JEFFREYS: CINEMA PROJECTS 1920s & 30s
Part-2

Troxy Cinema, Stepney, London

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, London

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 pre-heater 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, London

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

Granada Cinema, Maidstone

Date Built/Opened: 1934
Seating Capacity: 1750
Architect: Cecil Masey
HVAC Engineer: J Jeffreys & Co Ltd, London
HVAC System: Mechanical supply and extract ventilation with washer providing 6 air changes per hour
Status: unknown
References: The Heating & Ventilating Engineer, May 1934

Granada Cinema, Maidstone

" Selfix " pattern, designed for operating against a frictional head of 10-ft.

The hot water supply installation serving the various lavatory blocks is designed on the direct principle working by gravity. As in the case of the heating boilers, the hot water supply boiler is hand stoked, being of the " Ideal " No. 15D. pattern, bower-barffed.

This boiler is connected direct to a 130-galls. copper storage cylinder fixed adjacently. From the cylinder the secondary mains are run in solid drawn copper tube with screwed gunmetal fittings and circulations run to each range of taps.

The heating system is designed to give a temperature of 65° F. inside with an external temperature of 30° F. and three air changes per hour. Exceptions to this were made in cases where rooms are fitted with fireplaces when the designed temperature rise was reduced to 30° F.

The contractors responsible for the Heating, Ventilation and Hot Water Supply Installations were Messrs. The Brightside Foundry and Engineering Co., Ltd., of Birmingham.

(*See pictures on pages 2 & 3 of Coloured Supplement*).

THE GRANADA CINEMA, MAIDSTONE.

This handsome new cinema, with seating accommodation for 1,750, erected by Messrs. Bovis, Ltd., for Messrs. Bernstein Theatres, Ltd., presents a novel and unique idea in building construction, in that the general public are afforded the opportunity of seeing what arrangements have been provided for their comfort.

When the plans for the building were prepared, provision was made by the Architect, Mr. Cecil Masey, F.R.I.B.A., for the construction of a new road, known as Granada Street, terminating in a *cul de sac*, which would not only act as a car park and a place for queue accommodation, but a place where the public could see, in the form of a shop window, the whole of the plant which warms and ventilates the building.

The heating medium throughout is hot water supplied from two Britannia boilers of 3,500,000 B.T.U.'s capacity fired by two " Parwinac " P4 oil burners supplied by Messrs. Parker, Winder and Achurch, Ltd.

The installation really consists of an air conditioning plant for the cinema which delivers 2,000,000 cu. ft. of warmed fresh air per hour to the auditorium, the remainder of the building being heated by means of hot water radiators with the exception of the main entrance vestibule which is heated by invisible panel floor heating.

The heating of the auditorium is sectionalised, separate air heaters being provided for the various parts, the returns from each heater being brought back separately to a special heater in the boiler house, each return being fitted with a regulating valve for temperature regulation.

The café attached to the cinema is partly warmed by electricity and partly by low pressure hot water from the central boiler plant, while the ventilation is carried out by means of a separate installation which supplies six changes of fresh air per hour.

The finish of the installation is well illustrated in the photograph of the Control Room from which it will be seen that the floor of the boiler house is actually covered with linoleum, which would have been impossible with any solid fuel firing system to the boilers. The photograph also shows a good example of modern pipe covering by the Apex Insulation Co.

The whole chamber is floodlighted and the various parts are clearly labelled for the instruction of the general public. Particular attention may be drawn to the air washing plant, the air washer of which is fitted with a glass side so that the whole process of air cleaning is clearly visible to the public eye.

The conditioned air is delivered into the auditorium through a system of galvanised steel ducts and the vitiated air is extracted by means of a large motor-driven centrifugal silent-running fan supplied by Messrs. Matthews and Yates of Swinton, Manchester.

It will be observed that a telephone is installed at the Control Board which communicates with all parts of the house and this considerably assists in the efficient running of the plant.

The entire system of heating and ventilation is controlled by means of a special control panel on which is mounted an electrical distance temperature indicator by means of which the temperature at any point in the building can be read and recorded, thereby enabling the engineer to control the whole installation without leaving the boiler house.

The whole of the heating and ventilating plant were installed by Messrs. J. Jeffreys and Co., Ltd., of London, and the electrical work was carried out by Messrs. Bernstein's engineer, Mr. Pope.

(*See pictures on pages 3 & 4 of Coloured Supplement*).

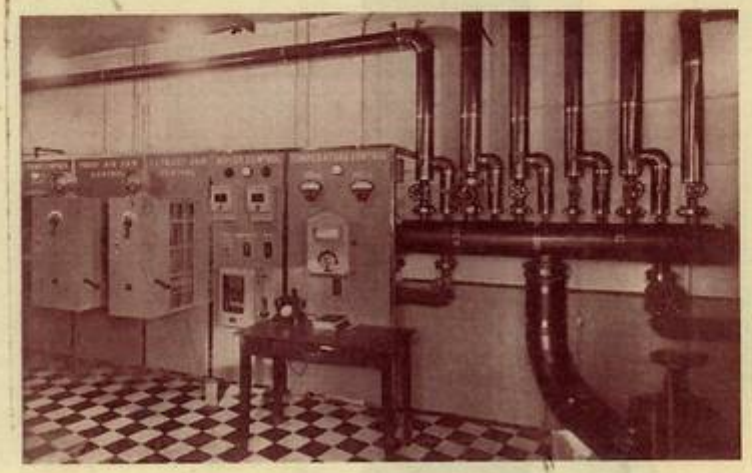
BEQUEST TO ESSEX CHURCH.—An American lady visitor to the fine old Parish Church at Thaxted, Essex, has bequeathed £4,000, to be spent in connection with the church. It has been decided to spend £1,000 in building a church hall, and £500 to provide a new heating system of the church, among other items including the necessary repairs to the fabric.

Granada Cinema, Maidstone

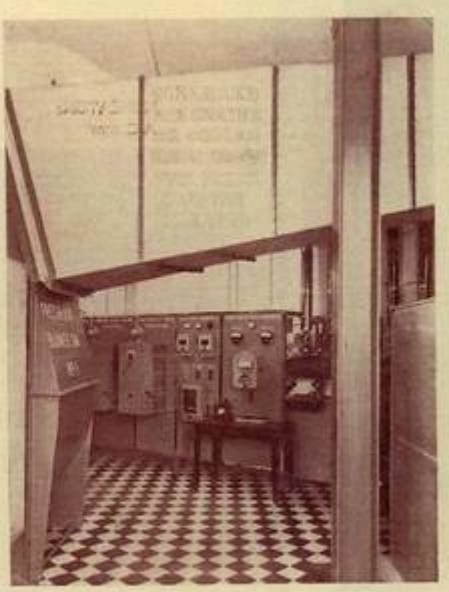
HEATING & VENTILATING ENGINEER
MAY 1934

PICTURES OF THE MONTH

"GRANADA" CINEMA, MAIDSTONE.



The Controls.



Blower Fan and Duct.

Air Washing Plant.

(Photos: Bedford Lemere and John Maltph)

Gaumont, Manchester

Date Built/Opened: 1935
Seating Capacity: 2300
Architect: William T Benslyn & James Morrison with interior décor by Theodore Komisarjevsky
HVAC Engineer: J Jeffreys & Co Ltd
HVAC System: Mechanical fresh air and exhaust ventilation with hot water radiator heating
Status: Closed 1974, demolished 1990
References: *Gaumont British Cinemas*, Allen Eyles, 1996

Gaumont Cinema, Manchester

PICTURES OF THE MONTH.

WALLINGTON TOWN HALL.

THIS recent addition to the already lengthy list of municipal buildings built during the last few years, was opened in September last, and is a building of more than ordinary distinction, designed by Mr. Robert Atkinson, F.R.I.B.A., acting in collaboration with Mr. S. F. R. Carter, Engineer and Surveyor to the Urban District Council of Beddington and Wallington.

The heating of the building is carried out by a low pressure accelerated system, the heating medium in the rooms being steel Convective Panels fitted below the windows and arranged with an air circulation passing through an air inlet in the skirting and passing out of a copper grille let into the window board. The mains for the installation are carried in the basement and utilised for warming purposes, the pipework on the upper floors being concealed in the building structure.

The Council Chamber is warmed and ventilated by means of a balanced system, the plenum and extract fans being accommodated over the Council Chamber roof in a Common Chamber. The air is filtered by a Visco Type Filter and is thermostatically controlled by a motorised valve working in conjunction with a thermostat in the chamber.

The air is carried into the building by sheet metal ducts on the Council Chamber roof, these connecting up to ducts in the building which are run to two inlet ducts on the ceiling. The extract outlets are situated at high level at the far end of the Council Chamber, the connections being carried back to the fan by two ducts on the roof.

The whole system is gas fired, two " Rex " boilers being employed for the heating and four " Empire " sets for the Domestic Hot Water.

The boilers have a total maximum gas consumption of 2,520 cubic feet of gas per hour. An electrically operated accelerator is fitted to the main return pipe of the boilers, which enables the water to circulate around the building in 20 minutes.

The hot water supply for lavatory basins and other purposes is obtained by the installation of a 300 gallon hot water storage cylinder attached to the hot water boilers. These boilers, which are thermostatically controlled, have a total maximum gas consumption of 320 cubic feet per hour. They are capable of heating the entire contents of the storage tank from 60° Fahr. to 140° Fahr. in about two hours.

The warming and ventilating system was installed by Messrs. A. J. Snelling and Co., of Hull, who supplied their own R/C Patent Decorative Steel Panels.

The following manufacturers supplied the principal items of apparatus :—

Boilers : Messrs. T. Potterton (Heating Engineers) Ltd.

Pump : Messrs. Pulsometer Engineering Co., Ltd.

Fans and Battery : Messrs. James Keith and Blackman Co., Ltd.

Thermostat and Valves : Messrs. The Drayton Regulator and Instrument Co., Ltd.

Filter : Messrs. Visco Engineering Co., Ltd.

(*See pictures on page 1 of Coloured Supplement.*)

THE GAUMONT THEATRE, MANCHESTER.

The heating and ventilation plant installed at the Gaumont Theatre, Manchester, was designed with a view to reducing to the minimum the operating difficulties without in any way impairing the effectiveness or efficiency of the system.

At street level, at the stage end of the theatre, has been constructed a building, in which is housed a complete air-washing and humidifying plant, the motor-driven Theatre Fresh Air Fan, the Boiler Plant and centralised Control Room. The whole plant is housed behind large windows which occupy the whole of the available wall space, and the apparatus is flood lit at night. The air-washing process may be viewed through a plate glass window in the side of the air-washer, which is over 13 feet high, a coloured flood light giving an artistic effect, which is visible to the public passing along the street.

Three million cubic feet of air each hour is cleansed, tempered and drawn into the fan, which weighs over three tons, and is driven by a motor developing nearly 25 horse-power. The fan discharges the air into a system of ducts in the basement under the stalls, in the roof space, and in the void under the balcony, the air being conducted to outlets, all of which are arranged at high level. Separate supplies are given to the rear, mid and front stalls, and the front and rear of the balcony. Each section is supplied with its own heater to warm the air as required, the control being effected and the result of control indicated in the Control Room.

The quantity of air delivered is varied according to the number of patrons in the theatre, and here again the regulators are installed in the Control Room. All the air is drawn away as quickly as it becomes vitiated through the step risers in the balcony, and through special

Gaumont Cinema, Manchester

mushroom ventilators fitted under the seats in the stalls. To ensure that consistent conditions are maintained even when patrons are standing at the back of the balcony, and back and sides of the stalls, further extra grilles are provided at high level in the auditorium.

The stalls foyer, balcony foyer, café and restaurant are each provided with a complete fresh and exhaust air system, the air being warmed by heaters regulated direct from the Control Room. The remainder of the building is warmed by means of radiators which are subdivided into circuits so that overheating may be avoided.

The Control Room situated at street level and visible to the public, contains a switchboard on which is mounted all the starting and speed regulating gear for the fan motors. Ammeters and pilot lamps show the engineer how each plant is operating, this being very necessary when it is remembered that the fans are situated at remote stations in the building, and are only visited by the engineer two or three times each day.

The Heating Control Panel includes no fewer than eleven circuits, each separately marked and provided with means of direct control. An electrical distance thermometer is mounted on the switchboard enabling the engineer to read at any time temperatures at 21 stations throughout the building. In this way, the engineer may watch not only the temperature in the theatre, but the effects of the variations made to the heater circuits without leaving the Control Room.

All the temperatures and operating conditions are recorded each half-hour on log sheets, and an automatic telephone is provided to enable the engineer to obtain information concerning the number of patrons in the house.

At lower ground floor level, but visible to the public, are installed two hot water boilers capable of generating over four million B.Th.U.'s per hour.

These boilers are fired by means of an automatic stoker specially designed for use with this type of boiler, and arranged so that hand firing may be employed if necessary. The fuel used is anthracite burnt under forced draught conditions, the whole plant being under fully automatic control. The starting and operating conditions are indicated in the Control Room. The question of filling the stoker hoppers with anthracite had to be carefully considered, as it is possible to burn as much as three tons of fuel each day. An electrically driven automatic elevator and conveyor was installed communicating between the fuel store and the boiler house, so that the engineer is able to fill the hoppers as required, merely by touching a button. The passage of the anthracite along the conveyor may be watched through a special glass cover which forms part of the conveyor casing.

Separate fresh air and exhaust fan systems are installed for the restaurant and kitchen. A unique method of ventilation is applied to the restaurant, the fresh air being admitted and distributed without draught, and in such a way that the atmosphere is always clear of smoke. The temperature is regulated from the main Control Room, where an indication is given of the operating conditions of the plant.

Special attention has been paid to the matter of sound absorption. All the plant is mounted in sound absorbing material, and the air velocities are such that even under full load conditions, no distraction is caused to patrons in the theatre.

The architects of the Gaumont Theatre were Messrs. Benslyn and Morrison, F/A.R.I.B.A., and the warming and ventilating plant was installed by Messrs. J. Jeffreys and Co., Ltd., of London.

The following manufacturers supplied apparatus :—

Boilers and Radiators : Ideal Boilers and Radiators, Ltd.

Stokers : Crosthwaite Engineering and Furnace Co., Ltd.

Fans : Fan Equipment Co.

Pumps : Holden and Brooke, Ltd.

(*See pictures on pages 2 and 3 of Coloured Supplement.*)

COVERED TENNIS COURTS, AMSTERDAM.

One of the latest developments in the world of sport is the erection of pavilions in which games hitherto played out of doors can be played indoors at all times of the day and in any Season.

Indoor, or so-called " covered " tennis courts have been in existence for many years, although their development has been retarded by the high cost of buildings large enough to house such an expanse as that needed for a full-size court, and by the difficulty experienced with artificial lighting. These difficulties now seem to have been largely overcome, the first named by reason of the fact that there is now a larger demand for indoor tennis and the second, because lighting engineers have perfected lamps that provide that type of illumination which enables fast ball games to be played in artificial light. In addition to tennis, the game of indoor bowls is also gaining in popularity and indoor bowling " greens " are springing up everywhere.

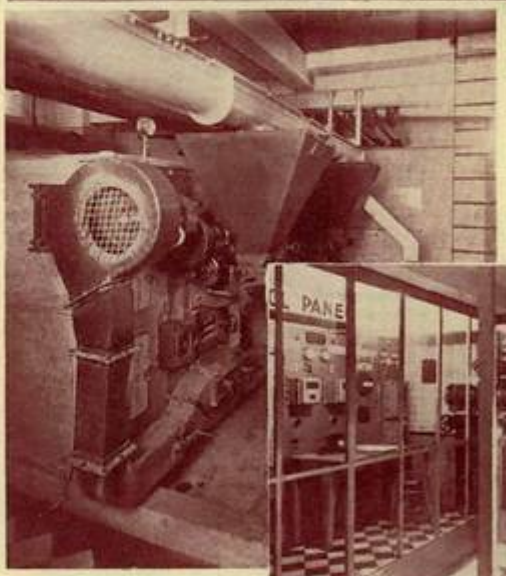
Gaumont Cinema, Manchester

HEATING & VENTILATING ENGINEER
FEB. 1931

PICTURES OF THE MONTH

GAUMONT CINEMA THEATRE, MANCHESTER.

(Right) Foyer.



(Right) Auditorium.

Boilers and Stokers.

View of Warming and Ventilating Plant from Public Window.