to act as stops for rollers 34 to prevent the racks from being drawn off the slides and the slides in turn are provided with stops 38^a which limit their motion relative to tracks 35. The racks may be easily withdrawn entirely from the compartments to permit the removal of films and they may be easily slid back into place each within its compartment. Anti-friction balls 39 may be mounted on tracks 35 and engage slides 36. Inasmuch as the slide mechanism whereby the racks are supported is common and well-known and many different forms may be used, I do not believe that any further description of the slide mechanism is necessary.

For the purpose of preventing the opening of the doors upon one side of the drier,

unless the doors on the opposite side are closed, I provide the front and rear rails 24a which define the compartments and form the frames of the door opening with a latching handle 40 pivoted at 41.

When this latching handle is turned at right angles to the rail 24a, it will project out over a pair of doors 25 and will thus prevent the opening of the doors. When, however, the locking handle is turned to a position of alinement with the rail 24a, it will release these doors 25 and permit the doors to open. Preferably the doors are provided with wear plates 42 with which the locking handle has frictional engagement so as to retain the latching handle in its latching position unless forcibly turned into a position of alinement with the rail 24a. The doors are provided with knobs 43 whereby they may be pulled open when the handle 40 is turned into a position of alinement with the rail 24a. Extending through each rail 24a from front to rear is a locking rod 44 which has a length slightly greater than the length of the partition. When this locking rod, therefore, is projected on one side of the casing by being pushed in from the opposite side of the casing, the projected portion of the rod will prevent the latching handle from being turned to a position of alinement with the partition, but, of course, on that side of the casing from which the locking rod has been projected, the end of the locking rod will be flush with the face of the rail 24a and thus will form no obstruction to the rotation of the latching handle 40 on this side to its alined position with the partition 24. When it is desired to open one or a pair of doors from the front of the drier casing, for instance, the operator pushes in on the locking rod, thus projecting it on the opposite side of the casing and rotates the handle 40 to a position of alinement with the rail 24a which brings the latching handle over the extremity of the locking rod, thus holding the locking rod projected from the opposite side of the drier.

Therefore, when the handle 40 is turned to this position of alinement and the doors on this side are opened, it is impossible for the operator on the other side to open his doors because the locking rod is projected into a position where it will impede the full rotation of the handle 40. When the doors are closed, the handle is turned into its door holding position, at right angles to the rail 24a, thus releasing the locking rod 44 so that the operator on the other side if he desires to open his door may push in on the locking rod. Thus it is impossible for the doors on one side to be opened unless the doors on the other side are closed. This prevents any inlet of light from the light room to the dark room. As illustrated, the handle 40 is preferably mounted upon a plate

45 attached to the rail 24a. Obviously, I do not wish to be limited to the details of construction as these might be modified in many ways.

A drier of the character described, provides for the drying of large quantities of photographic films by the passage of warmed air over the films or the passage of cool air if desired. It provides for the entire removal of the air from the room in which the films are being dried if desired, thus very greatly expediting the drying of the films. It is obvious that means may be provided whereby the heat within the drier may be increased or decreased according to circumstances and according to the humidity of the air. No such means is shown, however, as such a means is obvious. This construction entirely avoids the necessity of doctors, nurses or others entering the dark room for the purpose of removing dried films and carrying them out of the room.

The films in their cassettes are brought into the dark room, the cassettes are opened, the films developed here in the dark room, attached to supporting rods and placed in the drier on the dark room side and the doors on the dark room side are closed. Then when the films are sufficiently dried, they are taken out on the lighted room side. If films are wanted in a hurry, this is a very great advantage. In either case, there is no interruption to the work of the dark room and the work of removing the films, placing them in their proper envelopes, and tabulating them is more easily accomplished and greatly expedited. It will be understood that this drier may be constructed of any desired length and with any number of tiers of film drying compartments, each film drying compartment, of course, being provided with its opposed doors in the manner described. Preferably, the casing will be of metal and a time clock may be used in connection with the drier for the purpose of automatically turning off the heat and the fan after a predetermined time.

As before stated, there are switches 17 and 19 disposed upon opposite sides of the casing to thereby control the electrical heating element and the fan from either side of the casing. These switches are preferably of such character that the fan can be turned on without affecting the heating element but the heating element cannot be turned on without energizing the fan as if the fan were not turned on when the heating element was turned on, the films would be exposed to great heat and would melt. The wiring switches are illustrated diagrammatically in Figure 10. The two switches 19 govern the action of the fan and the two switches 17 govern the action of the heater.

In this diagram the heating element is designated 16 and the fan 18. The switches

17 and 19 are three-way switches, one switch 19 being connected by a conductor 46 to one terminal of the usual socket member 47 whereby the machine may be connected up with a source of power. The switch arm of the other three-way switch 19 on the opposite side of the machine is connected by a conductor 48 to the fan 18 and from this fan a return wire 49 leads. It will thus be obvious that the fan 48 may be turned on from either side of the machine. From the three-way switch a wire 50 leads to one of the three-way switches 17 and from the other three-way switch a wire 51 leads to the bus-bar of the electrical heating element 16. From the bus-bar a return wire 52 leads to the return terminal of the member 47. From this diagram, it will be obvious that the fan can be turned on from either side, but that if the switches 17 are thrown to an "off" position, the circuit to the heater is broken, but that if it is desired to operate the heater in conjunction with the fan, either one of the switches 17 may be turned to its "on" position, but in no case can the heater be operated without operating the fan.

This I regard as a very important feature of my invention as it prevents any chance of melting or softening the films through the heater being energized without the fan being operated to draw off the hot air.

I claim:—

1. A film drier comprising a casing closed at its top, bottom and sides but open at its opposite ends and having a door opening on one side of the casing and provided with a door, means at opposite ends of the casing for preventing the passage of light but permitting the passage of air, air heating means disposed in one end of the casing, a fan withdrawing air from the other end of the casing, and a rack slidably mounted within the casing and withdrawable through said door opening.

2. A film drier of the character described, including a casing closed at its top, bottom and sides but open at opposite ends and having means for preventing the entry of light into the interior of the casing, but permitting the passage of air, the casing having a door, a rack mounted in the casing for movement transverse to the length thereof, means for supporting a plurality of films on the rack in dependent position, the sides of the casing having opposed doors and the rack being withdrawable from the casing in either direction through the openings normally closed by said doors.

3. A film drier of the character described, including a casing closed at its top, bottom and sides but open at opposite ends and having means at its ends for preventing the entrance of light, but permitting the passage of air longitudinally through the casing, the casing having opposed openings and doors nor-

mally closing said openings, a trackway mounted in the upper portion of the casing and extending transversely thereof, and a film rack slidably mounted on the trackway for movement transverse to the length of the casing, the rack being withdrawable from the casing through the door openings in either direction, the rack having means for supporting a plurality of films thereon in dependent position and means for causing the circulation of air longitudinally through said casing.

4. A film drier of the character described, including a casing closed at its top, bottom and sides but open at its ends and having opposed door openings, doors closing said openings, means for preventing the entry of light to the casing, but permitting the passage of air longitudinally therethrough, means for causing air to traverse the casing from end to end a film supporting rack mounted in the casing for movement transverse to the length thereof, and withdrawable through either of the door openings, and means for preventing the doors on both sides of the casing from being opened simultaneously.

5. A film drier of the character described including a casing closed at its top, bottom and sides but open at its opposite ends, the casing having opposed openings in its sides, means at opposite ends for preventing the inlet of light to the interior of the casing, but permitting the passage of air, doors at opposite sides of the casing, coacting with said openings parallel tracks attached to the casing adjacent the top thereof and extending from front to rear thereof, slides slidably mounted on said tracks, and film supporting racks slidably mounted on the slides.

6. A film drier of the character described, including a casing closed at its top, bottom and sides but open at its opposite ends, the sides of the casing having door openings means at opposite ends of the casing for preventing the inlet of light to the interior of the casing, but permitting the passage of air, means for causing the circulation of air longitudinally of the casing, doors at opposite sides of the casing and coacting with said openings, parallel tracks attached to the casing adjacent the top thereof and extending from front to rear thereof and coincident with said openings, slides slidably mounted on said tracks, and anti-friction elements carried by the rack and engaging above and below the slides and having limited movement relative to the slides whereby said racks may be withdrawn from within the casing in either direction.

7. A film drier of the character described, including a casing closed at its top, bottom and sides but open at opposite ends and having means at its ends for preventing the entry of light to the interior of the casing, but permitting the passage of air therethrough,

means for causing the circulation of air longitudinally of the casing, doors in opposite sides of the casing, a pair of parallel tracks disposed between each front and rear door, the tracks being mounted upon the casing, 5 slides slidably mounted on said tracks, a film rack mounted between each pair of slides and having sliding engagement therewith, each rack having transverse grooves upon its upper face extending parallel to the side walls 10 of the casing for the reception of film supporting rods, each rack having inwardly extending flanges having notches within which the several films engage to hold the films in spaced relation to each other and parallel to 15 the side walls of the casing.

8. A film drier comprising a casing open at its opposite ends, means at opposite ends for preventing the inlet of light, but permitting the passage of air, electrically energized 20 air heating means disposed in one end of the casing, and an electrically operated exhaust fan withdrawing air from the opposite end of the casing, three-way switches disposed 25 on opposite sides of the casing whereby the fan may be connected to a source of current, oppositely disposed three-way switches, one having its switch member connected in circuit with the heating element and the other 30 having its switch member connected to one of the first named switch members whereby the heating element may be connected in circuit with the fan from either side of the casing.

9. A film drier including a casing and the casing being closed at its top, bottom and sides but being open at its opposite ends and having means at its opposite ends for permitting the passage of air but preventing the 40 passage of light, the casing having opposed door openings in its sides and doors coacting therewith, the doors on one side of the casing being adapted to open into a dark room and on the other side of the casing being designed 45 to open into a light room, racks mounted in the casing for transverse sliding movement and disposed in coactive relation to the door openings and withdrawable through either of the opposed door openings, the racks being 50 formed to support a plurality of films within the drier with the films disposed parallel to the sides walls of the casing, means for causing the circulation of air longitudinally through the casing, and means for preventing the simultaneous opening of both 55 doors at the same time.

In testimony whereof I hereunto affix my signature.

ARTHUR W. BUCK.