

Air Conditioning American Movie Theatres 1917-1932

Random Press Cuttings

48 *Motion Picture News* May 3, 1930



**This Summer—
Manufactured Weather**

Will Greet
Patrons of These
Three
Cincinnati Theatres

*Capitol, Palace and
Lyric Theatres, Cincin-
nati, of the Libson, Har-
ris & Heidingsfeld Circuit,
M. G. Harbula, Consulting
Engineer.*



The Clinton Theatre, Columbus, O., equipped with air conditioning system. The Clinton is a 1500-seat house and is one of the many theatres with less than 2000 capacity having this equipment.



Exterior view of the Eastern, a companion house in Columbus to the Clinton, and also equipped with air conditioning machinery. It is operated by the same company, the James Amusement Enterprises.

Air Conditioning in the Small Theatre

THE development of air conditioning machinery to the uses of the smaller theatres is discussed in an article by D. C. Lindsay, publicity director of the Carrier Engineering Corporation, which will appear in the 1927 Paramount Pep Club Year Book, to be published in August.

The article points out that during the past six years approximately two hundred theatres in cities throughout the United States have invested in air conditioning systems. This equipment is distinguished from the fan ventilation and heating equipment by the fact that it provides for cooling the air during summer and offers means of controlling the condition of humidity in the theatre.

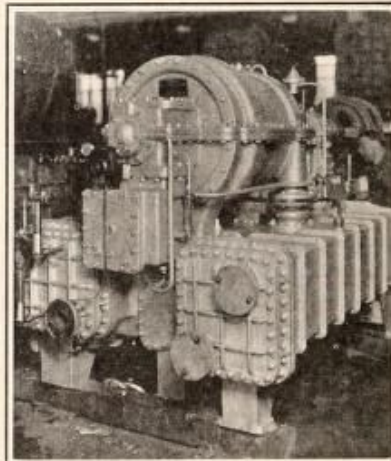
The primary factor which has persuaded theatre owners that air conditioning will prove profitable because of the spectacular cooling of the theatre during the extremely hot weather of summer. This too, has been the primary appeal to the public. Though this is sufficient justification for the investment, the writer declares, air conditioning has more to offer than the mere cooling of a theatre during these three or four sultry months. The article continues.

Air conditioning as provided in the theatre is not simply a refrigeration system. The refrigeration machine is not used to make ice according to the popular conception. The refrigeration machine has little more to do with the system as a whole than the boiler by which the theatre is supplied with the heat in the winter. Nor is it more important than the indispensable fan which is used to distribute conditioned air.

It is important, therefore, that the theatre owner should know that a complete and properly installed air conditioning system provides his theatre with the means of maintaining ideally comfortable and healthful conditions every day in the year. Furthermore, he has something to offer his patrons which cannot be approached by a theatre not so equipped.

People are learning by feeling for themselves, the comfort which is offered in an air conditioned theatre in contrast

to many of our old theatres, particularly the legitimate houses, which are almost invariably stuffy and over-heated even on the coldest winter day. We believe that from this point of view the theatre owners who have invested in air conditioning systems are overlooking a field of exploitation. The average person is conscious of comfort principally by contrast. That is why it has been easy to attract the public from the hot streets to the pleasant atmosphere of a properly cooled theatre. At times when outdoor conditions do not bring this contrast boldly to the attention of the patron the only comparison we have is to bring to his mind the fact that he is comfortable in comparison to some experience which he has had in a stuffy overheated audience.



The new Carrier Centrifugal Refrigeration Unit, developed for use in the smaller theatres. The unit is of sufficient capacity to cool and dehumidify the air of a 1,000-seat theatre. It may be located at any point in the building and will occupy a room approximately 12 feet square allowing ample room for control boards and access to all parts of the machine.

IT was quite natural that the application of air conditioning in the theatre should have had its beginning in the large elaborate Metropolitan houses which represent large investments and which have far greater prospective incomes than the theatres in smaller cities or the neighborhood houses in any city. It is to be expected, however, that a feature which has proven to be such a great asset to the central theatres is worth a careful economic investigation on the part of the theatre owner operating first-class small theatres and neighborhood houses.

Theatre owners have foreseen this and so have the architects and air conditioning engineers. The result has been a concerted effort to devise and standardize equipment that shall be within the economical reach of, and a profitable in-

(Continued on page 368)

THEATRE MANAGEMENT EQUIPMENT CONSTRUCTION OPERATION

Advertising That Sells The Cool Idea

*Newspaper and Lobby Displays Theatres Are
Using to Induce Hot Weather Attendance*

THE development of efficient cooling systems and the installation of them in many theatres within the past three years has brought about one decided change in the summer advertising campaigns of motion picture houses. Now the theatres equipped with refrigeration plants sell facts in their newspaper and lobby displays during the hot weather period.

Large expenditures by theatres which have installed cooling plants alone are sufficient to warrant a vigorous advertising effort to sell them to the public. But above that is the fact that the refrigerated theatre on this feature alone is enabled, other things being equal, to draw as much patronage in the hot weather as at any other time of the year—and so of late there has been a lot of institutional advertising concentrating on cooled atmosphere.

The advertising itself is of a high grade, both in newspaper campaigns and lobby displays. The catch-line "Cooled by Refrigeration" is featured in permanent banners and lobby frames at the Publix theatres equipped with cooling plants, and displays ads in which all the space is devoted to the refrigeration feature are being carried in newspapers. Each Publix theatre equipped with a system will show the thermometer, recording the atmospheric condition inside the house, on boards mounted outside on the street line.

But where "facts" cannot be offered—in theatres that is which have no means of manufacturing their own weather conditions with refrigeration or other types of cooling—there is still a place and a very important place for the "cool idea" in the regular advertising of the house. The theatre name cut is the most popular advertising device of the theatre men for carrying this "cool suggestion." Lettering decorated with "frosting" and catch lines suggesting coolness are now being used by a very large percentage of the theatres.

As the reproductions of ads here show, this year's theatre advertising follows the "safe and sane" lines adopted several years ago by theatre men to sell the cool idea. Improvements are to be noted, but these are refinements of familiar ideas rather than new advertising principles.

The following list of catch lines used by theatres with cooling plants, about covers the range of ideas found in the advertising in the principal cities throughout the country:

"Atlanta's Refrigerating Station" (Howard, Atlanta); "Entertainment on Ice" (Loew's Temple, Birmingham); "Where Dallas Keeps Cool" (Palace, Dallas); "Cool as a Mountain Top—The Ice Plant Does It" (Rialto, Des Moines); "It's Al-

(Continued on next page)

Equipment

"News"

—By P. M. ABBOTT—

THE Royal Theatre front is being re-arranged and improved. A new and continuous-operation machine is also being installed which will eliminate the stops between reels.—The Exponent, Oak Harbor, Ohio.

Splendid evidence of the importance of proper screen presentation in the eyes of the public—a local newspaper going so far as to make a news item of the installation of two new projectors. Not so much because there is news in the actual installation as to spread the tidings to the town folks that they can now anticipate sitting through a whole evening's performance without once being jarred to commonplace realities by white screens and irritating delays.

This item isn't an isolated instance. We have on our desk several clippings pertaining to installations of seats, organs, lighting equipment, and other improvements that make for better theatres. But items commenting on "continuous projection," as it is usually termed, predominate. In our opinion, theatres having a single projector, and that often cranked by hand, still number in the thousands. They are located, almost without exception, in small towns or cheap city neighborhoods.

The keen appreciation the public now has of modernized theatres will cause these thousands of out-of-date houses—the last of a passing era—to remodel or go out of business.

And many of the owners of these theatres, when they find themselves losing money and seeking a solution for their loss, will fail to correctly analyze the reason. They never have believed that good equipment played a part in making profits and they never will.



"Facts" about the cooling system of the Rivoli in New York, equipped with a refrigerating plant installed by the Carrier Engineering Company, of Newark, N. J., are convincingly represented out front by the display of a thermometer registering the inside temperature of the theatre

Cooling Plant for Paramount Theatre Comprised of Three Systems

AFTER tests of the Carrier Cooling systems in use in the Rivoli and Rialto theatres, it was decided by Publix that the same system should be installed in the new Paramount Theatre at Times Square.

This week the huge motors arrived and were set upon their concrete bases in the nether regions of the new movie palace. While the principles involved are exactly the same as the installation in the other two houses, the plant in the Paramount will be of much greater capacity, in that, allowance must be made for enough cool air to compensate the heat generated by the human systems of 4,000 patrons, when the house is filled, in addition to the general atmospheric conditions.

This theatre also has a large lobby within which cooling is to be done, a feature which does not exist at the Rivoli or Rialto. Cooling and dehumidification are to be produced by passing the air through chambers within which cold refrigerated water is sprayed. The air is delivered to the theatre through the high ceiling and the balcony ceiling according to the carrier downward diffusion method. Air is drawn from the theatre through openings beneath the seats and at other low points in the house from whence it is taken to be rewashed, re-cooled, and mixed with a suitable portion of new air from out-of-doors.

There are three distinct cooling systems for this house; one provides properly conditioned air to the orchestra, one to the balcony and mezzanine, and one to the great lobby. All of these are subjected to one master control station centrally located.

The quantity of air to be delivered to the house is more than 120,000 cubic feet per minute, or nearly 30 tons of washed cool air per hour. This provides approximately 30 cubic feet of air per person per minute.

To cool the water for the spray chambers, two units of Carrier centrifugal refrigeration are provided. Each of these machines has a rated capacity of 160 tons of refrigeration. This means that the cooling produced by each machine during 24 hours of operation is the equivalent of freezing 160 tons of ice. During intermediate seasons, when only a small amount of cooling is required, it will be necessary to use but one of these machines.

The weather plant not only cools the air, but removes every particle of dust and dirt, giving the theatre an atmosphere found only on the highest mountains without the discomfort of reduced air pressure. The patrons rest in a cooling atmosphere of 70 degrees, while the cool air passes down over their bodies, first reaching the breathing zone and then gently enveloping them, with no sense of draught whatever, as it reaches the floor and passes out to be rewashed or discharged.

Sign Flashing Light Control

Reco

Flashers

are the reliable method wherever light control is needed—in electric signs, flood lighting, spectacular lighting effects. Leaders for 20 years.

REYNOLDS

2628 W. Congress St.,
Chicago

Makers of Reynolds
Horns, Green Color
Horns, Sign Window
Flashers, Traffic Con-
trols, etc.

Write for
catalogue



LOBBY FRAMES
TICKET BOOTHS
OPERA CHAIRS

Libman-Spanjer Corp.
1600 BROADWAY
NEW YORK

DIMMERS

EVERY form of dimmer for the theatre is furnished by Kliegl—from small portable dimmers for spotlights to large dimmer banks that control the numberless stage and auditorium lights in the largest of theatres—dimmers that provide a smooth range of control from full-bright to black-out without flickering, and are properly designed and constructed to give a long life of service—write for catalogue.

KLIEGL BROS
UNIVERSAL ELECTRIC STAGE LIGHTING CO., INC.
ESTABLISHED 1906
321 WEST 50TH STREET
NEW YORK, N. Y.

Tell the Story—

About your product in an advertisement here in the *Theatre Management, Construction, Equipment* department—where it will be read by the buyers you want to reach

—and Get Results

COOLING BREEZES

You can have them in your Theatres this Summer—supplied at a velocity of 35 miles per hour with the **SUPREME BLOWER**—plenty of volume, too, 35,000 to 40,000 cubic feet per minute

ORDER NOW AT THE NEW LOW COST

\$150.00 with wood wheel
165.00 with all steel wheel

F. O. B. St. Louis
Convenient Terms

Sturdily constructed—6 foot housing—4 foot wheel
Built to last—a real cooling plant

DON'T DELAY—TO DAY

SUPREME HEATER & VENTILATING CORP.
ST. LOUIS, MO.

Exploiting Manufactured Weather*

Some Suggestions for the Showman—
A Source of Far Greater Profits

Patrons and Prosperity



them about it.

And in these days of super-competition, no showman can afford to overlook one single item which may affect patronage.

"Every day a good day"

OWNERS of Carrier Conditioned Theaters should realize that they have complete and properly installed air conditioning systems, providing the means of maintaining ideally comfortable and healthful conditions every day in the year, *regardless of season or outdoor weather*. Furthermore, these owners have something to offer their patrons which cannot be approached by those theaters *not* Carrier Conditioned. They have, therefore, the very finest kind of opportunity for exploitation, if properly handled.

An Overlooked Field of Exploitation

WE do not claim to be theatrical publicity experts, telling the old-time showman and publicity man how to advertise. We *do*, however, believe that with our years of experience in designing and installing air conditioning systems, and our observation of human reactions, we can suggest certain ways in which *Manufactured Weather** may be exploited to advantage by the theater owner. We believe, also, that a great many owners who have invested in air conditioning systems are neglecting a field of exploitation which cannot fail to pay large dividends.

A source of far greater profits for the theater today, too frequently overlooked by otherwise progressive showmen, lies in providing greater comfort for patrons, and telling

Out Front Ballyhoo



by smart showmen, the while laughing up their sleeves, long before the advent of *real* and positive air conditioning, and usually meant little or nothing so far as temperature was concerned, and absolutely nothing so far as humidity was concerned. Small wonder that the polar bear and painted icicle idea of out front ballyhoo is looked upon today with such strong distrust!

Creating a Summery Atmosphere

AS a refreshing change we suggest, during the hot spells, when attendance needs to be stimulated as much as possible, that owners and managers of Carrier Conditioned Theaters turn to the creation



of a cool, summery atmosphere outside their houses and in the lobbies. Even the most modest neighborhood house can be turned into a veritable fairyland by the judicious use of gay awnings, potted ferns, plants and trees,

POLAR bears, painted icicles, snow-capped mountains — all have fallen into decided disrepute with those showmen whose earnest desire is to attract the discriminating. These devices were used

subdued green light effects, Japanese lanterns and a few green mats.

Tell Your Patrons About Manufactured Weather*

FEATURE *Manufactured Weather** in connection with this display—for next to the obvious advantage of having *Manufactured Weather** is telling your patrons about it, creating a *consciousness of comfort* by word and picture. Tell your public, with a real note of triumph in the telling, what a delightfully pleasant atmosphere they will find in your theater, how much more enjoyable the programs will



be when viewed from amid perfect atmospheric conditions, and how much more their health is guarded when seated in an atmosphere of *Manufactured Weather.** Tell people about your good air, loudly and often, and you will discover that you have an attention-getter that your competitors will find it next to impossible to equal, and a form of publicity which will bring most satisfactory results.

If your theater is not included in the ever-growing list of Carrier Conditioned Houses, we shall be pleased to have you ask for a visit from one of our engineers, who will present, without obligation, all of the essential facts underlying the successful application of air conditioning in the theater. Ask, too, for the Book, "*Theater Cooling and Conditioning*."

**It isn't Manufactured Weather unless it's a Carrier System*

Carrier Engineering Corporation

Offices and Laboratories

NEWARK, NEW JERSEY

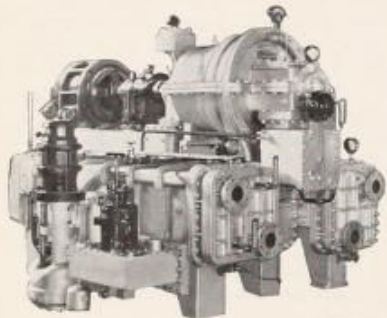
New York Philadelphia Boston Chicago
Cleveland Washington Kansas City Los Angeles

What is Theatre Refrigeration?

Some Facts Concerning the Use of Refrigeration
in connection with Air Conditioning Equipment

What is Theatre Refrigeration?

REFRIGERATION is an essential part of a complete air conditioning system as installed in the modern theatre today. It is important that the refrigeration unit or units should be installed and considered as an integral part of the entire air conditioning system, comparable in every respect with such essential units as the boiler, which is used to heat the theatre in the Winter and the fan, which is used to distribute air to the theatre at all seasons. The refrigeration machine is not used to make ice according to the popular conception. Its real purpose is to cool the water which is used during the hot, humid season for the purpose of washing, cooling and dehumidifying the air supplied to the theatre as it passes through the spray chamber.



This is the latest model Carrier Centrifugal Refrigeration unit. Safe, simple, compact, automatic. The unit is complete as it stands. There are no external expansion or condensing coils or receivers.

CARRIER CENTRIFUGAL REFRIGERATION has met with remarkable success in the cooling and dehumidification of theatres and public buildings because it was designed primarily to meet the many peculiar requirements of air conditioning and as an integral part of the air conditioning system. The machine is completely automatic in its control, assuming and releasing its load according to every fluctuation in weather conditions and the size of the crowd. It is absolutely safe for installation in public buildings since it uses a harmless liquid refrigerant. It occupies less than $\frac{1}{4}$ of the space required for other refrigeration equipment of like capacity.

The Comfort Zone

THE prime use for your refrigeration unit in connection with the air conditioning system is to produce comfort for your patrons and not to shock them or chill them. The American Society of Heating and Ventilating Engineers has, through long research, laid down for us combinations for temperature, humidity and air movement which are conducive to the maximum state of comfort for the average person. On the basis of this, we recommend the following temperatures to be maintained in your theatre according to the variations in outdoor temperature:

Outside Temp.	Theatre Temp.
75° F.	73° F.
80°	74.5°
85°	76°
90°	77°
95°	78°
100° & above	79-80°

FOR all of the above conditions we recommend a relative humidity in your theatre ranging from 55% to 60%. A more elaborate table and recommendation for the maintenance of these conditions in your theatre will be sent for the use of your engineer upon request.

Refrigeration and Publicity

OBSERVATION in hundreds of air conditioned theatres throughout the country has taught us that unfavorable reactions result from operation at exceedingly low temperatures. We recommend that your engineers be instructed carefully on this point. We recommend that you do not emphasize refrigeration as such, but build your publicity on conditions of *healthful comfort*.



ARECORDING thermometer placed outside your theatre to show the indoor temperature at the breathing zone will prove an interesting and valuable means of publicity. But—tell the

truth! Be sure that the sensitive bulb of your thermometer is situated to record accurately the temperature at the *breathing zone* and that it is properly calibrated. The public will find you out if you do not tell the truth and you will pay the penalty in lost patronage.

Manufactured Weather*

THE Carrier System for Air Conditioning provides the theatre with the means of creating and maintaining ideally comfortable and healthful conditions every day in the year regardless of outdoor weather, the season or the size of the crowd.



IF you have Manufactured Weather* tell your patrons about it in connection with your advertising. The beautifully executed bronze tablet shown in the accompanying illustration will be presented to the owner of any Carrier Conditioned Theatre upon request. This tablet displayed in the lobby or foyer will serve as a permanent announcement to your patrons that you have provided Manufactured Weather* for their health and comfort.

WE shall be pleased to have you ask for a visit from one of our engineers, also for the Book, "Theatre Cooling and Conditioning."

* It isn't Manufactured Weather unless it's a Carrier System

Carrier Engineering Corporation

Offices and Laboratories

NEWARK, NEW JERSEY

New York Philadelphia Boston Chicago
Cleveland Washington Kansas City Los Angeles

Outdoor Air in the Theatre, A Guarantee of Satisfied Patrons

Seasons Mean Nothing Under Modern Ventilating Methods—An Expert Explains Why and Describes a Few of the Fundamentals

By D. C. LINDSAY

Physicist with Carrier Engineering Corporation

LET us outline the ideal conditions which should be maintained within a theatre and follow the process of their accomplishments:

1. Air should be relatively clean, washed or filtered to protect the health of patrons and to preserve the beauty of the decorations and draperies.

2. During the summer months a temperature of approximately 75 degrees F. and a relative humidity of 55 percent is in most cases comfortable, though there is a tendency now to carry a slightly higher temperature and a correspondingly lower relative humidity. During the winter months a temperature of approximately 70 degrees F. with a relative humidity of from 35 to 50 percent is found practicable and comfortable.

3. The proper quantity of conditioned air to be supplied to the theatre is generally conceded to be about 30 cubic feet per minute, per person. This is not based upon the quantity of air which one person breathes in a minute. The average person inhales little more than one cubic foot of air per minute. The quantity of air is based rather upon the heat dissipation of the average individual which is sufficient in one minute to raise the temperature of 30 cubic feet of air approximately nine degrees F.

Velocity Regulated

4. Finally, this quantity of air must be carried to and distributed uniformly throughout every portion of the building. Since the air is cooled, the greatest care must be used in regulating the velocity and the direction at which it is delivered in order to avoid draughts. In other words, reference must be made to the comfort chart and the velocity of air delivered carefully adjusted to establish a comfortable combination with the existing temperature and humidity.

5. A certain quantity of fresh outdoor air should always be a part of the air delivered to the house. The practice in this regard varies rather widely. Some cities have ordinances which require that all of the air delivered to the theatre be fresh outdoor air and forbid re-circulation of any portion of the air within the building. Such a requirement is absurd and would subject the owner to a prohibitive expense either to heat or to cool his theatre. Air conditioning engineers and numbers of health authorities have pretty generally agreed that a constant minimum dilution of 25 per cent of fresh outdoor air, or approximately eight cubic feet, per minute, is ample from every point of view.

We have outlined five general problems to be solved in establishing ideal air conditions within the theatre.

Consider now a theatre completely equipped with a typical air conditioning and refrigeration system.

Assume there is an outdoor temperature of 85 degrees F. and a wet bulb temperature of 75 degrees F. This is not an unusual summer day.

Under these conditions the outdoor relative humidity is found on the psychrometric chart to be 63 per cent. The dew-point or condensation temperature of the outdoor air is about 71 degrees F. We wish to establish, as outlined in the requirement in No. 2 given above, a temperature of 75 degrees F., and a relative humidity of 55 per cent.

We find from the chart that this condition calls for a dew-point of approximately 57 degrees F. in the theatre. We have not only to cool the air from 85 degrees to 75 degrees but we have to dehumidify, that is,

to condense sufficient water out of the air so that the dew-point is lowered from 71 degrees to 57 degrees. Here is how it is done:

How It's Done

We have as a part of the air conditioning equipment a spray chamber within which hundreds of small nozzles are atomizing perfect clouds of water. During summer operation the water supplied to this chamber is cooled by refrigeration to a temperature of about 45 degrees F. By means of the large centrifugal fan, air is drawn through the chamber in intimate contact with the water spray. Here it is completely washed, meeting requirement No. 1 as set forth above. Here, also, the air is cooled to a temperature of about 50 degrees F.

The air has given up its heat to the water, and the water temperature has risen about five degrees. Observe, also, that cooling the air to this extent we have gone below the initial dew-point of the outside air.

It follows, therefore, that water vapor must have been condensed out of the air. In other words, we have reduced the dew-point of the entering air from 71 degrees F. to 50 degrees F.

Re-Circulation Follows

From this chamber the air is drawn into the fan. It would not be desirable to admit air at 50 degrees F., saturated, as it is, upon leaving the spray chamber. Some economical means must be adopted for raising the temperature of the air and incidentally for reducing its relative humidity.

One very economical method of doing this is a patented scheme of re-circulation. Some warm air is drawn from the theatre and intermixed with the cold, saturated air at the intake of the fan. The mixture has a temperature ranging from 62 degrees to 65 degrees F., and the dew-point of this mixture has been slightly increased by the vapor carried in the warm re-circulated air.

The fan then delivers the air through a metal duct system to outlets carefully located in the high ceiling of the theatre, in the ceiling beneath the balcony and at other points throughout the building where cooling is required.

The location and design of the outlets have been a matter of careful investigation on the part of air conditioning engineers. The air delivered through these is not blown into the building, but is delivered at adjusted velocities and is so directed that the result is one of diffusion, a blanket of air, passing downward over the audience.

(Continued on page 91)

Insuring the Health of the Picturegoer

IN the onrush of innovations and improvements incident to the exhibition of motion pictures there perhaps has been no one step taken that has brought more real comfort to the millions who visit the theatre daily than that which brought with it proper ventilation.

During the past six years approximately hundreds of theatres in the United States have installed air conditioning systems. There are 1500 additional which are prepared immediately to add such equipment.

Insurance against breathing bad air is worth something to the patron. That is what the air conditioning system insures. And that is why THE SHOWMAN is passing along Mr. Lindsay's detailed account of just how it's done.

Outdoor Air as a Patron Developer

(Continued from page 78)

The temperature of the air leaving the outlets ranges from 62 degrees to 65 degrees F. In mixing with the warmer air of the theatre, gathering up heat which has been given off by the occupants, by lights and through infiltration from out-of-doors, it reaches the breathing zone at our stipulated temperature of approximately 75 degrees F.

After passing over the audience, a portion of the air is withdrawn through mushroom openings beneath the seats or through openings arranged at other low points. This air is drawn back to the spray chamber to be re-washed and re-cooled or a portion of it may be mixed with the stream of newly washed air, as previously explained.

Since an adjusted quantity of fresh, outdoor air is at all times being drawn into the air conditioning system, a like quantity is being discharged from the theatre. In a properly balanced system the overflow occurs outward through the lobbies and exits. Thus the air within the building has a very slight outward pressure. The old and bothersome inward draughts are eliminated and the commonly used glass screen to protect the audience at the rear of the orchestra seats is no longer needed.

Downward Diffusion

This system of air circulation is known as the downward diffusion system and is pretty generally conceded by air conditioning engineers to be far superior to the former practice of admitting conditioned air at the floor line.

Automatic instruments located in the supply and return air ducts are subjected to the incoming and outgoing conditions of the air and react upon systems of dampers and valves to produce the proper temperature and humidity at the breathing zone. The automatic instruments which have been developed for this purpose are positive and extremely accurate. Once properly installed that are almost fool-proof and require virtually no attention.

Refrigeration Process

In describing the spray chamber within which the air is cooled and dehumidified we mentioned that refrigeration is necessary for reducing the temperature of the water to about 40 degrees or 45 degrees F. Most any form of refrigeration machine may be used to cool water. There are requirements, however, within a building, such as a theatre, which narrow selection of refrigeration equipment down to two types.

The refrigerating medium must, in the first place, offer no hazards to congregated people. This immediately bars the use of the familiar refrigerants—ammonia, sulphur dioxide and kindred gases that are offensive or dangerous.

The second requirement is compactness, because most theatres are limited in available space for equipment and the property upon which they are constructed is usually very valuable. Again, compactness will offer a decided saving if excavation is required.

Two Successful Systems

The two refrigeration systems which have found successful adaptation in the theatre have been the reciprocating machines using carbon dioxide as a refrigerant and the

more recent developed Carrier Centrifugal Refrigeration, using as a refrigerant, Carrene, one of a group of stable liquid chemicals which have been found suitable for centrifugal compression.

Wayne, Ind.; Princess, Springfield, O.; Hines, Portland, Ind.; Grand, Bluffton, Ind., and Princess, Bluffton, Ind.

Maller Goes De Forest

Bluffton, Ind.—The Peter Maller chain in Indiana and Ohio have gone 100 per cent DeForest. The houses of the chain are now being wired by engineers of General Talking Pictures. The theatres are Royal, Lima, O.; Transfer, State, Broadway, Riley, Rialto and Majestic, Ft.

Service Firm For Wired O. Houses

Cleveland—Servicing of wired theatres not regularly serviced by the makers of the equipment installed or by union operators, is planned by Sound Service, formed here by John B. Dunton. A monthly charge will be made to all subscribers to the service.

Starrett Leaves Oliver

Cleveland—H. W. Starrett has resigned as field manager of the Oliver Picture Co., which manufactures and distributes the Oliver Reproducer.



Recently enlarged plant devoted entirely to the manufacture of Vallen Noiseless Curtain Control Equipment

Our Plant...

The result of your Cooperation and our Efforts in providing equipment of right Design, Real Quality, and exceptional Service; Proof of the mutual advantages derived from a manufacturing policy embracing Skill, Integrity, and Responsibility.



"Every Stage is a Better Stage when Vallen Equipped!"



This Summer— Manufactured Weather

Will Greet
Patrons of These
Three
Cincinnati Theatres

*Capitol, Palace and
Lyric Theatres, Cincinnati,
of the Libson, Harris &
Heidingsfeld Circuit.
M. G. Harbula, Consulting
Engineer.*

CINCINNATI theatre-goers this summer will be assured the added attraction of Manufactured Weather in three more houses—the Capitol, Palace and Lyric. These theatres, although not new, have been completely equipped to give patrons an ideally comfortable and a scientifically healthful atmosphere every day of the year, regardless of outdoor weather or the size of the audience.

Manufactured Weather is not new in Cincinnati. For two years patrons of the E. F. Albee Theatre have enjoyed this added attraction. Artists in Radio Station WLW (Crosley Radio Corporation) broadcast in ideal, *quiet* comfort. Guests at the Hotel Gibson dine and dance on the Roof in the healthful comfort of Manufactured Weather . . . as provided through the Carrier System for Air Conditioning.

This is the same system, including Carrier Centrifugal Refrigeration, which is providing ideal conditions of comfort at all seasons in many of the best known and most prominent theatres in the country, as well as in a good percentage of sound stages and broadcasting studios *in which there must not be a single sound interfering with recording or reproduction.*

Manufactured Weather, as provided by the Carrier System for Air Conditioning, is the *only* system guaranteed on a scientific basis as to sound level . . . that is guaranteed *not* to produce the slightest disturbing sound. A visit to any one of the Carrier conditioned sound stages or broadcasting studios will convince you as to the superiority of Manufactured Weather for these studios . . . and for your theatre.

A visit from one of our engineers will not incur any obligation.

Carrier Engineering Corporation

NEWARK, NEW JERSEY

OFFICES: New York, Philadelphia, Boston, Chicago, Cleveland,
Washington, Detroit, Kansas City, Dallas, Los Angeles

CARRIER ENGINEERING CO., LTD.
LONDON, PARIS, BOMBAY
CALCUTTA, JOHANNESBURG

Manufactured Weather makes "Every day a good day"

CARRIER
LUFTTECHNISCHE GESELLSCHAFT
STUTTGART, BERLIN

Many Attend Opening of Albee Theatre, Cincinnati

BEFITTING general Yuletide festivities, the new E. F. Albee Theatre, located on Fountain Square, in the very heart of the downtown business district of Cincinnati, was formally opened and dedicated the day before Christmas, with the sponsors, E. F. Albee, Isaac Libson, Ben Heidingsfeld and other high dignitaries of the motion picture and theatrical world, as well as the city officials on hand for the occasion, which, however, was entirely without celebration or ceremony, strictly informal and minus undue pomp.

\$4,000,000 Investment

The new house, representing an expenditure of \$4,000,000, and with a combined seating capacity of approximately 4,000 in the main auditorium and balcony, is finished in a color scheme of ivory and old gold with harmonizing undertone of gray and taupe. Luxurious tapestries done in imperial design adorn the walls, while expensive and, in many instances, exclusive paintings, some of which are originals by the world's masters, are generously hung.

The lobby is flanked by massive pillars of pure marble which lead to the massive stairway, which is likewise of marble. Here two bronze illuminating pedestals stand sentinel-like at either side of the staircase. These pedestals did a like service in the famous Astor mansion in New York, and were bought personally by Mr. Albee at a cost of \$5,000 each. An enormous dome of indirect lighting adds materially to the grandeur of the lobby.

Fine Equipment

Cooling machines, two units of the Carrier system, placed 40 feet below Vine street, provide complete changes of air.

There is a movable orchestra pit, and also a huge pipe organ of the latest design—a three-manual instrument, electrically controlled and elevated to position in front of the stage when required for musical accompaniments in connecting with screenings. The musical features are under supervision of Theodore Hahn, Jr., who has charge of all musical programs in all theatres controlled by Libson. Henry C. Geis, formerly with Graumann's theatres in Los Angeles, is organist.

Cliff Boyd, until recently manager of the Lyric Theatre, another house in the Libson chain in Cincinnati, has been made manager of the new theatre. Edgar Volz is assistant manager. The regular house staff consists of 100 employees.

Continuous Policy

The policy of the E. F. Albee Theatre will be continuous from 11 a. m. to 11:30 p. m. presenting pictures and stage features. The initial picture was Clara Bow in "Get Your Man," while among the outstanding novelties in the stage presentations was the Albee Entertainers, a band of

twenty hand-picked musicians trained under direction of Harry Willsey, orchestra conductor.

Admission scale is 50 and 60 cents during the afternoon, with a scale of 50 and 65 cents for the lower floor and balcony respectively during the evenings and holidays.

Presentations are given only at stated hours during the day with an increased schedule during Sundays and holidays.

Cosmetic and smoking rooms and other ultra-modern conveniences have been provided for the patrons, while the back stage arrangements are complete in every detail, including private rooms for the house employees, pressing and laundry service, diettes, refrigeration accommodations, nursery and play rooms for performer's children, and even special quarters for animal entertainers. Programs will be changed weekly.

Libman-Spanjer's Xmas Party a Success

Libman-Spanjer, manufacturers of theatre lobby fixtures, played host at their offices at 1000 Broadway last Saturday, Dec. 24th, to the combined factory and office forces. The Libman-Spanjer landing was artistically decorated for the occasion.

Mr. Libman, of the firm, acted as host, personally distributing the gifts and extending his greetings to each employee in turn. Installations of several out-of-town orders prevented the Libman outside forces from participating in this gay affair at which music, song and Christmas cheer prevailed until late afternoon, and at which the lady associates of the Libman offices acted as gracious assistant hostesses to their genial employer, and doubled, too, as waitresses.

Besides the Messrs. Libman and Spanjer, among those present were: J. C. Eanslen, C. L. Coekfair, Miss Marian Berman, Fay Peters, Jean Herrera, Minnie Stillman, Philip Frank, L. A. San Filippo, N. Castro, R. DuBois, L. Flock, D. Pasquale, L. Giannetta and others of the factory staff.

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News

Out

Next Week

UNIFORMS FOR HOUSE ATTACHES **COSTUMES** FOR STAGE PRESENTATIONS **BROOKS** 1437 B'way N. Y. City

Will "Tell it to Marines" with Motion Pictures

THE Marine Barracks at Parris Island, just off the coast from Charleston, South Carolina, will soon have a large theatre for the entertainment of the marines. Heretofore, they have used only one machine and offered spasmodic performances, but with the new theatre in readiness and the increased amount of equipment including an additional Powers projector, G. E. high intensity lamps on both machines, one a 125-125 ampere Hertner Transverter, special projection lens and other booth equipment, there will be regular performances in the Barracks Theatre and the finest possible projection.

Coral Gables Theatre, Fla., Nearing Completion

From all reports, the Coral Gables Theatre, Coral Gables, Florida, is going to be one of the most pretentious buildings of its kind in a state where every architect and builder tries to outdo every other in creating a marvel of beauty.

C. M. Maxfield, builder, announces that work is being pushed as rapidly as practical and that the house will be ready for opening in the near future.

The full equipment of the Coral Gables Theatre was purchased through the Southern Theatre Equipment Company and M. V. Loumax, chief of the service department of that organization, left on Thursday night to look after installation of machines and other equipment.

Broadway Interested in Installation of Rialto's Cooling System

FOR the past two months or more one of the chief objects of public curiosity in the neighborhood of Broadway and Forty-second St., New York City, has been the scaffolding on the 42nd St. side of the Rialto Theatre, rising from the sidewalk level to the roof of the building. Illuminated signs showing Harold Lloyd hanging by his finger tips, just as he does from the roof of a Fifth Avenue bus, and of Gilda Gray dancing a South Sea Island hula-hula or siva-siva, have failed to entirely disguise the structure of two-by-fours or satisfy the curiosity of passersby as to what may be going on up on the Rialto roof. At last the Rialto press department has come to the rescue, and likewise to its own defense against daily questioning, with the announcement that a cooling system is being installed in the theatre and that the scaffolding is part of the temporary construction necessary to the installation by the Carrier Engineering Corporation.

Thus, the Rialto enters the Broadway battle royal of the artificially cooled motion picture theatres. The system now being installed by the Carrier Engineering Corp., which will be in operation about the first of June, is similar to that which proved successful during the hot days last Summer at the Rivoli Theatre at Broadway and 49th Street. This system reduces not only the temperature but the humidity as well. In the Rivoli Theatre the humidity is controlled automatically and the same

conditions will prevail at the Rialto. The system operates not only in hot weather but the year around, maintaining an atmosphere of even temperature and condition. Incidentally, owing to its interior design and its present system of ventilation, the Rialto has presented a difficult cooling problem.

Birmingham's Ritz to Open During August

A date in August has been set by the Interstate Amusement Company for the opening of the Ritz Theatre being built in Birmingham. Full booth equipment and Minusa DeLuxe screen were purchased from the Southern Theatre Equipment Company through their Alabama salesman, W. C. Alexander.

Keith vaudiville and big features will be the policy.

San Pablo to Have New Theatre

A \$200,000 motion picture theatre will be erected at San Pablo Avenue and Main Street, Berkeley, Cal. The site was purchased from F. C. Fry by Oakland Title Insurance & Guaranty Co., for an unnamed client. Charles M. Wiggin Co. of Oakland, acted for owners and David Glazier for the purchasers.



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A Two-Theatre System Served By a Single Refrigeration Plant

• The Riviera and Riverside theatres on upper Broadway, New York, adjoin each other and have a common owner. Here is the way each was successfully air-conditioned with cooling by the same equipment

By ROBERT HAMBURGER

WHEN TWO theatres are located in close proximity to each other, and either are owned by the same interests, or their owners could work out a satisfactory arrangement for joint operation of the system, a dual air-conditioning plant can be designed so as to effect substantial

saving in cost. An excellent example is afforded by the air-conditioning of two New York City theatres operated by the Skouras circuit. With cooling supplied by a single refrigeration plant, these two systems were effectively and economically operated throughout the past summer.

These theatres are located on the west side of Broadway between 96th and 97th Street, each seating approximately 1,700 and separated by an open court 20 feet wide. The Riverside is the southern one with its side on 96th Street, and its standee space is separated from the Broadway building line by a three-story building some 50 feet deep. The Riviera Theatre, with its north side on 97th Street, is also separated from Broadway by an office building seven stories high, but not as deep as that adjoining the Riverside. The roof of the Riviera theatre is at the height of the seven-story office building.

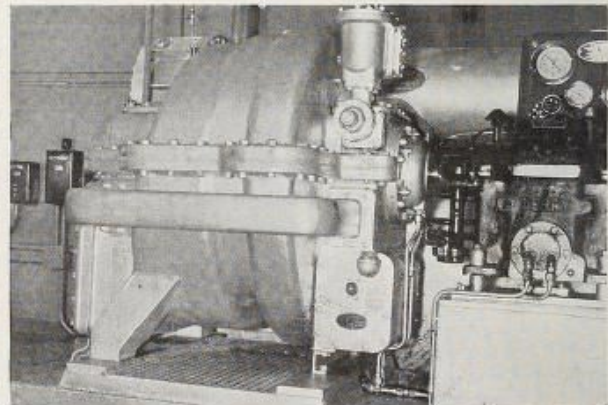
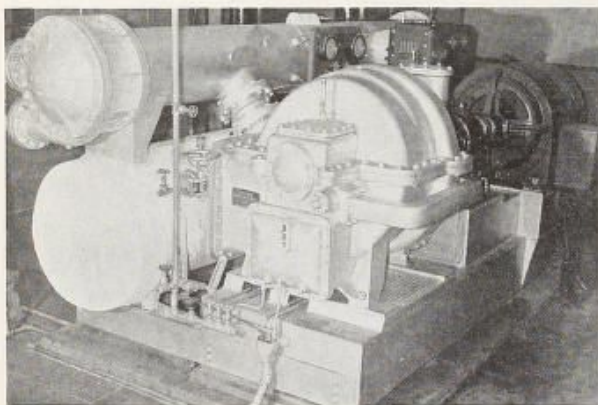
The total available refrigeration load for the two theatres combined is 200 tons. Arrangements had to contemplate, however,

the possibility of one theatre being filled to capacity while the other was almost empty, so two separate assemblies are used.

It was difficult to find an advantageous location for the air conditioning assemblies, each of which consists of a large single inlet, single-width fan with two-speed motor, three six-row Aero-fin continuous tube cooling coils, two Aero-fin non-freeze heating coils, and filters. It was decided to use the space of the 20-foot court separating the two theatres, and a new fire-proof enclosure about 20x20 foot in plan, by about 12 feet high, was built across the court, the floor and roof being of steel I-beams bearing on the existing theatre side walls on either side of the court, and the floor and roof slabs being 4-inch cinder-concrete arches reinforced with wire fabric.

Cooling Equipment

For refrigeration, a 200-ton Carrier centrifugal machine was selected. The space chosen for it is in a vacant basement room



PHOTOS BY STAFF PHOTOGRAPHER

Two views of the compact 200-ton Carrier centrifugal refrigeration machine located in space provided under the lobby of the Riviera.



CONSTRUCTION & EQUIPMENT DEPARTMENT



Rivoli, Broadway, Installs Cooling System

*Atmospheric Conditions Ideal During Hottest Weather;
Box Office Receipts Equal Winter Season*

THE first serious depression in attendance with the motion picture theatres on Broadway was experienced last week during the record hot wave. However, there was one outstanding exception to this slump in attendance—the Rivoli theatre not only maintained normal receipts but actually enjoyed abnormal attendance during the entire hot weather. The explanation for this very remarkable attendance record lies in the fact that this theatre was prepared to set into operation the new cooling plant which had been installed during the early Spring. The enviable results obtained by this system in the Rivoli has been the cause of general comment among theatre men.

The cooling system was installed by the Carrier Engineering Corporation of Newark, N. J., and is the most recent of a series of such installations which that firm has placed in a number of other large first-class theatres, among which are Grauman's Metropolitan; the Palace, Dallas; and the Texan, Houston. These theatres are mentioned in support of the showing of the Rivoli's record hot weather attendance as these large houses are also reporting exceptional summer business resulting from complete control of atmospheric conditions within their auditorium proper.

Judging from what the writer has seen and felt in the Rivoli when the most humid and hot weather out of doors only served as a contrast for the perfect conditions within the theatre, it is our prediction that the time is not far distant when all modern motion picture theatres will have similar installations. We are placing this prediction on two grounds: First, because an installation of this type apparently completely eliminates the summer slump and in so doing eradicates a very material loss to theatres in nearly every part of this country; Second, atmospheric conditioning installations will be forced on those theatres who do not take the initiative in being the first to install such systems through competition with houses who are in a position to dominate a great majority of the summer business.

Our prediction is that these new developments in engineering are now in a fair way to eliminate hot weather as a competitor in this industry.

Though descriptions of installations of atmospheric conditioning apparatus similar to

that installed in the Rivoli theatre have previously appeared in this department of the NEWS it is timely to again describe their salient features. The purpose of the system for summer operation is four fold, i. e.: to cool the air; to condense and remove excess moisture or humidity; to wash the air or free it from all foreign matter, and finally, to so distribute the air in the theatre that no drafts or unventilated pockets are created.

The cooling, dehumidify and washing is accomplished by passing the air through a spray chamber such as shown on the following page. To cool the water for use in this spray chamber, an efficient refrigeration machine, known as the Carrier Centrifugal Refrigeration Unit, which is entirely self-contained, is employed. This unit does not include the familiar reciprocating compressor as the compressor is centrifugal or rotary, and is motor driven. The other major parts of the unit are the evaporators

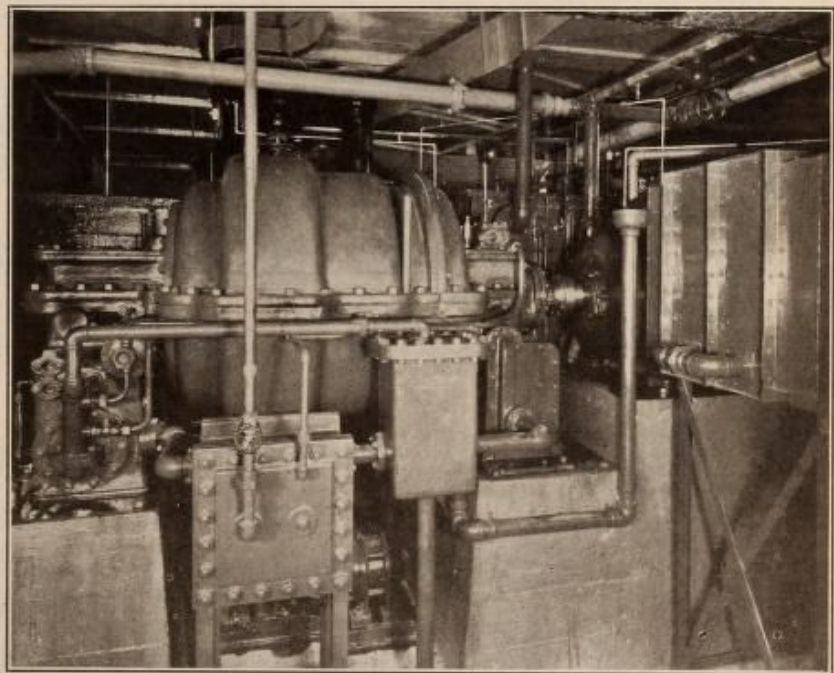
and the condenser where the refrigerant is recovered and returned to evaporator. The entire unit is compact and occupies, it is claimed, only about one-quarter the space of other systems.

In the Rivoli theatre, this machine with all its parts, is capable of producing 150 tons of refrigeration and is located in a small room beneath the lobby approximately twelve feet. The machine is automatic in operation and maintains the air at any desired temperature and humidity.

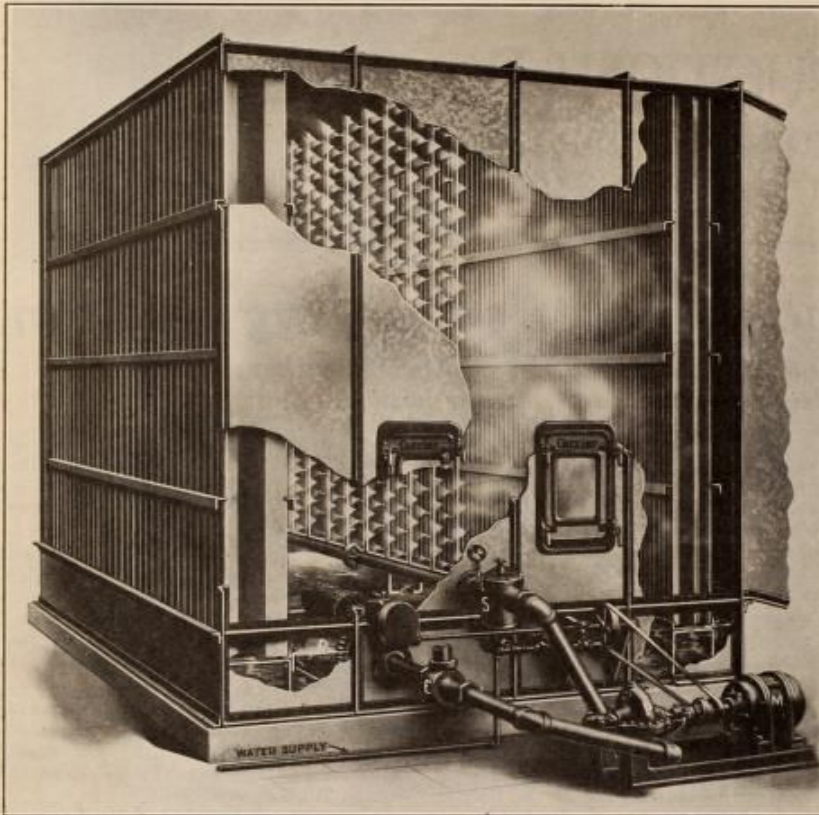
A very unusual feature about this system is its operation at a vacuum rather than at a pressure, so that any leaks that might occur are always inward. The refrigerating medium is a harmless liquid.

The automatic temperature and humidity controls acting upon the temperature of the air and regulating the chambers, maintain a very uniform condition of temperature and humidity in the theatre.

(Continued on next page)



The refrigerating machine of the Carrier Atmospheric conditioning system, recently installed in the Rivoli theatre, Broadway. This installation is proving a great boon for hot weather business.



Spray chamber of the Carrier atmospheric conditioning system installed in the Rivoli theatre, Broadway. Here the air is cooled, dehumidified and washed and made ready for "manufacturing weather" in the auditorium proper. (The refrigerating machine is illustrated on the preceding page.)

Rivoli, Broadway, Installs Cooling System

(Continued from preceding page)

With such a system for the proper atmospheric conditioning of the air as has been described above, the final consideration is the proper air distribution and circulation. This is accomplished at the Rivoli by admitting the air through numerous diffusers in the ceiling of the auditorium. The velocity of the air thus submitted is low enough so that it is never perceptible as a draft. The air passes down over the audience, reaching the breathing zone first, and then over the bodies, finally to be exhausted at the low points of the house. It is then returned and mixed with fresh air, or it is re-washed while certain portions of it are discharged to out of doors.

Plans for New Chicago 2,200 Seat House Are Drawn

It is reported that plans are being prepared by Walter W. Alschlager, for a twenty-two hundred seat motion picture theatre, which will be erected at the southwest corner of Halsted and 35th Streets, Chicago, and operated by Harry Reekas & Brothers. The architects say that the design will carry out the idea of a Babylonian banquet hall, with the entire seating capacity on one floor, the monotony of which will be broken by a series of terraces.

Attractive 800 Seat Theatre Opens in Aurora, N. Y.

The beautiful new Aurora theatre was opened in East Aurora, N. Y., on the evening of June 2. Roycroft town may well be proud of this fine new 800-seat motion picture theatre, fire proof to the highest degree, most attractively decorated and featuring equipment equal to the largest houses in the land.

Merritt A. Kyser is the manager of the Aurora and the following are members of the board of directors: Elbert Hubbard II, president; Irving Price, vice-president; James W. Persons, Robert North, Lyman S. Loom's, Cecil M. Jackson, secretary and treasurer.

The house is built of brick and hollow tile with concrete floors, wide aisles and more exits than the law requires. The lobby is of fire-proof construction. The building is plastered on metal lath and is fully equipped with sprinklers. It has the lowest insurance rate of any structure in the town. The roof is supported by structural steel girders on brick piers with independent foundations below the frost line and the structure conforms with the most rigid city building inspection codes. Comfort as well as safety is essential in every modern public building and the owners have looked after this feature with great care. The 800 seats are roomy, with deep, curved backs and upholstered seats. The Simplex projection machines are used in the modernly equipped booth. Comfortable dressing rooms, a large stage, 32 by 25 feet, footlights, border lights, dimmers, etc., are

ample to meet all possible demands for local performances if needed.

The plans were drawn by Robert North of the North, Shelgren & Swift, Buffalo architects. The mason work was done by Luppa & Maggio of Rochester. Admission is 30 cents for adults and 15 cents for children. The Becker Theatre Supply Company of Buffalo installed the booth equipment and the Raven half-tone screen.

Many New Theatre Projects in Oregon Towns

There is considerable activity in theatre building in Oregon. Eugene has just opened a handsome new picture house known as the Lowell theatre.

Salem is to have three new houses one of which is to be built by Frank Blich, who owns and operates the present Salem theatre which bears his name, another by George B. Guthrie, manager of Oregon, Liberty and Grand theatres, and the third by a recently organized company known as Salem Amusement Company.

Three theatres are in the process of erection at Astoria, and a fourth, the new Liberty theatre, of Jensen and Von Herberg, has just been opened. Warner Brothers are building one of these new theatres and Sam Sax is building another.

Ed. Blair is building a theatre at Nye Beach.

A suburban theatre at East 28th street and Hawthorne avenue is to be erected by Jensen and Von Herberg, who own a number of Portland theatres. The contract is to be let May 22 and the building is expected to be ready by autumn.

This motion picture house is to be reinforced concrete and the exterior is to be stucco with brick and stone trimmings. The building which will house the theatre will provide space for four retail stores and will occupy nearly a block. The theatre will seat 1,200 and will be equipped with rest rooms, check rooms and a stage large enough for road shows.

Nashville House Opens in Residential Section

The Hillsboro Theatre was recently opened in the residential section of Nashville, Tenn., and provides one of the most up-to-date and attractive houses in that city. The new theatre is in the center of the business section of the Hillsboro section, and was erected by M. A. Lightman of the Malco Amusement Company, who operates a chain of five theatres.

The Hillsboro Theatre has a large pipe organ and a stage that measures 60 feet wide by 25 feet deep. This stage is the largest in Nashville, and was especially designed to accommodate road shows.

Every modern convenience has been installed in this theatre for the comfort of the patrons. A fine air cooling system is used, which is expected to provide a comfortable atmosphere during the hottest weather.

An unusual feature is incorporated in the box office, in that a mesh wire screening is used during the summer months in place of solid construction. This meshing is removed during the winter.

Manufactured Weather in Winter

Some Suggestions for the Showman in Connection with the Proper Operation and Advertising of Air Conditioning Equipment



THE passing of Summer and approach of the Winter season, with its promise of competition keener than ever before, brings to the showman of sound business judgment a new realization that patronage depends largely upon conditions of *healthful comfort within the theatre.*

Showmen, therefore, would do well to look to their air conditioning equipment as a very definite and important medium for increasing patronage and box office receipts.

Manufactured Weather A Boon to Patronage

The theatre-going public is recognizing and patronizing those theatres which make adequate provision for their health and comfort, and are avoiding, whenever possible, the unconditioned theatre. Patronage once lost is extremely difficult, perhaps impossible, to regain.

Create a Consciousness of Comfort

Owners of Carrier Conditioned Theatres have complete and properly installed air conditioning systems, capable of maintaining ideally comfortable and healthful conditions throughout the house every day in the year, *regardless of outside weather conditions.* It is up to those owners, therefore, if they would make the most of their opportunities, not only to provide for their patrons the most healthfully comfortable conditions possible, but to see that their Carrier Systems are exploited to the fullest extent.

Check Your System Now

To owners of Carrier Conditioned Theatres we recommend an examination of the Autumn and Winter conditions maintained in your theatres. Are you operating properly the equipment in which you have invested? What is the temperature? What is the humidity? And, above all, are your patrons comfortable?

Tell Your Patrons

Out front ballyhoo as an advertising medium, if properly handled, is not a passing whim. It has already proved its worth in many of the Carrier Conditioned Theatres throughout the



country. Signs, but not of the side-show variety, displayed out front, in lobby or foyer, may be used to announce to your patrons that you have provided *Manufactured Weather* for their health and comfort. The beautifully executed bronze tablet shown in the accompanying illustration will serve as a permanent announcement to your patrons and will be presented, upon request, to the owner of any Carrier Conditioned Theatre.

Trailers may be run occasionally, calling attention to the scientifically conditioned air within the theatre. Dignified announcements on the back of your program may also be used to good advantage. If your claims are true the audience will be led into a *consciousness of comfort* and will remember it.

Cooling Required in Winter

The air conditioning problem in Winter, when the theatre is well filled, is still one of cooling rather than of heating. This is evidenced by the fact that in most un-conditioned houses during the Winter it is invariably too hot, too stuffy, too draughty. This nearly always means an ill-smelling, enervating, dangerously contaminated atmosphere. The correctly air conditioned house, however, can provide for its patrons the ideal combination of temperature, humidity and air movement which is conducive to the maximum state of comfort for the average person. See that your engineer is instructed not to overheat the house—then watch the saving in fuel.

Through long research it has been found that a temperature of approximately 70 degrees F. with a relative humidity of from 35 to 40 per cent. is most practicable and comfortable. The air should be clean and washed or filtered to protect the health of patrons and to preserve the beauty of the decorations and draperies. The proper quantity of conditioned air should be carried to and distributed uniformly throughout every part of the building, *without draughts.*

Correct air conditioning, producing these results, can be obtained only from a correct installation of equipment which has been designed and installed to meet the individual needs of each theatre, *and which is properly operated by your engineer.*

If your theatre is NOT Carrier Conditioned, or if you are contemplating the construction of a new house, now is the time to have our Engineers call and present to you the essential facts underlying the successful application of Air Conditioning to the Theatre. Ask, too, for the Book, "Theatre Cooling and Conditioning."

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