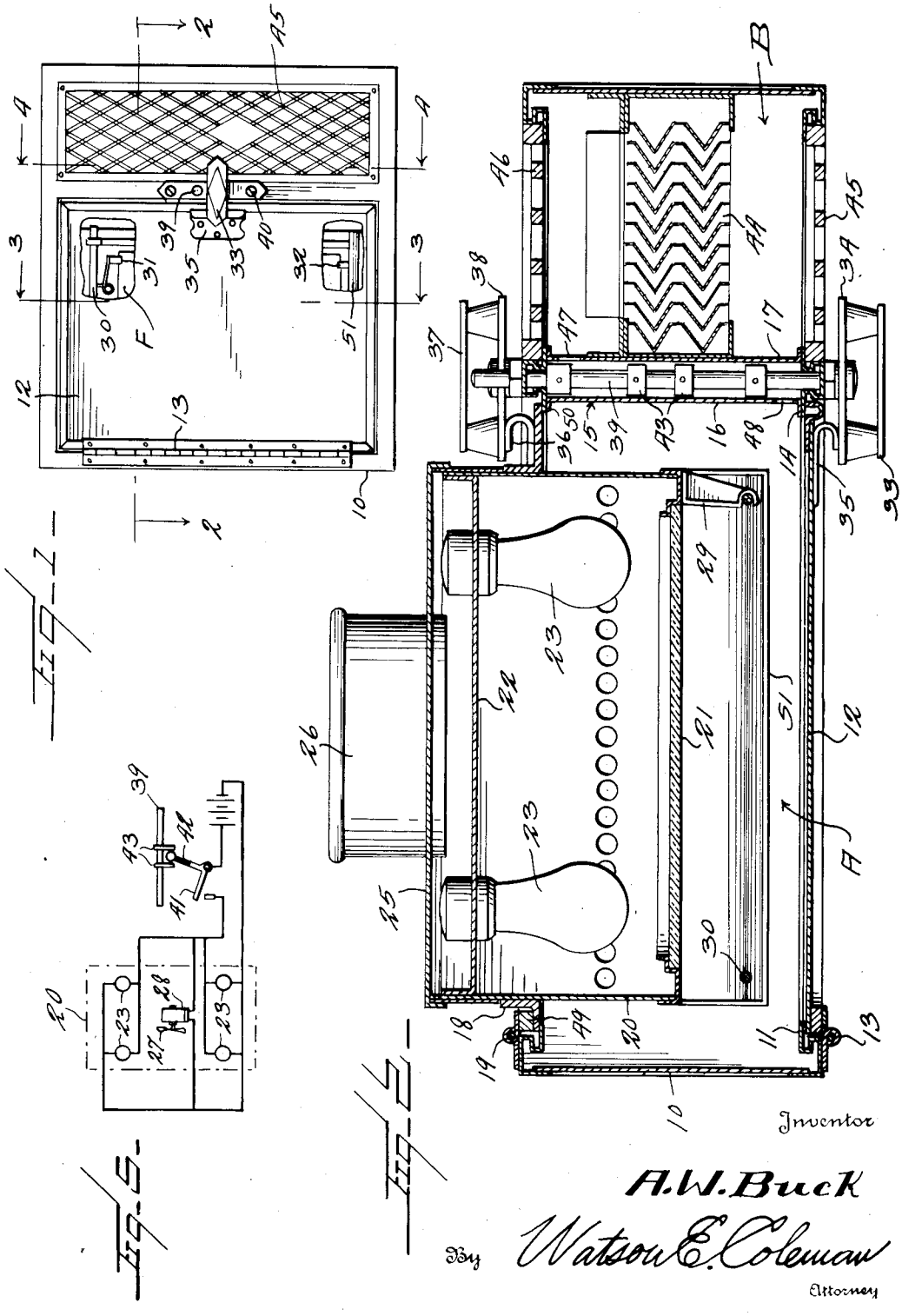
Sept. 3, 1935. A. W. BUCK 2,012,940

WET FILM TRANSFER ILLUMINATOR

Filed Jan. 29, 1935 2 Sheets-Sheet 1



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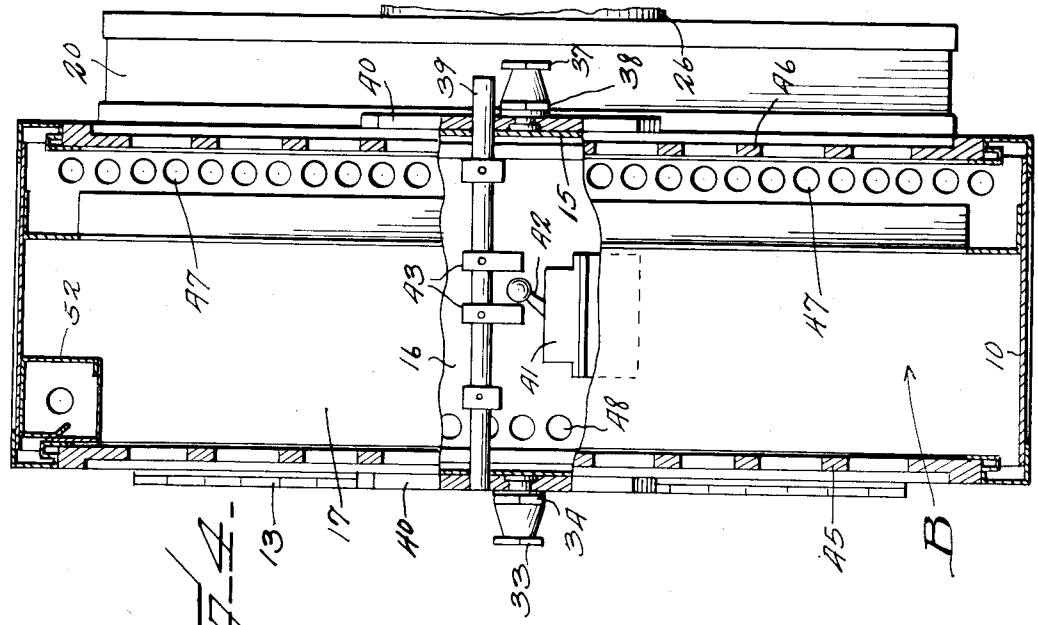


Fig. 4.

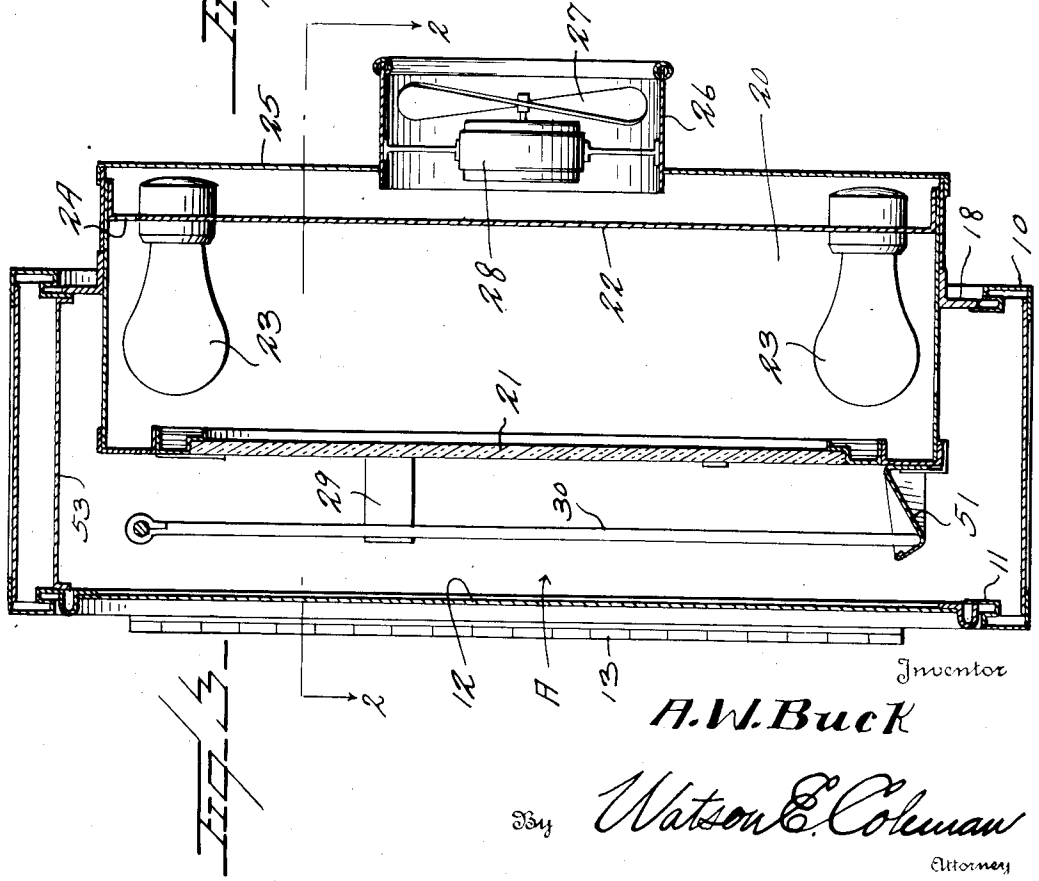


Fig. 3.

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WET FILM TRANSFER ILLUMINATOR

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9 Claims. (Cl. 40—132)

This invention relates to X-ray film viewing apparatus and particularly means for viewing X-ray films while they are still wet. Considerable inconvenience is caused in the X-ray darkrooms of laboratories and hospitals by doctors who bring in a patient and desire to know that the X-ray pictures or radiographs made of this patient are satisfactory before dismissing the patient as, should something be wrong with these radiographs, it might be extremely inconvenient to get the patient back again. Another and similar condition arises in the setting of fractures, putting a limb in a cast, etc., following which a radiograph is always made to show that the bone is in proper alinement before dismissing the patient.

Under ordinary circumstances, it is necessary that the doctor and patient wait for the films to be developed, fixed, dried, etc. before they can be inspected in order to determine if the films are satisfactory. Then the doctor, usually in a hurry, causes a lot of inconvenience by going into the X-ray darkroom and fishing around among the various films being developed and fixed in an effort to find the films of his patient in order to see them as quickly as possible. This is annoying to the operators of the darkroom as on account of the darkness therein, the doctor is likely to tip over something or run into something, get in the way and meddle with films in the process of fixing or washing.

The general object of my invention is to provide an X-ray film illuminator or viewer which is so constructed that it may be disposed in a wall between the darkroom and a viewing room and which is so constructed that the operator in the darkroom may open the door at the rear of the exhibitor or illuminator, the front door being closed, dispose a film in the exhibitor, close the rear door into the darkroom, notify the doctor in the exhibition room and the doctor can then open the front door and at the same time illuminate the film so that he can observe it carefully without handling the film and, of course, without any light entering the darkroom.

Another object is to provide a construction of this character in which lamps are used for illuminating the film and in which means is provided for preventing the heat from these lamps from melting the film, this means consisting of a fan for circulating air within the lamp space or chamber.

A further object is to provide means whereby neither door can be opened unless the other door is closed and provide means whereby when the front door is opened, the rear door into the darkroom will be locked and the lamps and fan will be energized and whereby when the rear door is unlocked, the lamps and fan will be de-energized and the front door will be locked against opening.

A further object is to provide a light locked ventilator screened on either side by a grille, this ventilator being so constructed that it is possible for the doctor to converse with the darkroom technician, requesting certain radiographs to be placed in the illuminator or changed, etc.

Other objects have to do with the details of construction and arrangement of parts as will appear more fully hereinafter.

My invention is illustrated in the accompanying drawings wherein:—

Figure 1 is a front elevation of a wet film exhibitor constructed in accordance with my invention, the front being partly broken away.

Figure 2 is a longitudinal section on the line 2—2 of Figures 1 and 3.

Figure 3 is a vertical section on the line 3—3 of Figure 1.

Figure 4 is a vertical section on the line 4—4 of Figure 1.

Figure 5 is a wiring diagram of the connections for the lights, the fan and the door operated switch.

Referring to these drawings, 10 designates a rectangular casing of any suitable construction having at its forward end the rearwardly turned and then laterally turned flanges 11 to which a door 12 is hinged by hinges 13. The free margin of the door seats against an inturned flange 14 which extends vertically and is carried by a hollow partition designated generally 15 and formed of sheet metal wall 16 and the sheet metal wall 17. It will thus be seen that two compartments are provided, namely, the compartment A and the compartment B, the compartment A being for the purpose of exhibiting the film while the compartment B is a ventilating compartment which will be later described.

The rear of compartment A is open and is closed by a door frame 18 which is operatively hinged at 19 to the rear wall of the casing. This frame supports within it the rectangular lamp housing 20. This lamp housing at its front is provided with the glass pane 21, and extending vertically through the rear portion of this housing 20 is a lamp supporting plate 22 which carries the bases of the incandescent bulbs 23. This plate 22 is perforated as at 24 throughout its length. The rear wall 25 of the lamp housing

carries upon it a fan housing 26 in which is disposed the electric fan 27 and which may be of any suitable type operated by the usual motor 28. Carried upon one corner of the lamp housing 20 is a bracket 29 which projects forward from the lamp housing and which supports a rectangular frame 30 carrying at its upper end the spring clips 31 whereby the film may be supported. Clips 32 may be provided at the lower end of the frame for gripping the lower end of the film F.

It will be understood that this frame designated generally 30 may be rigidly mounted on the bracket 29 or that this frame 30 may be mounted in any other suitable manner in connection with the lamp housing though I prefer the mounting which is illustrated as this has been found thoroughly practical. By this means the film carrier and the film supported thereon is supported immediately in front of and parallel to the glass pane 21 so that when the lamps 23 are energized the film will be illuminated by light passing through the film to the daylight side of the casing 10.

For the purpose of latching the door 12 in its closed position and latching the rear door 18 in its closed position, I mount upon the outer end of the partition 15, that is, the daylight side of this partition, a rotatable latch 33 which includes the latch bar 34. This when turned into a horizontal position bears against a resilient keeper 35 mounted upon the free margin of the door 12. When the bar 34 is rotated from a vertical position to a horizontal position, with the door 12 closed, it bears against this spring keeper and extends directly across it and resiliently forces the door 12 to its closed position against the seat 14. When the latch bar 34 is turned to a vertical position, however, it permits the door 12 to be opened. The door 18 also carries upon it the reverted or U-shaped spring keeper 36 and the side wall of the partition 15 also carries upon it a rotatable handle 37 having a latch bar 38 which when turned to a horizontal position bears against the resilient keeper 36 and urges the door 18 to its closed position.

For the purpose of preventing one door from being unlatched if the other door be opened, I provide a bolt or locking rod 39 sliding in guides 40 which locking rod has a length greater than the depth of the casing 10. This locking rod, as shown in Figure 4 is disposed above the centers of the locking handles 33 and 37. Assuming, therefore, that it be desired to open the door 18 on the darkroom side for the insertion of a film, the operator pushes inward on the projecting end of the locking rod 39 which pushes this locking rod into a position to permit only a partial and very slight rotation of the latching handle 33 and the latch bar 34, which rotation is so slight that the latch bar does not release its engagement with the keeper 35 of door 12. The forcing inward of the bolt 39 from the darkroom side pushes it beyond the path of travel of the latching bar 38 so that when the bolt 39 has been pushed all the way in, the handle 37 may then be turned to release the engagement between the latch plate 38 and the keeper 36 and permit the door 18 to be swung open on its hinges 19. The film may then be put in place and the door closed. The handle 37 is turned to its horizontal position which clears the bolt 39. If the doctor wishes now to view the film, he pushes in on the bolt 39 from the daylight side of the casing or cabinet, pushing this bolt into a position to prevent the rotation of the locking plate 38 but permitting the rotation of the handle 33 and locking plate 34 to release the door 12. This action causes the energizing of the lamps 23 and the energizing of the motor 28. To this end the motor and lamps are connected in the circuit of a switch of any ordinary suitable construction designated generally 41. This switch includes a pivoted arm 42 having a head disposed between two shoulders or collars 43 mounted upon the bolt 39. Thus when the bolt is shifted inward from the daylight side of the cabinet to the darkroom side, the arm 42 is shifted to a position to switch on the lights and the fan, but when the bolt 39 is shifted outward from the darkroom side, the arm 42 is shifted to switch off the lights and the fan. It will be seen that the lights and the fan cannot be switched on unless the darkroom door is closed and latched.

The compartment B is designed to provide means for the inlet of air, ventilation purposes, and also for the purpose of permitting the doctor to converse with the darkroom technician without permitting the passage of light from the lightroom to the darkroom. To this end there extends transversely through the middle portion of this compartment B a plurality of corrugated baffles 44. These baffles are deeply corrugated or formed of V-shaped portions at a plurality of points, the V-shaped portion of one baffle extending into but, of course, not fitting closely against the V-shaped portion of the next adjacent baffle, etc. This prevents the passage of light transversely through the baffles from one side of the baffles to the other but permits the passage of sound. I do not wish to be limited to the particular form of the baffles which I have illustrated as this might be varied in many ways.

The front of the compartment B is closed by a grid 45 which may be made more or less ornamental and the rear of the compartment is also closed by a grid 46. These grids permit air to be drawn into the compartment B and through the spaces between the baffles, and the rear margin of the partition wall 17 is provided with a series of openings 47 which allows the air to pass into the interior of the hollow partition 15. Air may be drawn into the compartment A from this hollow partition through the openings 48 which are out of alinement with the openings 47. This air is drawn into the lamp housing 20 through suitable perforations and out through the perforations 24 in the plate 22 and expelled through perforations in the fan housing 29. Thus the fan causes the circulation of air through the fan housing and also the circulation of air around the film without causing such a draft of air as would tend to flutter the film. Thus the heat of the lamps is carried off and does not in any way affect the film while the film is additionally protected by the glass pane 21 which is interposed between the film and the lamps.

It will be understood, of course, that every portion of the casing is made light-tight and that the doors may close against fiber pads so as to prevent the possibility of light breaking through at the hinges. In order to absolutely prevent the passage of light through the hinge 19 when the door 12 is opened, I provide upon the rear wall 18 adjacent the hinge the supporting block 49 and provide the seat 50 against which the margin of the wall 18 bears when the door is closed.

For the purpose of catching any water which may drip from the wet films supported on the hanger 30, I provide a trough 51 mounted upon brackets carried by the lower margin of the front

wall of the lamp housing 25, this trough being preferably made of monometal, the lower edge of the film hanger extending downward into this trough and the film therefore discharging any water into the trough.

Attention may be called to the fact that with this construction air drawn into the interior of the exhibitor from the darkroom is not expelled through the grid into the lightroom where the doctor and his patient are sitting, but is expelled back into the darkroom so that very unpleasant fumes or odors incident to developing, fixing, etc. are not projected into the lightroom through the grid.

In Figure 4 the compartment 52 is simply a "knock-out" or junction box for the service connection which extends across the upper front corner of the ventilator section and opens into the hollow partition 15. In Figure 3 the partition 53 defines a compartment at the upper end of the main casing which extends from the hollow partition 15 and which acts as a conduit for the electric wire to the light sockets.

While I have illustrated certain details of construction and arrangement of parts, I do not wish to be limited to these details as it is obvious that these might be modified in many ways without departing from the spirit of the invention as defined in the appended claims.

What is claimed is:—

1. A wet film exhibitor including a light-tight casing, a rear door and a front door for the casing and having light-tight engagement therewith, the rear door carrying film illuminating means, film supporting means disposed in front of the illuminating means, and means for preventing either door from being opened when the other door is closed.

2. A wet film exhibitor including a light-tight casing, a rear door and a front door for the casing and having light-tight engagement therewith, the rear door carrying film illuminating means, film supporting means disposed in front of the illuminating means, means for latching each of said doors in a closed position, and means for preventing the unlatching of either door when the other door has been unlatched.

3. A wet film exhibitor including a light-tight casing, a rear door and a front door for the casing and having light-tight engagement therewith, the rear door carrying film illuminating means, film supporting means disposed in front of the illuminating means, means for latching each of said doors in a closed position, means for preventing the unlatching of either door when the other door has been unlatched, and means for automatically energizing the illuminating means when the rear door latching means is held from released movement and for de-energizing the illuminating means when the rear door is unlatched and the front door is held from unlatching movement.

4. A wet film exhibitor of the character described including a light-tight casing having a front door and a rear door, electric lamps mounted upon the rear door, a fan mounted upon the rear door, means carried by the rear door for supporting an X-ray film in front of said lamps, means for latching the rear door in a closed position, means for latching the front door in a closed position, means for preventing the unlatching of the front door when the rear door is unlatched, means for preventing the unlatching of the rear door when the front door is unlatched, and means acting automatically when the rear door is prevented from being unlatched, energizing the lamps and said fan.

5. A wet film exhibitor including a light-tight casing having front and rear doors, electric lamps carried by the rear door, means disposed in front of said electric lamps for supporting a film to be exhibited, a glass pane disposed between the film and the lamps, an air circulating fan carried by the rear door, latching means for the rear door and for the front door, means preventing the unlatching of the front door unless the rear door is closed and latched, said means preventing the unlatching of the rear door until the front door is closed and latched, means acting upon the release of the front door latching means to energize the lamps and the fan, and a light-tight voice carrying duct associated with the exhibitor and extending parallel thereto.

6. A wet film exhibitor including a light-tight casing divided into two compartments, one of said compartments having means for supporting and illuminating a wet film, the other compartment having front and rear grids and light baffling means disposed between the grids, and an exhaust fan mounted upon one wall of the first named compartment and discharging through the rear wall thereof, the inner wall of the second named compartment having openings leading into the second named compartment whereby air drawn into the second named compartment will be circulated through the first named compartment and injected rearward therefrom.

7. A wet film exhibitor including a casing divided by a partition into a film display compartment and a sound conveying compartment, said last named compartment having grids in front and rear and means disposed between the grids permitting the passage of sound but preventing the passage of light, the other of said compartments having a front door and a rear door, the rear door carrying film illuminating means, a suction fan carried by the rear door, means mounted within the casing for supporting a film in front of the illuminating means, and means for admitting air from the sound communicating compartment into the display compartment to furnish air to the fan, said means being constructed and arranged to prevent the passage of light into the display compartment.

8. In a wet film exhibitor of the character described, a light-tight casing having a front door and a rear door, a fan adapted to draw air from within the casing, illuminating means for the interior of the casing, means for supporting an X-ray film between the front door and the illuminating means, means for latching the rear door in a closed position, means for latching the front door in a closed position, means for preventing the unlatching of the front door when the rear door is unlatched and for preventing the unlatching of the rear door when the front door is unlatched, and means acting automatically when the front door is opened for energizing the lamps and the fan.

9. A wet film exhibitor including a light-tight casing having front and rear doors, electric lamps carried by the rear door, a transparent pane disposed between the electric lamps and the front door, means disposed in front of said transparent pane for supporting the film to be exhibited, an air circulating fan carried by the rear door, latching means for the rear door and for the front door, means preventing unlatching of the front door unless the rear door is closed

and latched, said means preventing the unlatching of the rear door until the front door is closed and latched, and means acting upon the release of the front door latching means to energize the lamps and the fan, and a light-tight voice carrying duct associated with the exhibitor and extending parallel thereto, there being means permitting the passage of air from said duct into the interior of the fan casing and into the space within which the lamps are disposed and to the fan.

ARTHUR W. BUCK.