The
GAUMONT-KALEE
"21"

EXCLUSIVE

WORLD DISTRIBUTION

by

G.B. - KALEE Ltd.

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Foreword

THE G.B-Kalee Organisation, throughout its career of 35 years, has been responsible for many outstanding achievements in the design of sound and film projection equipment, which eventually became standard practice.

With a wealth of unsurpassed experience behind it; a staff of highly qualified designers, technicians and engineers; and with manufacturing resources that have no equal in the industry, the Organisation has sponsored improvement after improvement which have undoubtedly led to better and better projection.

These unremitting efforts, with the closest attention given to detail, and with the cumulative effect of so many years of practical, specialised experience, have resulted in an enviable reputation for efficiency, dependability and long trouble-free service.

Such is the foundation on which the new and outstanding Gaumont-Kalee " 21 " equipment has been built to serve the world of films.

At no time in its history has the Organisation been prouder of its product—and never has it had greater reason. The new equipment admittedly is a masterpiece, well deserving the acclamation it has received from all who have seen it, experienced it in action and especially from those who operate it.

" A Gaumont-Kalee Product " . . . . in those four words is found the standard by which all other projection and sound equipment is now judged.

A GAUMONT KALEE PRODUCT

The GAUMONT-KALEE "21"

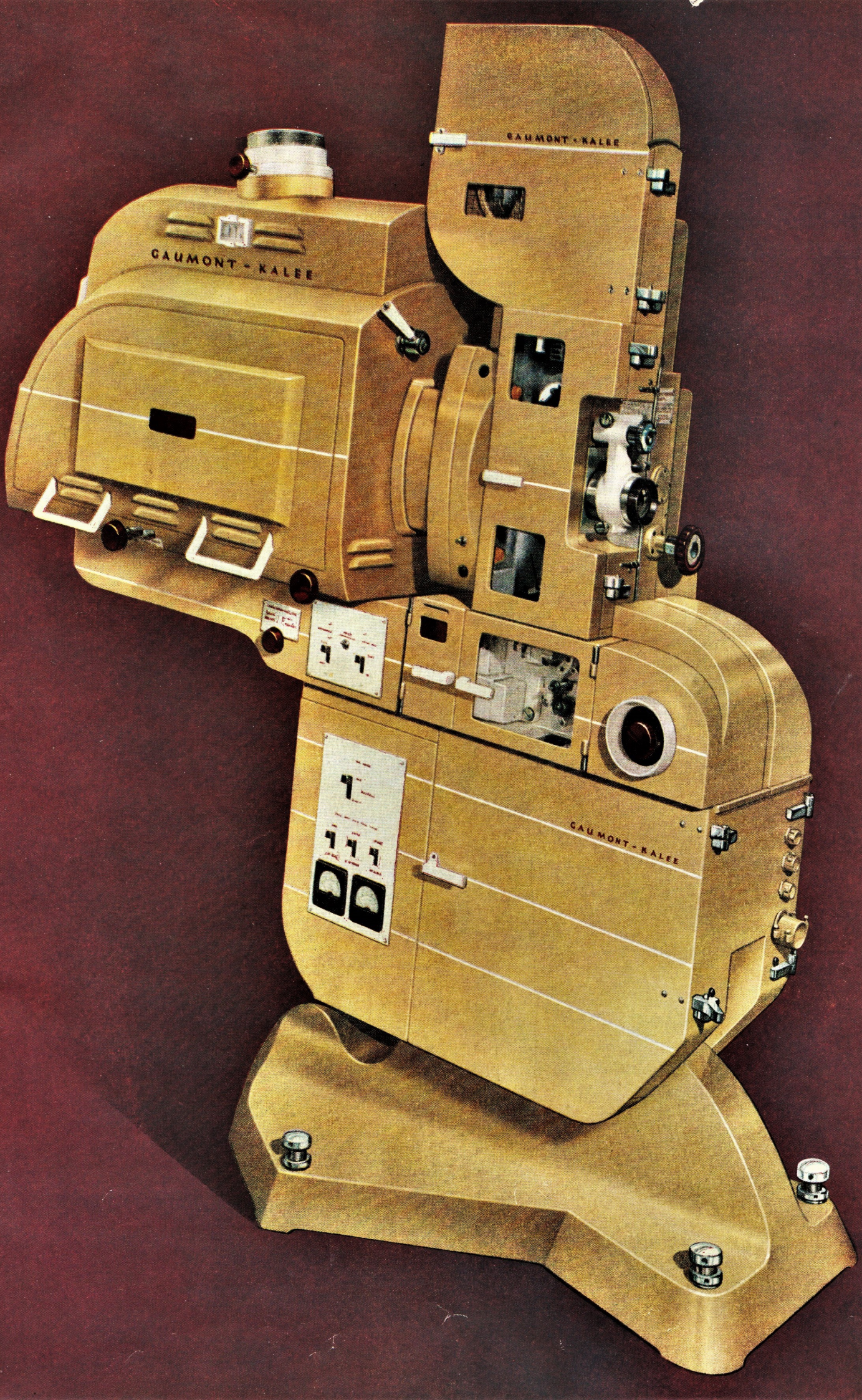
THE Gaumont-Kalee "21" has established itself. Already it is recognised as a new conception in motion picture equipment that is destined to set the standard for a long time to come.

It is modern: modern in every sense of the word. Revolutionary in thought and principle; boldly conceived in design, style and colouring, it presents an appearance that is at once pleasing and business-like. For the first time in the production of cinematograph equipment, the services of an industrial designer have been used to collaborate with the technicians and mechanical designers, resulting in an equipment that is a thing of beauty as well as being of the utmost efficiency. Its appearance is enhanced by an attractive and serviceable colour scheme of light stone and maroon with bright metal parts chromium finished.

The Gaumont-Kalee "21" is totally enclosed, thereby providing almost complete silence in operation, the maximum fire-protection and the utmost cleanliness throughout. All wiring and conduits—except the main services—are entirely concealed within the base of the equipment, leaving the floor of the projection room clear. Yet although completely enclosed, every part of the equipment is readily accessible for inspection, servicing and cleaning.

The Gaumont-Kalee "21" has been designed as a complete unit, including in one piece of equipment the various components such as projector, optical system, arc lamp and soundhead which hitherto have been treated as separate units. This has meant the closest co-operation between scientists and technicians, with the result that the Gaumont-Kalee "21" is a complete functional entity.

The equipment is of robust construction throughout. Projector, soundhead, spool boxes and doors, are ribbed castings, eliminating whip or drumming. It is a veritable masterpiece of British motion-picture development, precision engineering and scientific skill, and it brings to the screen a sound and picture presentation which is admittedly unsurpassed.


GAUMONT - KALEE
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The Projector

THE Gaumont-Kalee "21" Projector has been designed to match the wide optical aperture of the new Kalee "bloomed" lenses and the correspondingly large diameter 16 in: (406 m.m.) mirror of the new Gaumont-Kalee "Lightmaster" arc lamp which pass an unrestricted flood of light hitherto unattained.

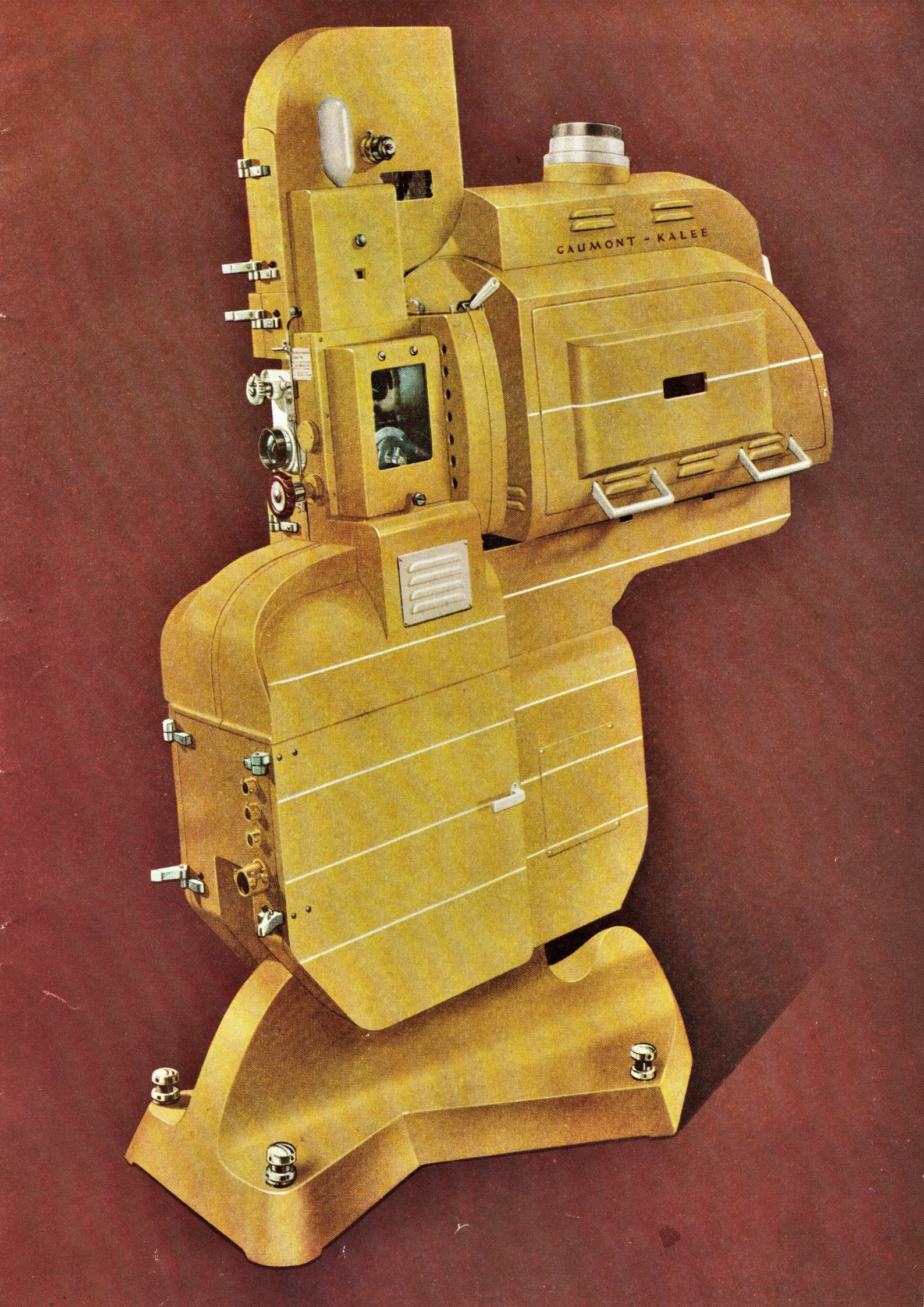
The Projector incorporates an improved shutter with a single blade, running at twice the normal speed, thus cutting the light beam in half the time taken by the usual two bladed shutter, and giving a 20% increase in light efficiency with less flicker and an improved definition. The aluminium blade has an integral counterbalance in a full-floating sleeve, along which oil is continuously circulated.

Special attention has been given to the design of the gate to eliminate the extra heat inevitably associated with more light on the film. The aperture itself is screened by a heat reflector and the gate is massively constructed with ample radiating surface to ensure adequate heat diffusion and dissipation.

The sturdy gate construction, the rigidly supported intermittent unit accurate to .0001", the equally accurate hardened and ground sprocket with precise end location avoiding risk of shaft deflection, all contribute to give a rock-steady picture.

Threading is simple and is facilitated by two low-voltage pilot lamps operated from a small built-in transformer, thus combining the advantage of mains supply. The parallel opening gate, which is instantly detachable for cleaning, and the pressure rollers, are self-sustaining in the open position. A secondary aperture in the mask plate provides for inspection and threading in frame with the gate closed. Framing during projection is accomplished by rotation of the intermittent unit, through a control situated on the front of the machine which is easily accessible from both sides.

The projector incorporates a simple but effective picture change-over device electrically controlled from either machine. Provision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The Projector – CONTINUED

has also been made for the fitting of a specially designed built-in Pyrene fire extinguisher when required. (See description on page 17).

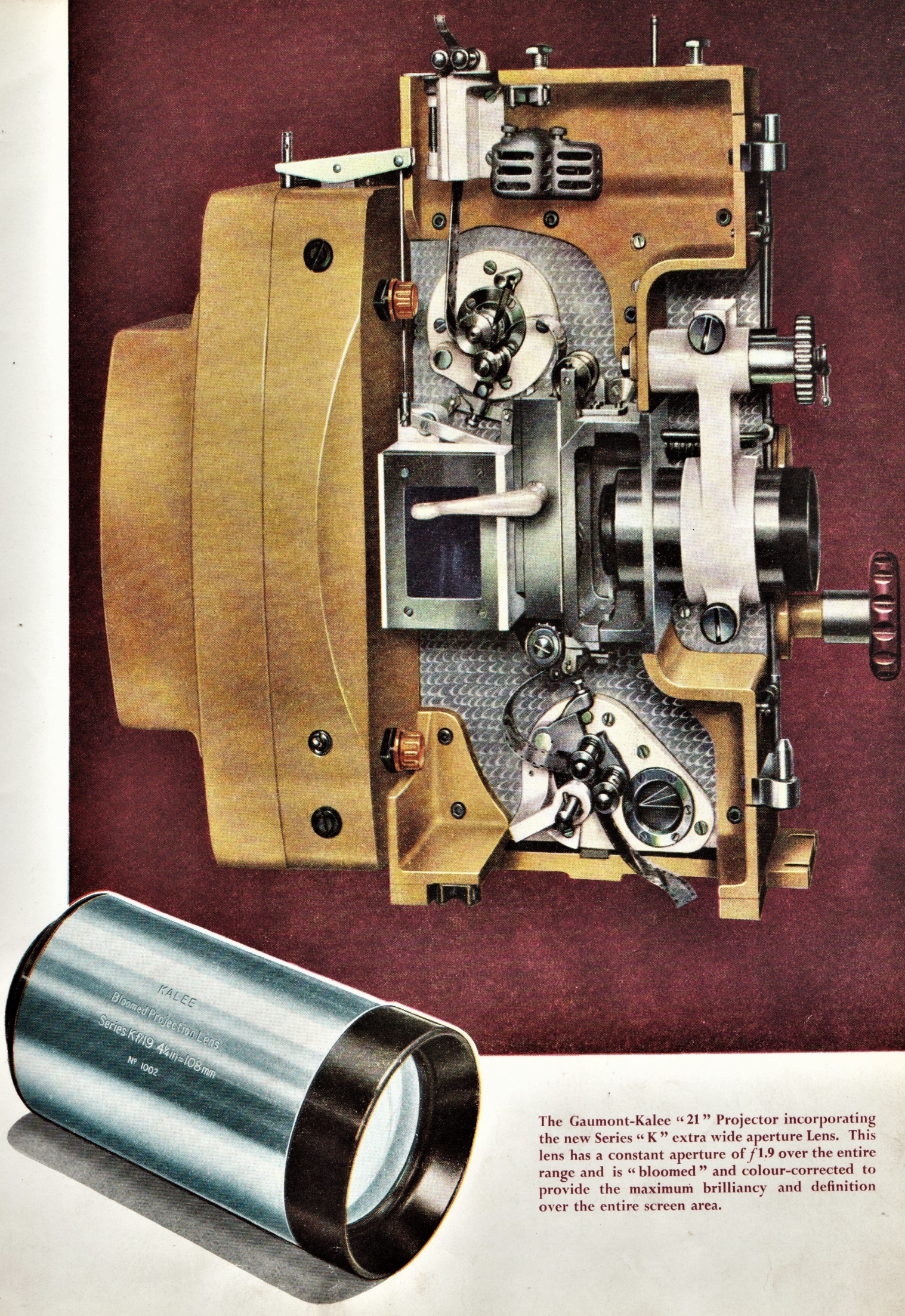
The operating side has been enclosed for cleanliness and silent running without restricting the capacity of the lens holder. The lens jacket is arranged for the standard Kalee series "K" *f*1.9 lens of 2.786 ins: (70.8 m.m.) diameter and an adapter is supplied for standard lenses 2.057 ins: (52.2 m.m.) diameter when required.

Rigidity and maintenance of alignment of all spindles are ensured by the substantial box casting of the main frame, which serves as an oil bath in which the mechanism operates under a constant stream of filtered oil, circulated and distributed by a mechanical pump, and which is readily removable as a unit without opening the mechanism. This system ensures ample, automatic lubrication under all operating conditions. Oil leakage is prevented by oil-throwers and by return passages on all spindles which pass through the frame. On the operating side, the oil-level is clearly visible through a sight-glass. The mechanism, and the working of the oiling system, can be seen through a large, clear window on the rear side. The oil filler and filter are accessibly mounted on top of the case, readily detachable for cleaning. The draining of the machine is by means of a drain plug located on the front of the mechanism.

The intermittent unit has a large cross and cam, the latter being 2 ins. nominal diameter. The cam roller is supported on both sides and the flywheel is mounted upon the camshaft without intervening gears. All working parts are of heat-treated, precision-ground steel and operate in an oil box constantly flooded with clean oil. The unit is detachable as a complete assembly.

All gears have helical teeth for quiet running and are paired, metallic and non-metallic, with general employment of "hunting tooth" ratios.

The mechanism has been designed on unit lines throughout and dismantles into a few major assemblies removable as units and interchangeable for easy replacement and service.



The Gaumont-Kalee "21" Projector incorporating the new Series "K" extra wide aperture Lens. This lens has a constant aperture of *f* 1.9 over the entire range and is "bloomed" and colour-corrected to provide the maximum brilliancy and definition over the entire screen area.

The Arc Lamp

THE Gaumont-Kalee "Lightmaster" Arc Lamp features an elliptical mirror of 16 in: (406 m.m.) diameter, which gives a greater light output than ever before obtained, yet requires less critical focussing. Any H.I. carbon combination up to 75-80 amperes is accommodated.

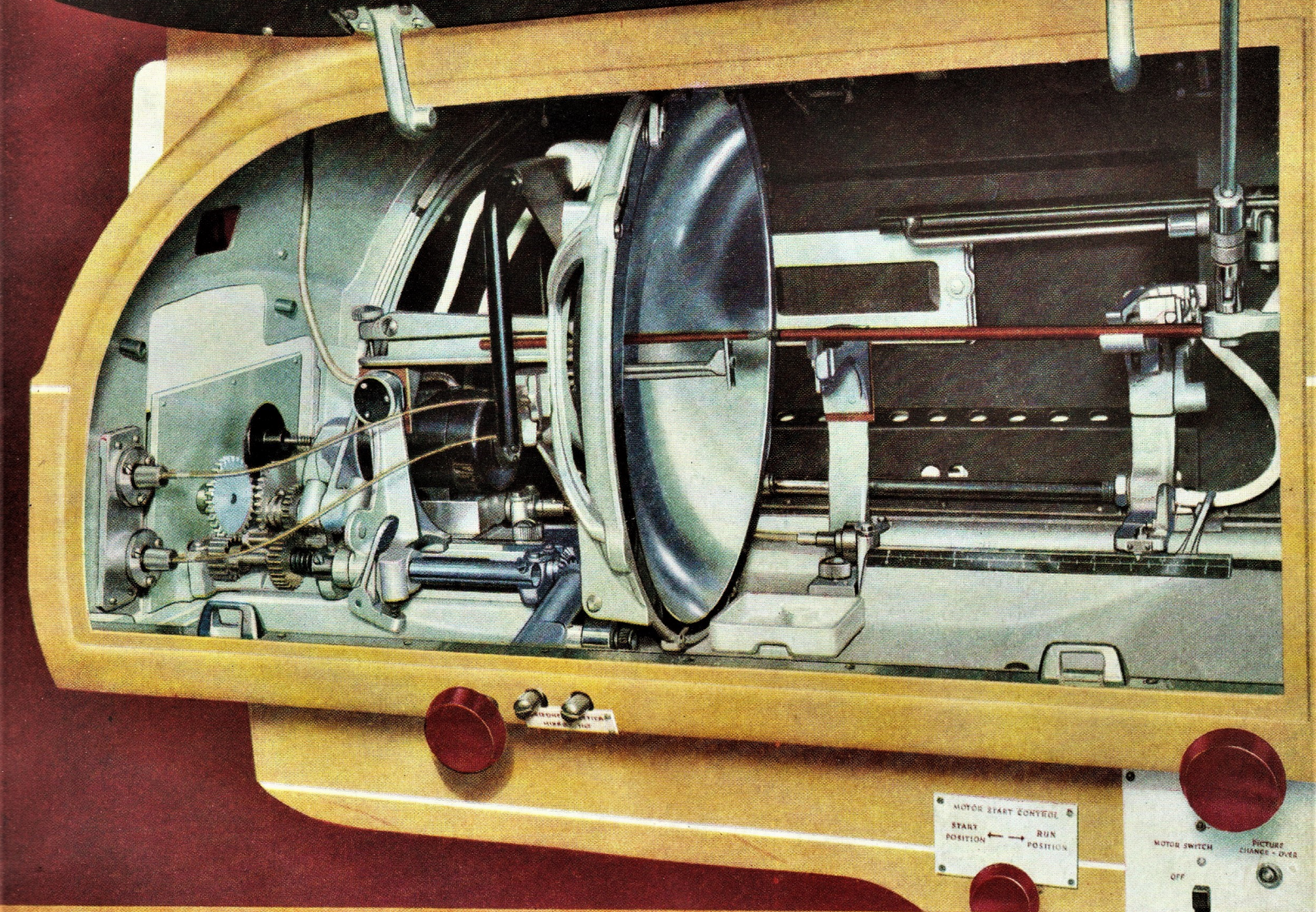
The lamphouse is a rigid, one-piece shell of stream-lined appearance, with flush-fitting doors opening to expose the full length, with a heavy cast base upon which the mechanism is mounted. The motor and drive are mounted behind the mirror in the cool part of the lamphouse and are removable as a complete unit for cleaning and adjustment. Interior illumination, controlled by a door-opening switch, is provided.

The controls conveniently grouped at the rear, include a speed control for the feed motor, "shaded" for sensitive regulation throughout the speed range, with micrometer adjustment of the positive/negative feed ratio. The mirror tilt controls are on the operating side of the lamp and are slotted for screw-driver or coin operation as a precaution against accidental disturbance.

Both carbons are guided near the crater for accurate alignment in replaceable "Vee" guides. The carbon carriages have quick releases for rapid setting and can be adjusted manually by knobs on the operating side of the lamphouse. These normally allow independent control of the carbons, but can be clutched by pressing a push-button on the rear control panel for adjustment of focus without disturbance of the length of the gap. The negative carbon drive is arranged with a push-button striker. An optical system enclosed within the lamphouse forms an enlarged image of the crater on a translucent screen on the operating side.

The dowser is enclosed within the lamphouse and is coupled with a heat-resistant mirror guard which folds up out of the light beam. Operation is by handles on both sides of the front end of the lamp. Control is by a positive linkage, no springs being employed.

Energised magnet arc flame control is fitted which automatically adjusts the magnet field strength to match the current loading, ensuring arc stability and correct formation.



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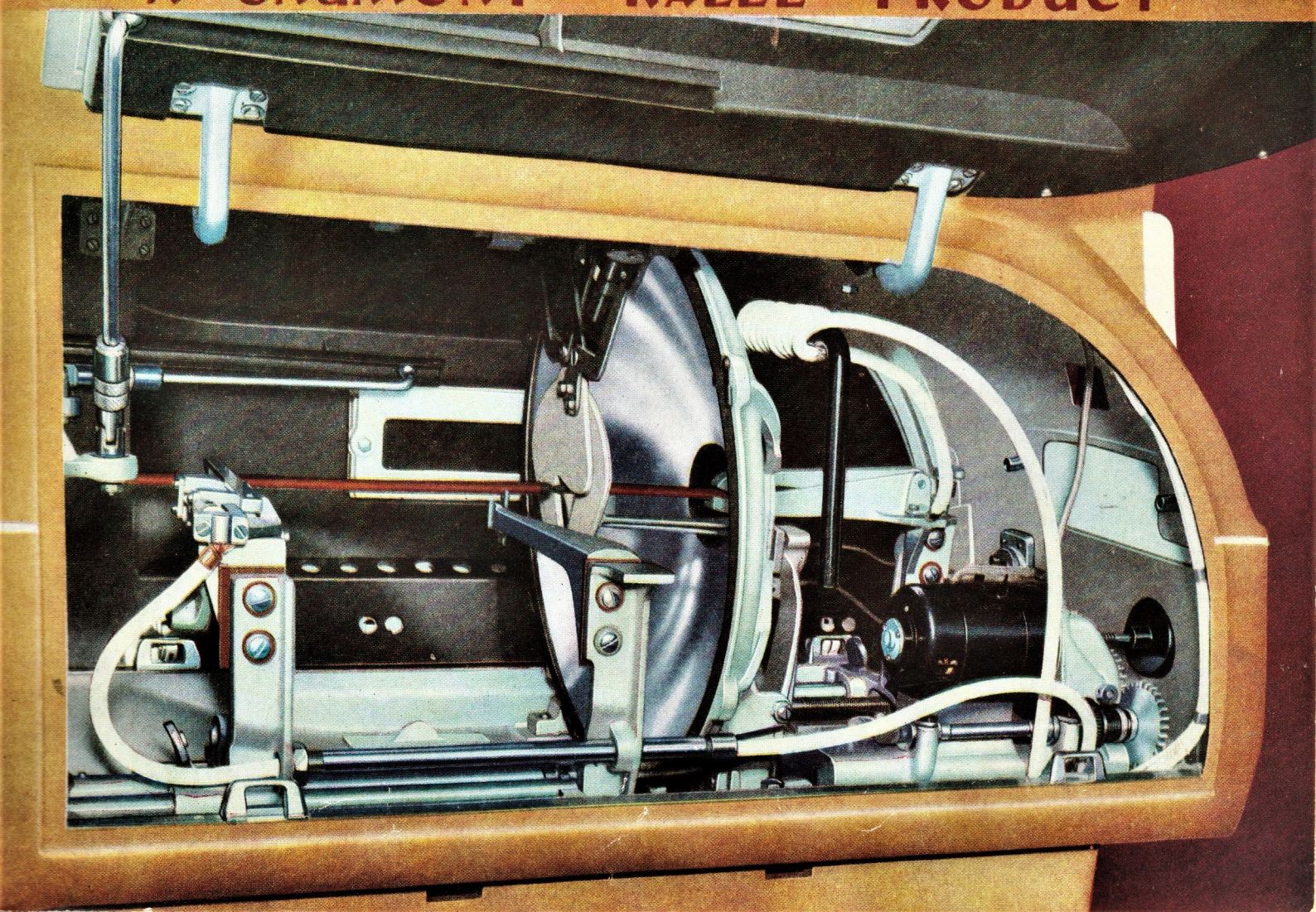

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The Soundhead

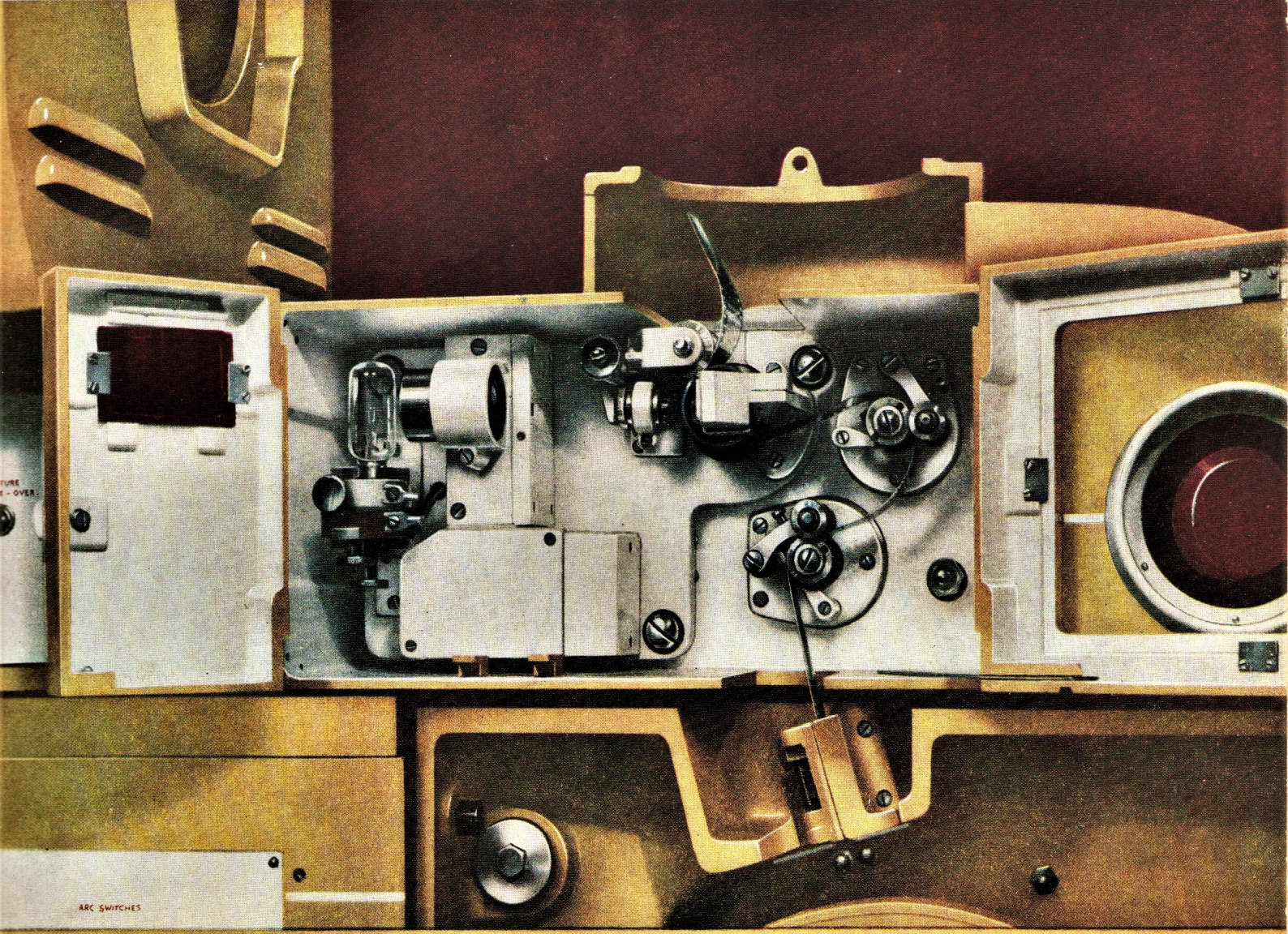
THE Gaumont-Kalee Type 83 Soundhead has been designed to satisfy not only the most exacting Theatre conditions, but also the higher standards required for film-studio re-recording. It incorporates drum-scanning and fluid-flywheel stabilization, and the unique enlarged image optical system, in a new design of clean and attractive appearance.

Each of the rotating shafts is contained in a housing which fits into a machined bore in the main casting, so that when it becomes necessary to replace bearings and shaft, the complete assembly can be withdrawn by the removal of three screws. Accurate manufacturing technique ensures that the assemblies are interchangeable without any necessity for " fitting " of replacement parts. The design is such that it may be kept in service for twenty years without return to the factory, and without the necessity during that period of the use of file, reamer, hammer, or drift.

To accommodate different electrical supply voltages and periodicities motors can be supplied for direct operation from 25, 30, 40, 50 or 60 cycles, and for voltages from 100 to 120 and from 190 to 260. Irrespective of type, the motor is resiliently mounted and drives the soundhead by twin "Vee" belts. The scanning drum shaft, together with the optical system, photo cell, and exciter lamp, are carried on a plate which is resiliently mounted in the soundhead.

The optical system of the Soundhead is one of its most interesting features. The optical magnification is six times, which means that an enlarged image, six times the size of the actual sound track, is impressed on to the window which carries the mechanical slit. With the film stationary it is immediately evident if either sprocket holes or frame lines are being scanned. The scanning masks are fixed, and scanning is correctly aligned by means of the adjustable tracking of the lay-on roller. Slit azimuth is pre-set at the factory. The efficiency of the optical system is high, due to the use of components of large effective aperture, and to the " blooming " of all surfaces.

The Soundhead is rustproof, and is finished internally in a hard porcelain-like white enamel, for easy inspection and maximum cleanliness. The Type 83 Soundhead is readily adaptable to all types of projectors.



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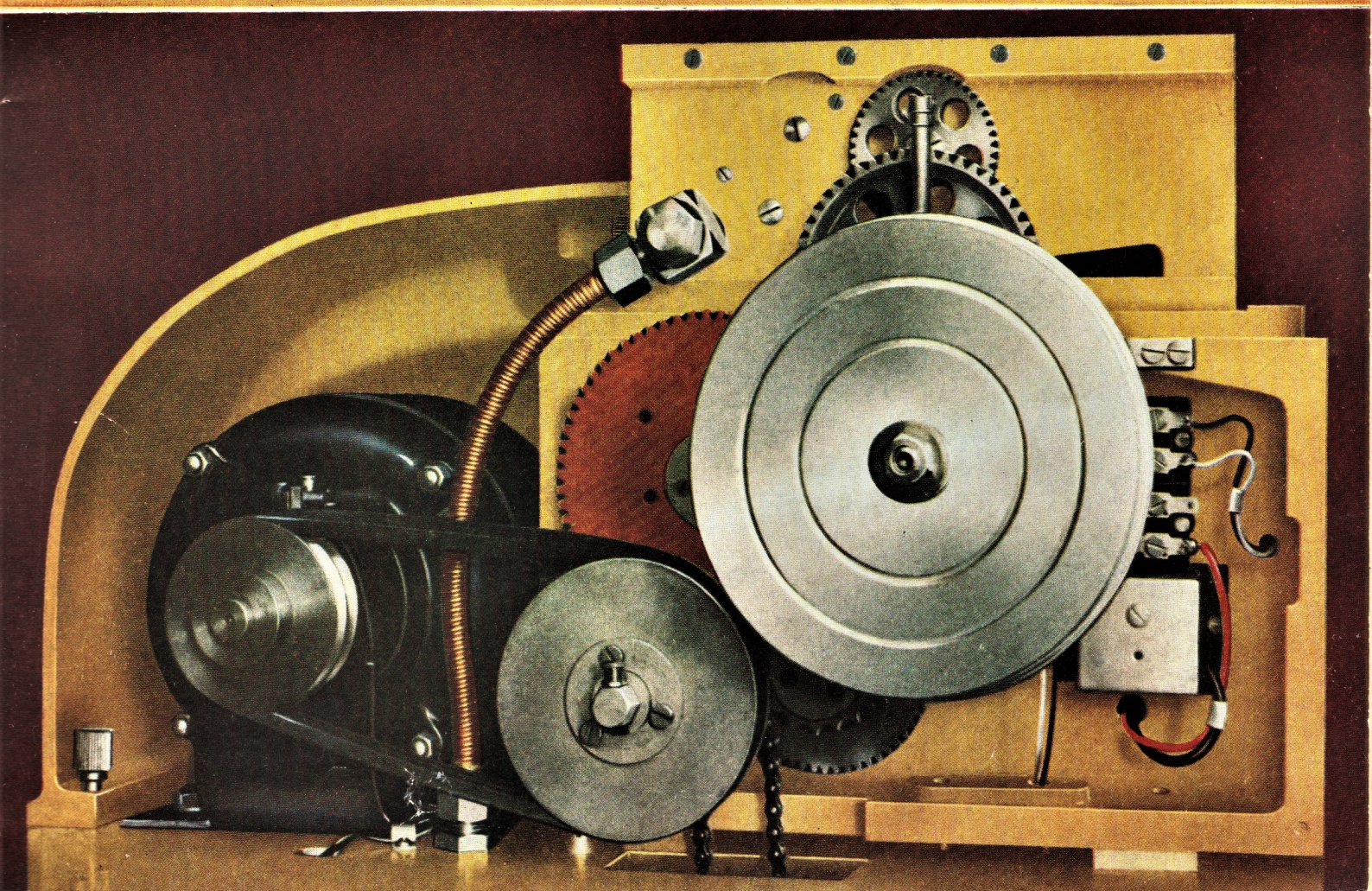

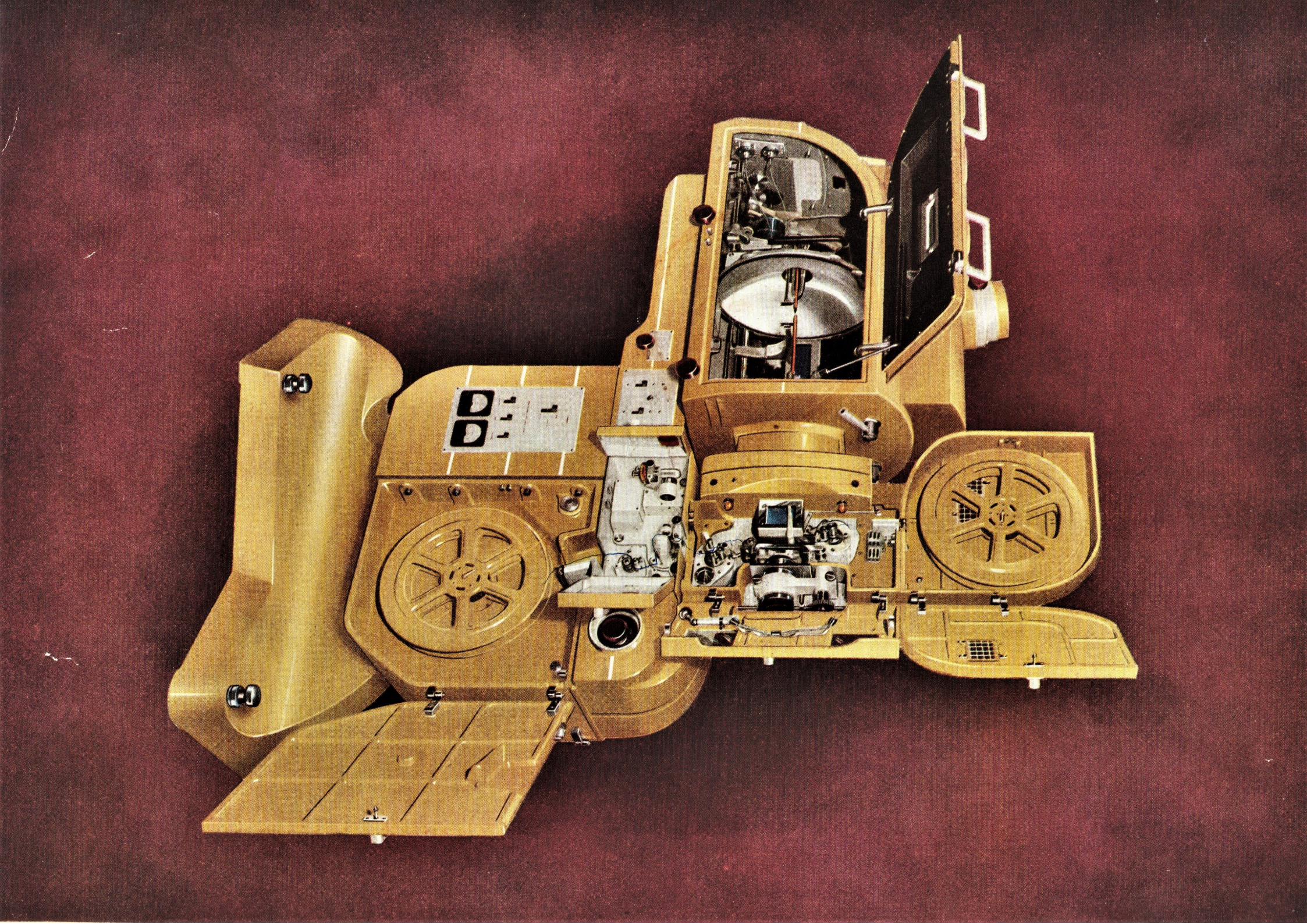

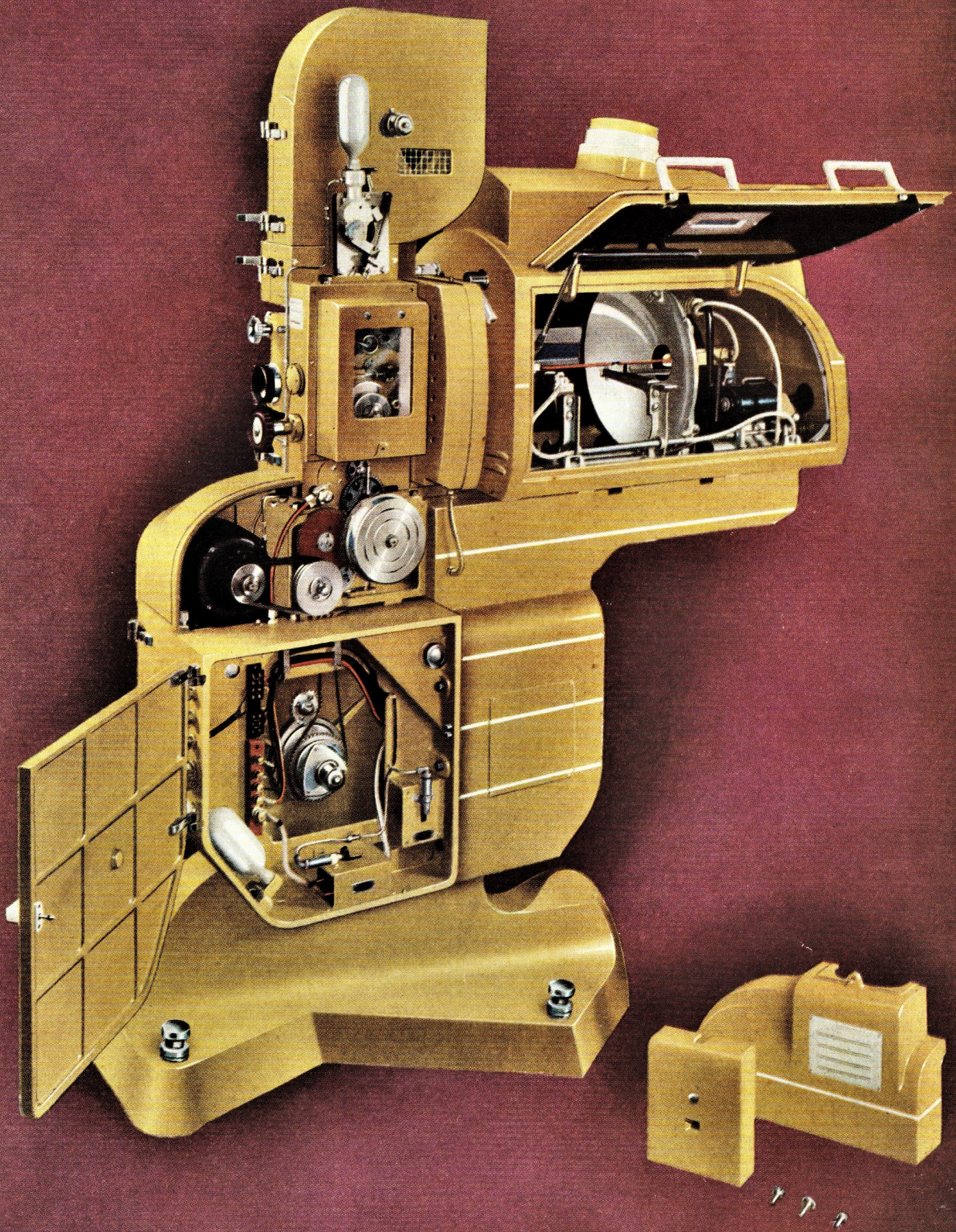

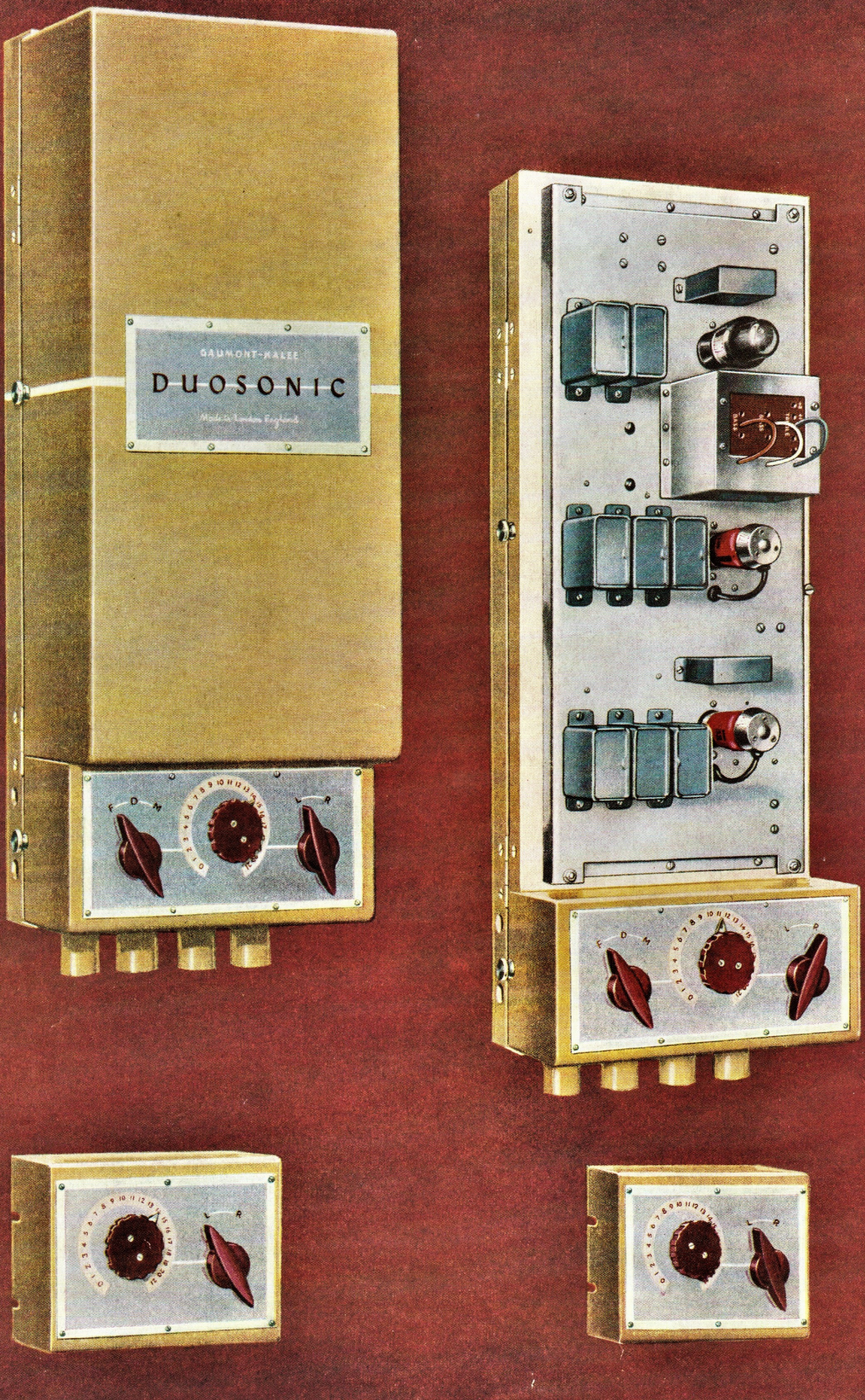
GAUMONT-KALEE
DUOSONIC
Made in London, England
F D M
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The Voltage Amplifier

THE Voltage Amplifier is assembled upon a cadmium-plated panel, 20 inches by 9 inches (51 cms. by 23 cms.). The plating renders the panel rust-proof, and ensures permanent metallic contact with all components mounted upon it.

All valves and components are on the front of the panel, with "Uniplane" wiring on the back, and all components are rated for continuous tropical use.

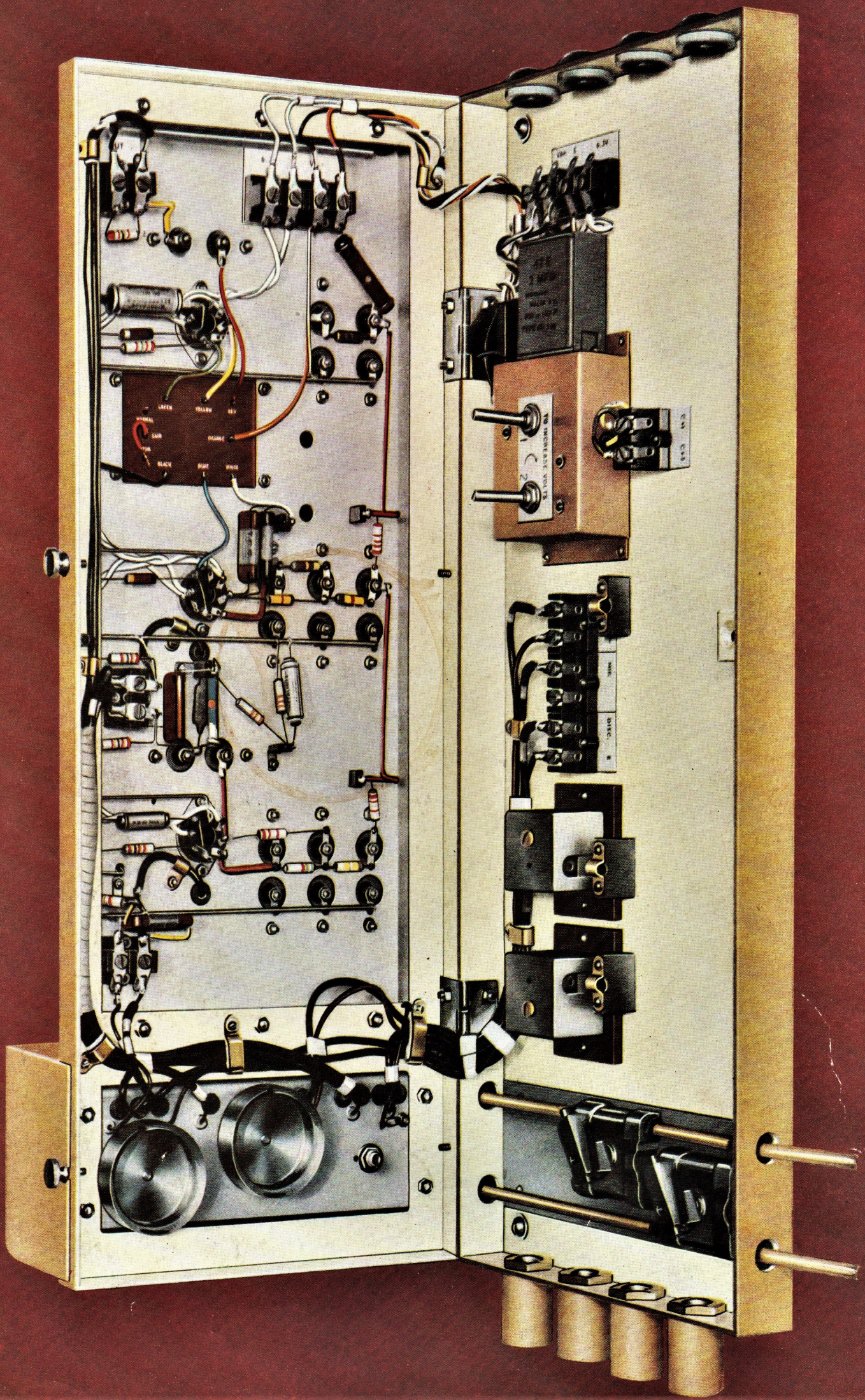
Three valves are used, two 6J7G pentodes and a 6J5G triode. Negative feedback is applied over the last two stages.

Disc input is provided to the second stage. Independent bass and treble equalization is provided in a self-contained unit which is readily detachable from the panel. The standard setting gives an overall response curve to Academy of Motion Picture Arts and Sciences recommendation.

The amplifier panel and its associated control equipment are mounted upon a hinged frame, the rear portion of which is fixed solidly to the wall of the projection room. Instant access to the rear of the amplifier is obtained by releasing a catch and swinging the amplifier forward on its hinges. The "above chassis" components are quickly reached by detaching the amplifier cover.

The entire unit, the dimensions of which are 26 inches high by 10 inches wide by 6 inches deep (66 cms. high by 25 cms. wide by 15 cms. deep), is always mounted in the "upright" position, with the control panel at the top or bottom as dictated by convenience of installation. Normally, only one voltage amplifier is supplied with the Gaumont-Kalee "21" equipment, but two or more of these units can be supplied as required.

When two voltage amplifiers are employed, each carries an emergency switch, so that, in the unlikely event of the failure of



The Voltage Amplifier – CONTINUED

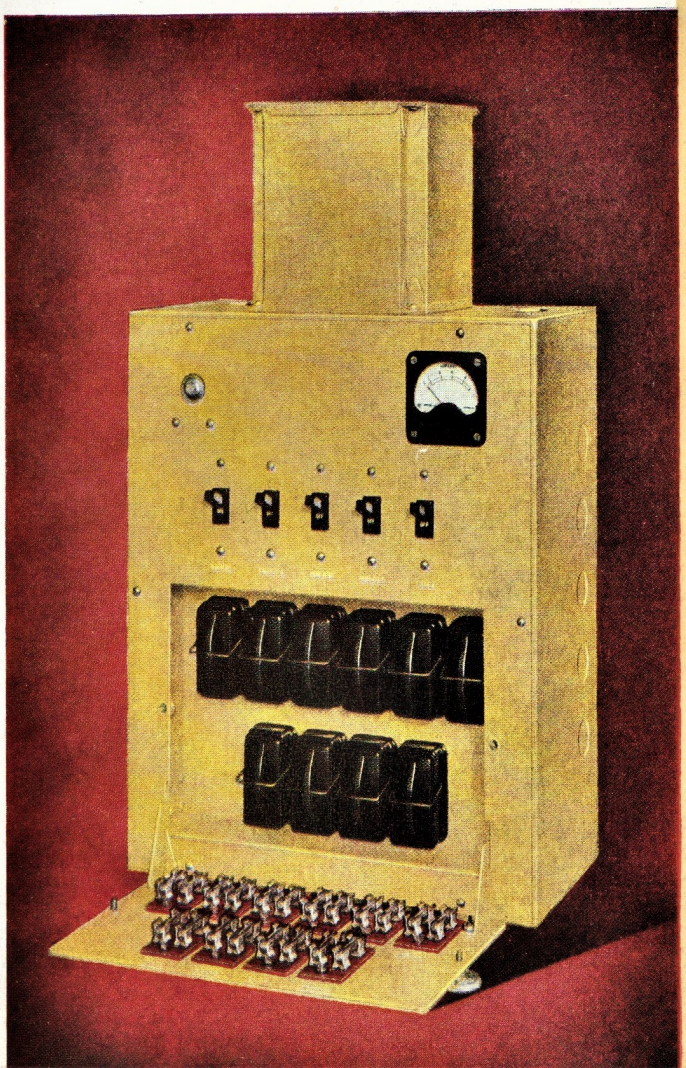
either amplifier, the performance is continued without interruption by switching both machines to the remaining amplifier.

The Mains Distribution Unit

THIS Unit illustrated below, contains the switching and fusing for all mains circuits. The standard voltage for which the individual mains transformers are designed, in the equipment for 50/60 cycle supplies, is 230 volts. (For 25/60 cycle equipment, individual transformers are designed to accept mains voltages of 115 or 230). A power auto-transformer, built into the mains distribution unit, is designed to accept any local voltage and adjust it to 230 volts (or 115 volts). Thus only one voltage adjustment is required for the entire equipment.

PYRENE FIRE EXTINGUISHER
(Optional Equipment)

THIS equipment consists of a sealed cylinder containing compressed carbon dioxide gas and a spring loaded device held in check by a celluloid loop. In the event of fire, the loop ignites and the gas is discharged at strategic points along the film path and to both spool boxes. The gas also operates switches which cut off the motor and the arc supply thereby shutting down the equipment. Exhaustive tests have proved that this equipment will instantaneously put out any fire occuring in the film track. Insertion of a new cylinder and resetting the striker mechanism takes only a few seconds, enabling performance on the same machine to be continued almost immediately without the audience being aware that a fire has occured.



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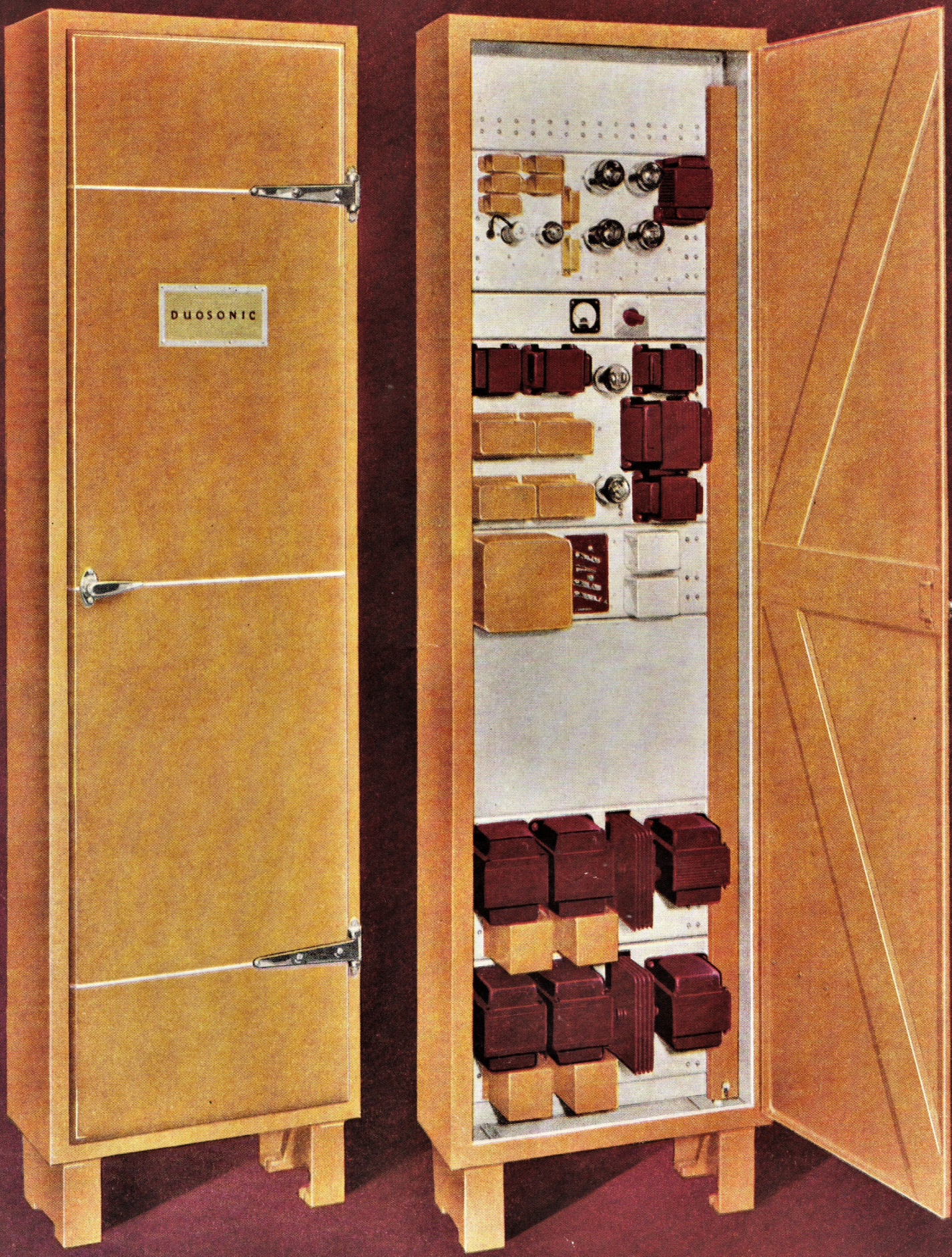

DUOSONIC

The Main Amplifier Group

THE Main Amplifier together with ancillary units, is housed in a heavy gauge sheet steel cabinet, fitted with a door, and finished in the standard GAUMONT-KALEE colours.

The Cabinet contains:—

(a) The Terminal Panel.

(b) The Main Amplifier, with a power output of 30 watts. Negative feedback is applied over the whole amplifier, from output to input. Total harmonic distortion on full output is less than $1\frac{1}{2}\%$.

The valves employed, and their equivalent variants, are:—
1st Stage, 6J7G (or EF37).
2nd Stage (Phase inverter) 6J5G (or L63).
3rd Stage, Four 6L6G in parallel push pull (or four KT66).

(c) Meter panel with meter and selector switch for check-metering.

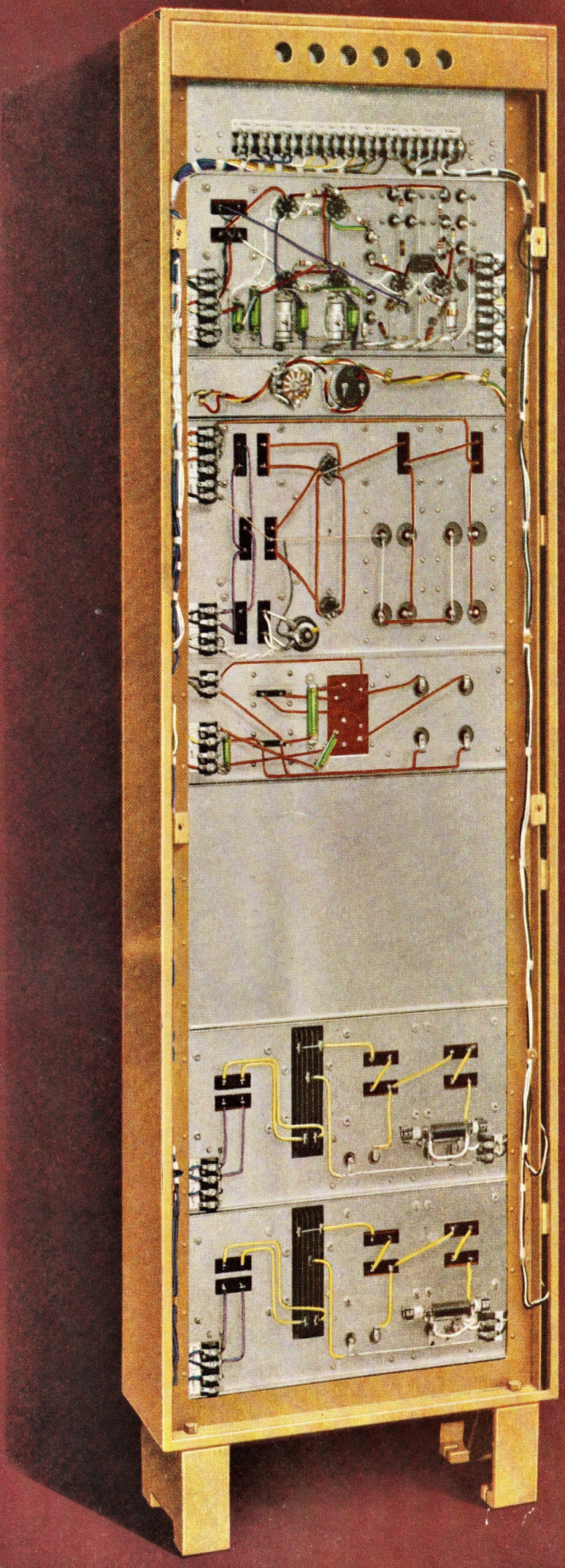
(d) Power supply panel for voltage and power amplifier. Two rectifier valves 5U4G (or U52) are employed.

(e) Frequency dividing network for DUOSONIC speakers, with output and emergency switches.

(f) Two Exciter lamp supply units.

The cabinet is 6′ 2″ high, 1′ 11″ wide, and $10\frac{1}{2}$″ deep (188 cms. high, 58 cms. wide, and 27 cms. deep). Permanent cableform wiring is employed, colour coded, finished off, and ready for connection to the standard terminal blocks.

The "above chassis" components of all units in the Main Amplifier Group are instantly accessible on opening the door of the cabinet.



The Main Amplifier Group – CONTINUED

The "under chassis" components, including terminal blocks, of individual units are reached for maintenance purposes by removing the back of the cabinet. Any unit requiring attention can be removed instantly and replaced by a substitute unit.

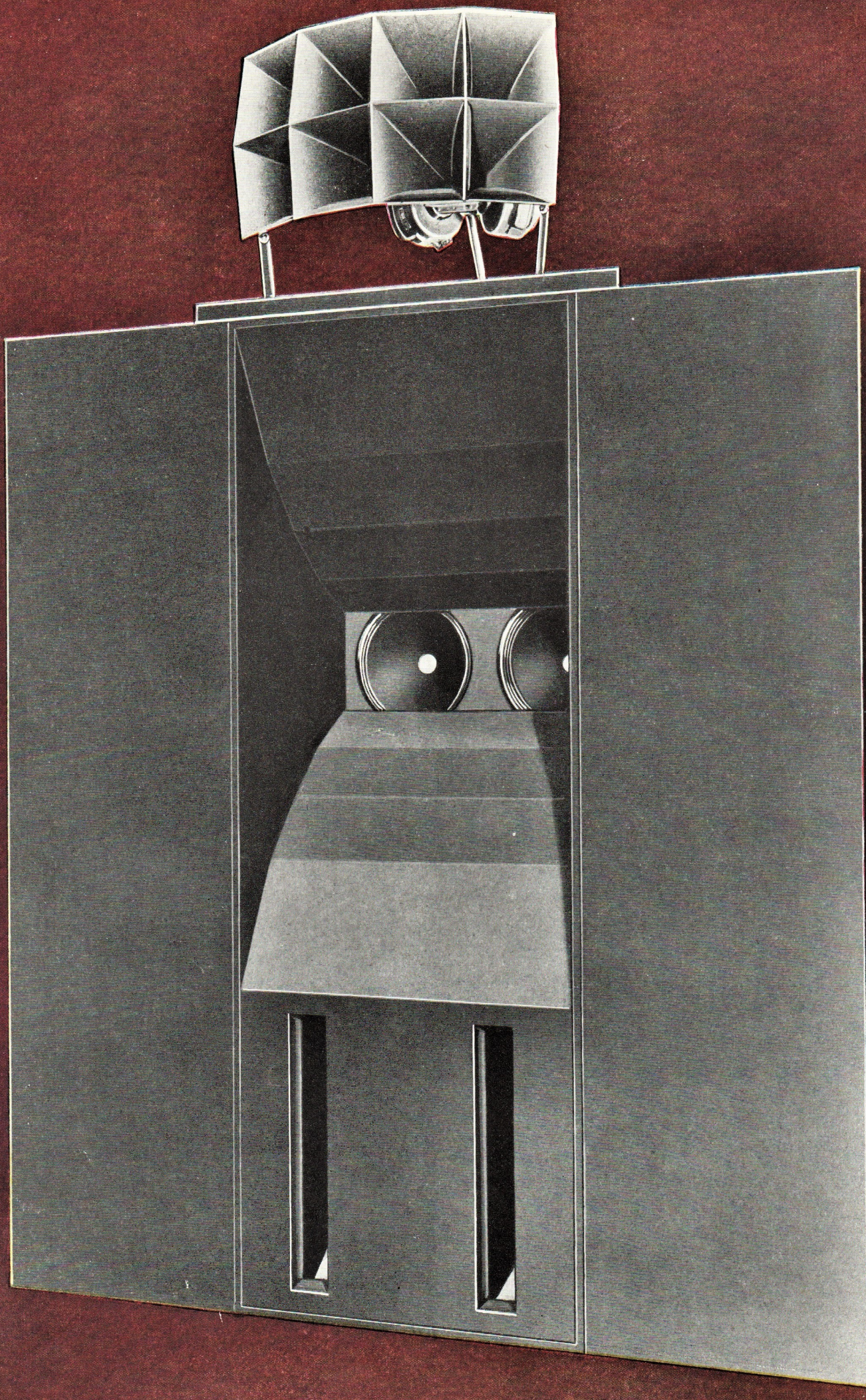
In the design of the units comprised in the Main Amplifier Group, dependability, accessibility, and convenience have been placed second only to performance of an exemplary nature.

The exciter lamp supply units employ long lived selenium metal rectifiers.

The Stand

ALL control switches, i.e. motor and exciter lamp; motor starting control and picture changeover; arc control switches and meters; and the bottom spool box, are incorporated in the Stand. On the off side of the Stand to the bottom spool box, a door gives access to the chain-driven take-up, as well as to the switches for motor and arc control incorporated in the automatic fire-extinguisher. The front of the Stand allows for all cable entries, and the internal wiring which is an integral part of the Stand terminates in a distribution panel at the cable entry point. The wiring arrangements are sufficiently flexible to suit any variation which may arise.

Height adjustment, in 3″ steps, is provided by distance pieces, and tilt adjustment is by means of a jack-screw accessible through the rear door. The projection angle is variable from 10° positive to 20°/30° negative, according to the height at which the Stand is set.



The Speaker Assembly

A RANGE of five sizes of "Duosonic" speaker is available, covering theatres with seating capacities of from 1,000 to 5,000 seats. Each of the five sizes is characterised by faithful response and a high conversion efficiency, of the order of 40% in the smallest size, rising to 50% in the largest size. The dividing network operates at a cross over frequency of 375 c.p.s. with an attenuation of 12 d.B above and below this frequency.

Frequencies below 375 cycles are handled by a large bass horn of the direct flare type, driven by two or four permanent magnet cone speakers. The horn is of the type with no openings at the rear, with, in consequence, no sound emanation from the back of the speaker assembly. Frequencies above 375 cycles are handled by an all-metal multi-cellular horn, driven by one or two treble units with metal diaphragms. Each cell of the treble horn covers a horizontal and vertical angle of $17\frac{1}{2}^{\circ}$. The number of cells required in a treble horn is determined by the seating layout of the individual theatre.

Monitoring

TWO small monitor speakers for suspension directly over the two operating positions, are supplied. The level from the monitors is adjusted at the time of installation to suit the prevailing conditions and the operator's preference, and remains thereafter in direct relationship to the volume of sound in the auditorium. A monitor on-off switch is provided which is fixed next to the projection room telephone.

A monitor and deaf-aid amplifier unit is available as an additional panel for mounting in the main cabinet rack. Where used, it frees the whole output of the main amplifier for employment by the auditorium speakers.

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