

Lighting Equipment News

Vol 9 No 3

March 1975

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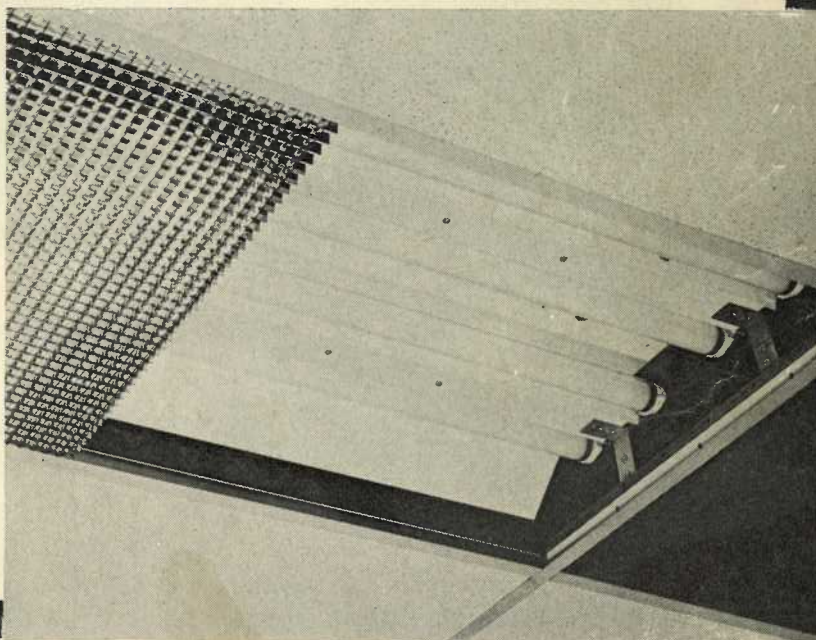
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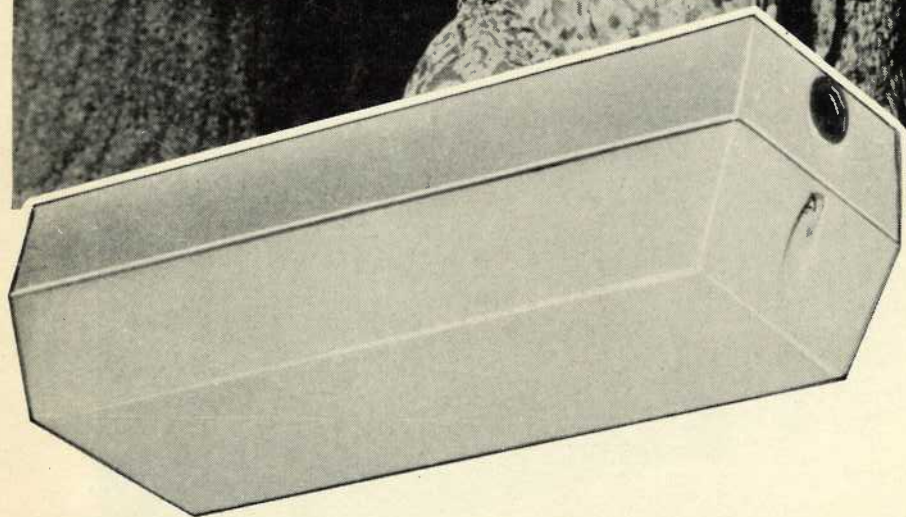
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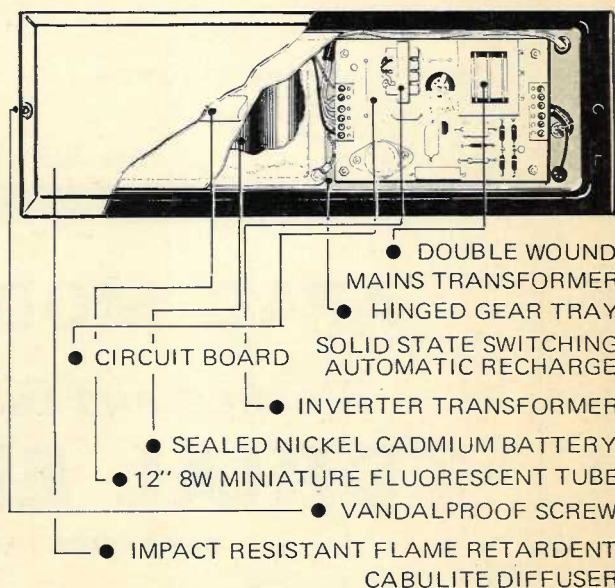


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Safety Regulations— latest position

ALTHOUGH the lighting industry is still awaiting publication of the new safety regulations for household electrical appliances, there has been a sudden flurry of activity to obtain clarification of the situation for manufacturers and retailers before the regulations become law.

At the time of writing, the regulations still have to go before parliament and the date on which they will become law is not known. However, because the regulations are being introduced as a statutory instrument under an existing Act (Consumer Protection Act), they are expected to be approved by parliament comparatively quickly. The date of operation could possibly be 1 May.

The Decorative Lighting Association has now had consultations with various bodies such as the Department of Prices and Consumer Protection and has just written to its members giving them technical guidance on the basic safety points that local authority inspectors will be looking for initially, such as no sharp edges on fittings that could cut into the cable, firm anchoring of the cable, etc. It has written along similar lines to retailers so that they have the most up-to-date information available, since manufacturers have been concerned that lighting buyers may hold back from placing orders because of uncertainty about the new regulations and so slow down trade before the regulations are even published.

A helpful, duplicated eight-page booklet which also gives guidance to manufacturers by setting out a summary of current and expected requirements for home lighting fittings has been produced by Collingwood-VLM Ltd. (suppliers of electrical accessories). Copies of this can be obtained free of charge from their address at 33 Alfred Place, London WC1E 7DP, telephone 01-636 2171.

Lack of information about the requirements from the Home Office and/or the Department of Prices and Consumer Protection has caused much concern in the decorative lighting industry. If small firms (and the decorative lighting industry consists almost entirely of small firms) have to comply at short notice with technical regulations of which they have no prior detailed knowledge, and existing stocks cannot be sold, they could be driven out of business through lack of capital to stay the course while models are being re-designed and stocks altered.

Drafts of the regulations have been circulated to trade associations, but a number of points were still unclear and in any case not all companies are members of a trade association. No information has been issued to the press by government departments, so companies cannot read about the expected requirements in trade journals such as this.

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Lighting Equipment News is a controlled circulation journal, and is sent free of charge each month to qualified readers, i.e., those concerned in an executive capacity with the design, specification, purchase, installation, operation, maintenance, distribution and sale of lamps, lighting fittings and accessories of all types for the lighting and domestic, industrial, commercial and public buildings, including display, street and specialised outdoor lighting. The qualifying job functions and industrial classifications are given on the enclosed Reader Application Form.

Paris says Tiffany



THE 10th international lighting exhibition (*Salon International du Luminaire*) was held in Paris from January 15 to 20. This year a new fashion trend swept the exhibition, everywhere one looked there were vividly coloured, mosaic Tiffany shades. The fashion pendulum on the Continent has swung from one extreme to the other, from the rather harsh monochromatic effect of chromium plating and white glass, to the colourful, elaborately designed, subdued lighting of late 19th century America. It is interesting that the Italians, who were leaders in the chromium and glass fashion, have not been left behind and were prominent among companies showing Tiffany styles.

As usual there was pressure on stand space, particularly as the adjoining hall was not available this time, the extra space being required for the furniture exhibition, because it was one of the alternate years when the furnishing event was international rather than national. By reducing as much as possible the space occupied by administration and visitors' facilities, 277 stands were accommodated. This compares with 316 in 1974 and 252 in 1973.

There were 135 French stands, while among the overseas exhibitors Italy had the largest number of stands with 45 companies represented; this was 16 less than the previous year.

The UK had 23 stands, or nine less than in 1974; almost all of these were taking part in the group scheme organised by the Decorative Lighting Association and the British Overseas Trade Board. Many British firms who exhibited last year did not take part this time, some because they now have established agents who show the fittings on their own stands, others because business was too slack. About half of the UK companies were therefore making their first appearance in Paris. Some of the newcomers reported, however, that business

was slow. The Continental taste in lighting is very sophisticated for the most part and it is essential to have the sort of designs that appeal to that market.

Spain, with 28 stands, also had nine less than the previous year. These figures seem to reflect the general economic situation and trading conditions in Europe, as well as the fact that space is short at the exhibition.

In describing individual stands this year, we have concentrated on companies whose products we have not previously mentioned, in order to introduce our readers to a wider range of overseas manufacturers. Further information about the fittings can be obtained by using the Reader Service Form inside the back cover and quoting the appropriate LEN number.

Tiffany lights

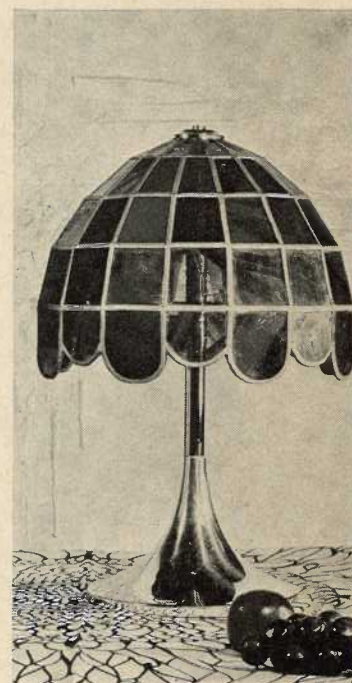
Each company exhibiting Tiffany shades had its own variations of decoration, shape or depth of colour and claimed advantages for its particular style. Some of the models had an inner diffuser in the form of a white opal globe.

The original Tiffany shades were made by a member of the Tiffany family, the famous New

York jewellers, in the 1880s. He made them more or less as a hobby and though they were sold, they were never mass produced. Richly coloured pieces of glass held together in a metal framework gave the dome-shaped lampshades an effect similar to stained glass windows. Most of the glass used was opaque, but some pieces were clear. The real Tiffany shades, we were told, gave a soft, very well diffused light that created a special 'Tiffany atmosphere'.

Certainly lighting fittings as colourful and attention catching as these, become an important item of furnishing in a room. This is in line with the Continental attitude to lighting fittings, so perhaps it is not surprising that this dramatic style has become popular there.

There has been a revived interest in Tiffany lights in America for about five years. In Britain, for about two years we have seen domed Tiffany shapes, some with fringe, but these have been almost all in lightweight



A Tiffany type table lamp by Biancardi & Jordan. The panels are described as multi-coloured crystal, the base is chromium plated

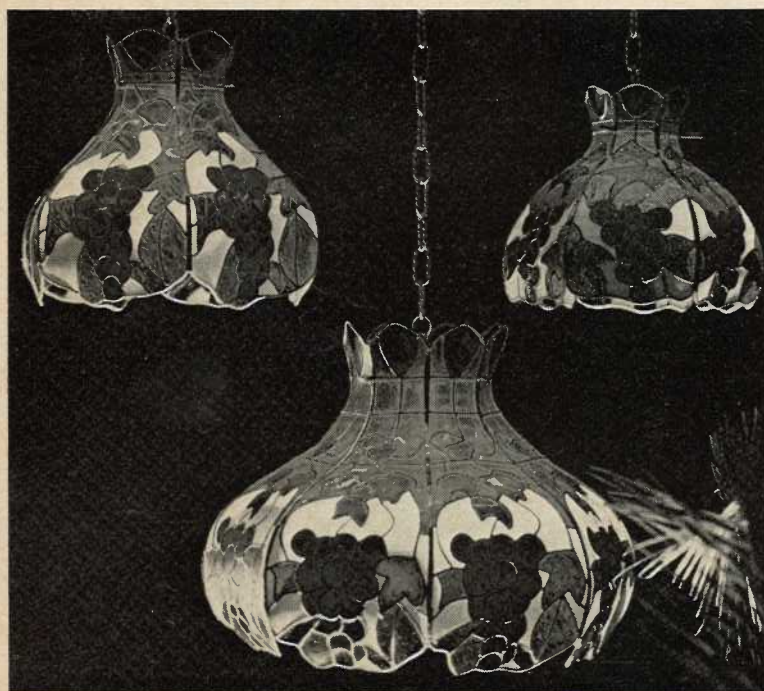


Right:

A pendant from one of the Tiffany ranges by Arte Vetro Italiana. This model, Tulip, is in dark coloured, clear glass



A pendant 450 mm in diameter in opaque glass, by Biancardi & Jordan



Tiffany type pendants in yellow, red and green by Flair

materials such as soft fabrics, moulded plastic or paper, and in pale pastel colours.

Arte Vetro Italiana SRL, Italy, was among the firms showing a wide selection of Tiffany lights in several styles. The company claimed that these were made in the same manner as the original Tiffany shades.

One range of pendants and table lamps was shaped like inverted buttercups with the glass petals set in a brass frame. Colours such as honey, pinky brown and soft violet were used for the petals and the colour was intermingled with white to give a streaky or water marked effect

to the glass. The pendants had a white opal spherical diffuser in the centre of the petals which further softened the light and enabled the pendants to be used above eye level without glare. There were three sizes, some with crowns, and 10 colours. This range was already selling well on the first day of the exhibition and AVI said it was competitively priced. Another range used dark coloured, clear glass with mosaic patterns of flowers set into it. Styles included shallow dish-shaped ceiling fittings suspended on chains.

LEN C401

The same company displayed its blown glass hanging lamps in opal, flowered or smoked glass, some on rise-and-fall fittings. There were also oil lamps with flower patterns on the glass.

LEN C402

Biancardi & Jordan SRL, Italy, also had a variety of Tiffany style shapes, some curved and others angular, some without crowns and others with tall crowns. They were made of panels of multi-coloured crystal held together in a lead framework. Matching wall lights were available and also table lamps with chromium plated bases. Most of the designs relied for effect on the multi-colour reflections in the material, but two incorporated pictures of fruit.

LEN C403

Biancardi & Jordan also make modern Italian style lighting in very original designs. Among new fittings this year were spotlights called Napoleon, because the shape of the reflector was

reminiscent of Napoleon's hat. Variations included ceiling fittings with two or three spotlights, a clamp-on light, wall brackets, floor standards with two, three or four lights, an arched floor lamp, and a floor-to-ceiling fitting that either supported one light on a slim wire, or several lights on a pole.

LEN C404

Deknudt, Belgium, showed Tiffany table lamps in plastic alongside its traditionally styled table lamps, floor standards, ceiling lights and wall brackets.

LEN C405

Flair, Italy, showed a large collection of glass Tiffany shades, mainly in gracefully curved shapes. Mixtures of yellow and red were predominant among the clear vibrant colours. The designs included pictures of roses, daisies, bunches of grapes, fishes, geometric patterns, playing cards and faces. There were matching wall brackets, and table and floor lamps on metal bases decorated with scrolls and foliage. The range included 1930s style dish-shaped ceiling fittings suspended on chains.

LEN C406

In addition, Flair exhibited copper and iron wall lights, chandeliers and oil lamps.

LEN C407

Glaswerke Haller GmbH, is a West German glassworks that supplies glass components to lighting manufacturers.

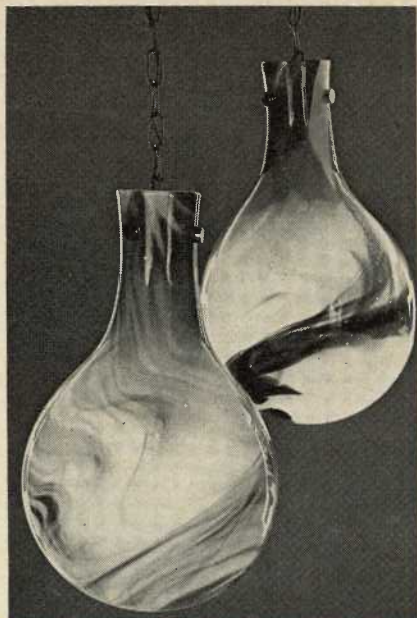
LEN C408

This year for the first time its Bramsche Division showed complete lighting fittings. The Pendel

range consisted of hand blown, pear-shaped pendants 470 mm tall. There was a choice of four colours intermingled with white opal. Because of the glass being hand blown, no two fittings are exactly alike, the interplay of the colours giving different patterns each time. As well as being used singly, these pendants could be grouped in large rooms or foyers. There was also a range of table lamps called Leonardo, with glass bases similar to the pendants just described, with a lamp inside the bases as well as in the lampshades. **LEN C409**

Tiffany pendants shaped like inverted buttercups had opalescent glass petals set in a soldered lead frame. Here again the colours were intermingled with white opal, the subtle hues included blue-violet, lemon and copper colour. White spheres in the centre of the petals diffused the downward light. The company regards its Tiffany lamps as the highlight of its collection of exclusive lighting and emphasises the skilful craftsmanship and quality of these fittings. **LEN C410**

Idées 2000, France, had an exotic stand which included Tiffany pendants made of brightly painted sea shells. Some of the shades did not have a continuous surface but had



Left:
The Pendel range of individually blown glass pendants from the Bramsche Division Glaswerke Haller

Right:
Tiffany pendants, also from Glaswerke Haller, with opalescent glass petals set in a lead framework



spaces between the motifs of flowers and fruit. A huge 'waterfall' chandelier of white circular sea shells dominated the stand and there were small matching table lamps, pendants and a floor standard. **LEN C411**

Lamp Fashion, USA, making its first appearance at the Paris exhibition, had a colourful stand with many Tiffany lamps in pendant, table and floor models. Each shade was made of a mixture of different types of hand-

made glass, mainly opaque but with an occasional piece of clear red glass included in the pattern. The glass was held together mosaic style, and all the pieces had a rippled finish on the inside. The shades diffused the light very well and the company told us that they gave the 'real Tiffany atmosphere'.

Set into some of the shades were representations in relief of flowers or fruit. Each pendant had three lamps which were individually switched by pull cords

of metal beads with a shaped bobble on the end. The metal bases were elaborate, the floor standards having bases shaped like classical columns.

Staff on the stand told us that the company's Managing Director in New York had a valuable collection of genuine Tiffany lamps and that the lights they were selling were inspired by original Tiffany designs. **LEN C412**

Morel, France, showed tor-

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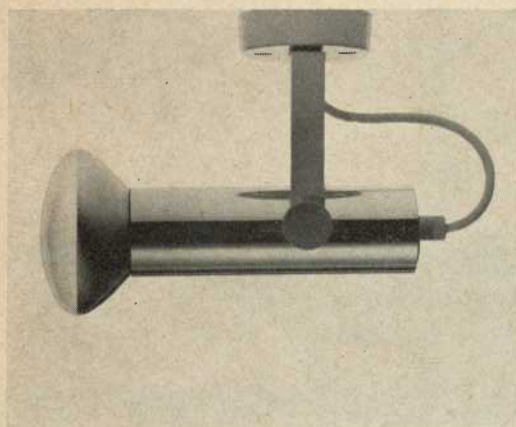
Perfect chimneys of perfect Czech glass are even in the atomic age a needful and necessary article.

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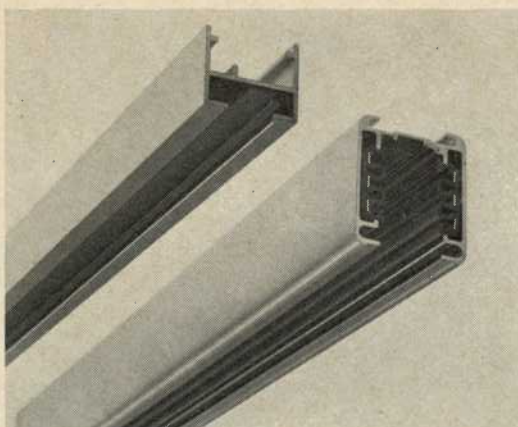
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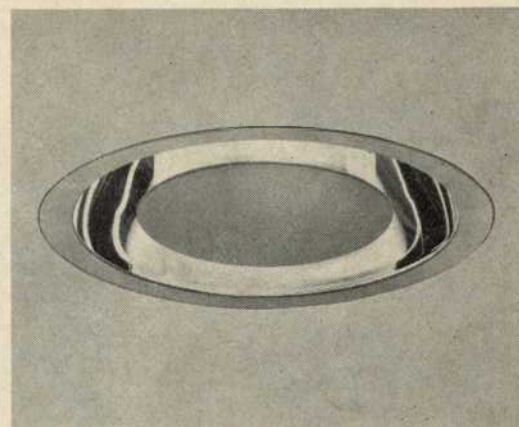
IT LOOKS AS IF 1975 WILL BE ANOTHER EXCITING YEAR.



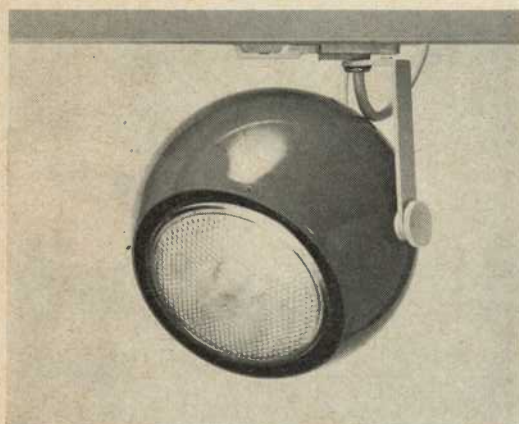
1961 UNIVERSAL SPOT
Council of Industrial Design Award.



1963 LYTESPAN 2 **1973 LYTESPAN 7**
Bundespreis.



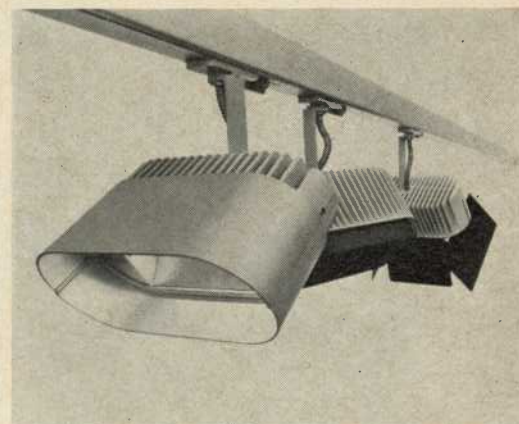
1965 SPILLRING



1968 LYTESPHERE



1970 QUADRILLE



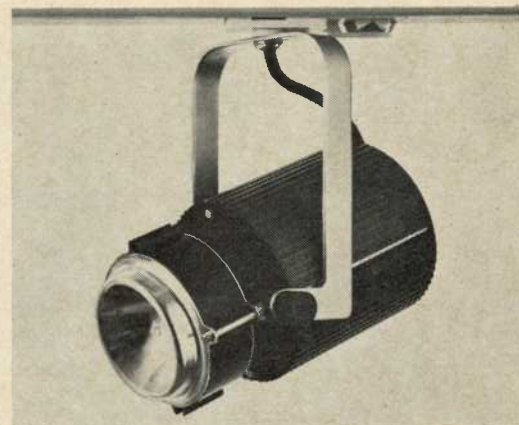
1971 POWERFLOOD
Council of Industrial Design Award.



1973 EUROSPOT
Design Council Award.



1974 FLAMINGO



1975 LYTELAB

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toiseshell Tiffany lamps. Other ranges from this company are in painted wood and in metal. A wide range of lampshades is supplied in many styles and materials. **LEN C413**

Fluorescent news

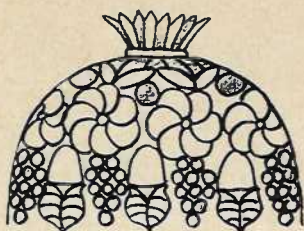
It is unusual to see any fluorescent lighting at the Paris exhibition; on the Continent there is still a strong feeling that fluorescent lamps do not give a sufficiently warm light for the home. This year, however, two firms included fluorescent lighting in their displays. It will be interesting to see if the energy shortage eventually results in more fluorescent lighting in the home to save power.

Ateljé Lyktan AB, part of the Fagerhult International Group in Sweden, showed a range of fluorescent fittings specially designed for modern interiors and which are being promoted under the theme that energy is scarce and it is important to develop more energy-saving equipment.

Models for the domestic market were suspended on two cables and had adjustable, cylindrical reflectors in a choice of 10 bright colours. Two lamp lengths were available, each fitted with small-cell louvres. They would look particularly good hung low over a breakfast bar or table in the kitchen, where they would match modern kitchenware. Other applications include lighting cork boards in children's rooms, or desks.

For the commercial and industrial markets there was a range called Supertube in four sizes of lamp. These fittings had brightly coloured or polished aluminium cylindrical reflectors that could be adjusted through 355° to direct the light where it was required. They can be suspended on chains or cables, or wall or ceiling mounted. Louvres are available as an optional extra. A special feature of this range is that the fittings can be joined together into continuous runs, or squares, or other formations by using a range of pvc couplings that includes T-joints, 90° and X joints. This means that a network of fluorescent lighting can be suspended at a chosen height in a high ceilinged room. Other applications include individual fittings hung low to provide local lighting, wall mounted for display lighting, or coupled fittings mounted in patterns on the ceiling.

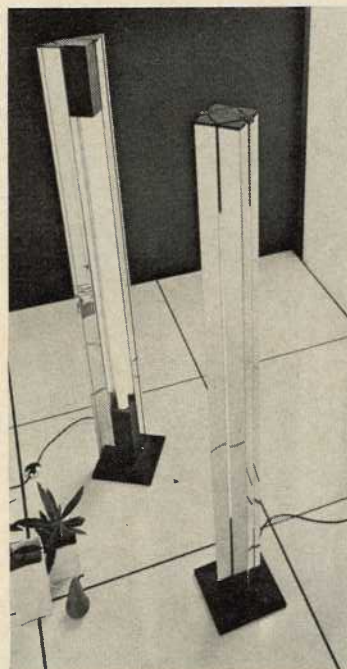
A series of elegant modern desk lights also used fluorescent lamps. These slim, L-shaped fittings were seen with three alternative bases: a circular free-standing base, a clamp fixing, and a base in the form of a pen tray. A 13 W tube was used in



A Tiffany shade of painted sea shells, by Idées 2000



Table lamp with suspended sea shells, by Idées 2000



Fluorescent floor standards by Fili. Martini

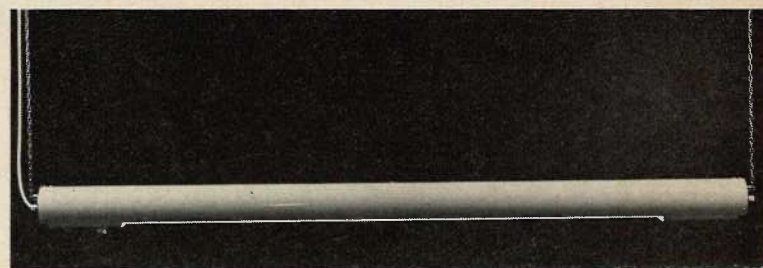
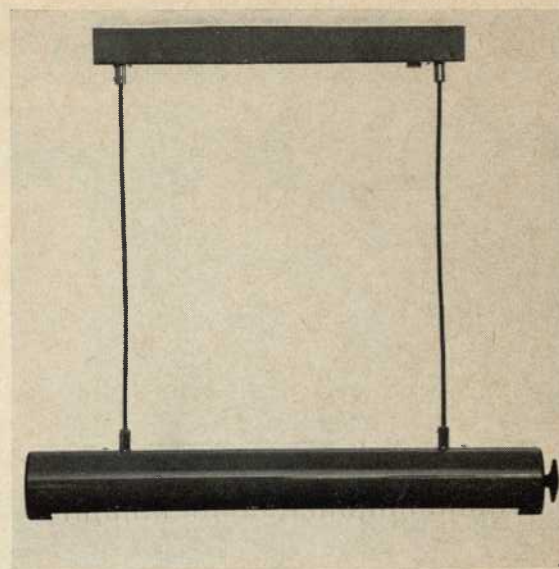
Colour 27 and the lights were again available in gay colours.

Lyktan's UK agent is Associated Aims. **LEN C414**

Tungsten lighting fittings were also shown by Lyktan in plastic. There were modern pendants, wall lights and table lamps. **LEN C415**

Fili. Martini, Italy, among its display of ultra modern Italian designs had fluorescent floor standards. These 1630 mm tall fittings had a series of slim, linear, stainless steel reflectors grouped around the lamp leaving slits of light in between them. One side of the fitting was open

Right:
Lyktan's brightly coloured fluorescent fitting for the home



Supertube fittings by Lyktan can be joined into patterns to form a network of fluorescent lighting



A fluorescent desk light by Lyktan

allowing maximum light to shine on a wall or object to be illuminated. **LEN C416**

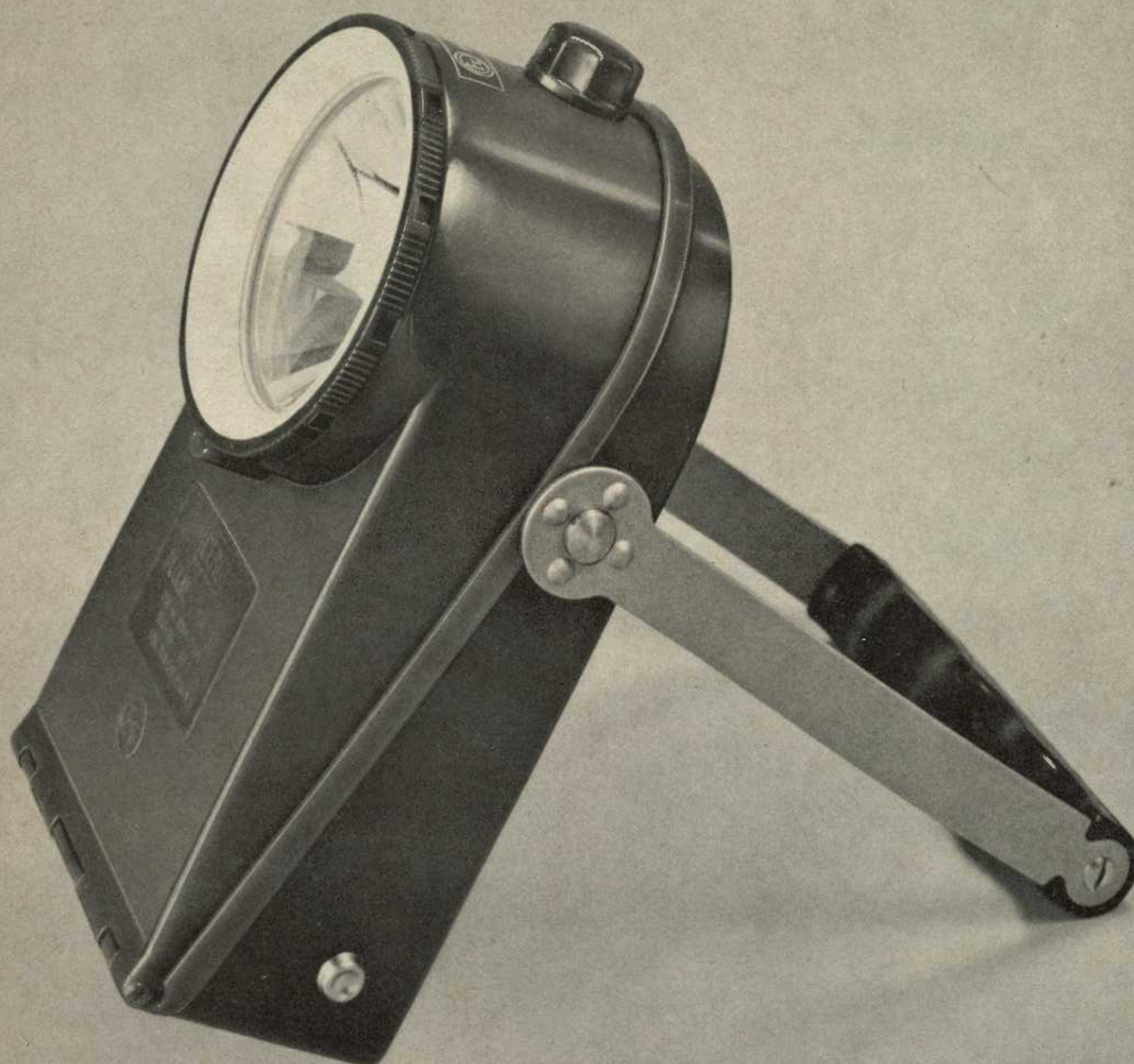
Other lights seen on Martini's stand were graceful opal glass pendants, brightly lacquered metal pendants on rise-and-fall fittings, and adjustable cup-shaped wall lights enamelled in white, red, green, yellow or blue. **LEN C417**

New packaging

A new, economical way of packing small lighting fittings was seen at the stand of Allidec SA, France (*Alliance Internationale pour la Diffusion d'Éléments de Décoration*). This company is using a type of shrink-wrap for its wall lights up to 230 mm high. A thick plastic film covers the lighting fitting

and a cardboard square on which it is mounted. This film gives good protection and makes it unnecessary to use individual cartons. The company's Export Manager demonstrated the degree of protection by dropping a glass fitting on the floor from a height of 900 mm or more and it was quite undamaged. He told us that this packaging method had been well received by buyers.

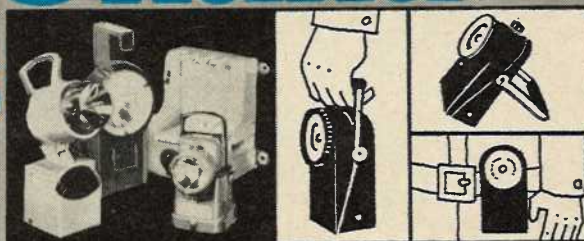
A wide variety of fittings can be supplied by Allidec in this wrapping; for example, traditionally styled double-arm wall brackets, small glass cylindrical wall lights decorated with animals' heads; spotlights, and crystal glass wall or ceiling mounting units. The company is interested in quantity orders. **LEN C418**



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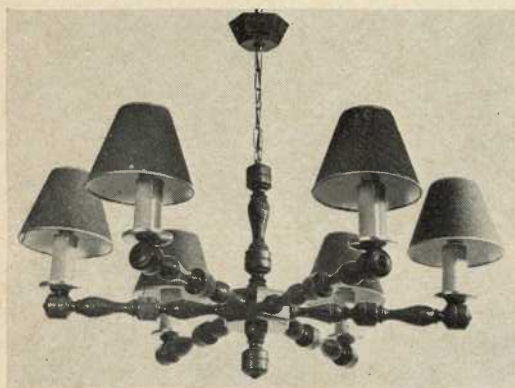
Flli. Martini opal glass pendant with contrasting band in either red or black



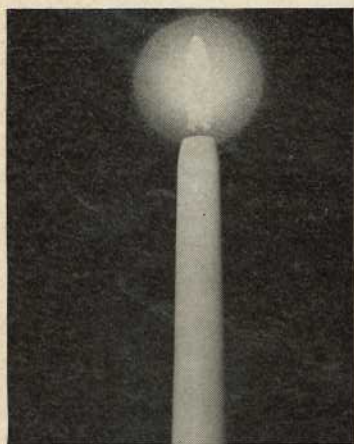
Children's night light, model 420 by Parabel Electric



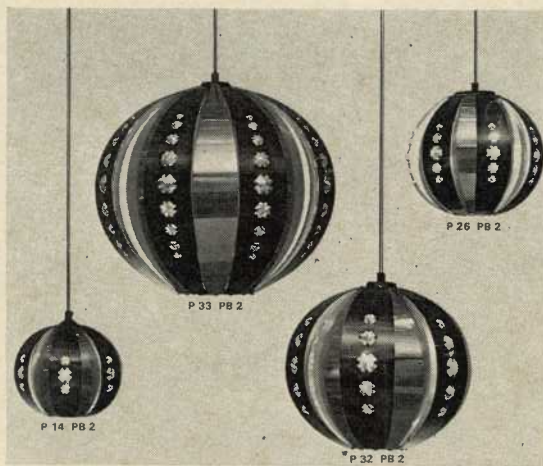
Modern chandelier dressed in Strass crystal, by Martinez Y Orts



Left: Multi-arm ceiling fitting No. 4162 in wood, by Aldes



Cima electronic candle with moving flame, by Cimaco



Pendants made of copper slats inset with crystal, by Coronell

Children's lights

A West German firm, Parabel Electric GmbH, exhibited an attractive collection of children's lights—this company's speciality. There were new pendants 350 mm in diameter in fur fabric in the form of animal's heads and an orange with a face on it. Small bedside lights had a white, blow moulded, plastic cylinder shade and standing beside it, on the same base, a small toy such as a doll, elephant, lion or mouse.

For situations where parents prefer children to have a wall light rather than a free standing light on a bedside table, there were small, cylindrical, wall mounted fittings trimmed with

pictures of animals and operated by push button switches.

Other ranges shown were gaily coloured soft toys with fabric lampshades above their heads to form table lamps and a large black and white cat as the base for a standard lamp. Dolls' heads with comic faces and a red lamp in place of the nose were another novelty.

These children's lights are being introduced to Britain through the firm's agents, **Progressive Import Merchants Ltd.** and were shown at Brightshow recently.

LEN C419

Selection of other stands

Cottage-style lighting was

shown by **Aldes**, France, a company making its first appearance at the Paris exhibition. A floor lamp with a full sized spinning wheel as the base caught our attention; it was fitted with a tall fabric lampshade. Other fittings in wood were multi-arm ceiling fittings and single and double wall brackets. The company's range of lampshades included variations in tapestry and printed cotton. One table lamp had a base like a small sewing machine about 150 mm across.

LEN C420

A wide assortment of lighting was displayed by **Henri Chatard**, France. We noticed bell shaped pendants in pastel

coloured stretch fabric trimmed with fringe; a new range of table lamps with ceramic bases in geometric shapes, such as rectangles with a circular hole in the centre, and small table lamps with the base and shade covered in the same polka dot, printed cotton. Another type of table or bedside lamp had a ceramic base that looked like a small pewter vase supporting a balloon lined lampshade.

Ceiling fittings included three- and four-arm models finished in gold leaf and with pleated fabric shades. A range of floor lamps stood about 1200 mm high and had tall, slim lampshades.

LEN C421

Cimaco AB, Sweden, had a stand devoted entirely to the Cima electronic candle which has a small opal 'flame' that moves like the flicker of a candle in a slight draught. The effect is so much like the real thing that at first sight it is difficult to tell the difference. These candles, for use in chandeliers, candelabra etc., are available in the UK through **Northern Light Ltd.**

LEN C422

From Denmark, Coronell A-S had brought a collection of fittings made up of metal slats which were selling very well. There were pendants in a variety of shapes in brass, or copper, trimmed with crystal and wood. A speciality of this firm is models trimmed with a band of black copper inset with pieces of

crystal. Matching wall lights were available. Another range on show was in flame-cut metal, a process that leaves a decorative jagged edge to each piece of metal. Coronell's UK agent is **Otmerod Ltd.** **LEN C423**

Lighting in traditional styles was shown by **Martinez Y Orts SA**, Spain. There were chandeliers in crystal and in bronze. Styles included Flemish, Louis XV, Louis XVI and Colonial models. There were also one or two modern designs inspired by traditional styles, such as a silver plated chandelier dressed with glass drops and a modern chandelier in Strass crystal. The company's UK agent is **Arnold Montrose Ltd.** **LEN C424**

The French company **Novalux SA** exhibited a collection of traditional style lamps imported from the Italian company **Old Lamps**. There were electric candle sticks, lanterns, wall lights, table lamps and pendants in styles such as Louis XIII, old American and Regency.

LEN C425

The crystal lighting shown by **Peris Andreau SA**, Spain, caught the attention of visitors because at first glance the crystal all appeared to be green. On closer inspection, the chandeliers and wall lights were fitted with green lamps and the crystal was clear. However it did draw attention to the firm's products, which included traditional styles of ceiling fittings, lanterns, table lamps, wall lights and floor standards. The company's speciality is bronze metalwork.

LEN C426

Lighting like huge illuminated white flowers was shown by **Raoul Raba**, France, who also

designed the fittings. Table lamps, floor standards and pendants resembled large balls of white petals. A floor lamp was supported on a plastic covered steel rod that curved round almost into a circle to form the base. Some models were displayed in white plastic with an irregular brown or black stripe on it. Buyers at the exhibition were very interested in this range which is available in Britain through **Plus Lighting Ltd.**

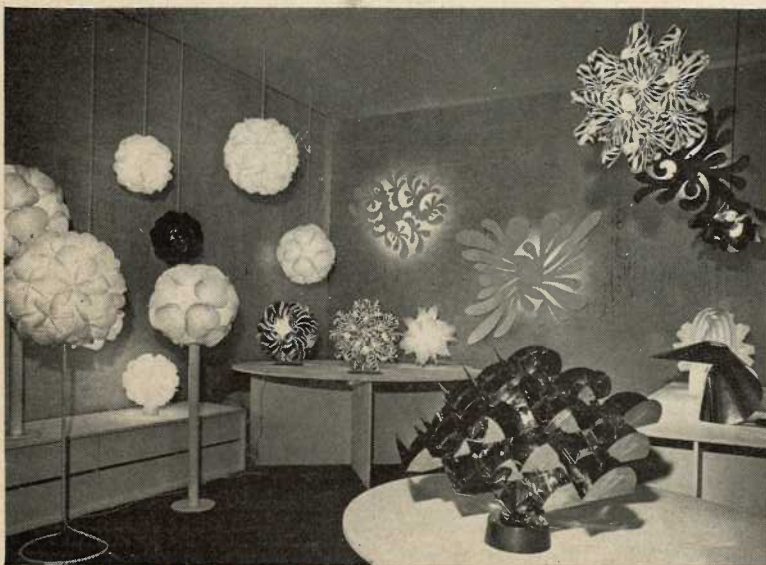
LEN C427

Ropal, France, formed in March 1973, showed illuminated spheres and cubes in orange, green, mauve and clear polystyrene. There were separate models for indoor and outdoor use. The spheres were available on rise-and-fall fittings, as well as being available for table or floor lighting. The cubes could be grouped together like building bricks, for instance a column of them made a floor lamp, or four in a square made an impromptu illuminated coffee table.

LEN C428



Western hanging lamp from Novalux



A view of Raoul Raba's stand at the Paris exhibition

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Lighting in Commercial and Amenity Horticulture

by C. W. Gould, NW Electricity Board

IN two previous articles the development of commercial growing rooms and other replacement lighting techniques were outlined. The recent increase in the cost of oil has resulted in many growers either accepting lighting for greenhouse crops for the first time, or extending their existing systems. The main crops treated are still tomatoes and lettuce, (Figs. 1 and 2) while bedding plants, saintpaulia, geraniums and some other flower crops are chiefly handled by specialist growers and Parks Departments. Supplementary lighting, mostly with sodium lamps is becoming acceptable for chrysanthemums carnations etc. The use of supplementary systems for tomatoes and lettuce has disadvantages which tend to outweigh the greater efficiency in terms of lumens per watt of sodium discharge lamps over fluorescent tubes. Among these disadvantages are:-

- (a) More uneven light pattern
- (b) Excess light spill
- (c) No temperature benefit at plant level from the lighting units
- (d) Dependence on a steady natural light level to provide a comparable growth rate.

Advantages of replacement lighting include:-

- (a) Predictable growth rate
- (b) Even light spread over the planting area
- (c) Maximum use can be made of heat from the lamps
- (d) A brick or wooden structure, (or even an uninsulated black polythene tunnel) may be used to produce juvenile plants, thus saving greenhouse space and heating costs
- (e) Where required, a greenhouse may be used for a total lighting system, and because reflecting covers and side curtains are used with fluorescent tube banks



Fig. 1. Tomato plant 38 days old, after light treatment under linear rig

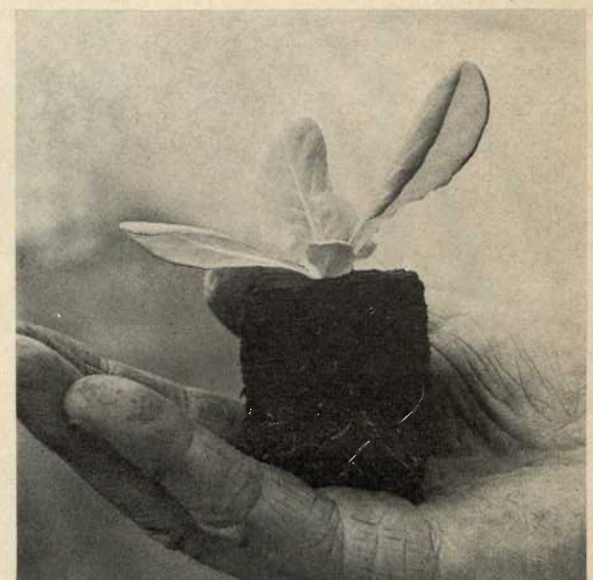


Fig. 2. Lettuce plant after 11 days light under linear rig

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mounted at some 600 mm above the seedling plant level, all heat emitted during the lighting period can be used and a lower temperature with lower costs is needed in the greenhouse.

- (f) CO₂ enrichment is more economically applied in a situation such as a packing shed or black polythene structure where ventilation is minimal,

Recent developments

Linear rigs consisting of a mobile frame either suspended or supported by legs with wheels fitted, and running on the floor or at bench level having (2400 mm) 125 W fluorescent tubes at spacings of 15 or 30 mm. One characteristic of the linear rig is that by the use of a 2400 mm width of frame, turning the fluorescent tubes across the frame area, it is possible to

economise in lighting units and avoid the uneven spacing and increase of loading necessary with narrower areas to give an even intensity over the majority of the planting area. Since, however, less tubes are used, the lower energy input must result in less output and with it, lower illuminance level.

If non cosine corrected 11 000 lux and 5500 lux respectively are required, for instance, to maintain a plantingschedule, then tube spacings of 127-254 mm with an extra tube at each end at half this spacing will be necessary. The use of tubes with internal reflectors and the regular cleaning or re-painting of the reflector covering will also assist in maintaining a maximum illuminance level.

The length of linear rigs varies from 6 m to 30 m, and they are moved either laterally or longitudinally every 12 hours. Enclosure of the rig by a reflector above the tubes and side curtains to restrict light spill, whilst giving the maximum light output has the effect of increasing the operating temperature of the lamps to a degree which then reduces the light output and useful tube life. The present generation of linear rigs is therefore ventilated by means of a fan. The method used consists of a

reflecting cover of material such as perforated hardboard (peg-board), with a fan mounted on a vertical board at one end of the rig, a similar board at the opposite end, and a polythene cover fitted to each board and along the edges of the rig frame, forming an air plenum. The fan draws in air and forces it through the reflector past the tubes, picking up heat from them. An air circulating system is thus set up which cools the tubes and warms the plants (see Fig. 3). The back pressure developed in an average size of rig is between 50-75N/m². The volume of air required may be read from the graph (Fig. 4). This is based on the formula:-

$$M3/sec = \frac{kW}{\Delta t^{\circ}C} \times \frac{(273 + t^{\circ}C)}{356}$$

where Δt = the temperature under the rig — the temperature of the air outside the rig (ts).

Where a ventilated linear rig is installed in a greenhouse, additional air is provided and a speed control fitted, so that some compensation is given for solar gain. This development has been successful in a number of new installations, and some existing systems are also being modified.

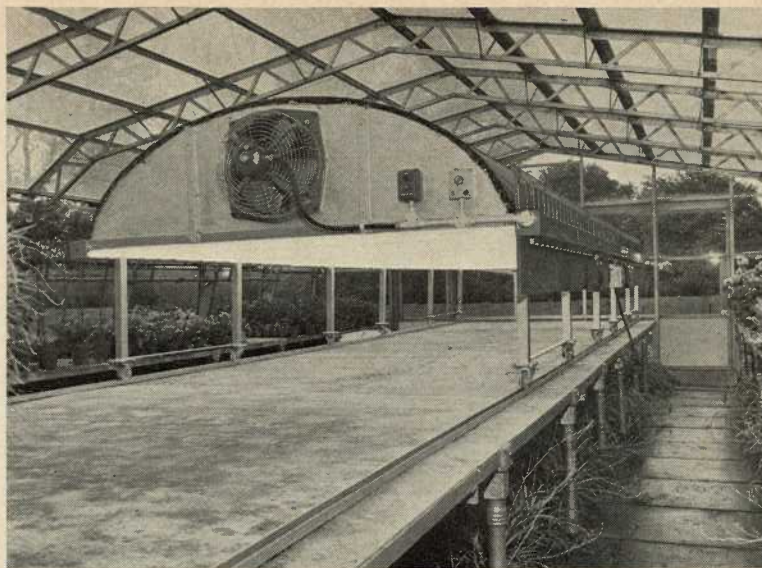


Fig. 3. Ventilated rig in a Park's Department greenhouse

Total lighting with sodium

Some experimental work has been done using high and low pressure sodium lamps. The growth of plants such as tomatoes and lettuce is very different from that under fluorescent tubes.

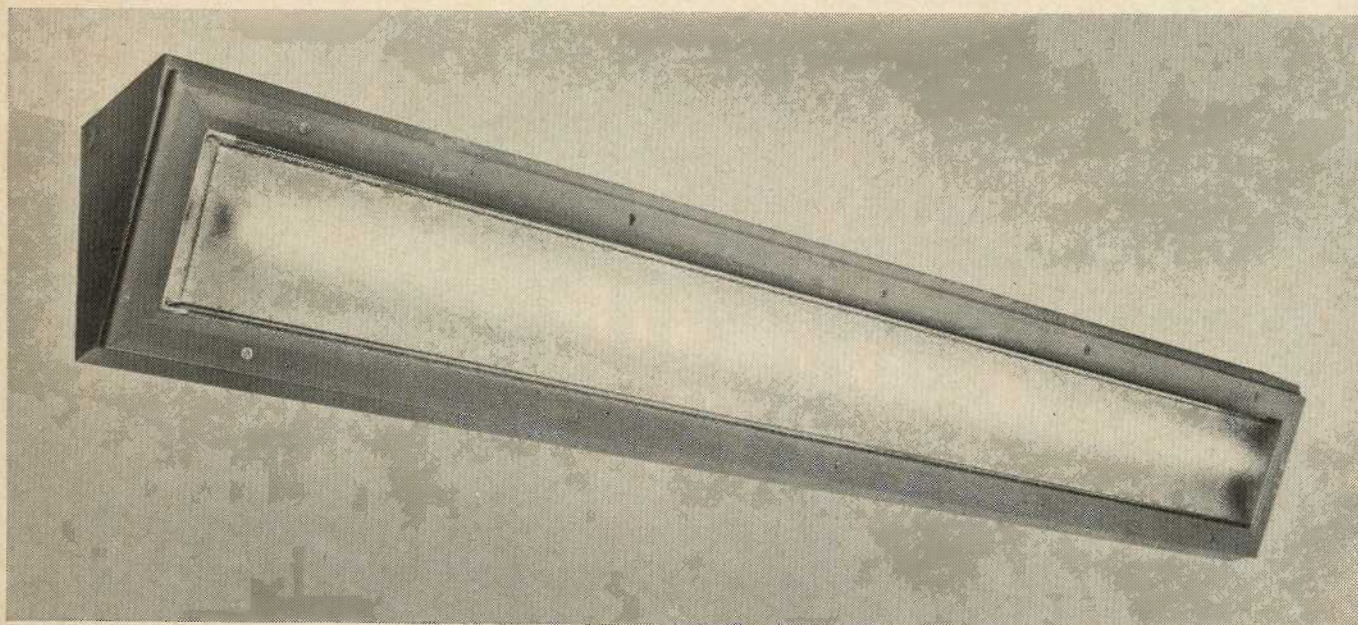
Comparisons made with equal energy emission from the several light sources have produced tomato plants from sodium which were taller and thinner than those from fluorescent tubes requiring staking before being set out. Little difference

was observed however in the final weight and quality of crop. Lettuce plants were less compact under sodium but again cropped equally well.

Supplementary lighting

The success of lighting used to supplement natural light, depends on the provision of sufficient illuminance to make up the variable amount of sunlight to at least the required level. This generally means a boost of 5000 lux. When SOX or SON/T or MBFR/U lamps are used, it is

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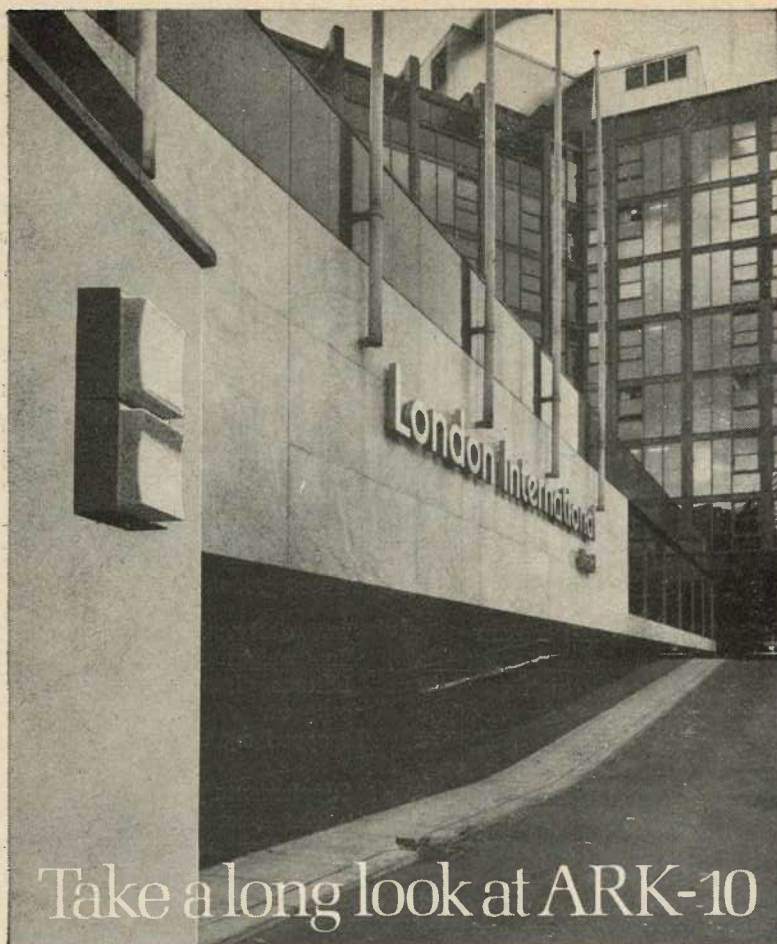
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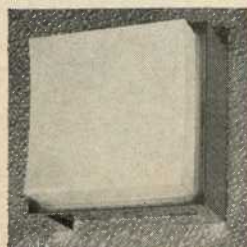


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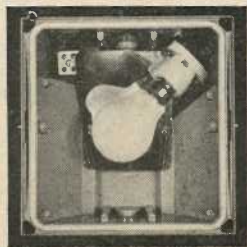
*Mounted in pairs, or in multi-formations,
ARK-10s make a pleasing design feature*



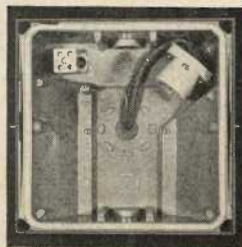
*Mounted singly
it looks elegant
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*The highly polished
reflector is easily
detached*



*Is supplied pre-wired
from lampholder with
high temperature cable*



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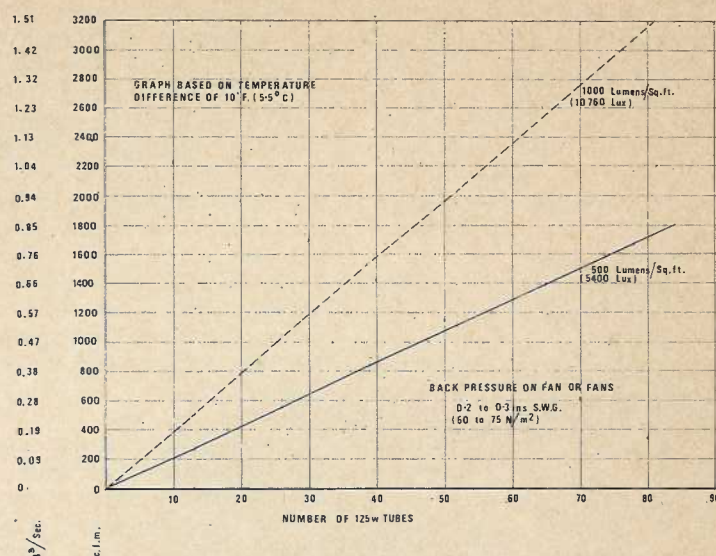


Fig. 4. Graph giving the air circulation required in rigs with various numbers of tubes

necessary to mount them in a block formation rather than narrow lines to give a more even coverage and reduce the effects of light spill as far as possible.

When comparing costs of replacement and supplementary systems, it is necessary to allow for the fact that because of the greater mounting height and higher efficiency, no increase in air temperature at plant level is obtained from the latter and additional heat must be provided in the glasshouse to provide optimum growth when supplementary lighting is in operation.

Parks Department — plant propagation

Local government reorganisation has resulted in the amalgamation of many smaller authorities, and the grouping of propagation units to improve efficiency. This means that large propagating and planting programmes are necessary. Increases in wages and overtime rates have also encouraged

management staffs to plan their bedding plant, flowering bulb, pot plant and shrub production more precisely. High humidity germination rooms and cabinets with water-tight fluorescent fittings (Fig. 5), bench lighting units and linear rigs are being installed in increasing numbers to meet these needs.

Future development

An extensive use of new light sources in horticulture seems unlikely, and it may well be that a combination of two or more different types of lamp will give better overall results. Replacement lighting for some crops followed by a supplementary period, may also be more economical in total energy expenditure.

Much development work remains to be done, and precision growing programmes, the study of the relationship between light temperature and CO₂ enrichment are among the factors calling for urgent examination.

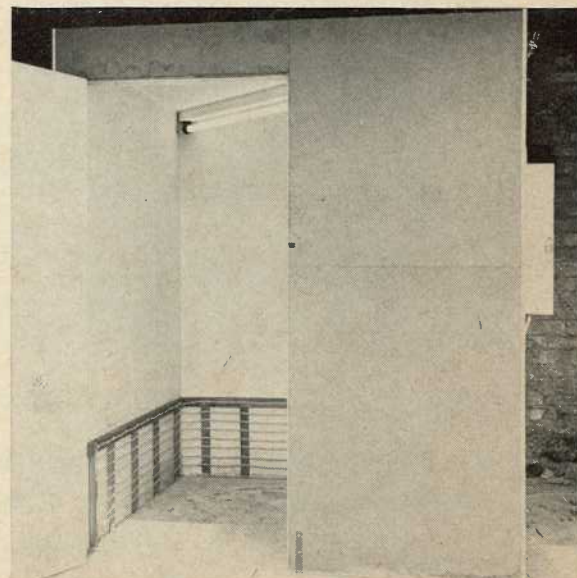
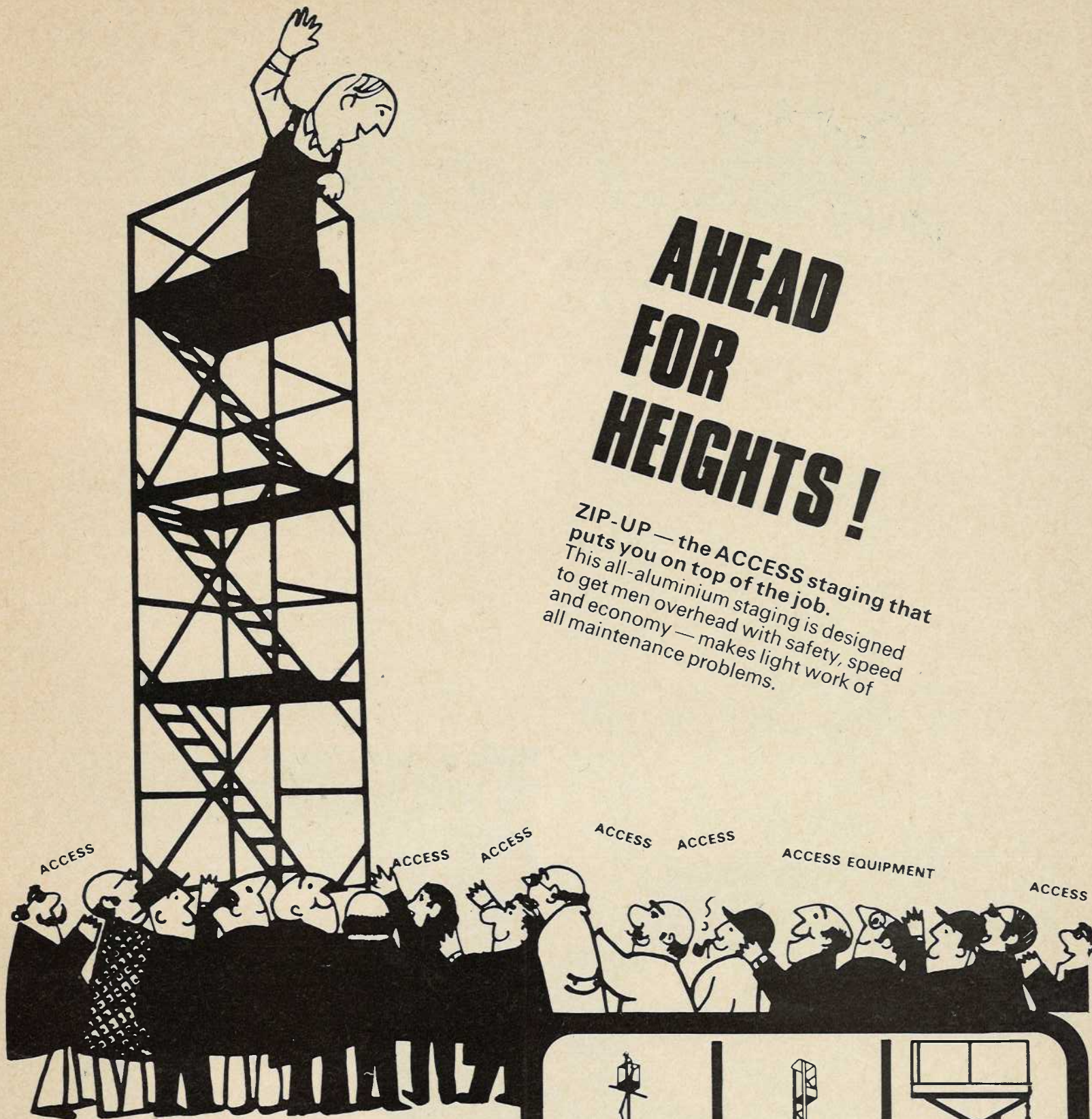


Fig. 5. Germination cabinet in a Parks Department nursery

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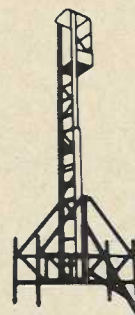


LEN/3/75



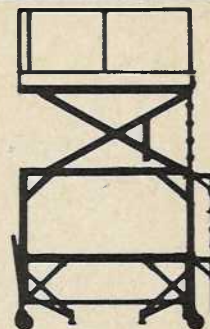
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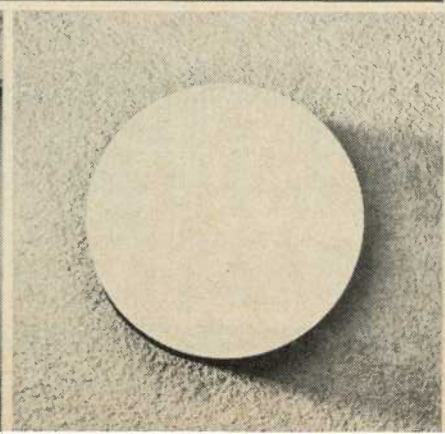
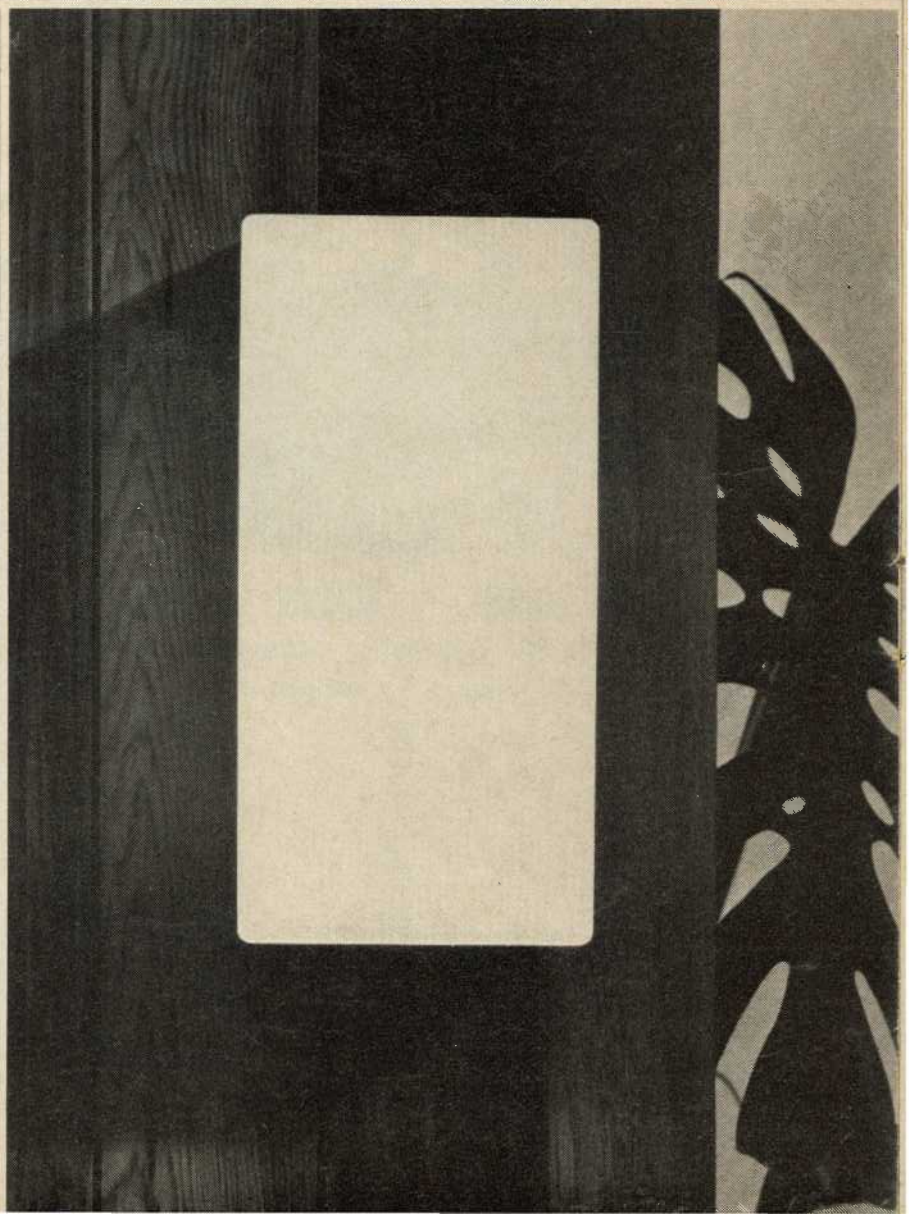
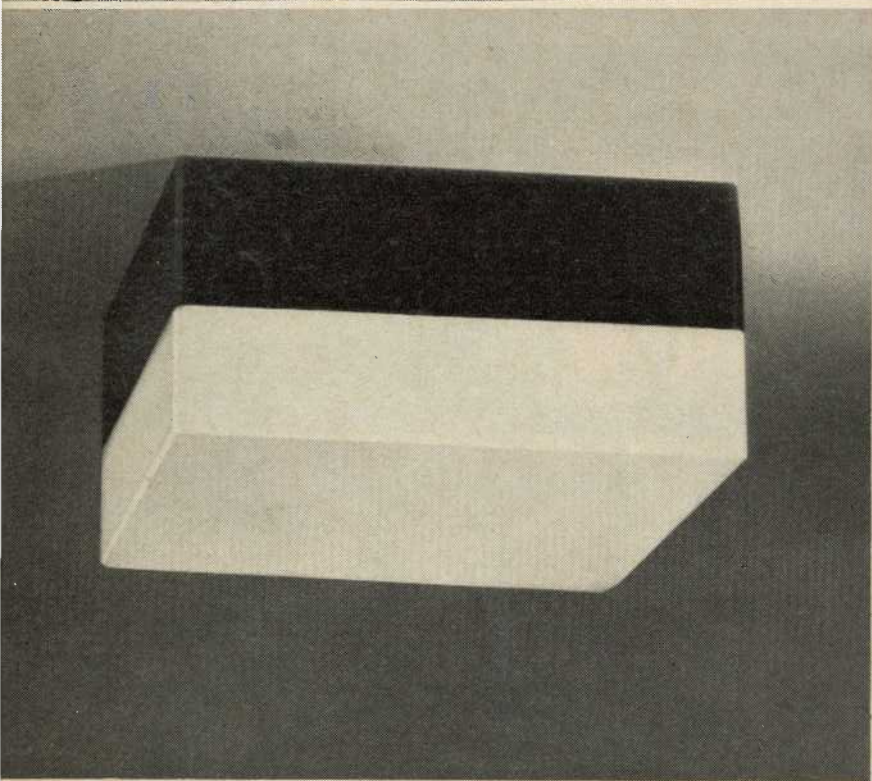
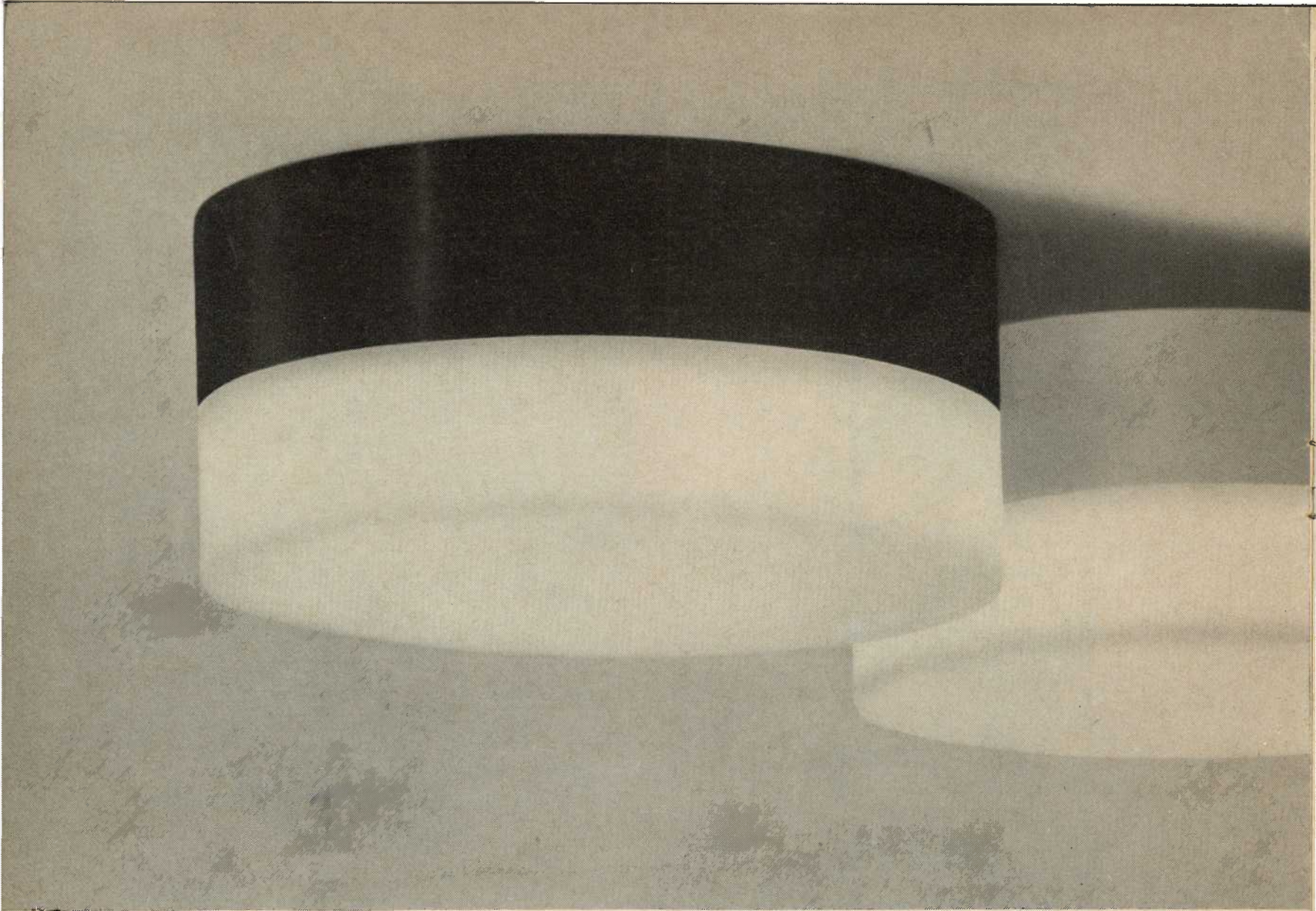
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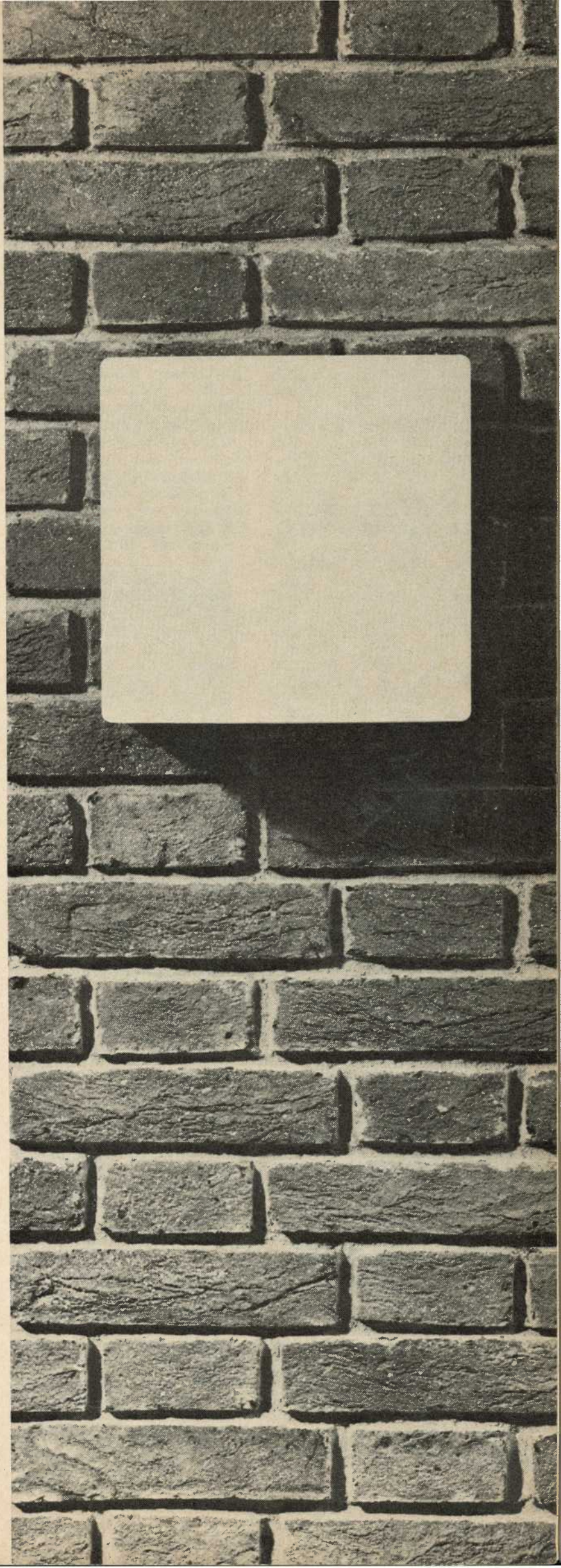
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News

Hanover Fair and LIF

five year agreement signed

MR. Stanley H. Brain, President of the Lighting Industry Federation, has recently signed on behalf of the Federation the contract for stand rental at the Hanover Fair for the five years 1975-1979 inclusive.

After the signing, Mr. Brain said that the Federation had been sponsoring ventures at the Hanover Fair since 1967 when only six companies exhibited. The agreement for the 1975-79 Fairs covered twenty-seven exhibitors drawn from the LIF and its affiliated organisation, the Decorative Lighting Association. This is the largest joint venture ever organised by LIF and DLA and is the largest UK joint venture at the Hanover Fair. This takes on increased significance when it is realised that the UK will form the largest overseas contingent to the electrical section of the

Hanover Fair.

Mr. Brain continued: 'It is a measure of the importance of the Hanover Fair that twenty-seven of our leading lighting companies have applied for space in this joint venture. It is also an indication of the importance which these companies attach to export at a time when prospects in the home market are less than encouraging. I believe that as a result of our activities in this area, UK exports of lighting products will significantly increase in real terms over the next few years.'

Further information on the Hanover Fair can be obtained from the two sponsoring bodies: The Lighting Industry Federation Ltd., 25 Bedford Square, London WC1B 3HH. Tel.: 01-636 0766; The Decorative Lighting Association, Tyn-Pwll, Moelfre, Anglesey, N. Wales. Tel.: 0248 88 396.



S. H. Brain, President of the LIF signing on behalf of the Federation, the contract for stand rental at the Hanover Fair for the five years 1975-1979. Mr. Brain is accompanied by the Director of the Federation, Mr. E. J. Counter

FLOODLIGHT BAN CONSIDERED

MR. Eric Varley, Secretary of State for Energy, speaking at the inaugural course of the British Gas Corporation School of Fuel Management, has said that he had been advised to extend his ban on display lighting and to ban floodlighting. These were measures he had considered and would look at again in his next package.

Energy consumption, in its myriad forms was woven into the fabric of our national life. The inter-relationships were complex and the consequences of particular steps had to be properly thought through if we were to avoid unacceptable damage. Our energy savings must come not from gimmicks but from maximum savings at the margin.

SOLE DISTRIBUTORS APPOINTED FOR GRAPHICA 47

MARKETING of the innovative Philips GraphicA 47 colour-assessment fluorescent lamp has been rationalised in the UK with the announcement by the Lighting Division of Philips Electrical Limited that it has appointed the Hayes company, Electographic Group, as sole UK distributors.

The GraphicA 47, made to conform to BS950 part 2, has been sold by Philips since its launch to the graphic arts industry five years ago.

GraphicA 47 was introduced by Philips in response to demand for a lamp which is an internationally accepted light source, to enable critical assessment of colour to be made.



The Bournemouth Symphony Orchestra, conducted by Rudolf Schwarz, playing for Southern Television's *Music in Camera* series. The main features of the set are the nine modern chandeliers supplied by BBI Lighting of Basingstoke. Called Staff Space Crystal Clusters, each chandelier consists of 28 tubular lamps enclosed within glass spheres attached to chrome stems. Total value of the installation was approximately £3000

German trade information service

THE German Chamber of Commerce was founded in July 1971. In October 1974, in addition to its own trade information service it became responsible for the trade information service previously provided by the Embassy of the Federal Republic of Germany. The Chamber's membership continues to increase as more and more lighting firms wish to develop their markets in both the United Kingdom and the Federal Republic of Germany.

The Chamber's special position, whereby it co-operates with Chambers of Commerce in both Germany and Britain, and various trade associations, enables it to offer an excellent service to both British and German members — from assistance in securing markets, to finding suitable suppliers of materials, and the placing of enquiries for production capacity in either country. Among its many services, it offers assistance regarding:

1. Export, import and trade practices.
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4. Joint ventures and mergers.
5. Commercial agencies.
6. Direct investment.

For an annual subscription of £55 this specialised service can

be made available to British firms who wish to expand or investigate the possibility of business prospects in West Germany.

Firms interested in receiving further details are invited to write, mentioning *Lighting Equipment News*, to Herr K. Balzer, Director, German Chamber of Industry and Commerce, 11 Grosvenor Crescent, London SW1X 7EE.

BEAMA in Gothenburg

THE British Electrical and Allied Manufacturers' Association Limited (BEAMA) is to sponsor/organise a group of British firms at the 4th International Trade Fair for the Electrical Engineering Industry (ELFAK) at Gothenburg, Sweden, from October 6-10 1975.

The Fair covers the whole spectrum of the electrical/electronic industry and main product groups to be featured in 1975 include electrical power and distribution, telecommunications, industrial lighting, machinery and motors, installation equipment and electronics.

Details of the Joint Venture can be obtained from the BEAMA Exhibitions Organiser at 8 Leicester Street, London WC2H 7BN.

Streetlighting death warrant?

GROUPS of Lighting Industry Federation members are to be asked to keep an eye on local councils whom the LIF feels are not following the right policies on streetlighting. These groups will keep a watching brief and where a council makes unwise cuts in streetlighting they will chart the increase in road accidents that the LIF is sure will follow. Such cuts are the equivalent of signing a death warrant, says the Federation.

Convincing arguments were put forward for modernising streetlighting rather than switching it off, by Mr. Basil Austin, past president of the Association of Public Lighting Engineers, at a press conference in February. He said that the initial cost could be recouped in four years and meanwhile there were immediate and worthwhile savings in energy and maintenance costs.

Lighting for rail depot

THE contract for the manufacture and supply of all the interior lighting fittings to be installed at British Rail's new Hornsey EMU Depot has been placed with Industrolite Ltd., Radiant Works, Croydon Airport, Surrey.

The depot will service all 90 electric multiple units for the Great Northern Suburban electrification scheme linking the London stations of King's Cross and Moorgate (Northern City) with Royston, via Welwyn Garden City and Hertford North.

Fittings specified for the project include dimmer-operated continuous units for the control room, specially designed stainless steel jetproof fittings with toughened glass diffusers for use in inspection and service pits, and standard vapour proof fluorescent fittings with acrylic diffusers for the main sheds.

Simon scholarship

THE Association of Public Lighting Engineers has announced details of a Golden Jubilee Scholarship which is being sponsored by Simon Engineering Dudley Ltd., manufacturers of hydraulic platforms.

The Scholarship is to be an annual one open to men and women up to 30 years of age who are members of the Association. The successful candidate will spend 14 days overseas at Simon's expense to study public lighting techniques.

Town & Around

DR. William D. Coolidge, retired General Electric Company of the USA vice president and director of research, died on 3rd February at his home in New York after a short illness. He was 101 years old.

The world-famous scientist, who retired from GE(USA) at the end of 1944, made major contributions to lighting and X-ray technology and had been awarded 83 patents for his pioneering work.

Early in his career, Dr. Coolidge played a major role in the development of the modern incandescent electric lamp. In 1910, GE(USA) announced his invention of ductile tungsten, the filament material still used in incandescent electric lamps.

The scientist's name also is inseparably linked with the X-ray tube that he invented. His "Coolidge tube," unveiled in 1913, completely revolutionised the generation of X-rays.

SKANDESCO Ltd is now UK distributor for Five Lamp-makers ab, a new export company formed by five Swedish decorative lighting manufacturers who are pooling their resources to give an improved service to their customers abroad. Skandesco has a new address for correspondence and accounts: 4, Sauncy Wood, Harpenden, Herts. AL5 5DA. The factory remains at Matlock.

THE biennial lighting display and forum of the West Midlands Region of The Illuminating Engineering Society will be held on April 24 at 6.30 pm, MEB Summer Lane, Birmingham.

DIESELS TO MECCA

ROLLS-Royce Motors Ltd., Diesel Division, has received its largest ever order valued at £3.2 million.

The order for diesel engines, has been placed by Petbow Limited of Sandwich, Kent, an independent generating plant manufacturer and a major exporter of electrical generating equipment.

Petbow generating sets with Rolls-Royce engines are being used for such diverse duties as for lighting the Road to Mecca, for the Sultan of Muscat's new palace in the Oman and for emergency standby purposes both in the United Kingdom and overseas.

WILLINGS Sign Division Limited has announced the appointment of Colin Haughton to lead its market development activity. Well known throughout the UK sign industry, Mr. Haughton has, for the last nine years worked mainly in the sign development field for Rohm and Haas (UK) Ltd. marketing its acrylic sheet.

DUE to personal reasons, Mr. R. P. Lane has resigned as Chairman of Rowlands Electrical Accessories, Ltd. Mr. N. J. Smith, Managing Director, has been appointed Chairman and Managing Director, and Mr. P. Ordish has joined the Board of Directors.



A. J. Critchley

MR. Arthur J. Critchley has been appointed Managing Director of Ceag Limited, Barnsley, manufacturers of Lumax car components, accessories and allied electrical products. He succeeds Mr. D. J. Weighton who is retiring.

Varna exhibition

THE International Exhibition on Sources and Luminaires will be held from 9-14 June in the International House of Scientists, 'Frederick Joliot Curie', Varna on the Black Sea.

The international exhibition is organised by the Bulgarian Chamber of Commerce and Industry and is to be held on the occasion of the 3rd International Conference on Illuminating Engineering, which will be held at the same time and place.

Scientific reports will be delivered by prominent scientists from socialist countries and from England, USA, France, The Netherlands and West Germany.



C. Haughton

MERCHANT Adventurers — Marlin Lighting has announced that it has acquired premises at 44 Upper Gough Street, Birmingham from Walsall Conduits, which they will be opening as a distribution trade counter and display centre early in 1975.

The centre will hold comprehensive stocks of the Marlin Lighting range for immediate delivery and the showroom will be available for clients to bring their customers.

MOLE-Richardson (England) Ltd. has now opened a showroom at 25/29 Chase Road, London NW10 6SJ. Telephone 01-965 6834, at which may be seen the range of Erco lighting fittings.



J. Seabrook

RELITE Electric Ltd has announced the appointment of John Seabrook as sales director. Prior to this appointment he was national sales manager with Moorlite Electrical Ltd. He is married and lives in Cuddington, Cheshire.

Edison's Electric Light

by Stanley Wells, Clarke (Electrical) Co. Ltd.

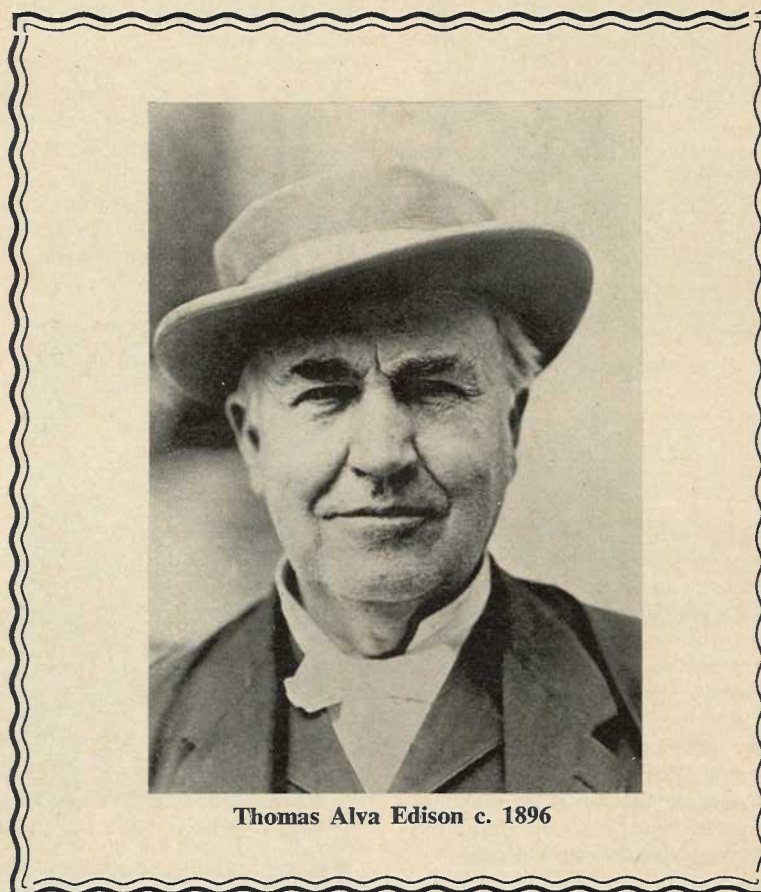
THE name of Thomas Alva Edison (1847-1931) is as inseparable from the history of lighting development as it is from history itself, for Edison was already famed for his many inventions by the time he turned his attention to the problem of lighting towns and cities by means of electricity; and on more than one occasion he was heard to remark to certain of his friends, "I believe the day is coming when all our great waterfalls will become sources of electric power . . . I believe that a means will be found to utilise them to give us electric light for our homes and factories. There is no reason why we should not have electric lamps to replace those evil-smelling gas lamps we have today."

At the time of those remarks, in 1878, the most common form of public lighting was by gas lamp, and the paraffin lamp was still a standard piece of lighting equipment in almost every household in the land.

The original idea of using electricity for making a practical light source had previously occurred to Sir Humphrey Davy (1778-1829) in England as far back as 1808, when he had passed an electric current through two sticks of charcoal causing a silver-blue arch of light to pass between their glowing ends.

Understandably, Davy had christened his inspiration the 'arc' light, and he and others proceeded to develop it as a form of streetlighting to replace the gas and oil lamps in the streets of London and other big cities. In America, at the Philadelphia Exposition of 1876, Moses G. Farmer demonstrated three powerful arc lights burning with painful brilliance in the open air and powered by a motor dynamo of his own design.

But the whole aspect of arc lighting remained on an experimental basis until about 1876/7 when the Russian engineer Paul Jablockhoff introduced his 'electric candle' in Paris, after which the system became a practical proposition.



Thomas Alva Edison c. 1896

During 1877, Edison himself set to work experimenting with open arc lights, but the use of either hundreds of electric cells for the production of the necessary power, or the application of an inefficient direct current dynamo did nothing to excite his enthusiasm for the system as its technicalities stood at that time. Although, in the same year, the introduction of the alternating current dynamo abroad allowed for improvements to the circuitry and produced increased efficiency in arc lighting techniques, Edison either did not hear of the alternating current dynamo at the time, or he had decided to branch out without further deviation into the problems of incandescent light; a line of investigation which was already being pursued by other inventors elsewhere and on both sides of the Atlantic. At all events he discarded the idea of using arc lights as the medium for his proposed im-

provements to the embryo electric light and turned his attention to the alternative method of 'incandescent' light.

Edison's first encounter with the new electric light was during a visit to the workshops of American scientist William Wallace at Ansonia in Connecticut, where he was able to see the principles for himself and to discuss the possibilities of producing a more successful, long-lasting light which could be used indoors as well as out. The disadvantage of the arc lamp was that it required immense power to activate the arc, and soon destroyed itself while burning because of its low resistance to the current. Edison saw that in producing an incandescent lamp, it would be necessary to increase the resistance of the lamp to the passage of the current, and to subdivide the current until only a small proportion of the original power entered any one lamp on a

multi-lamp circuit.

In his laboratory at Menlo Park, in the September of 1878, Edison set his restless mind to work on his vision of making a lamp that would turn night into day: a form of bottled sunshine which could be installed in every home and place of business, to burn steadily without smoke or flame, and to be controlled by the turn of a simple switch.

Edison made no secret of his latest brainchild. He informed the press and made it generally known both at home and abroad that he intended to perfect the electric light as a domestic and commercial proposition; a statement that started a sudden panic in the stock market of gas securities, and brought howls of derision from all points of the compass, including the foremost authorities on electricity in England. All, that is, except Sir Joseph Swan (1828-1914) who was currently attempting to solve the problem of domestic lighting from the identical angle.

Edison's decision was to produce a lamp which consisted of a filament mounted inside a glass envelope, and to heat the filament to incandescence without melting it. His first lamp burned out after only eight minutes, and so he proceeded through hundreds of experiments with different metals and filament shapes until he came to making a double-spiral element of platinum wire to which the application of power was controlled by a regulator. The regulator was designed to cut out when the spiral came close to melting point, and to reconnect the circuit after it had cooled enough to accept more current; but even so the lamps burned out quickly and produced a fluctuating light.

The next decision was to use a completely sealed glass bulb and to pump out all the air so that an almost perfect vacuum existed around the filament.

The vacuum pump had been devised in 1865 by the German inventor Herman Sprengel, and was improved upon in Britain

by Sir William Crookes in 1875; and but for these pioneers the work of making electric lamps would have gone on without much success for a long time.

Edison's French glass blower Ludwig Boehm, made a quantity of new bulbs for the latest experiment, and he and Edison's other aide, Francis Jehl, helped to assemble and seal the filament into one of the bulbs, which was then attached to the pump and exhausted of air.

When the electricity was switched on the filament glowed brightly and provided a light intensity of twenty-five candle power as against previous experiments which had given only five candle power.

An improved pump gave an improved vacuum so that subsequent lamp filaments burned more brightly and lasted longer. By coiling the filament, Edison multiplied the lamps' electrical resistance from 4 ohms to 100 ohms, and thereby improved the life-span of the burning lamp; but still it lasted only a few minutes as against the seven hundred or so hours visualised by the inventor.

During the October of 1879, over a year after his first attempts to make a successful lamp, Edison discarded platinum in favour of a slender filament of burnt thread, in other words,

a carbon rod; very fragile and tedious to make, although no less tedious than trying to fit such a filament into a glass bulb and sealing it in.

After much trial and error, the lamp was made ready and exhausted of air, and when the electricity was applied to its external contacts, the carbon filament lit up and shed its brilliant light across the room in all directions. Its resistance measured 275 ohms, and it continued to burn for forty-five hours before disintegrating and plunging them into darkness.

Following exhaustive experiments with carbonised filaments, the team set about making a lamp to last 200 hours, and the surprising result was the use of a carbonised cardboard filament which was found to have advantages over previously used materials.

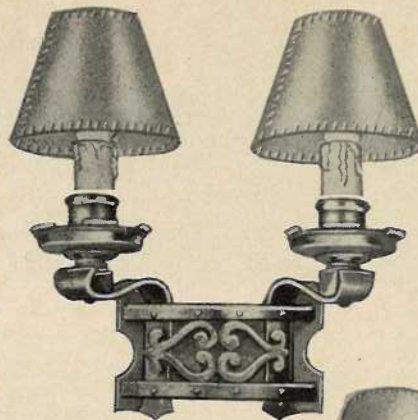
With further successes within his grasp, Edison decided that it was time to show his invention to an incredulous Press and a curious public, and for this purpose he decided to arrange a spectacular demonstration which would make history in its own right, for it was scheduled for New Year's Eve 1880, and for this occasion he invited anyone who wanted to attend his unusual party to come to Menlo Park.



Edison's offices at 65, Fifth Avenue, New York City

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As it turned out, something like 3000 visitors arrived by special trains; many more came by carriages and wagons, others came on horseback or on foot, until the grounds were full of curious people staring about in disbelief at the hundreds of electric lamps that had been draped through the trees bordering the approach from the station to the house.

To most people it must have looked like a fairyland, the unfamiliar twinkle of the lamps being made even more dramatic by a steady snow fall, but to Edison it was his great chance to show them all that his invention of the electric light was not a pipe dream but a reality. Apart from this he wanted the opportunity of convincing the more influential personalities amongst them that, given more time and official support, he could develop an efficient system capable of lighting up all New York.

In the laboratory his visitors were shown electric dynamos, copper conductors, lamps that burned when immersed in water, electric magnetos, and a new lamp that Edison claimed would burn for 600 hours. Really his ideal was for a lamp that would burn for 1500 hours, but that was well into the future, and Edison knew that although his lamps were improving, the best possible filament had not yet been found.

After the publicity about his demonstrations at Menlo Park, Edison's fame spread fast across the world and he was duly acclaimed as a wizard of invention; indeed, even the innocently shining evening star was rechristened as the 'Edison Star', and was so called for many years afterwards, in spite of Edison's efforts to assure everyone that it was not one of his electric lamps hanging from a balloon.

The next successful filament consisted of Japanese bamboo, and this was superseded by an even more successful cellulose mixture, a development which formed only one of the 170 patents obtained by Edison during 1880.

Throughout his efforts to develop efficient lamps before his contemporaries, and especially before Joseph Swan in England, his closest rival, Edison did not ignore the need for a constant voltage dynamo to generate the power for distribution to the thousands of lamps that he hoped one day would be alight in towns and cities all over the Country. But little was known about dynamo design at that time. Scientists and electricians

had been improving upon the theories of the British chemist and physicist Michael Faraday (1791-1867), who in 1831 had invented a rudimentary dynamo based on his discovery of the principle of induced electricity converting mechanical power into electrical energy as a conductor was passed or rotated through the field of a magnet. The dynamo, driven by a steam engine, had undergone improvements by many developers in England, and by the 1860's large arc lights, driven by dynamos were in use in lighthouses along the coasts. Now, on the eve of even more momentous developments in incandescent lighting, the principles to follow seemed to be those based on the structure of the Siemens dynamo in England, and of those in use for the supply of electricity to the arc lamps which lined so many streets.

In the matter of dynamo design in America, a good deal of the credit must go to Francis R. Upton, who was mathematician and chief scientific assistant at the Menlo Park laboratory, for he had to help Edison with the design of the constant-voltage dynamo for parallel lighting circuits as opposed to the constant-current d.c. dynamos at that time in use for arc lighting.

The result of all their work, produced in 1880, the 'long-waisted Mary Ann' of Edison-Upton design, a dynamo which was shaft-coupled direct to a Porter-Allen steam engine for motive power, so forming a self-powered, self-contained generator. Improvements and new designs on this arrangement resulted in January of 1881 in the delivery of a new steam engine, which, after subsequent adjustments gave a test-run performance of some twelve hours while sustaining a constant electrical supply for as long as the machinery was kept running. At last, Edison could go ahead with his plans for a reliable distribution system, and with his scheme for lighting a large area of New York.

At the age of thirty-two, and already famed for his inventions in other fields, Edison arrived in New York with his team of experts ready to set about the task of lighting the great city.

As one can imagine, few people knew anything about lighting by electricity, and only Edison and his staff had any idea about the project in hand. Everything that was needed had to be invented, then made and tested before they could forecast its probable degree of success or failure. Among the



Edison and his assistants, Menlo Park, February 1880

special factories that had to be established were the Edison Machine Works on Goerck Street to produce the first of the large scale dynamos; the Edison Electric Tube Company at 65 Washington Street to produce the components for the distribution system; a factory on Wooster Street for making the meters, sockets and cut-outs, and the now famous generator and distribution plant at 257 Pearl Street, known as the Pearl Street Central Station.

Edison directed the operation and growth of his companies from his headquarters at 65, Fifth Avenue, and from there established the organisation necessary for the first part of his plan — to light one square mile in New York City — an initial contract requiring the running of some eighteen miles of cable from South of Wall Street up to Canal Street, and from Broadway to the East River. Trenches to take the cables were dug and the supply lines were laid at the rate of one thousand feet per day, while trained electricians installed the wiring, sockets, switches and meters into business premises and private houses, until, by the following summer, some nine hundred buildings had been equipped with something like fourteen thousand of the latest electric lamps, and all was ready for the big 'switch-on'.

The final checks on generating equipment and installations were carried out over Sunday September 3rd, and during the morning of Monday 4th, 1882, and at three o'clock that afternoon, from the offices of Drexel

& Morgan, Edison gave the word to run up the generators and to switch on the lights of New York.

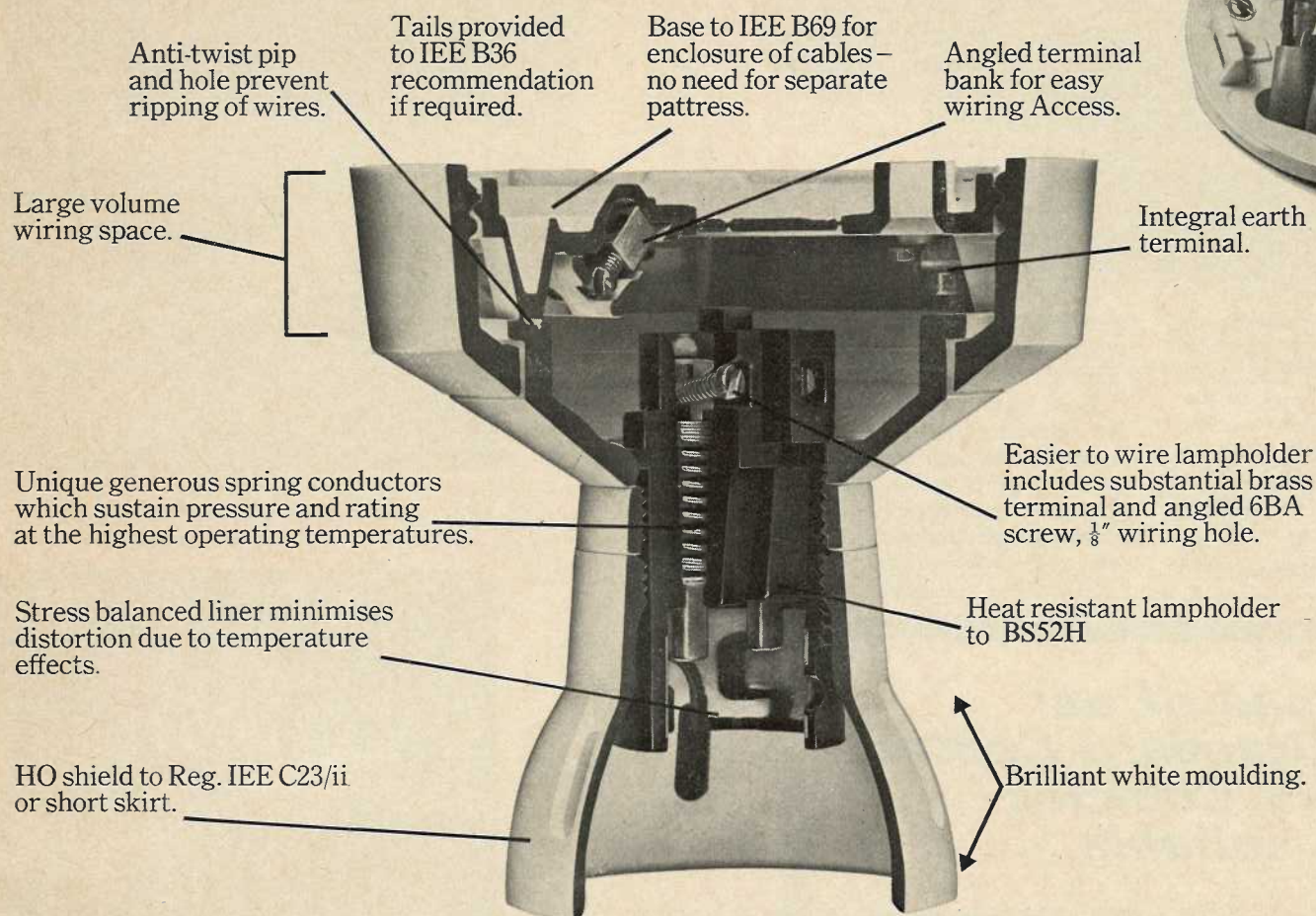
As the thousands of electric lamps throughout the district came to life, the occupants of houses, shops, offices and apartments, expressed their astonishment and delight at the new invention and at that moment the incandescent lamp established its claim to supremacy over all other forms of lighting.

As work commenced to build new generators and power houses. The Edison Electric Illuminating Company of New York became a formidable opponent of the powerful gas companies and Edison could foresee an ever expanding future for his enterprise. He now turned some of his attention to the situation in England where Joseph Swan, whose successful installations in his own home, shop premises and the mansion of Sir William Armstrong in the December of 1880, had made him a fierce competitor for success. However, whereas Swan's forte lay in his lamps with squirted cellulose filaments, Edison's strength was in his power stations and superior distribution system, and the time had come for co-operation between the two.

After tedious and often difficult negotiations, Edison agreed to an acceptable association, and in 1883 travelled to England where he and Swan joined forces in the Edison-Swan United Electric Light Company, a union for which the modern world of electric lighting can be truly thankful.

Ashley Accessibility

The inside story



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HAL 96T	HO, Base with E+3 Tmls.+PVC tails.



*Shown:
the HAL 96 'Access' battenholder*

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For more information use Reader Service Form quoting LEN C114

Osram low-pressure sodium lamp manufacture

LOW pressure sodium lamps are the most efficient commercially available long life lamps being made at the present time. With the current emphasis on economy in the use of electricity and the general need for better road lighting it is logical that there should be increasing use made of the low pressure sodium lamp's ability to convert power into useful light with the minimum waste.

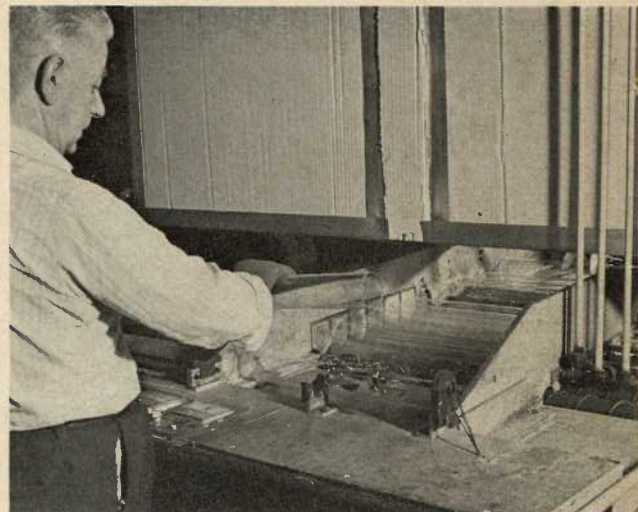
Osram (GEC) Ltd. Super SOX low pressure sodium lamps are made at the firm's Shaw factory. Although mainly used for streetlighting, there is a growing demand for them in area and car park lighting. A 135W lamp of this type gives as much light as a 1000 W tungsten halogen lamp and unless there is some particular reason for selecting the latter, such as a requirement for good colour definition, the sodium lamp is the obvious choice.

The Osram SOX lamp em-

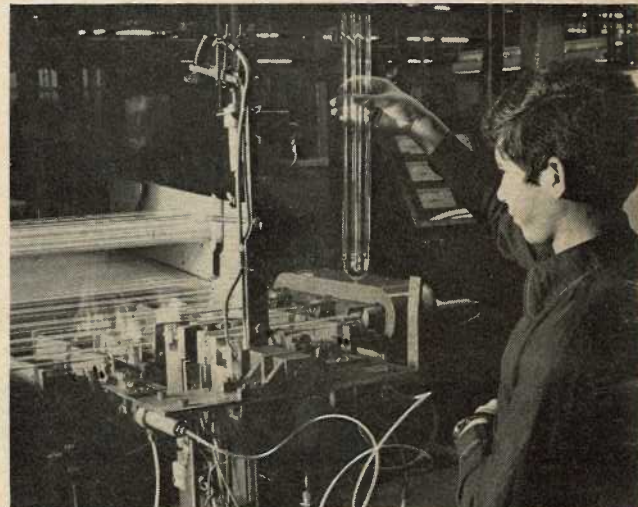
loys a special filming technique to maintain the distribution of sodium vapour throughout its full length. Dimple-free construction, ensures high lumen maintenance and absence of light masking, with reduced chance of breakage in transit.

New high-speed plant for the mechanical production of SOX lamps has recently been installed by the Engineering Development group in conjunction with the discharge development laboratory. The laboratory is also

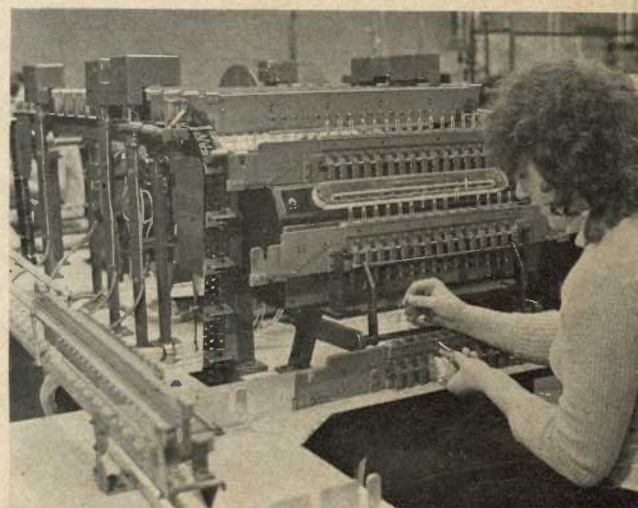
Filming operation for low pressure sodium outer jackets



Inspecting U-bends at auto U-bending machine



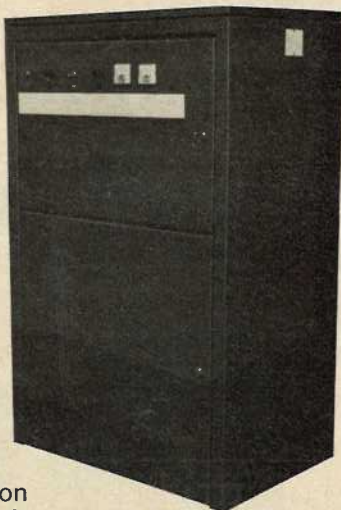
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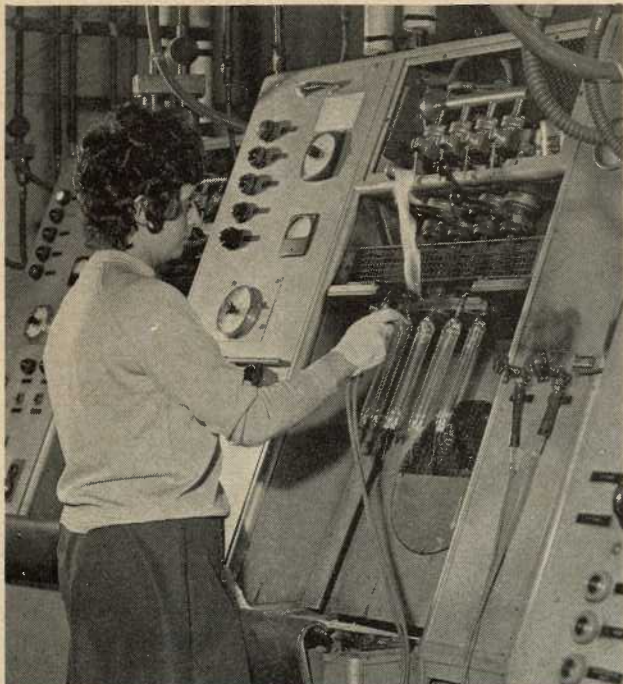
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Left:
Admitting the sodium to
the lamp



Right:
Inner pumping process

situated at Shaw and close liaison with the factory ensures minimum time lag between conceiving an idea and translating it into practical reality. The main features of the new plant include an inner arc tube U-bending machine which automatically does the work it would take months to train a glass worker to do, at five times the speed. New trap and seal mach-

ines further increase the efficiency of this section.

The very high vacuum required in the outer jacket for maximum light output is achieved by firing barium getters in the outer jacket after sealing off the lamp from the vacuum pumps. The getter absorbs re-

sidual particles of gas lingering in the jacket to ensure that the lamp operates at its optimum efficiency.

Standing in 5½ ha on the edge of the Pennines, the Shaw factory is one of the most important in the district. As well as SOX lamps, high pressure

sodium lamps, mercury lamps and fluorescent tubes are manufactured.

For more information about Osram-GEC sodium lamps use Reader Service Form quoting LEN C501.



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NEW INSTALLATIONS

Colour matching in controlled environment

A LIGHTING installation which facilitates accurate colour matching during the production of multi-colour cartons and other packaging products is one of the features of the controlled environment provided in the new printing works and warehouse of R. C. Kelly (Packaging) Limited at Dunston, Gateshead.

Since it is difficult and sometimes impossible to match colours in



The new printing works at Dunston

a combination of daylight and artificial light, R. C. Kelly has completely excluded natural light from the 5574 m² building. Instead, the printing operatives rely entirely on 100 colour-balanced fluorescent fittings supplied by **Walsall Conduits Limited**, the West Bromwich based electrical engineers and distributors.

The fittings provide constant levels of illumination and help the printers meet the exacting colour specifications imposed by packaging designers.

The adjacent warehouse area is illuminated by 300 standard fittings. Walsall Conduits Limited supplied electrical contractors B. Pickering & Company with all the equipment and accessories needed for the new building's lighting and power systems. The £15 000 consignment included 2500 m of lighting trunking and 400 m 4-pole 300 amp overhead bus-bar trunking.

To maintain stocks of printing materials in good condition, the building's internal temperature and humidity are carefully controlled — a task which is simplified by the fact that because only artificial lighting is used, there are no rooflights or windows.

For more information use Reader Service Form quoting LEN C601

Sainsbury's specify Climate ceilings

CLIMATE Integrated Ceilings Ltd., Solihull, has recently received orders totalling £180 000 for the supply and installation of fully integrated ceilings for a building owned by J. H. Sainsbury Ltd., in Rennie Street, London.

The six-storey building, believed to be one of the first 'mushroom column' reinforced concrete structures built in the mid 1930s, is being refurbished from a meat pie and processed foods factory to provide offices, laboratories, printing, display and conference amenities

for the company's own use.

The first phase of the work involves fitting out two floors of food laboratory areas with integrated ceilings using, for the first time in the UK, a Conwed metal faced universal fibre board on an Organosol treated grid. In order to prevent the growth of bacteria and fungi within the plenum space above the ceiling, these boards will be specially treated with Sileximer Fungicheck paint. The ceilings will incorporate 610 mm wide luminaires and return air will be handled through these on a heat recovery basis. Supply air will be from air boots on these fittings and from the dual tee suspension system.

The second phase will embrace the four levels of offices where the Climate 1500 fully coffered ceilings are to be installed. These have linear airbar distribution, 600 mm x 600 mm luminaires which will handle the return air, and the grid has facilities for partition head acceptance.

The printing, display and conference areas are to have slotted ventilating ceilings. Landings to staircases will have illuminated ceilings constructed from aluminium egg-crate pattern louvres.

The building has exterior blinds and in order to accommodate the mechanical gear for the blinds in a manner to allow access for maintenance the company had to design a special 1200 mm deep vapour-proof, fully insulated vertical return along all window heads.

The ceilings were specified by Scott, Brownrigg and Turner, architects to J. H. Sainsbury Ltd. and the main contract is being carried out by G. E. Wallis & Sons Ltd.

For more information use Reader Service Form quoting LEN C602

Osram lights Dodge City Supermarket

OSRAM (GEC) LTD. Europa fittings have been installed in the new Dodge City DIY Supermarket at Mount Vernon, Glasgow.

The installation in the new 1858 m² DIY supermarket utilises nearly 300 2400 mm Osram-GEC Europa reflector fittings and 609 m of Osram-GEC topline trunking.

Europa fittings using about 500, 2400 mm 125 W Warm White fluorescent tubes are used in the store to give, in the general areas, a lighting level of 350 lux and in the cash desk area, a lighting level of 700 lux.

"I am very happy with the installation" said Mr. Niven, general



Dodge City Supermarket, Glasgow

manager of Dodge City Supermarket, "the effect of the Warm White general lighting scheme shows the goods to their best advantage which in the long run can only be good for trade."

For more information use Reader Service Form quoting LEN C603

Edinburgh Castle floodlit to new standards

THE original floodlighting system for Edinburgh castle was installed during 1931 as a result of a request made to the then Office of Works by the International Illumination Congress which visited Edinburgh in September that year. This installation was provided by the Edinburgh Corporation Electricity Department and was of a temporary nature only.

In the following year authority was given by the Office of Works to Edinburgh Corporation to install a permanent floodlighting system

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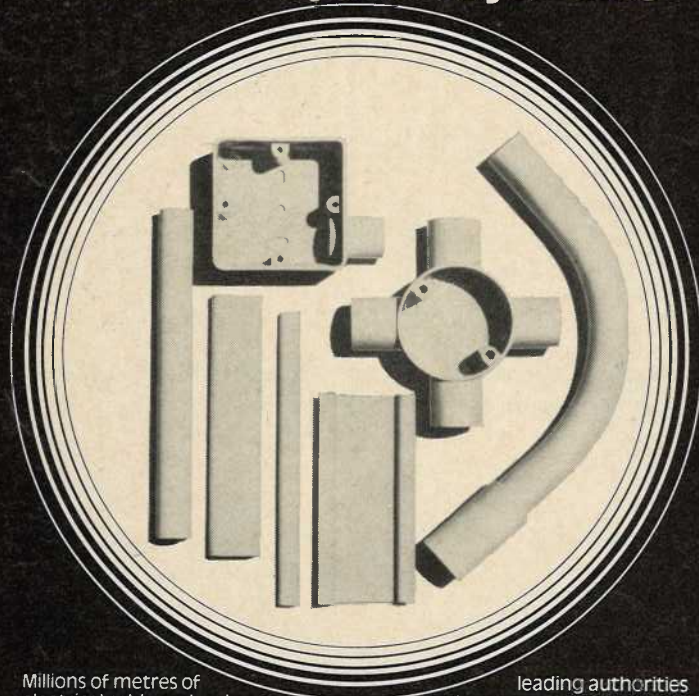


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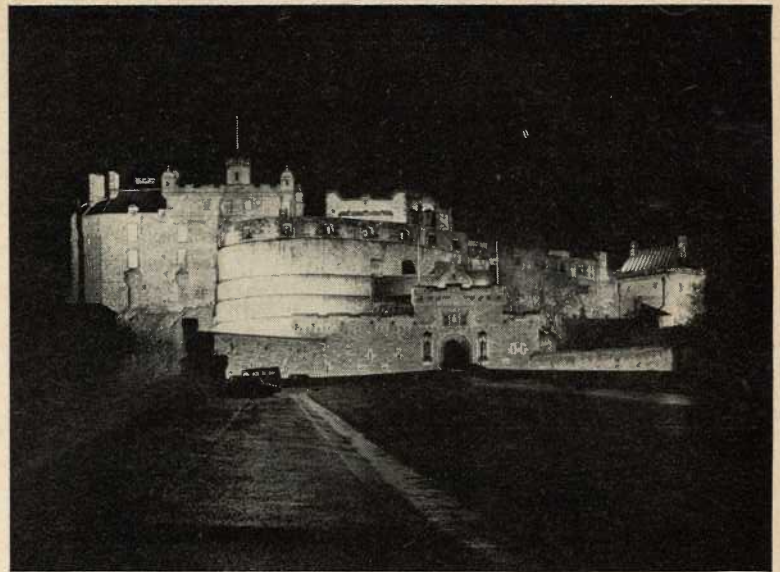
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For more information use Reader Service Form quoting LEN C120



Edinburgh Castle under the new floodlights

at the City's expense. Funds approved by the Corporation for the complete installation—fittings, lamps and cabling—amounted to £2350. This system was based entirely on tungsten filament lamps and according to records in its original state had a total electrical loading in excess of 150 kW. The system remained in service for 42 years until disconnected in October 1974.

In recent times consideration has been given to replacing the original system because of its general inefficiency and because of its overall deterioration. In framing the specification for the new installation the aim was to provide a high efficiency light source with acceptable colour rendering and as a result the high pressure sodium discharge lamp was selected for the main floodlighting with mercury vapour discharge lamps for highlighting certain prominent features of the castle. The reduction in the total electrical demand from 150 kW to 40 kW is a significant saving in energy and expense.

The new scheme was designed by engineers of the Property Services Agency of the Department of the Environment in conjunction with lighting specialists of **Philips Electrical Ltd.** who set out to give different brightness levels, where appropriate, on the various surrounding walls in order to separate these surfaces from each other so that the overall appearance would not be that of a 'cardboard cut-out.' The ends of the buildings are also lit to different levels compared with their frontages, as are the angles in the outer defence walls in order to reveal the shape and modelling more clearly.

The final setting up of all the floodlights was carried out from many viewing locations in the city with the aid of radio-telephones.

At present the new light sources are linked up to the original cabling system on a temporary basis. The intention is that the old cabling will be replaced during the next financial year by a system with a current-carrying capacity to match the reduced loadings.

The cost of the work carried out to date is approximately £12 500 which covers floodlighting fittings, control gear, lamps, fixings and temporary cabling connections.

The numbers and types of lighting units—some 20% of which were made in the Philips lamp factory at Hamilton, Lanarkshire, are as follows:

50 250 W SON lamps and floodlights (high pressure sodium)

49 400 W SON/T lamps and floodlights (very high pressure sodium with additional optical control)

2 375 W MBI/H lamps and floodlights (mercury discharge/halide)

20 125 W MBFR/U lamps and floodlights (mercury discharge/reflector)

5 150 W 24 volt PAR 38 spotlights and floodlights

Total 126 lamps (123 floodlights—three are twin-lamp types)

For more information on Philips floodlighting equipment use Reader Service Form quoting LEN C604.

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Sealed 'no maintenance' nickel cadmium batteries. 3 hours light per 24-hour charge.

Monitoring of mains and charging circuit by light-emitting diode.

BNS/3F (fluorescent) 200 lumens output.
BNS/3T (tungsten) 50 lumens output.

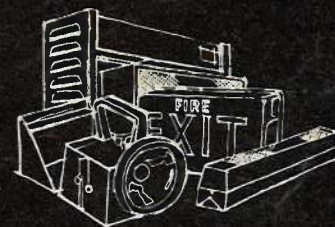
Fused input.

Not only are ELITE emergency lights designed to take the sting out of conventional lighting failures – they've been made to look good, too. To be part of the scene, however sophisticated.

ELITE FITTINGS – the latest addition to the BARDIC range – are competitively priced and easily obtainable – off the shelf from your local stockists: and a free advisory service for unit selection and system layout is all part of the deal.

CHLORIDE BARDIC leaders in safety – makers of emergency lighting, standby power systems and industrial handlamps.

Chloride Bardic Limited
Registered Office: William Street,
Southampton, England SO1 1QH
Telephone: 0703 30611



Please send me more information on BARDIC emergency lighting and the name of my nearest stockist.

Name _____
Company _____
Address _____
Tel _____

LEN/3/E

CHLORIDE BARDIC

Safety Regulations

(continued from page 3)

Manufacturers of decorative lighting fittings will not be the only producers in the lighting industry to be affected. All electrical equipment suitable for use in the home, even though it was not specifically designed for home use, will be covered. This will presumably include therefore, products such as effects lighting and lighting track. It remains to be seen where the line will be drawn in relation to fluorescent fittings that could be used in the home. Accessories such as plugs, sockets and adaptors, and control units are included.

Another development in the situation is that the British Standards Institution has introduced a safety mark that will indicate safety only, ie not quality, reliability, etc. Further details of this will be published in our next issue.

Test Equipment

A REVISED model of its electrical test station is now available from **Clare Instruments Ltd.** This has been produced specially to suit the needs of the decorative lighting industry.

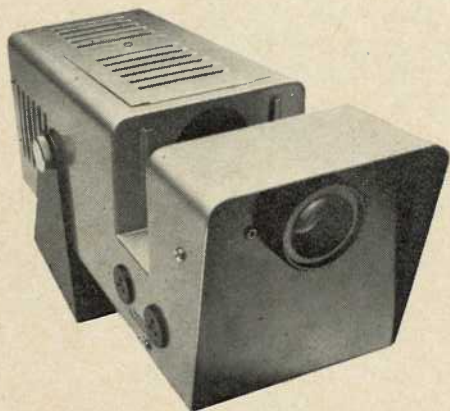
It enables testing to be carried out as required in BS 4533 for the following tests: earth bonding at 10 A or 25 A, 6 V; flash test at up to 5 kV ac; insu-

lation test, and a test for supply continuity.

All the tests are conducted from the one set of connections, so saving time on the production line.

Price and delivery: on application.

For more information use Reader Service Form quoting LEN C701



The Solar 250: a vast range of effects from just one compact projector.

Our new Solar 250 effects projector, although it's small and neat, can give you an unusually wide range of effects.

Using a system of dual runners and twin power sockets, hundreds of effects can be produced from the nine basic attachments available.

These include cassette and wheel rotator plates, slide changer, total eclipse and splodascope effects, kaleidoscope lens, clip-on and rotating prisms.

Up to three motor units can be used at once, so it's easy to build up the effects desired.

The Solar 250 employs the 250 watt M33 lamp, with a 400 hour life, and computer-designed optics, making it brighter than any other effects

projector available.

It weighs just 6kg, and comes complete with standing/hanging bracket.

This projector is ideal for almost any application. Its sheer versatility and compact size gives you a completely portable full light show. And for static operations, its simplicity and unobtrusiveness will be appreciated.

Write or phone Optikinetics for full information, including details of the various attachments available, and prices.

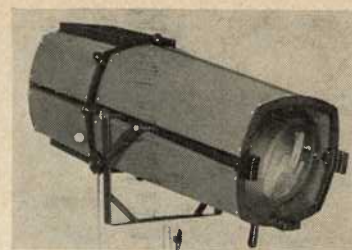
OPTIKINETICS

Optikinetics Limited,
38 Cromwell Road, Luton, Bedfordshire.
Telephone: Luton (0582) 411413/4.

Large profile spotlight

W. J. Furse & Co. Ltd., Theatre Division, has introduced a large profile spotlight designed to take advantage of the 2 kW tungsten halogen lamp and to meet the need for a high output profile projector for professional theatre and television studio work.

The optical system comprises a faceted ellipsoidal anodised aluminium reflector with plano-convex lens in a sliding cast aluminium frame that moves on nylon guides for accurate adjustment. A tilt angle of +5° to -45° and a 360° pan in the horizontal are possible. A



manual colour change unit can be fitted.

An alternative version uses a 1000 W compact source iodide lamp with associated control gear.

Price: on application.

Delivery: ex stock.

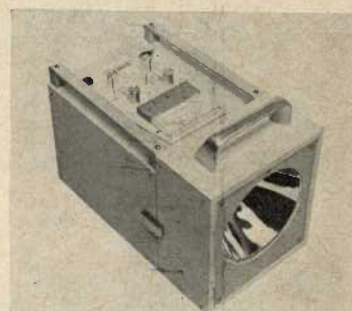
For more information use Reader Service Form quoting LEN C702

High intensity strobe

STROBE Automation Ltd. has a high intensity strobe type 16K designed for use in areas of high ambient lighting, or for those applications where a high intensity light beam is required.

It covers a speed range of 200 to 16 000 flashes per minute to an accuracy of 1%. The lamp head, which is detachable, incorporates a 40 W xenon flash tube with a 250 hours' life.

Price: £180.



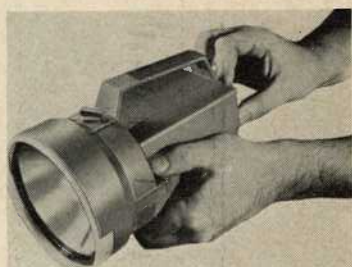
Delivery: 3-4 weeks.

For more information use Reader Service Form quoting LEN C703

Strobe for bench applications

ELECTRONIC Brokers Ltd. has available a combined stroboscope and tachometer in a portable, high impact resistant plastic case. It is designed for use in a wide range of fault detecting, measuring and observation applications. By optically slowing down or "freezing" a moving object the stroboscope allows close examination, while the tachometer measures speed or movement between 200 and 6000 rpm.

Weighing only 765.45 g the Strobette is suitable for tool boxes or bench applications and a built-in socket accepts a wide



range of camera tripod threads. A xenon white 6500 K daylight lamp is used. Accuracy is 3% or better and flash duration 10-25 microseconds.

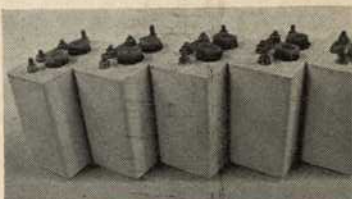
Price: £49.50.

Delivery: on application.

For more information use Reader Service Form quoting LEN C704

Compact double cell battery

INDUSTRIAL Instruments Ltd. has announced the availability of a new type compact double cell nickel cadmium battery suitable for emergency lighting purposes. The new plastic cased Alcos Ni-Cd double cell achieves 50% packaging economy as it comprises a single box into which two completely independent cells have been moulded thus providing almost the same nominal



voltage as a lead acid cell. A 12 V battery can be achieved with only five containers.

Price: £4.55 plus VAT.

Delivery: ex stock.

For more information use Reader Service Form quoting LEN C705

Coloured metal pendants

ELIT Lighting has added two new pendants to its range of Swedish lights. Called Alfa and Delta, they are large metal spinnings in red, yellow, green, brown or white.

Alfa is 580 mm in diameter and 320 mm high; Delta is 530 mm in diameter and 310 mm high.

Price and delivery:
on application.

For more information use Reader Service Form quoting LEN C706



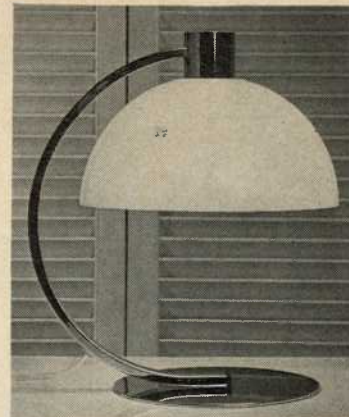
Italian table lamp

AN Italian table lamp with a hemispherical shade supported on a curved, chromium plated arm and flat circular base is available from **British Home Stores**. The shade is in white opal acrylic to give a softly diffused light.

The complete lamp is approximately 350 mm high; the diameter of the shade is 250 mm.

Price: £7.50.

Available: at most BHS branches.



For more information use Reader Service Form quoting LEN C708

Candle lamps in twinpacks

TWINPACKS for candle lamps have been introduced by **Osram (GEC) Ltd.** to help customers to easily identify the type of lamp required.

The pack allows the customer to see whether the lamps are clear or opal and whether the caps are BC or SBC; at the same time the retailer can test each lamp on the spot without having to open the carton.

Dispensers are available for wall mounting and there is



another version for standing on counters.

Price and delivery:
on application.

For more information use Reader Service Form quoting LEN C707

Non-maintained emergency fitting

PHOTAIN Controls Ltd. has a new non-maintained emergency lighting fitting, NMT-3, to replace its 9300 model.

A red indicator light shows that the unit is fully operational and that the nickel cadmium batteries are being charged. If the mains supply fails the fitting gives up to three hours' light. The batteries recharge within 24 hours.

The plastic housing measures 508 x 115 x 69 mm and is stated



to comply with BS 2782 Part 5. The circuitry and batteries are situated at opposite ends of the unit, so keeping the batteries away from any heat source.

Price and delivery:
on application.

For more information use Reader Service Form quoting LEN C709

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For more information use Reader Service Form quoting LEN C124

Temperature indicator labels

A. LEVERMORE & Co. Ltd. has a series of labels that change colour from silver to black when subjected to their rated temperature. There are 41 different temperature ratings from 37°C to 260°C. Each "bookmatch" pack contains 27

labels which are self-adhesive and hermetically sealed. The overall size is 14 mm by 11 mm. Accuracy is $\pm 1\%$ of temperature rating.

Price: £1 per pack.

Delivery: on application.

For more information use Reader Service Form quoting LEN C712

Power pack in the filing cabinet

TRANSIPACK 200D is a self-contained standby power supply designed to fit the bottom drawer of a standard foolscap filing cabinet. Introduced by **Industrial Instruments Ltd.** it consists of a taper/boost charger, 12V car battery, a sinusoidal static inverter and a mains failure switch-over unit.

In the event of a power cut, loads such as electric typewriters and adding machines are plugged into a standard square pin 13A socket on the Transipack. Power supply duration is two hours.

Price and delivery: on application.



For more information use Reader Service Form quoting LEN C713

New device to save life at sea

A BUOY claimed to be the most advanced and comprehensive marine automatic distress transmitter and life support system available anywhere has been introduced by **Lucas Marine**.

In an emergency the buoy is self-anchoring to the vessel in depths of less than 914 m, enabling life saving equipment to be used more effectively by emitting a high intensity flashing light and distress radio signal,

reeling out 914 m of tension control wire cable that is anchored to the ship, releasing a 15 m floating mooring line with light to act as a rallying point for survivors, releasing a 4/6 man liferaft, serving as a wreck location marker, and acting as a sea anchor.

It is ruggedly built of fibre glass and the electronics are contained in the foam core.

Price and delivery: on application.

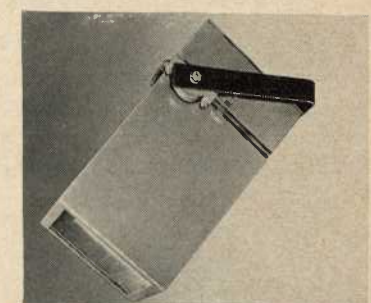
For more information use Reader Service Form quoting LEN C714

Reflector discharge fittings for Zone 2

VICTOR Products (Wallsend) Ltd. has introduced a range of lighting fittings that uses mercury fluorescent reflector lamps and has a BASEEFA Certificate for use in Zone 2 atmospheres.

The fittings have a rectangular housing in sheet metal; the lamp enclosure is restricted breathing with toughened glass window. The company states that control gear and capacitors comply with electrical and mechanical safety requirements of appropriate British Standards, and the fittings are constructed to BS 4533 section 2.1.

A general purpose type is



available for high bay lighting in 400 W and 250 W sizes and there is a version with an adjustable stirrup mounting (illustrated) for directional area lighting.

Price and delivery: on application.

For more information use Reader Service Form quoting LEN C715

Trade Publications

Hiatt & Co. Ltd. has literature covering its range of plastic cable clips for pvc and MI cable.

LEN C801

Lamps, lighting, electrical materials and apparatus are listed together with the exhibitors in the lighting section of the **Hanover Fair** lighting brochure. The **Hanover Fair** takes place from 16 to 24 April 1975.

LEN C802

The **Aladdin Industries Ltd.** booklet describes the range of Aladdin flicker flame electric fires and Victoriana lamps.

LEN C803

Pistor and Krönert (UK) Ltd. has a broadsheet illustrating its range of Express components and illuminated switches.

LEN C804

Rock lampholders, ceiling roses, batten holders and junction boxes are detailed in an illustrated folder from **Rock Electrical Accessories Ltd.**

LEN C805

A colourful display of Sundial home suntanning equipment has been prepared in a publication from the **House of Carmen Ltd.**

LEN C806

Published by **The Electricity Council**, a booklet entitled *Electric Aids for Disabled People*, gives much useful advice and information on electrical equipment for the disabled.

LEN C807

Ionlite Ltd. is issuing a new publication showing the extended range of fluorescent self-contained emergency luminaires. Added to the list are units fitted with opal vandal and fire resistant polycarbonate diffusers, eight of which comply with the Greater London Council's specification for safety, durability and performance.

LEN C808

The FAP-FIBO electrical conduit system is described in literature from **Fitter & Poulton Ltd.**

LEN C809

Two models of Rima heat and light fittings for the bathroom are described in the booklet *Make your house a home*, which also includes information on the other **Rima Electric Ltd.** appliances for home use.

LEN C810

The high demand by architects and designers for glass tungsten lighting fittings has prompted **Emess Lighting** to produce a new 54-page catalogue (No. 11174) showing over 800 designs.

LEN C811

Literature describing plastic covered steel conduit and the Burcol range of plastic conduit and fittings is available from **Burn Tubes Group.**

LEN C812

A 20-page colour booklet entitled *Heat Transfer Lighting Fittings for Integrated Environmental Design* has been published by **Osram (GEC) Ltd.** in conjunction with the Hirst Research Centre at Wembley. Full details are given on all aspects of lighting for the total environment.

LEN C813

A catalogue supplement from **Lightomation Ltd.** describes many new kinetic lighting devices that have been introduced since the company's main catalogue was published.

LEN C814

Ceag Ltd. has a leaflet on emergency lighting which describes the range of exit signs, sustained, maintained and non-sustained emergency lighting equipment produced by this firm.

LEN C815

The January 1975 price list from **Bill Switchgear Ltd.** lists the current prices of a wide range of switches, fuse gear and associated equipment.

LEN C816

Merchant Adventurers Ltd. *Lighting Guide 74B* describes and illustrates the current range of Marlin lighting fittings. A trade price list is included.

LEN C817

Technical data sheets describing the applications for, and properties of, four new silicone resins especially developed for use in the electrical and electronics industries, are now available from **The Goldschmidt Ltd.**

LEN C818

Pluto Electronics Ltd. has leaflets covering its range of special effects lighting and accessories.

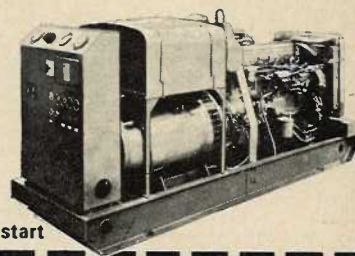
LEN C819

Building Regulations 1972/3 — *Guidance Note Structural Fire Precautions* has been published by HMSO, price £1.15 net.

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SITUATIONS VACANT

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Jarnkonst, a member of the International Asea Company, and one of the largest European manufacturers of technical luminaires are seeking an experienced

SENIOR SALES ENGINEER

to introduce its products to the U.K. market. These products comprise interior industrial and outdoor luminaires for incandescent fluorescent and discharge lamps.

Up-to-date market knowledge and extensive experience in the field of technical illumination, preferably including air handling luminaires is essential.

Based on previous experience and training, which will be given abroad, the successful applicant must be able to plan and offer qualified information for a variety of applications.

Excellent salary and conditions will be offered commensurate with the responsibility of the position, which has considerable growth prospects. Location will be based on either London or Cheadle Hulme.

Applications giving detailed experience, salary required etc., and marked "Confidential" should be addressed to the Sales Manager, Standard Products, ASEA (Great Britain) Limited, Earl Road, Cheadle Hulme, Cheshire SK8 6QP. CL.492

Lighting Manager

Sanderson, a name synonymous with high quality Wall-coverings and Furnishing Fabrics are now looking for a Manager to join them at Berners Street.

This is a new position and the person we seek will be directly involved in the setting up of an entirely new department, and will be responsible to the Store Director for its successful operation.

Ideally, applicants will have in-depth product knowledge, particularly in the high quality retailing field, preferably backed by buying and managerial experience.

Salary will be dependent upon experience and capabilities and will reflect the importance of the position. Conditions of Employment are in keeping with a large and progressive company.

Applications in confidence, giving brief details of career to date, should be addressed to:

Sanderson

Store Director
A Sanderson & Son Ltd
49-52 Berners Street
London W1

CL. 491

AGENTS

AGENTS REQUIRED with established wholesale/retail connections for a well established proven good selling range of high quality decorative Lighting. Good commissions, QUICK DELIVERIES, most counties. Stylelight, 10 Hegdale Farm, Ashford Road, Badlesmere, Faversham, Kent ME13 0JX. Phone: Challock (023-374) 514. CL. 472

Australia's largest manufacturer of decorative lighting wishes to appoint several exclusive agents with well established associations in both the wholesale and retail lighting trade.

This is a unique opportunity for any company wishing to establish a profitable and long term agency arrangement in the following areas —

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CL.493

AGENTS REQUIRED IN ALL AREAS to sell exclusive lighting fittings with established retail connections. Write with details to Box CL.490 Lighting Equipment News, 76 Oxford Street, London, W1N 0HH.

IMPORTER OF COMPREHENSIVE RANGE OF modern, decorative and commercial lighting from Scandinavia and W. Germany seeks experienced agents to expand established retail and contract trade in most areas of U.K. Good commission, delivery service and future prospects offered. Detailed application, stating age, area and other agencies covered, to SCANDESIGN LIGHTING, Kingswinford, W. Midlands, DY6 9PA. CL.494

Leading Manufacturer of self-contained re-chargeable emergency lighting requires Agents or Distributors in order to promote sales through electrical contractors, wholesalers, public authorities, hotels and industry. Applications are invited from agents with suitable experience, who should contact Box No. CL.495 Lighting Equipment News, 76 Oxford Street, London, W1N 0HH.

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to sell Swedish designed domestic lights.

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CL. 496

OLD ESTABLISHED LIGHT MANUFACTURING COMPANY is about to embark on an ambitious expansion programme. This well respected company requires agents in all areas of the U.K. with connections in the wholesale and retail lighting trade to introduce extensive range of traditional domestic Lighting. Apply Sales Director, Box Number CL.497, Lighting Equipment News, 76 Oxford Street, London, W1N 0HH.

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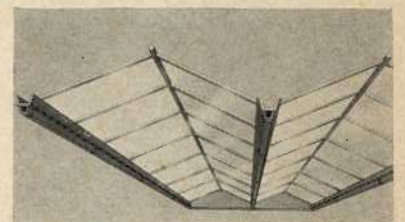
FURTHER INFORMATION FROM
PHOTAIN CONTROLS LTD.
Unit 18, Hanger No. 3, The Aerodrome, FORD, Sussex.
Tel: Littlehampton 21531 STD 09064.

CL. 456

Wide span rooflight

NOVOSPAN is the name of a new rooflight system by the Cordar Division of **Elders Walker Ltd.** It is designed for projects requiring large span continuous light membranes or intermittent lighting, being particularly suitable for spans of between 2 and 4 m.

The modular construction consists of factory formed single or double skin thermoplastic light components, extruded aluminium gutters and tie beams. The light components are up-turned for weathering at the top and sides and downturned



for drainage at the gutter. Gutters are fully insulated and all metal tie beams are externally protected with pvc capings.

Price and delivery: on application.

For more information use Reader Service Form quoting LEN C716

LEN Reader Service

Circulation Control

LIGHTING EQUIPMENT NEWS is a controlled circulation journal, and is sent free of charge each month to qualified readers, i.e., those concerned in an executive capacity with the design, specification, purchase, installation, operation, maintenance, distribution and sale of lamps, lighting fittings and accessories of all types for the lighting of domestic, industrial, commercial and public buildings, including display, street and specialised out-door lighting. The qualifying job functions and industrial classifications are given in the boxes below.

If you wish to receive this journal regularly — or to advise change* of name of addressee, designation or address—please complete in full the Reader Application Form below. No reader can be accepted until a fully completed form has been received and approved by the Circulation Department.

N.B. Reader applications must be confirmed at intervals of not more than three years, and you will be advised when your application is due for verification.

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Please send me each month, free of charge and without obligation, a copy of LIGHTING EQUIPMENT NEWS.

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Indicate by X position and nature of business

JOB FUNCTION	INDUSTRIAL CLASSIFICATION
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... General Manager	... Mining
... Works Manager	... Food and Drink
... Production Manager	... Chemicals
... Purchasing Officer	... Metal Manufacture
... Contracts Manager	... Engineering and Elect.
... Commercial Manager	... Textiles and Clothing
... Showroom Manager	... Bricks, Glass, etc.
... Proprietor	... Furniture
... Partner	... Paper and Printing
... Designer	... Lighting Manufacture
... Production Engineer	... Display Contractor
... Project Engineer	... Electrical Contractor
... Chief Engineer	... Building Contractor
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	... Educational Establt.
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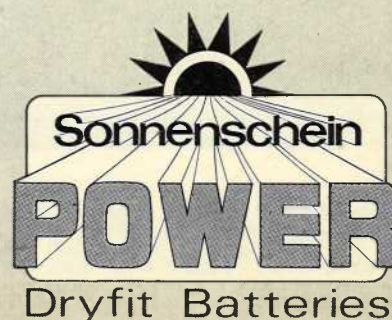
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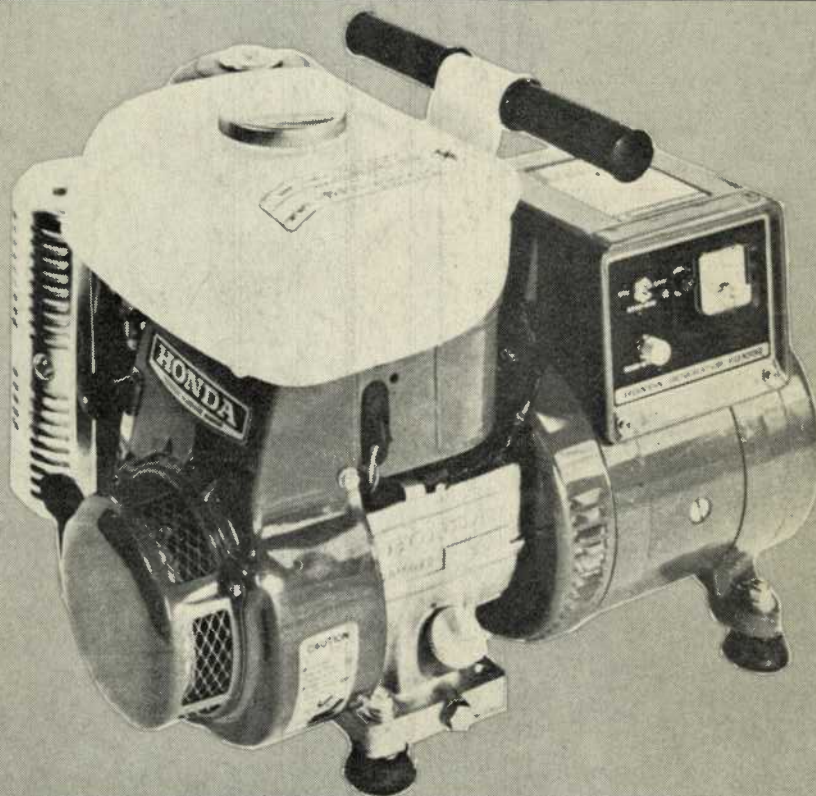
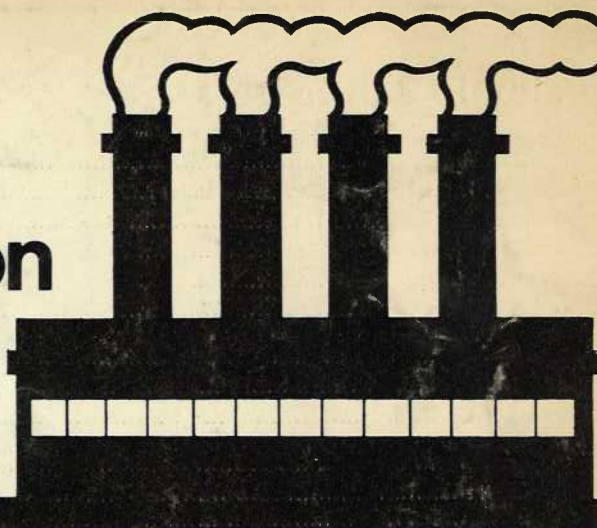
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