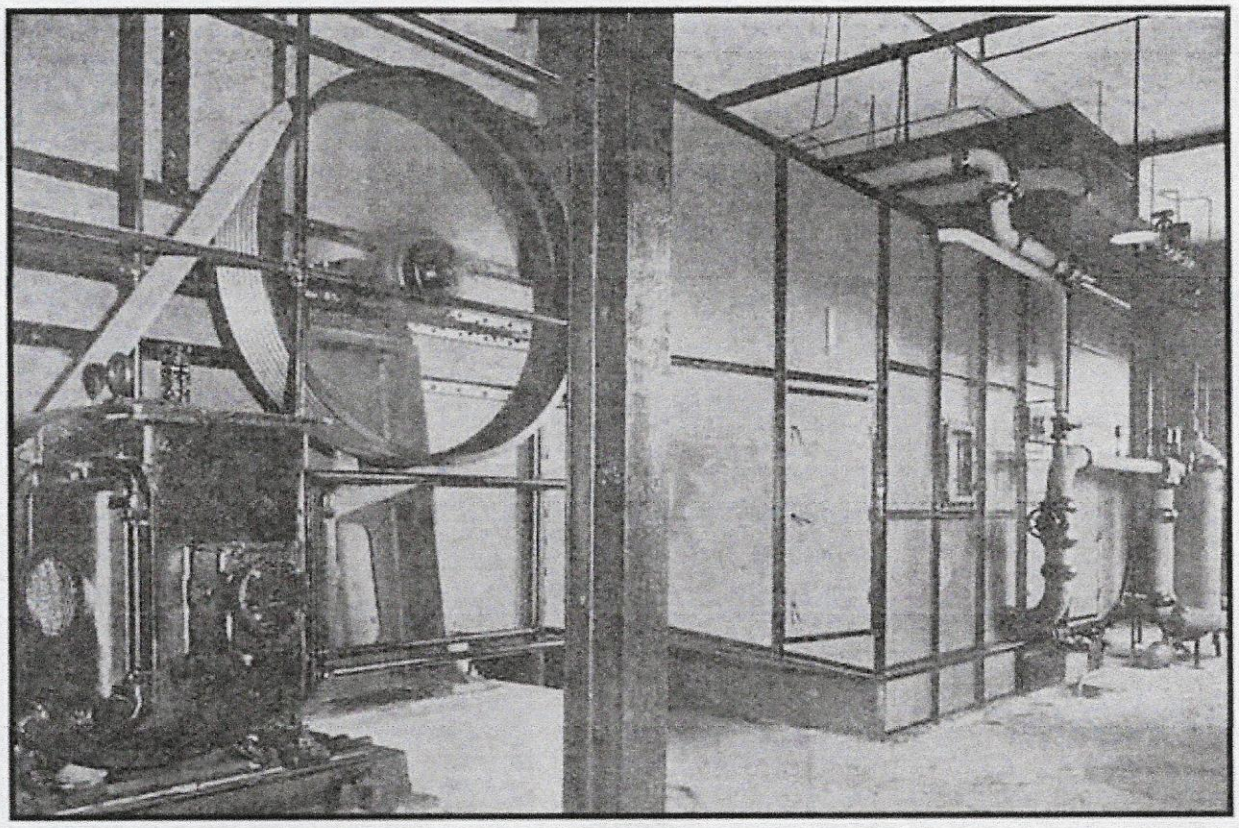
COMMODORE THEATRE HAMMERSMITH

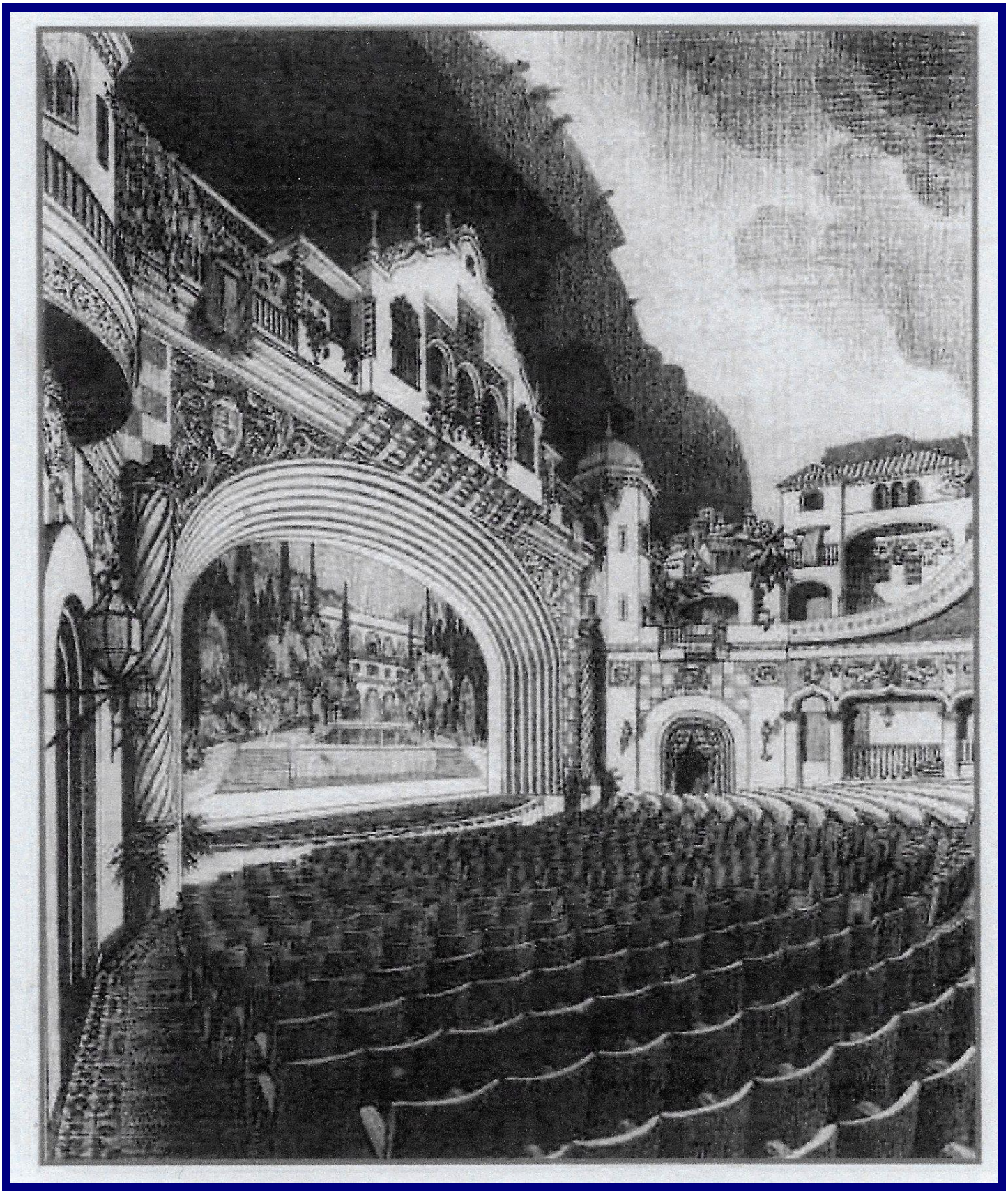


HEATING VENTILATING AIR CONDITIONING

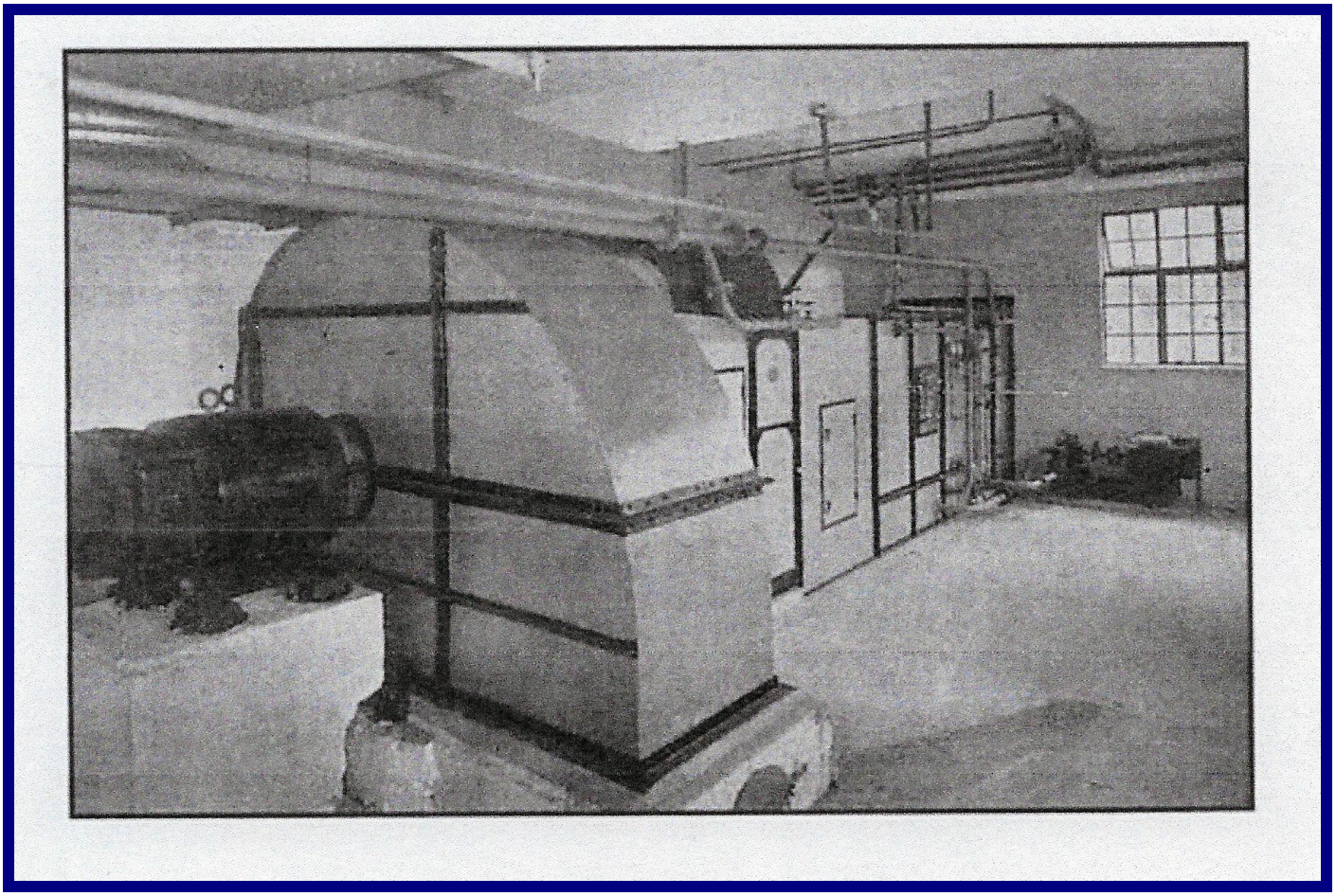
LONDON CINEMAS AND THEATRES 1920-1938

BRIAN ROBERTS

ASTORIA CINEMA FINSBURY PARK



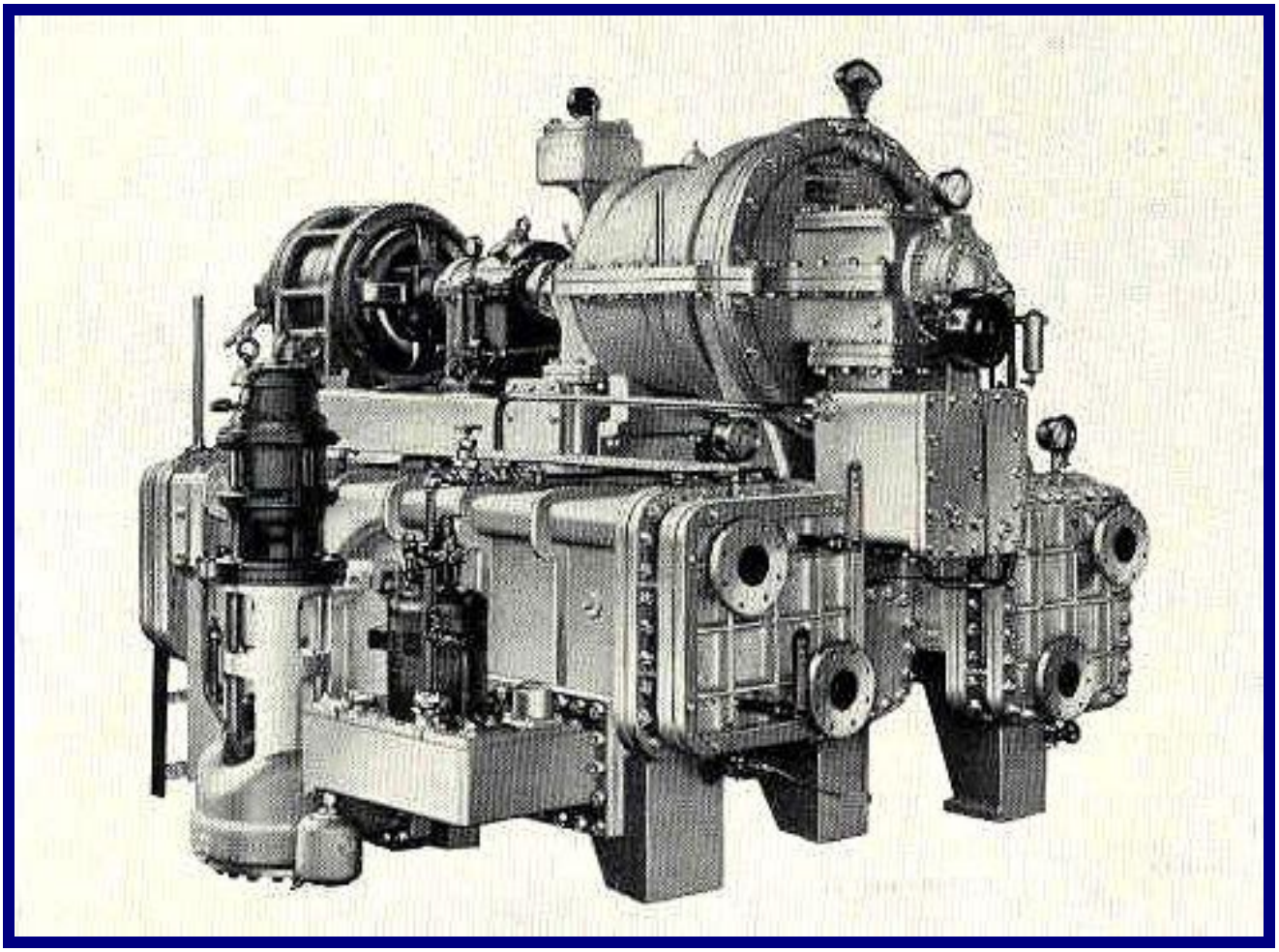
DUCHESS THEATRE



London cinemas and theatres are shown in date order of opening.

The following index is, for reader convenience, in alphabetical order.

INTRODUCTION



A Carrier centrifugal water chiller

At the start of the 1920s, Carrier set up a company in the UK, Carrier Engineering Company Ltd, which was 50% owned by UK Partners and was extremely successful. They introduced air conditioning to a number of important cinemas and theatres in London, some of which are included in the following pages. But when the Depression took hold in the United States the UK Company became fully British owned. Carrier UK continued successfully until the 1970s until it eventually ceased trading after a hostile take-off by Haden.

In the 1970s, the Chair of the CIBSE Heritage Group was J.A.E. (Archie) Heard the Managing Director of Carrier UK. He trained with Carrier in the USA and knew and worked with Willis Carrier in countries around the world. Archie wrote two books on the Man and the Company. His unpublished manuscripts are in the Heritage Group Archive at Cardiff University.

The UK Company of J. Jeffreys & Co. installed air washer spray-cooling systems in a number of London Cinemas. It may not be widely known, that many years later Graham Manly OBE, who served his student apprenticeship with Jeffreys went on to become President of CIBSE.

CARRIER ENGINEERING COMPANY

Carrier Centrifugal Refrigeration

Carrier Engineering Company Ltd
24 Buckingham Gate, London.

THE BROADWAY STRATFORD 1927

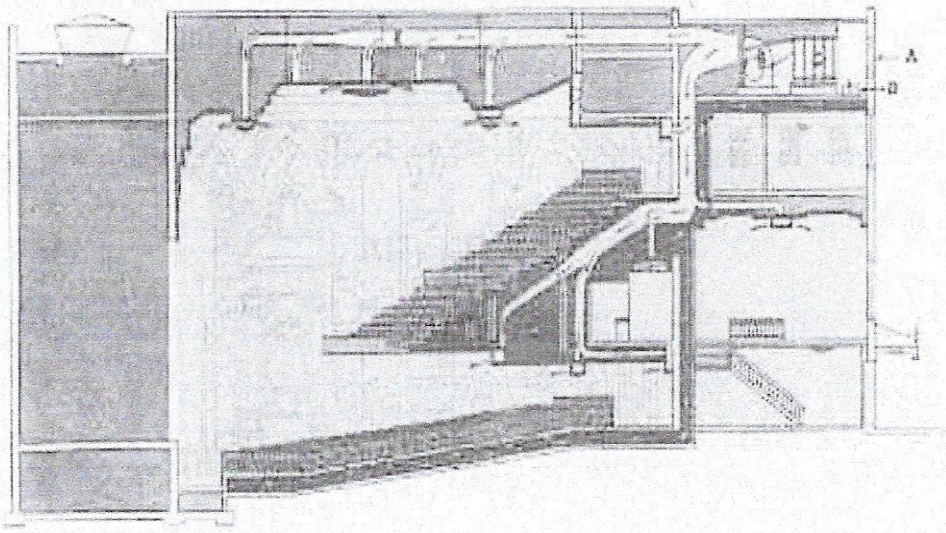
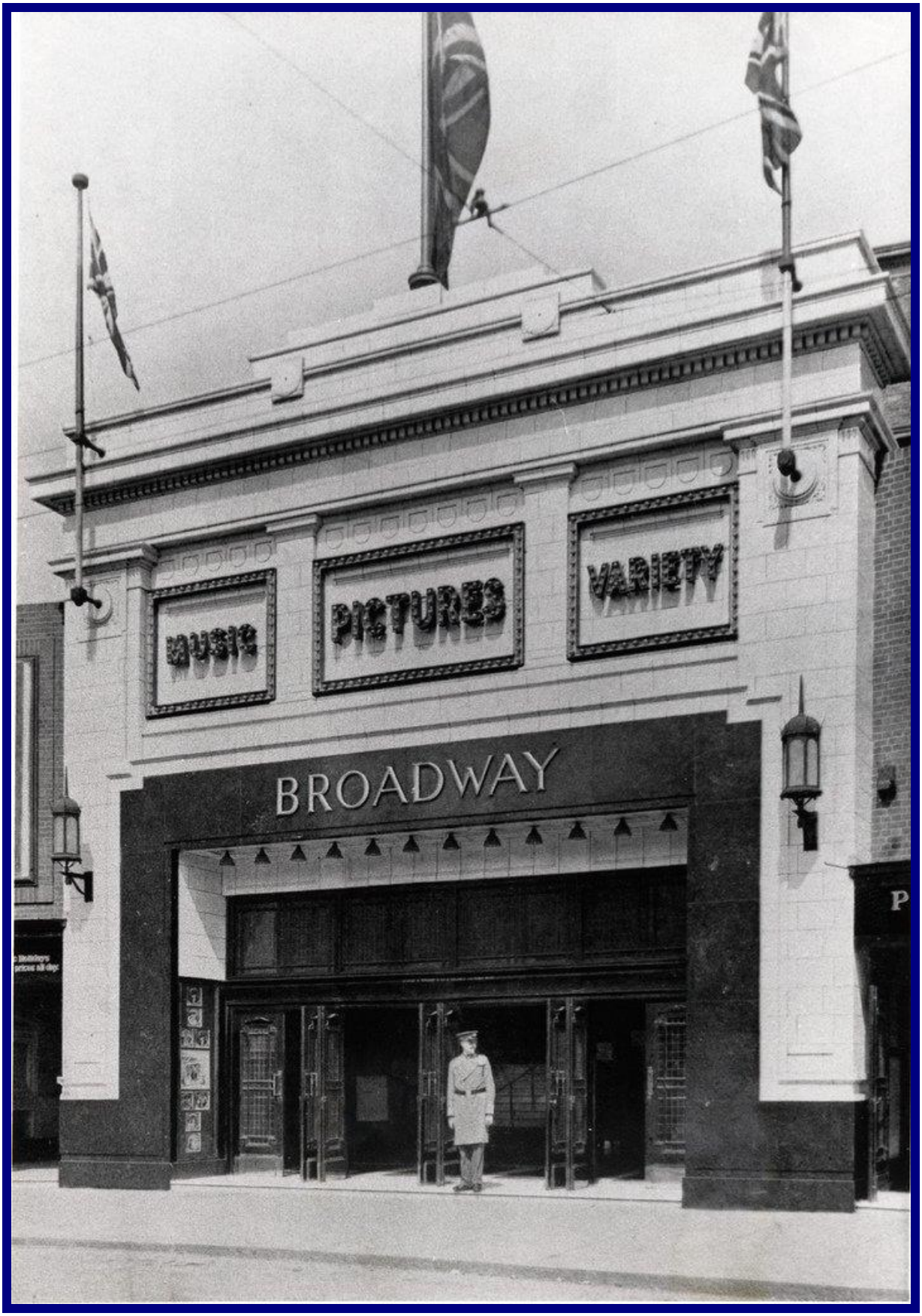


Diagram of Theatre Ventilated by Carrier Air Conditioning System

A *Fresh Air Inlet*
B *Fan*
C *Carrier Air Conditioning Machine*
D *Return Air Damper*
E *Main Supply Duct*
F *Return Air Duct*
G *Void under Balcony used for Return Air Duct*

Date Built/Opened: 1927
Seating Capacity: 2576
Architect: George Coles
HVAC Engineer: Carrier Engineering Company
HVAC System: Mechanical ventilation with air washer. The first cinema installation by Carrier, London and one on which the above diagram is thought to be based
Status: Bomb damaged 1940, re-opened 1941, closed 1960, demolished 1990
References: *Indoor Air by Carrier*, catalogue 1930s

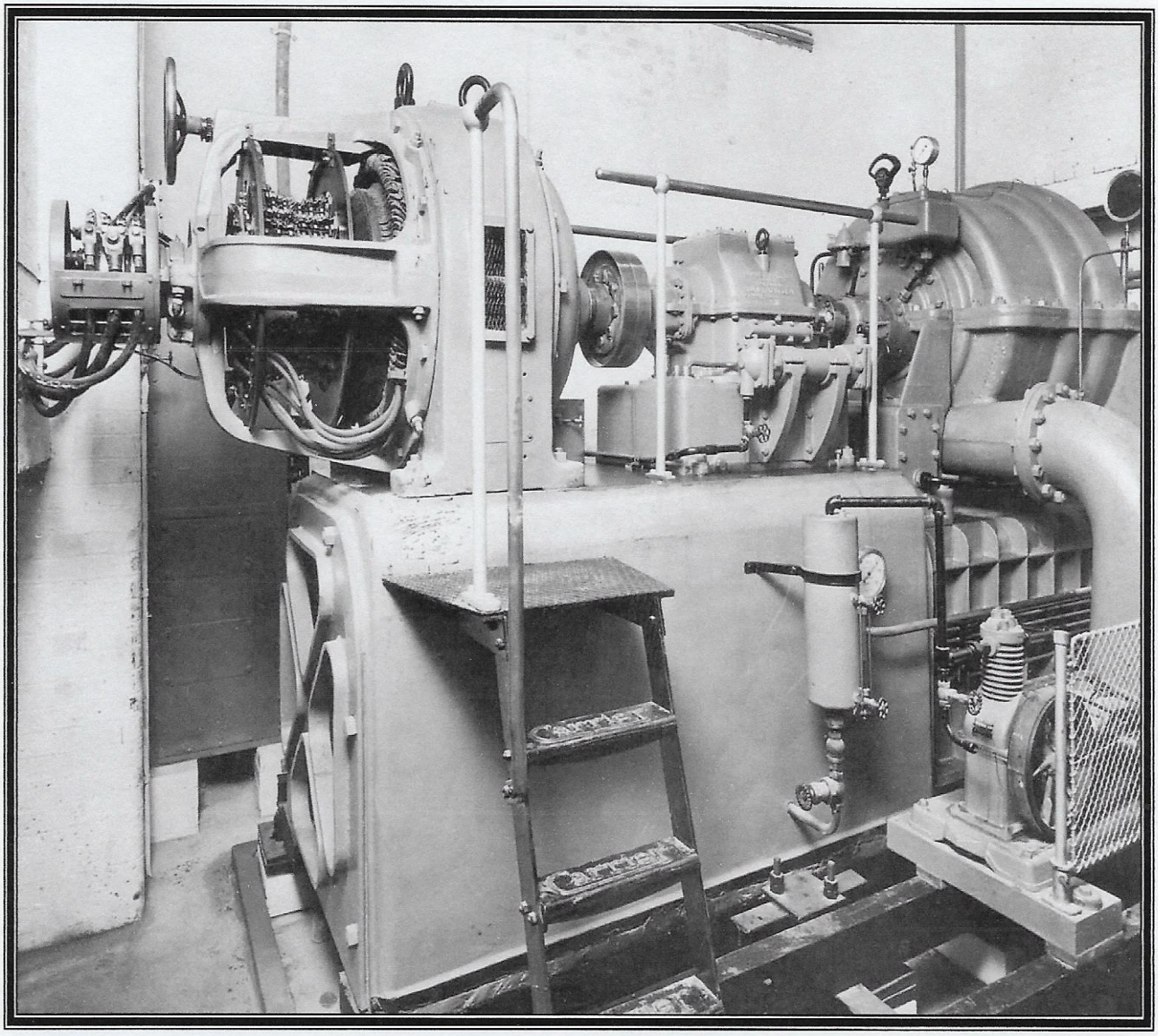
THE BROADWAY STRATFORD 1927



CARLTON THEATRE HAYMARKET 1927

Date Built/Opened: 1927
Seating Capacity: 1159
Architect: Frank T Verity
HVAC Engineer: Carrier Engineering Company Ltd, London
HVAC System: Air conditioning, with Carrier centrifugal chiller, the 4th to be installed in the UK. This was the first fully air conditioned cinema in Britain
Status: 1985 became a Cannon multiplex
References: CIBSE Heritage Group Collection

CARLTON THEATRE HAYMARKET 1927



The Carlton Theatre [Frank Verity, 1927] in London's Haymarket is believed to be as the first fully air conditioned cinema in Britain. The Carlton was designed for use either as a cinema, or as a live theatre (1159 seats). It opened with a stage production, but began showing silent films in March 1928. In 1929 it was wired for sound and became a cinema permanently. The Carrier centrifugal refrigeration machine (above) is stated as being the fourth to be installed in Britain.

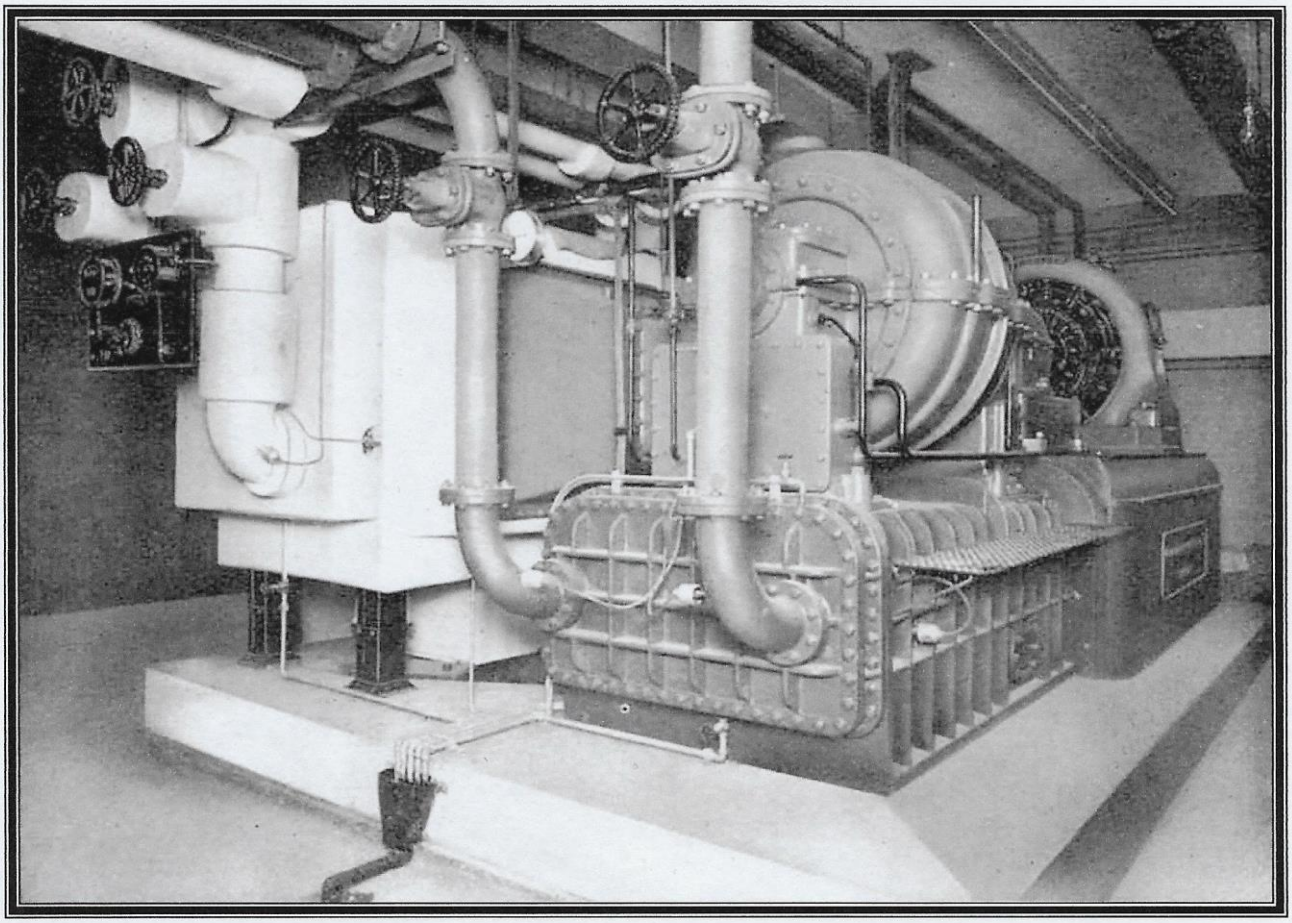
DAVIS THEATRE CROYDON 1928

Date Built/Opened: 1928
Seating Capacity: 3725, for a time the greatest in England
Architect: Robert Cromie
HVAC Engineer: J Jeffreys & Company Ltd
HVAC System: Mechanical ventilation, believed with air washer, not known if refrigeration included
Status: Closed May 1959
References: The Heating and Ventilating Engineer, January 1929

EMPIRE LEICESTER SQUARE 1928

Date Built/Opened: 1928
Seating Capacity: 3226
Architect: Thomas W Lamb with F G M Chancellor of the Frank Matcham practice
HVAC Engineer: Carrier Engineering Company Ltd, London
HVAC System: Air conditioning, with Carrier centrifugal chiller of 250 TR capacity
Status: Remodelled 1962, by George Coles
References: *Carrier Centrifugal Refrigeration*, catalogue, 1930s
London's West End Cinemas. Allen Eyles & Keith Skone, 1984.
Cinemas in Britain, Richard Gray, 1996

EMPIRE LEICESTER SQUARE 1928



Carrier installed air conditioning in London's Empire [Thomas Lamb with the Practice of the late Frank Matcham, 1928] in Leicester Square. Owned by Jury-Metro-Goldwyn (later MGM) the Empire super-cinema was built on the site of the Empire Music Hall which in 1896 had served as home to the moving pictures of Lumière's Cinématographe. Lamb's design for the facade was said to be based on his Albee cinema in Cincinnati while the lobby echoed his design for the air conditioned Capitol Theatre of 1920 in New York City. The original auditorium (3226 seats) was the largest of any in London's West End. Luxuriously decorated throughout in High Renaissance style, it came complete with a Wurlitzer organ and an elevating orchestra pit. The centrifugal refrigerating machine had *"a capacity of 250 ice-melting tons (880 kW)"*

EMPIRE LEICESTER SQUARE 1928

DECEMBER, 1928. *The Heating and Ventilating Engineer.* PAGE 136.

THE NEW "EMPIRE," LONDON.

THIS palatial Super-Cinema erected on the site of the old "Empire" Music Hall, in Leicester Square, was recently opened. It has a seating capacity of 3,500, and is the most luxurious and completely fitted cinema theatre in London.

The ventilation, warming and cooling is on a most elaborate and efficient scale.

The capacity of the Theatre is approximately one million cubic feet, and for ventilation purposes 250 tons of clean, invigorating air per hour are continually and evenly distributed throughout the Theatre to keep it cool and comfortable, both winter and summer. The air is warmed or cooled to suit the requirements of the moment, the temperature in the Theatre being automatically controlled, keeping constant conditions of both temperature and humidity.

The air is cooled by refrigeration equal to 250 tons of ice per day, this representing a block of ice 22-ft. cube.

The large modern Cinema Theatre does not need warming, but cooling, once the theatre is fully occupied; therefore, refrigeration which will require a 250 H.P. motor has been included in the ventilating equipment. The atmospheric conditions inside the theatre will be more comfortable than those prevailing outside, be it either winter or summer, afternoon or evening.

The greatest source of heat in the theatre is the audience, each group of 50 human beings radiating constantly a quantity of heat equivalent to that emitted by an average sized steam radiator. Then again, there is the moisture given off by the people, every ten human beings giving off 1 lb. of moisture per hour. Therefore, approximately 1,000 lb. of moisture are given off by the people during the showing of one

THE NEW "EMPIRE" CINEMA, LONDON.

Architects: Frank Hutchens & Co., and Thomas W. Lamb.
Ventilation, Warming and Cooling by Carrier Engineering Co., Ltd.

EMPIRE LEICESTER SQUARE 1928

programme. This moisture is the chief cause of the uncomfortable atmosphere experienced in most theatres. The air, therefore, must not only be cooled, but dried, *i.e.*, dehumidified, in order that a crisp invigorating and healthy atmosphere is at all times maintained, the patron leaving the theatre after the performance feeling refreshed both mentally and physically.

Uniform conditions throughout the whole of the house are maintained and the atmosphere at the back of the balcony is as good as that in the stalls.

The air is introduced at ceiling level, diffuses downwards and is finally exhausted through openings at the floor level.

Bearing in mind that the ventilating plant in a cinema theatre is called upon for cooling during 90 per cent. of the time, it is necessary that the entering air should be introduced at ceiling level. The cool, dry air must, of course, be admitted to the theatre at a temperature much lower than the temperature it is desired to maintain in the occupied zone, so that this air as it absorbs the heat from the occupants, the lights, etc., will be "warmed" to the temperature it is desired to maintain.

The fresh, cool air which enters overhead quickly absorbs the heat and becomes slightly warmer as it descends until it meets the hottest zone, directly above the heads of the audience. Mingling with the hottest air, the temperature of the downward stream is at once brought up to that desired and passes the audience at the predetermined temperature and humidity, finally passing through the exhaust openings at the floor level. Thus the occupants of the seats are never subjected to "cold" air, but are always surrounded by cool, dry air at precisely the temperature desired and this temperature does not vary, no matter how much it may be necessary to vary the temperature of

the entering air in order to meet the changing conditions within the theatre or the outside atmosphere.

The system employed in this theatre affords perfect cooling during the summer, dehumidifies the air and takes out the surplus moisture and warms the air as and when required, maintaining always health and comfort and an invigorating atmosphere.

The whole of the Ventilating, Warming and Cooling plant in the "Empire" was designed and installed by the Carrier Engineering Company, Limited, 24, Buckingham Gate, London, S.W.

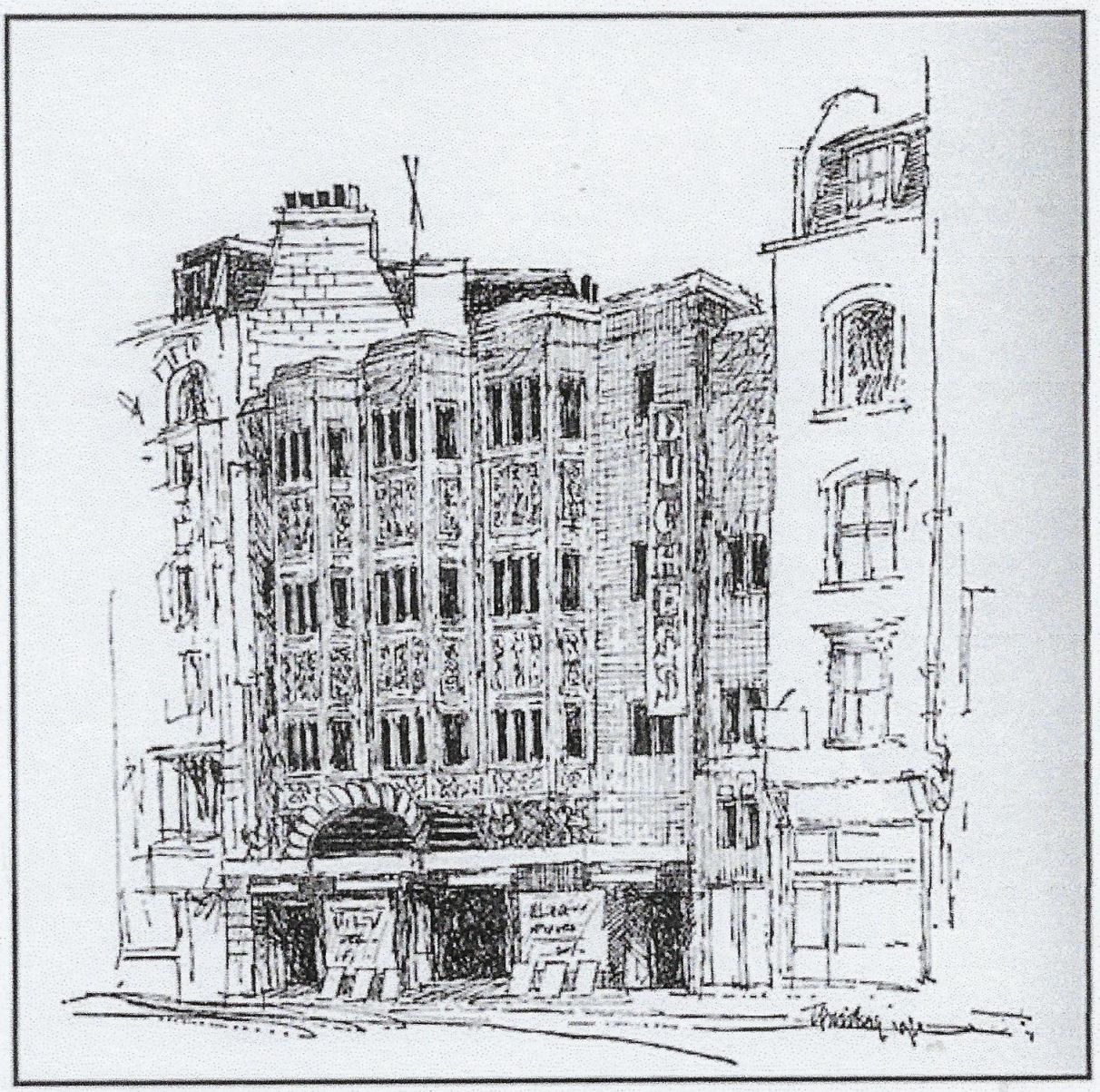
□

a pipe vice, with an adjustable head which enables the work to be set in the position best suited for the operator, and this position changed as frequently as required without removal from the jaws. Besides greater convenience and saving of time, the vice will accommodate jobs for which the usual fixed head vice is practically useless. By dispensing with the necessity for *both* a fitter's and a pipe vice is saved, frequently an important consideration.

Messrs. Mathew Ellis Ltd., showed a large selection of brass valves and tubes for gas, water and steam, also gas ovens and fires and circulating water cylinders.

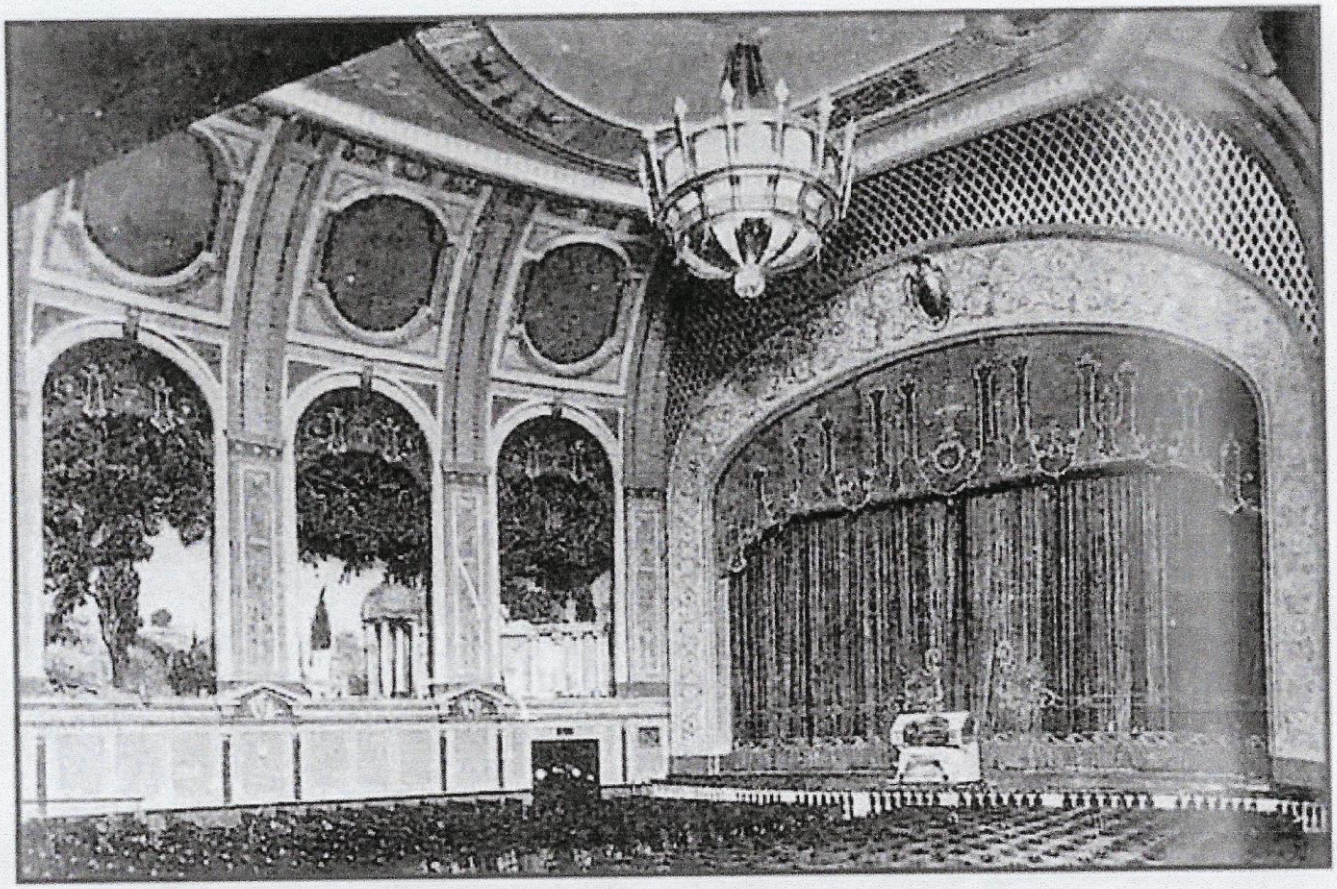
On this stand was also shown the "Speedy"

DUCHESS THEATRE 1929



Date Built/Opened: 1929
Seating Capacity: 491
Architect: Ewen Barr
HVAC Engineer: J Jeffreys & Company Ltd
HVAC System: Mechanical ventilation with air washer, not known if refrigeration included
Status: In use
References: The Heating and Ventilating Engineer, January 1931

COMMODORE HAMMERSMITH 1929

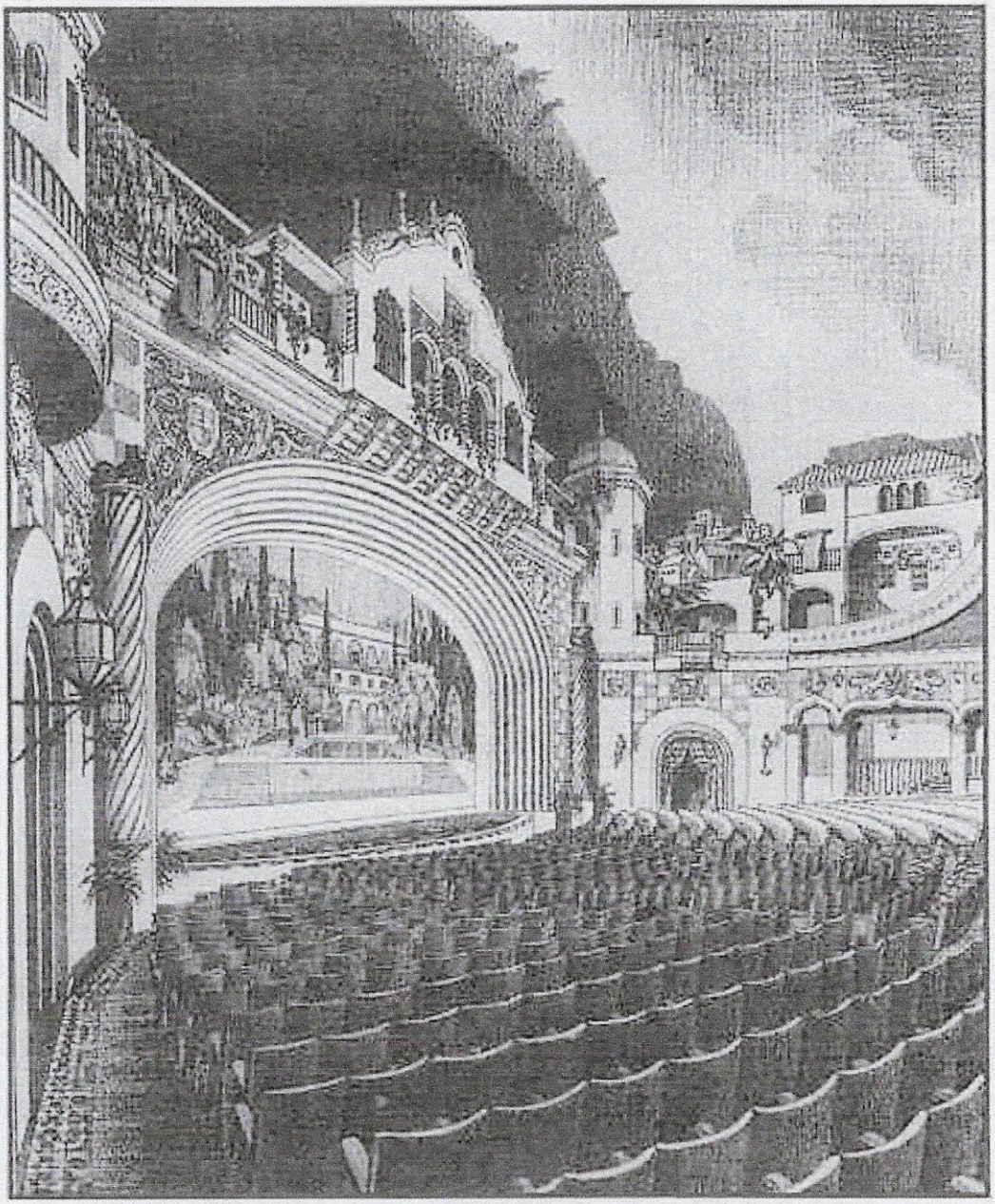


Date Built/Opened: 1929
Seating Capacity: 2884
Architect: George Coles
HVAC Engineer: J Jeffreys & Company Ltd
HVAC System: Mechanical ventilation with air washer, not known if refrigeration included
Status: Demolished
References: The Heating and Ventilating Engineer, January 1931

ASTORIA BRIXTON 1929

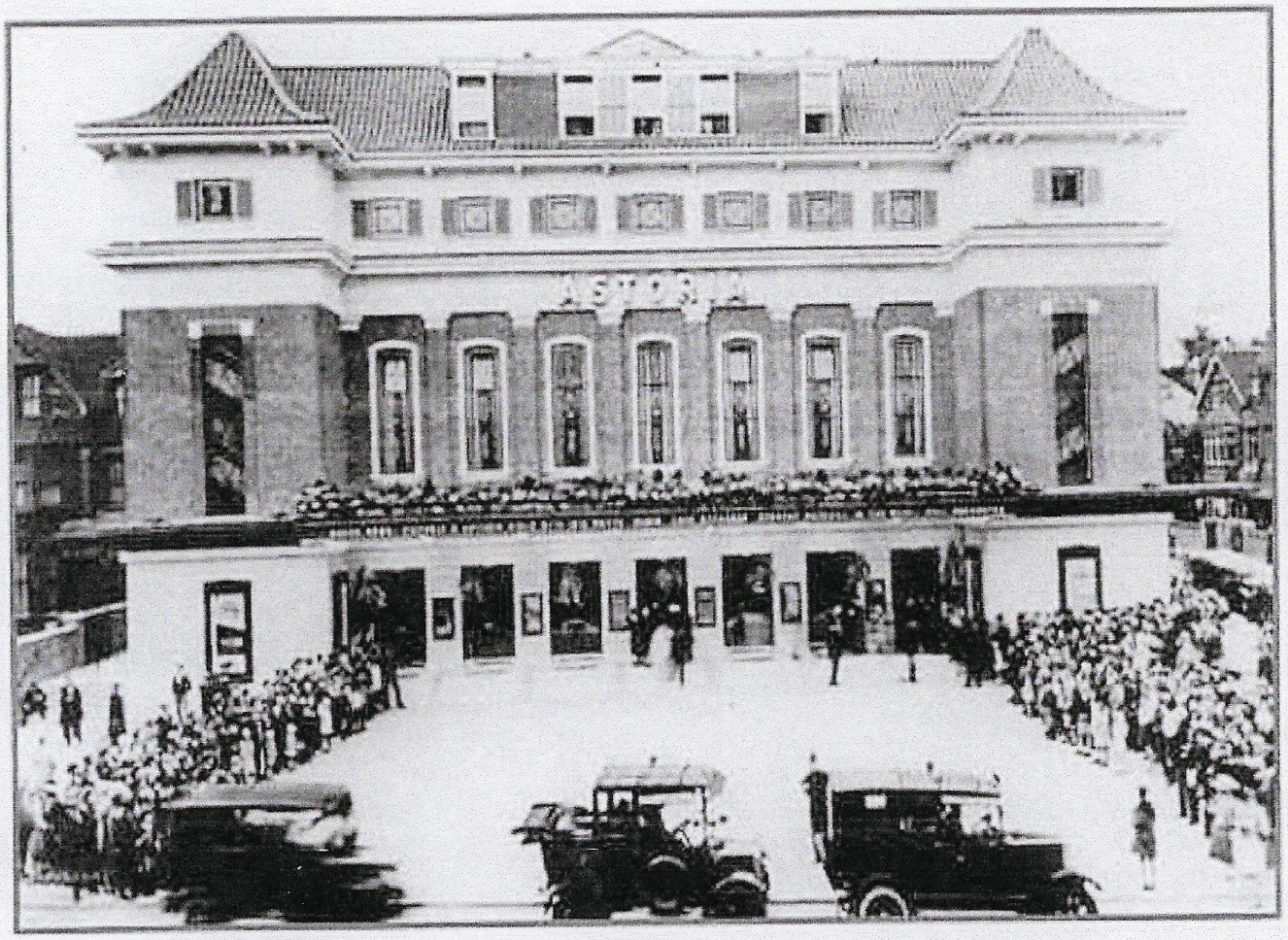
Date Built/Opened: 1929
Seating Capacity: nearly 3000
Architect: Edward A Stone
HVAC Engineer: Carrier Engineering Company
HVAC System: Mechanical ventilation, believed with air washer, no evidence discovered of refrigeration
Status: In use as a rock venue, listed building
References: *Cinemas in Britain,* Richard Gray, 1996

ASTORIA FINSBURY PARK 1930



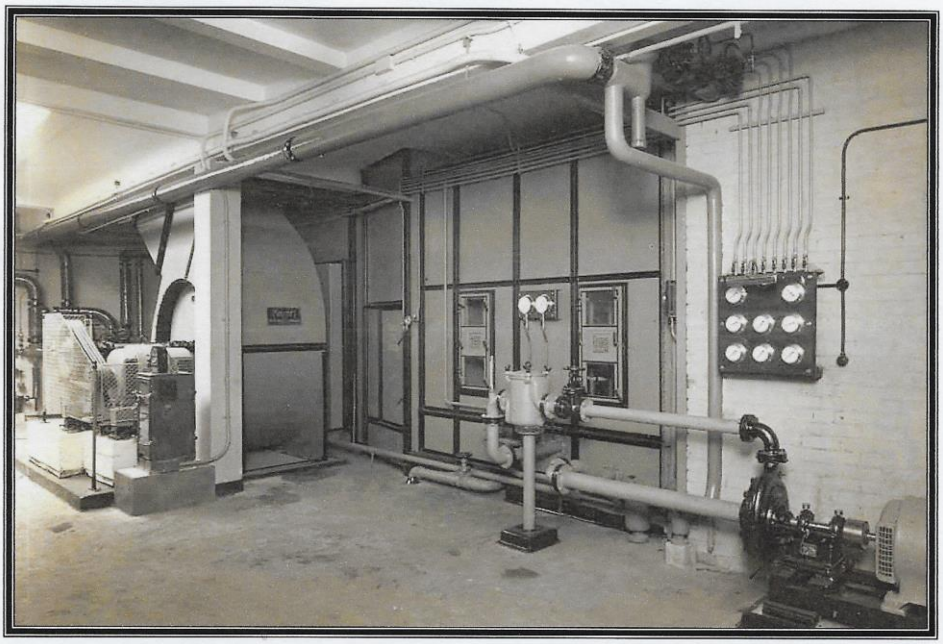
Date Built/Opened: 1930
Seating Capacity: 3300
Architect: Edward A Stone (a Spanish Moorish "atmospheric" design)
HVAC Engineer: Carrier Engineering Co Ltd, London
HVAC System: Mechanical ventilation with washer, believed without refrigeration
Status: Converted to church
References: *Indoor Air by Carrier*, catalogue, 1930s

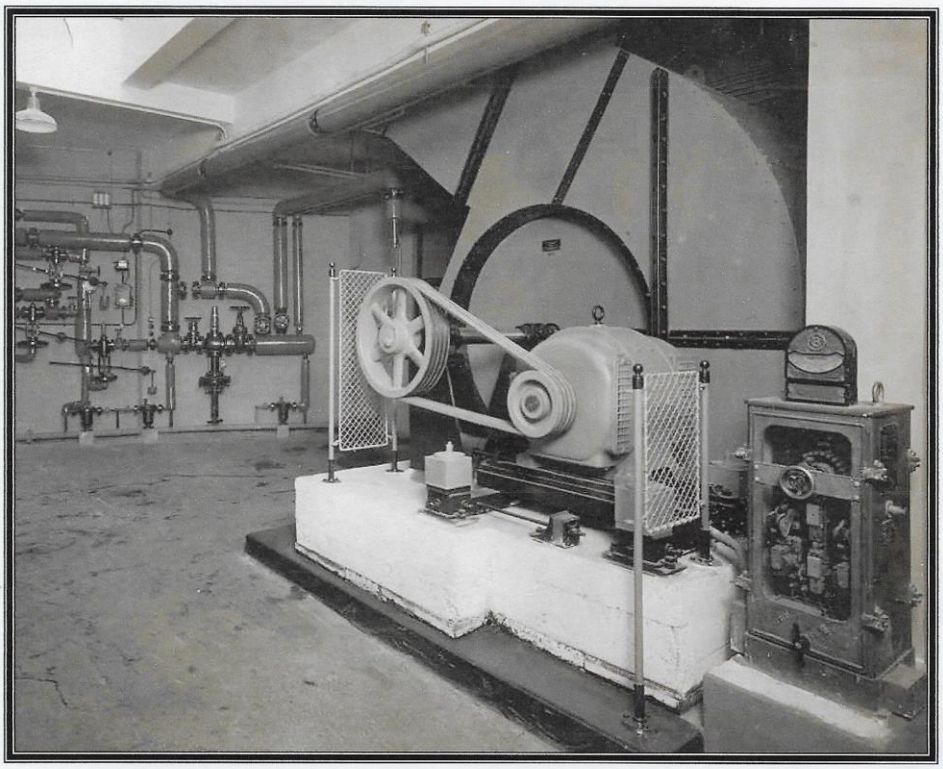
ASTORIA STREATHAM 1930



Date Built/Opened: 1930
Seating Capacity: 3000
Architect: Edward A Stone
HVAC Engineer: Carrier Engineering Co Ltd, London
HVAC System: Mechanical ventilation with washer, believed without refrigeration
Status: Converted to multiplex
References: CIBSE Heritage Group Collection

CAMBRIDGE THEATRE 1930





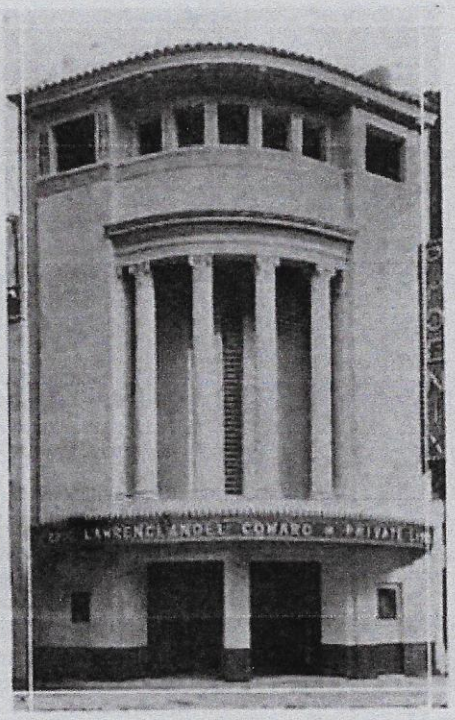
The Cambridge Theatre, London, 1930.

PHOENIX THEATRE 1930

THE PHOENIX THEATRE, LONDON.

THIS new house of entertainment is a striking addition to the ever-growing list of London theatres. Situated in Charing Cross Road, it occupies the site where once stood part of the works of a well-known firm of pickle manufacturers.

The theatre was designed by Sir Giles Gilbert Scott, F.R.I.B.A., Bertie Crewe, and Cecil Masey, F.R.I.B.A., who acted as associated Architects. The most modern theatrical equipment has been installed, and the warming and ventilation plant is of great interest.



Architects: Sir Gilbert Scott, F.R.I.B.A., Bertie Crewe, and Cecil Masey, F.R.I.B.A.
Warming and Ventilation: J. Jeffreys & Co., Ltd.

The ventilation is effected by the method known as the "downward" system, *i.e.*, fresh air is introduced at ceiling level, and the vitiated air exhausted at floor level. The warming of the theatre is effected by means of a pump circulated hot water radiator system fired by two oil-fired boilers. The whole of the central plant is accommodated at roof level.

Four motor-driven centrifugal fans are employed to ventilate the auditorium, these fans being made by Messrs. Matthews and Yates, Ltd., of Manchester.

The Plenum unit is capable of delivering about 2,200,000-cu. ft. of fresh air per hour to the auditorium, this being equivalent to 2,000-cu. ft. per occupant per hour. The air, after being pre-heated, is passed through a mist-type air washer, where it is thoroughly washed, and by means of which it can be cooled in the summer.

A system of ducts conveys this air to the auditorium, where it enters at high level, viz.: at the main ceiling and at the ceilings of the balcony and circle, and a certain amount of air is diverted into the entrance foyer.

Special provision has been made to ensure that the distribution of air within the auditorium is properly proportioned and a reasonably uniform temperature maintained throughout. The extraction of the vitiated air is effected by two motor-driven centrifugal fans situated on the roof also. These fans have a lower duty than the Plenum fan, in order to preserve a pressure within the auditorium to minimise draughts.

The main exhaust fan extracts air by way of mushroom ventilators in the rear portion of the auditorium, under the seats, and gratings in the risers of the balcony and circle steps. This air is collected by a second duct system, and discharged by the fans on to the roof. The remainder of the exhaust air is taken from the stage by a separate fan.

A third extract fan is situated over the proscenium arch. The duty of this fan is to come into operation under special conditions about to be described.

In accordance with London County Council fire precaution requirements, the Plenum fan, and three extract fans already mentioned, have their controls interlocked to ensure that they may come into operation in a prescribed order. The order of operation is as follows:

The fan over the stage must be started before any other can come into operation, and so is always running during occupation. The main extract fan starts when the Plenum fan starts, and is regulated *pro rata* with this fan.

When the fire curtain rises, a switch operated by the curtain stops the main extract fan, and starts the proscenium extract fan in its stead; the result of this arrangement is that any smoke produced from a fire in the auditorium is drawn towards the stage and away from exits, leaving the latter clear.

The whole of this equipment is covered by patents.

PHOENIX THEATRE 1930

The warming of the theatre is effected by the pump accelerated hot water system.

Two sectional cast-iron boilers made by the National Radiator Co., Ltd., and having a total heating capacity of 2,680,000 B.T.U. per hour, are installed in a boiler house on the roof. These boilers are oil fired by the "Parwinac" system. Two Matthews and Yates' blowers supply the air to the burners, and these are interconnected so that either may be used for either or both boilers at will.

The pipe circuits are divided into sections so that separate control can be obtained to different portions of the house, and also to each air heater.

Precautions against failure have been taken by installing the "Mercoid" thermostatic apparatus, which cuts off the oil in the event of any undue rise in temperature in the boiler or flue, or flame failure. Should fire originate in the boiler house, the melting of a fusible link will shut off the oil to the boilers.

The oil is stored in the basement, and pumped to the daily service tank, from which it is fed by gravitation to the boilers.

Special precautions have been taken to prevent the transmission of sound and vibration from the various machines installed. The ventilating fans and motors and also the boilers, blowers and pumps have all been mounted on special foundations, whilst spring suspension and texrope drives are used for many of the motors.

The boiler house has been specially insulated as a further precaution. Ducts and pipes are insulated where necessary with flexible joints.

The various salons and foyers are ventilated by local electrically driven propellor fans made by Messrs. James Keith and Blackman Company, Ltd.

The theatre temperature is kept under control by means of a number of Negretti and Zambra electric thermostats, situated at suitable points in the auditorium, which indicate these local temperatures in the boiler house. The heating control valves are all in proximity to this indicator, so that immediate adjustments may be made without leaving the plant room.

It will be seen that the main features of this installation are as follows: Quietness in running, flexibility and convenience of control, precautions against failure and fire.

The whole of this equipment has been installed by J. Jeffreys and Company, Ltd., of London.

THE HEATING OF ROOMS.

A LECTURE under the above title, forming Lecture II of the Cantor Lecture on "Modern Domestic Scientific Apparatus," was delivered on Monday, December 1st, by Professor Charles R. Darling, F.I.C., F.INST.P., in the Lecture Theatre of the Royal Society of Arts, John Street, Adelphi, W.C.1, who demonstrated his subject by the aid of a number of lantern slides and various types of heating apparatus.

During the course of his remarks, Professor Darling said that in fitting up new houses with heating appliances, it should be borne in mind that the prevention of smoke was an essential factor. At the present moment, in London, five-sixths of the smoke arose from domestic sources and the remaining one-sixth from

Phœnix Theatre. The Auditorium.

TROXY CINEMA STEPNEY 1933

Date Built/Opened: 1933
Seating Capacity: 3520
Architect: George Coles
HVAC Engineer: J Jeffreys & Co Ltd, London
HVAC System: Mechanical supply and extract ventilation with air washer; 110,000 ft^3/min total supply (84,000 ft^3/min to auditorium), 52,500 ft^3/min extract (30,000 ft^3/min from auditorium); radiator heating elsewhere.
Status: Closed
References: *Cinemas in Britain*, Richard Gray, 1996

TROXY CINEMA STEPNEY 1933

vertical type manufactured by The Cradley Boiler Co.

(*Pictures on page 2 of Coloured Supplement.*)

"TROXY" CINEMA, LONDON.

This latest addition to the already enormous number of places of entertainment serving the Metropolis is truly a super cinema in every sense of the word. One might marvel at so sumptuous a place being built in the East End of London, but it has been proved that the warmth, comfort and magnificent decoration of a building of this type form such strong attractions to patrons in the poorer neighbourhoods that they are almost a necessity to successful management.

The cinema is built on the site of an old brewery, and, in addition to films, is designed for the presentation of stage plays and musical productions. The architect was Mr. George Coles, F.R.I.B.A., who has designed many similar buildings, and it is noteworthy that the building was completed in twelve months.

As a result of many consultations between the clients, architect and engineers, every endeavour was made to produce perfect atmospheric conditions in the cinema with the result that for the ventilation a downward system was decided as being the best, Jeffrey's patent downward system being installed.

The principle of this system is that fresh air is blown in at low velocity through grilles in the ceiling of the auditorium and in the ceiling of the rear stalls under the balcony. Vitiated air is extracted through gratings formed in the step risers of the balcony and patent ventilators in the stalls floor connecting to ducts constructed under the floor. Incorporated with this are stage and proscenium extracts.

Under ordinary conditions, the auditorium fresh air and exhaust fans and stage extract fan run together and the proscenium fan does not operate.

The operation of the proscenium fan is by means of a switch fixed to the safety curtain. When the safety curtain is up the switch is in the "Off" position and as the curtain is lowered, the switch is thrown over and by means of relays to the automatic switch gear starts the proscenium extract fan and stops the main auditorium extract fans.

Therefore, it will be seen that in the case of a fire the safety curtain would be lowered, causing the switch to operate, start up the proscenium fan, stop the main auditorium extract but not the stage, and so extract air from high level over the proscenium arch forming an air movement towards the stage and preventing any fumes or smoke being blown down towards the audience.

There are also provided three emergency switches, one at the rear of the stalls, one at the rear of the balcony, and one in the Bio box in such a position that, if necessary, they can be operated by an attendant. All these have a similar effect, if thrown over, as the curtain switch.

Therefore, the whole plant can be put into emergency running conditions from any part of the building almost immediately should an occasion arise.

The air-washing and purifying plant, is installed at the front of the building, so as to draw fresh air from the main street, this being as required by the London County Council, and handles no less than 110,000 cu. ft. of air per minute, being provided with a preheater and water-heater, so that the air can be given the desired degree of humidity during the winter months.

Of this quantity, 84,000 cu. ft. of air per minute is delivered to the auditorium, being equivalent to 1,200 cu. ft. of fresh air per person per hour, the remainder serving entrance, vestibule and waiting spaces.

The distribution of this air into the theatre is arranged through sheet steel ducting in the roof space and balcony void, air-heaters being provided at various points so as to enable the temperature of the delivered air to be regulated at various parts of the house.

The main extract fans situated at stalls, basement and balcony level, handle a total quantity of 52,500 cu. ft. of air per minute; 38,000 cu. ft. of air per minute being taken from the theatre.

The proscenium fan extracts 38,000 cu. ft. of air per minute, the same quantity as extracted from the theatre by the main fans, and the stage fan extracts 25,000 cu. ft. of air per minute.

The whole of the vitiated air extracted from the building is discharged to atmosphere, none being re-used or re-circulated.

The heating for parts of the cinema other than the auditorium is provided by means of hot water radiators.

The boiler house is situated at basement level at the stage end of the building and houses two Economic Hot Water Boilers capable of supplying 6,500,000 B.T.U.'s per hour. These boilers are oil-fired and consume approximately 200 tons of oil during the winter months.

The oil burners are provided with automatic devices operating by means of thermostats. The boiler stat regulates the flame of the oil

TROXY CINEMA STEPNEY 1933

burners and keeps the boilers at a constant temperature. The flue stat operates the oil circulating pump, this being kept running only if the flue is hot.

For the purpose of starting when the flue is obviously cold and the stat cut out, a time lag switch is provided which allows the pump to be run for a period long enough for the flues to heat up and operate the stat and maintain the pump running.

The returns to all the various air-heaters and sections of house heating are taken back and valved to one common return header in the boiler house, each is provided with a thermometer so that the temperature of any part of the house can be adjusted from this point.

Adjacent to the boiler house is the control room, from which central point the temperature of various parts of the house can be read on an electrical indicating thermometer, of extreme accuracy, and as all the fans are controlled from this same room, the Engineer can ascertain the conditions in the house and vary them from here as necessary.

The whole of the starting switchgear is fully automatic and interlocked.

It is necessary, under any condition, to have the stage extract fan running, therefore, it is so arranged that to start the whole plant, it is necessary to first start the stage extract and then the remainder of the fans automatically start up in sequence and also the water circulating pump for the air washer.

The whole of the fans with the exception of the proscenium, which runs at constant speed, are controlled from one common speed regulating panel, making regulation of the plant as simple as possible and at all times equally balanced.

A Domestic Hot Water Boiler is provided in the boiler house complete with a fully automatic oil-burning unit serving the whole of the building.

An interesting feature of this system is that showers are provided in most of the dressing rooms.

The Warming, Ventilation and Hot Water Supply Services at the "Troxy" Cinema were designed and installed by Messrs. J. Jeffreys and Co., Ltd., of London.

(*Pictures on pages 3 and 4 of Coloured Supplement*).

NORTHUMBERLAND HEATH SENIOR SCHOOL.

The erection of this school marks the completion of the re-organisation of the schools of Erith, Kent. The school was built to replace old school buildings which had been in use since 1870, and now found unsuitable for present-day requirements.

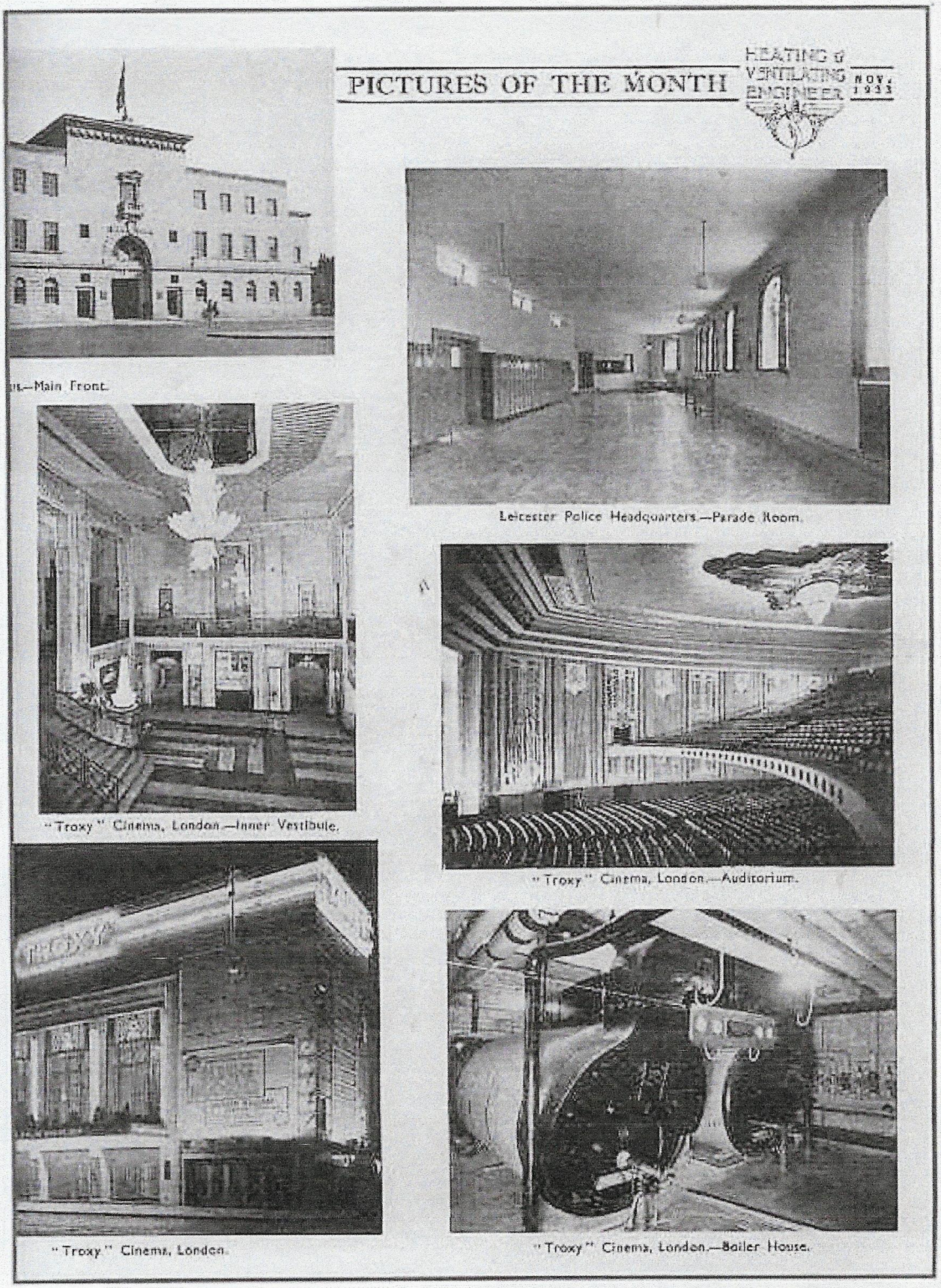
This new senior school for 1,040 children has received wide notice in the educational and daily press since it has a number of novel and up-to-date features. It has cost, inclusive of site, fencing, equipment, etc., about £60,000 in all, and was formally opened on September 28th by the Chairman of the Erith Education Committee, Councillor C. Whinnerah. The school was designed by Mr. Harold Hind, Architect and Surveyor to the Council.

The method of warming the school is by low temperature radiation produced from the Ideal Rayrad Panels. The system has been designed to give the equivalent comfort effect of 60° F. in the assembly hall, classrooms, teachers' room, etc., and 55° F. in the entrances, when the outside temperature registers 32° F., and it is assumed that ventilation is at the rate of three air changes in the rooms per hour.

The system generally consists of a battery of three Ideal "Britannia" cast-iron sectional boilers, fitted in the basement heating chamber fired by "Mastoker" automatic stokers using a cheap pea coal under air blast. The boilers are so inter-valved that either boiler may be isolated from the remainder and from this battery of boilers, flow water, which should be at a temperature of 180° F., rises to the top of the building and is distributed throughout the roof spaces of the various blocks. At numerous points, branch drops are taken down and connected to the Rayrad Panels, the returns from the panels continue down to trenches in the ground floor and lead back to the pumps and boilers, showing approximately a 20° F. drop throughout the system. This arrangement of pipework ensures a positive flow of hot water to each panel, and adequate venting of the whole system. The circulation of the water is assisted by means of electrically-driven pumps, in duplicate, fixed close to the boilers. The Rayrad Heating Panels are fixed at convenient points and heavily packed at the back with non-conducting covering material to prevent the heat being lost in the building fabric. The pipework in the roof spaces and trenches is also lagged to conserve the heat and so aim at economy in running costs. In the four cloak-rooms, heated cloak rails are fitted, constructed of galvanised tube and fittings. All warming panels and cloak rails are suitably valved so that they may be isolated if necessary, and also the various pipe circuits to the building are valved for isolating purposes.

The total capacity of the three boilers is

TROXY CINEMA STEPNEY 1933



PICTURES OF THE MONTH

HEATING & VENTILATING ENGINEER NOV. 1933

...—Main Front.

Leicester Police Headquarters.—Parade Room.

"Troxy" Cinema, London.—Inner Vestibule.

"Troxy" Cinema, London.—Auditorium.

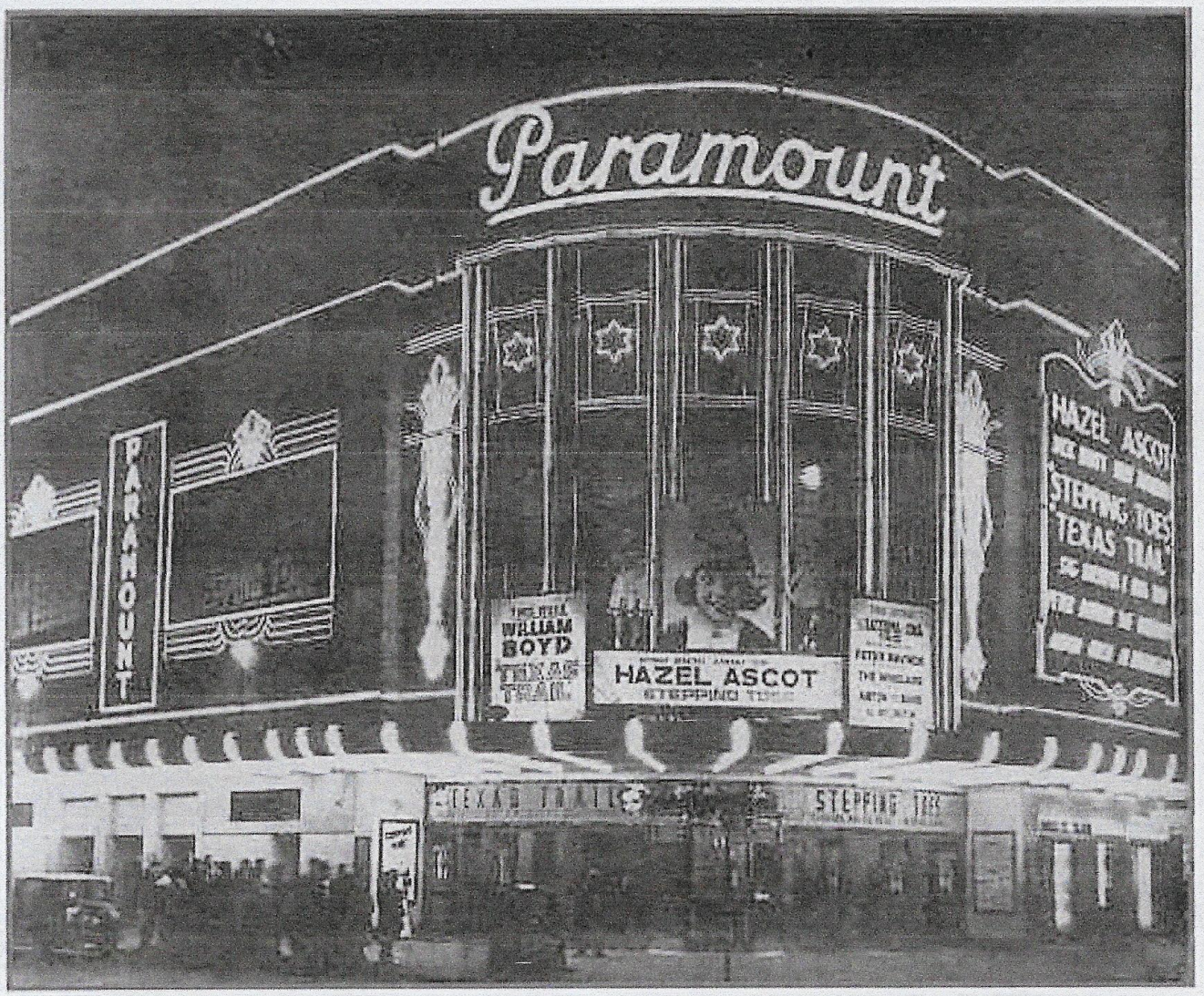
"Troxy" Cinema, London.

"Troxy" Cinema, London.—Boiler House.

GAUMONT PALACE CHELSEA 1934

Date Built/Opened: 1934
Seating Capacity: 2502
Architect: W E Trent & E F Tulley
HVAC Engineer: Unknown
HVAC System: Mechanical supply and extract plenum ventilation with washer
Status: Renamed Gaumont c.1937, renamed Odeon 1963, closed 1972
References: *Gaumont British Cinemas*, Allen Eyles, 1996

PARAMOUNT TOTTENHAM COURT RD 1936

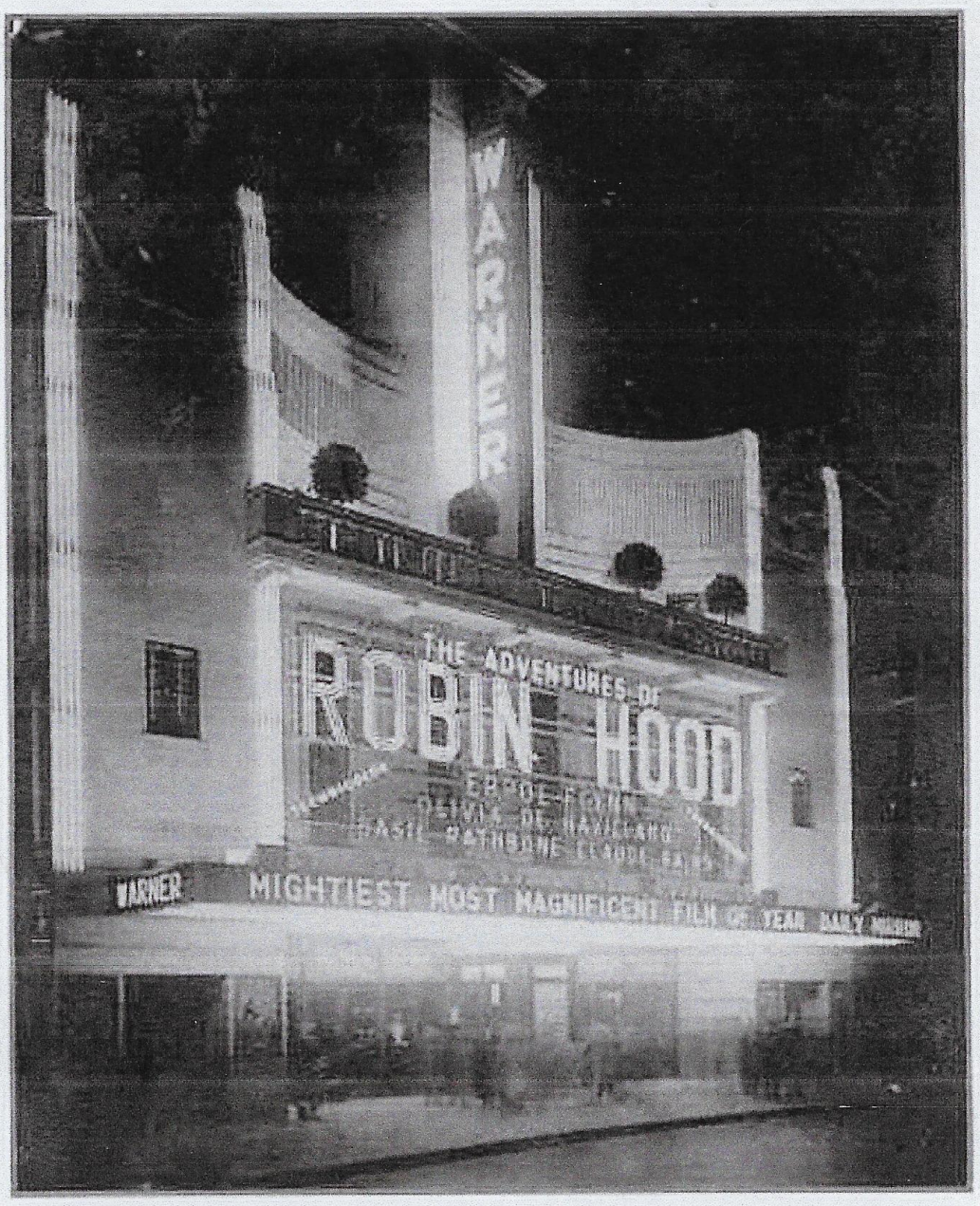


Date Built/Opened: 1936
Seating Capacity: 2568
Architect: Frank T Verity & Sam Beverly
HVAC Engineer: Carrier Engineering Company Ltd, London
HVAC System: Air conditioning, almost certainly with Carrier centrifugal chiller
Status: Renamed Odeon, closed 1960, demolished
References: *London's West End Cinemas*, Allen Eyles & Keith Skone, 1984.
CIBSE Heritage Group Collection

GAUMONT HOLLOWAY 1938

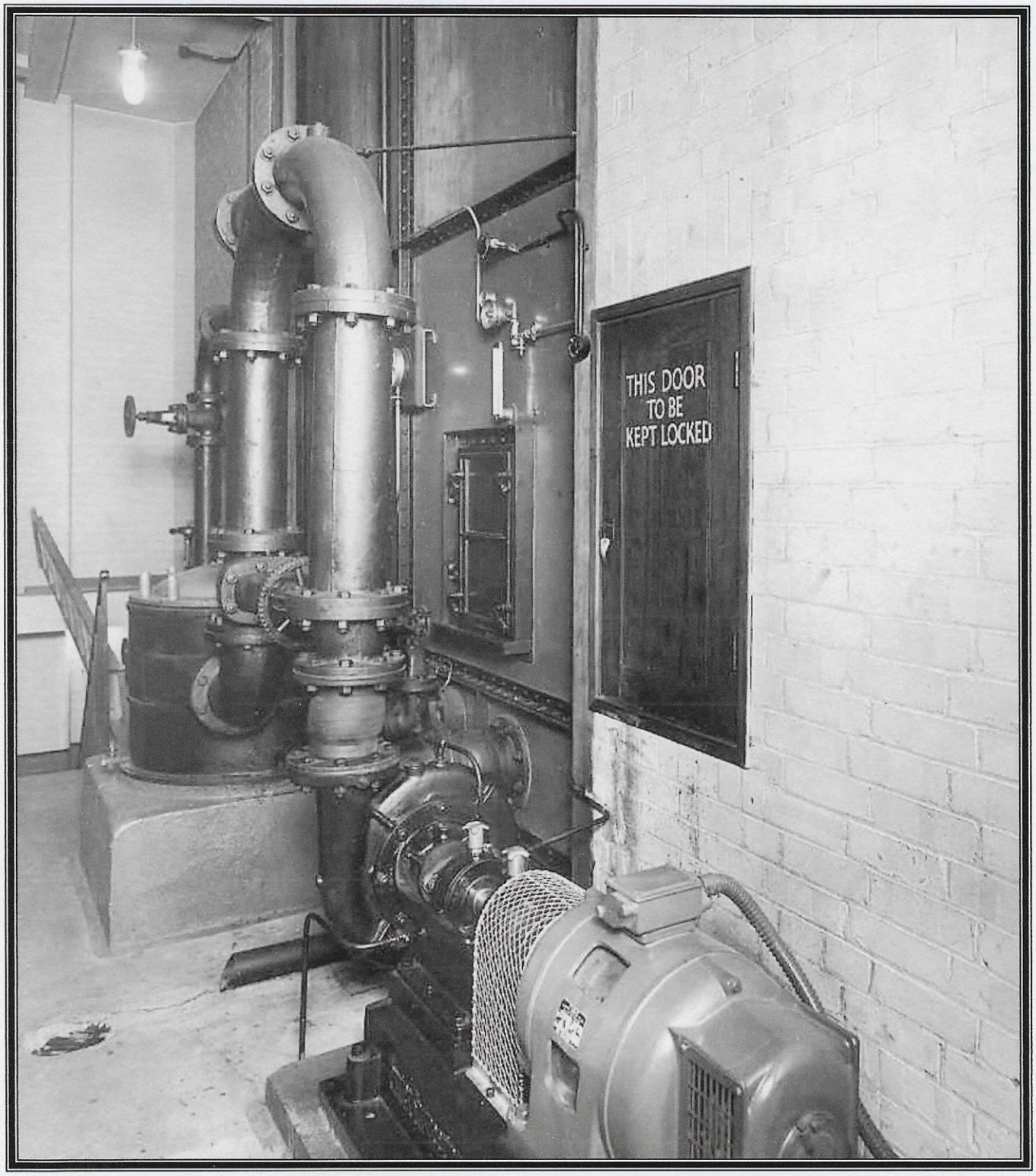
Date Built/Opened: 1938
Seating Capacity: 3006
Architect: C Howard Crane, alterations W E Trent
HVAC Engineer: John Evans (S & H) Ltd, London
HVAC System: Mechanical supply and extract plenum ventilation with washer, 73,000 ft^3/min
Status: Closed 1944 by bomb damage, reconstructed and re-opened 1958
References: *Gaumont British Cinemas*, Allen Eyles, 1996

WARNER LEICESTER SQUARE 1938



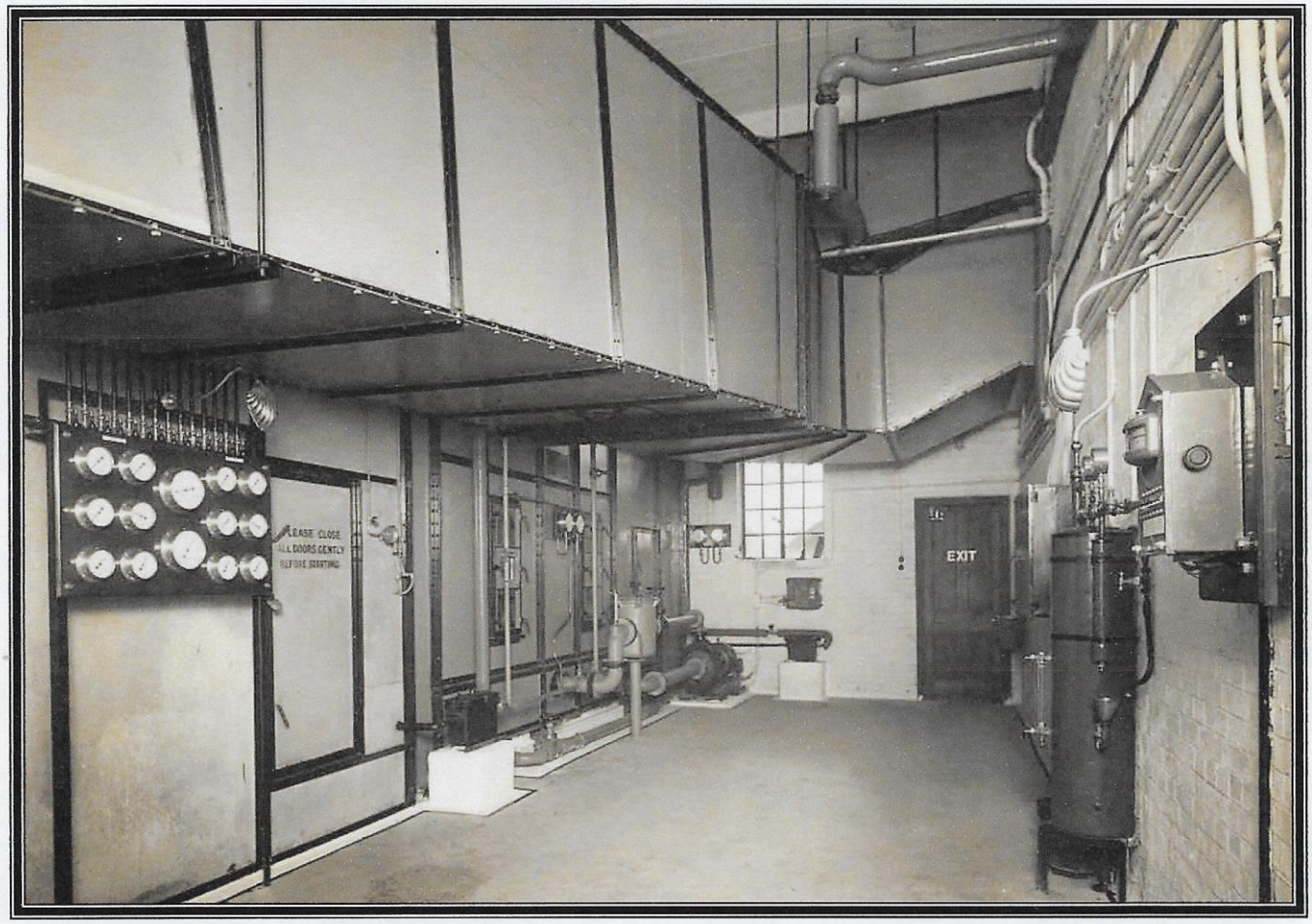
Date Built/Opened: 1938
Seating Capacity: 1789
Architect: Edward A Stone & T R Somerford
HVAC Engineer: Carrier Engineering Company
HVAC System: Air conditioning using a chilled water spray washer
Status: In use
References: CIBSE Heritage Group Collection

WARNER LEICESTER SQUARE 1938



Air conditioning was provided by a Carrier system using a chilled water spray washer.

REFERENCES AND FURTHER READING



The Astoria, Finsbury Park, London, 1930.

AIR CONDITIONING
LONDON CINEMAS AND THEATRES 1920-1935

1925 Theatre Cooling: Centrifugal Refrigeration and Air Distribution, Carrier Eng, Corp., Newark.
1930s Carrier Centrifugal Refrigeration (brochure), Carrier Engineering Company Ltd., London.
1930s Indoor Air by Carrier (brochure), Carrier Engineering Company Ltd., London.
1936 Modern Cinemas, The Architectural Press, London.
1942 A History of the Centrifugal Refrigerating Machine, W.A, Grant, *Refrigerating Engineering*, USA, February.
1952 Father of Air Conditioning: Willis Haviland Carrier, Margaret Ingels, Country Life Press, USA.
1961 The Theatres of London, Raymond Mander and Joe Mitchenson, Robert Hart-Davis, London.
1998 Air Conditioning America: Engineers and the Controlled Environment, Gail Cooper, The John Hopkins University Press, Baltimore.
1994 Heat & Cold: Mastering the Great Indoors, Barry Donaldson & Bernard Nagengast, ASHRAE.
2018 Air Conditioning American Movie Theatres 1917-1932, Brian Roberts, CIBSE Heritage Group*
*Website.

Sources of information for the London cinemas featured are given on a page-by-page basis.