

FINAL REPORT No. 248

ITEM Nos. 1, 7

THE RADIO VALVE AND LAMP INDUSTRY IN VIENNA

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BRITISH INTELLIGENCE OBJECTIVES
SUB-COMMITTEE

LONDON - H.M. STATIONERY OFFICE

THE RADIO VALVE AND LAMP INDUSTRY IN
VIENNA

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Summary

Vienna, with a population of two million, was at one time an important centre for the design and manufacture of electric lamps, radio valves and radio equipment, in that order.

The Anschluss of 1938 marked an importance change in control of companies by Nazi domination. Such important firms as Siemens-Halske, Osram and the Philips Group were brought under the direction of German Nazis, or Austrians of like persuasion. The companies of Schrack-Ericsson and Watt (Tungsram) were maintained in full employment.

The Germans made full use of Austrian capacity and several instances were given where factory employees increased during the war to three or four times the 1938 level of employment. In general discussion with a number of manufacturers, it was apparent that only 20-30% of total productive capacity remains. No records of unemployment exist in Vienna, although it is perilously high, and of course no Dole is paid to the unemployed. It was obvious that there will be 100% unemployment within 3/4 months unless there is a change in the administration, and some effort made to restore plant and refurbish the flow of raw materials.

Preliminary to our visit, a thorough coverage of targets in Vienna area had been carried out by S.M. Toulmin and E/O Whitmore of CAFT 1, Frankfurt, SIGLBO Field Team. In the time at our disposal not all their targets were visited for a variety of reasons:-

1. Not our subject (e.g. Siemens Schukert)
2. Too small to yield information of value.
3. Not available (e.g. in Russian Zone or bombed out).

Targets of principal interest in the Russian Zone were:-

1. Osram factory - (Lamps)
2. Vienna Telephone & Telegraph (VTF)
an IT & T associate
3. Rothmuller - Mena, small manufacturers of electrolytic condensers and components

but in the first two cases we made satisfactory contact with executives of the company.

A full list of targets in Vienna is in the possession of Co-ordinating Officer, SIGESO, as well as one each in the offices of CAFT 1, Frankfurt and Air Division (Intelligence), S/Ldr. Worthington, RAF, Vienna.

SIGESO also hold a copy of Siemens & Halske report to Military Government, Austria, giving full particulars of staff, plant, stocks and war activities.

Nothing of scientific or technical interest was uncovered, except for a somewhat interesting range of small electrolytic condensers made by Philips.

In the electric lamp field, there has been no development or production of fluorescent lamps, whilst such lamp making machinery as remained in the factories possessed no novelty; indeed, was much in arrears when compared to modern American plant.

But the opportunity to inspect machines, plant or test equipment was a rarity in itself, for a large number of factories and laboratories had been denuded for removal to Russia. Consequently it will be appreciated that the major part of our intelligence was secured by interview, and the tramping through almost empty floors yielded little more than blisters.

Through loss of plant, acute shortage of raw materials, complete absence of gas, and undependable electric power, the prospect of industry in Vienna is gloomy in the extreme. Even with the greatest optimism, which does not exist, we do not believe that their radio and lamp industry can make a useful contribution to Austrian internal economy within a year.

For subsequent use or map reference it should be noted that the city of Vienna is divided into the following zones of control

<u>Control Authority</u>	<u>District</u>
International Zone	1
British	3, 5, 11, 12, 13
Russian	2, 4, 10, 20, 21
U.S.A.	7, 8, 9, 17, 18, 19
French	6, 14, 15, 16

The country surrounding Vienna is under Russian Control.

Our special gratitude goes to Allied Commission, Austria, Air Division and particularly for the excellent and ready help given by G/Captain J.Greenhaugh (Policy) and S/Ldr. Worthington (Intelligence), .without whom our mission could not have been encompassed with expedition.

Schrack - Ericsson, Vienna XII, Pottendorferstrasse, 25-7;

Black List 1/355, 386. Visited November 12th, 1945

Personnel interrogated:- Dr. Eduard Schrack - Director.
Ing. Von. Hacht.

Except for minor damage, such as broken windows, the factory building was unaffected by air raids or other war activities. However, 700 machines were removed by the Russians and practically nothing was left by them. Only equipment was taken away; none of the factory staff was taken. Activities during the war covered telephone and telegraphy equipment, railway signals equipment, some radio equipment and valves, but nothing remained of these activities and, as it was clear that no original development work of any importance had taken place, interrogation directed to technical ends was limited. The valve types manufactured were ordinary receiving types, suitable for domestic radio sets and the entire work was managed by Ing. Von Hacht.

Hacht is one of the leading members of a committee of radio manufacturers of Vienna which is at present engaged in organising, if possible, what remains of the radio industry in Vienna. He is doing this work for the Austrian Government, and the aim is to make use of the resources which remain to produce one or two standard designs of receiver by a 'pool' of manufacturers.

The intention is to produce approximately 100,000 apparatus of one type (miniature super-het) and that these sets should be produced by approximately 10 firms; all the necessary components by 4 firms, the names of which we have. All sets are planned to be identical as far as chassis and parts are concerned, but each manufacturer can create an individual set by designing his own cabinet, scale, knobs, etc.,

The valve question does not present much difficulty at the moment because there are substantial stocks in the country, and Philips in Vienna can no doubt take care of their entire requirements in the future.

Machinery which has been left behind by the Russians in badly damaged factories is being salvaged under Schrack's direction and reconditioned is possible. A small amount of such reconditioned machinery has already been installed in the Schrack-Ericsson factory. For the year 1938 Schrack employed about 500 people, and is supposed to have about 500 now. He has current and water, but no gas. Raw materials are sufficient for about 3 months work. Schrack stated that he owns 82% of the Company's shares the

Austrian Government holds 15% and presumably the remaining 3% to Ericsson.

From a technical point of view there was practically nothing of interest at this target

Siemens - Halske, Vienna III, Apostelgasse and Hainburger
Strasse

Black List 1/61². Visited 13th and 14th November 1945

Personnel interviewed:-

First visit - Ing Supanko, Herr Blahe
2nd visit - Dr. Siebertz, Ing. Kraus
Ing. Colker.

The factory buildings were intact and did not appear to have received any damage at all, but the usual removal of machinery by the Russians had taken place and 90% of 1500 machines had been lost. The present activities of the company are limited to carrying out repair work for telephone and telegraph equipment and meter repairs.

The laboratory at Wien XVI, Thaliastrasse, 127, was mainly concerned with valve production and manufacture. 80% of the equipment of this building was taken by the Russians and what was left was being moved back to Hainburgerstrasse. The equipment which had been installed consisted of one or two rotary pumps, sealing-in machines, ageing racks, etc., of conventional design,

Dr. Siebertz, the chief radio valve research scientist, described the lines along which Siemens had been working since 1941 when their association with Telefunken came to an end. Prior to this date, Siemens had restricted their activities in the valve field to the development and manufacture of telephone repeater valves, leaving the rest of the field to Telefunken. In 1941 they started the development of valves for high frequency use, their chief requirements being valves suitable for operation on C.W. in the centimetre and decimetre wavebands. These valves were intended for use in radio links covering distances of 20 to 50 kilometres which were to be used where ordinary telephone circuits were difficult to instal. Magnetrons or Klystrons appeared to have been the most promising lines of development, and since all the experience on magnetron development was with Telefunken, Siemens decided to work on the klystron. By 1943, they had developed valves operating at 20 centimetres, giving a power output of 5 watts.

later, they concentrated on the wave-length of $9/10$ centimetres, and at the end of 1944 had succeeded in getting 200 watts output at this wavelength. These valves were experimental, however, and not made on any large scale.

One design which has become more or less standardised is shown diagrammatically in figure 1. The valve was water-cooled and gave an output of 100 watts at an efficiency of 10% with a wave-length coverage of 8.9 to 9.2 centimetres. The collector operated at 2000/3000 volts. The design is conventional and the only special features were the use of a honey-comb construction for the grids and the use of a distorting plate in the collector cavity to get the wave-length variation. Couplings between the two cavities were provided by three holes in the common wall.

When samples of British oscillator klystrons were lost over Germany, some were sent to Siemens to be copied. Exact copies were made in the first instance, but later variations were evolved. The first of these variations was introduced when larger powers were required. It was soon realised that very little variation in copper thickness could be tolerated if a satisfactory disc seal was to be obtained and this precluded the use of thicker copper giving greater heat conduction. Siemens, therefore, went over to a modified form of housekeeper seal as shown in Figure 2. Instead of sealing the glass directly to the thickened disc of the resonator an intermediate copper tube was used sealed to the glass by the housekeeper technique and soldered to the copper of the resonator. All soldered joints were made simultaneously.

A second variation was also introduced experimentally to extend the frequency range over which the klystron could operate. The outer wall of the resonator was built up from a large number of sliding parts operating on the same principle as a camera iris. Using this construction klystrons were made which operated over a wave-length range of $6/12$ centimetres.

Klystrons were also developed for operation at 3 cms and, at this wavelength, difficulties were encountered in getting good alignment between the gun and resonators. To overcome this difficulty the construction shown in Figure 3 was used. The sides of the bottom resonator disc were bent down to form a cylinder inside which the gun was located by means of an accurately ground ceramic disc. A similar construction on the other side of the resonator located the reflector electrode. A shoulder inside the copper cylinder determined the axial position of each ceramic disc which was fixed by two or three notches formed in the copper. A few valves of this construction (about 20 in all) were made under the type No. ID.25. Most of these were supplied for incorporation in equipment being made by Blaupunkt. Dr. Lammchen was using the valves at Blaupunkt

and Siebertz stated that he understood that Dr. Lanmchen was now working to British instructions at Hildersheim.

Apart from the LD 25 valves mentioned above, Siemens worked on these klystrons purely in an experimental way. It was impossible to secure any samples because all the valves which were available in Vienna had been removed by the Russians.

Ing. Kraus described the methods followed by Siemens in making pressed glass bases for valves such as the LD.2, LD5, LD15, LG12, which were among the decimetre types made at Vienna. These methods were similar to those used by Lorenz, as far as small bases were concerned. Tungsten pins were held in chrome iron moulds and short lengths of hard glass tube were threaded over the pins and some more placed between the pins. When the glass was molten, pressure between two chrome iron moulds produced the base. In some case the pins were glassed before being put in the moulds, but otherwise the methods were the same. For large bases hard glass blanks were bought and glassed pins moulded in. This method was used for bases required for cathode ray tubes. Siemens found the production of these bases was not free from troubles. The degree of oxidation of the tungsten required careful watching and the steel ejecting springs used in the moulds did not stand up well to the heat treatment. All pins were carefully tested before use to ensure that they were free from surface cracks. There was always an abnormal shrinkage in production caused by imperfect seals.

One other unusual valve design feature was designed by Dr. Siebertz. Towards the end of the war mica shortage was acute and in many type of valves ceramic plates were used instead of mica. The absence of flexibility in the ceramic meant that a means had to be devised for locating the ceramic properly against the glass bulb in spite of the inevitable irregularities of the shape of the bulb. This was done by a packing of glass wool which was fastened to the ceramic plates at three or four points around its periphery before inserting the assembly into the bulb.

Ing. Volker described the measuring instruments which had been developed and made by Siemens. They were all for special purposes and there was nothing fundamentally new in the design of any of them. They consisted for the most part of ordinary moving coil instruments with special scales according to the use to which the instrument was to be put., e.g., a scale reading in meters for an instrument to be used with an altimeter, one reading in degrees centigrade to be used with a temperature indicating device, etc.,

A small plant had been installed at Hainburgerstrasse for making carbon resistors but the equipment was quite normal and calls for no special comment. Its capacity is very limited and it is used by Siemens to provide the resistors they require for the repair work which they are now doing.

REPORT 111

Radiowerke A.G. Vienna, Abbegasse, 1.

1/378

Black List No. 1/378. - Visited 13th November 1945

Personnel Interrogated:- Prof. Dr. Ettenreich and others

The factory, which was undamaged, was not examined because all machinery had been removed by the Russians. During the war 10 valve making units had been in operation, and the number of employees reached a peak of 5,000 compared with 2,800 before the war. 500 people are now working. The machinery for two units had been returned by the Russians who wish to get valves made for themselves. No special types of valves were made here during the war. The majority were ordinary Philips types which are well known. Wehrmacht types were 4671, RV21.800, RV12P.2000, NF2 and LS4. The following types were made for the German post office. Ba. Ca. Bi. Ed. E2d, C3b. E2c. Z2b. 328a, 329a. Production rates for all types averaged about 200,000 per month which was not high for the number of people employed, although it is not clear how many of the 5,000 employees were used on valve production and how many on condenser and resistor production which was also part of the firm's activities.

The firm are now installing the two valve production units which the Russians have returned and they have sufficient raw material to make a total of 5,000 valves. They anticipate starting production in about 4 months, the type which will be made being AZ1, AZ11, CY1, CY2, UY11.

The thing of greatest technical interest at this target was a small and very neat design of electrolytic condenser which had been developed during the war by an Engineer named Victor Winkler, who has now been discharged by Philips because of his Nazi tendencies. Since Dr. Ettenreich was not with the firm during the war in Vienna (he was moved to Berlin) it was difficult to get any detailed description of the method of manufacture of this type of condenser but it was stated that the small size is due to the use of a special aluminium, the surface of which was roughened electrolytically giving an effective increase in electrode area which was claimed to be 8 times. The finished condensers were totally enclosed, except for the soldering tags, in what

appears to be a polythene moulding. The material used was an I.G. Farben product called "Igamid". These condensers were claimed to be satisfactory over a temperature range of 40°C to + 70°C and to be proof against the ingress of moisture. Samples were brought away and have been sent to R.A.E. Farnborough for test and examination.

Winkler was sought at his private address which was given as Vienna XVII Bergsteiggasse 50/14, but this house had been practically destroyed by bombs. A further address, Wien 11, Hausergasse 120/10, was obtained, but lack of time prevented a visit to this place to interrogate Winkler on the constructional details of the condensers.

Other components made by Weiner Radiowerke were carbon resistors, tuning condensers, compensating condensers and potentiometers, but no developments had taken place during the war and investigation into these lines was not worth while.

Dr. Eittenreich stated that other associated Philips factory was engaged during the war as follows:-

Horny Radiowerke. Wien XVv., Gieselhergasse 11, 1/73
French Zone - Dir. Ridiger in charge

most machines lost. Only 200 people employed now; pre-war 750; in 1944 - 1800. Factory completely destroyed.

Making SJ.165 ("Gema") and EB 12, both blind landing equipments; LRG5, an equipment for applying final corrections when flying along a radio beam, and LRG 10, and improved version of LRG5; and a small portable transmitter-receiver.

Report IV

Osram. Vienna 1, Fleischmarkt, 1 (Head Office)

1/383

Black List No 1/383 - Visited 14th November 1945

Personnel interrogated - Mr. Horaczek.

The main object in visiting this target was to ascertain the condition of the factory which is located in the Russian area of Vienna.

72 bombs destroyed the factory on 15th January 1945. Some repairs have been effected and it is estimated that 10% rehabilitation has taken place. Domestic lamp production is possible with an output of 5000 per day compared with an output of 30,000 large lamps and 25,000 miniature lamps per day normal production. The section of the factory concerned with 2.5v, 3.5v, and 6v miniature lamps is intact.

Materials are available for 6 months production except for nitrogen and argon, which means that only vacuum lamps can be made. These are the two chemicals which Austria cannot produce. No gas is available.

No fluorescent lighting is produced in Vienna. The whole of this work, including development and manufacture was produced in Berlin. There were no technical development facilities at Vienna at all.

Horaczek stated that the factory had been owned 100% by Westinghouse (USA). It was sold in 1924 to Osram and Philips who owned it 50-50 in 1931. Philips sold their share to Osram, Berlin. The management is in the hands of a Mr. Frey, Dr. Kohler (chemist) and Mr. Altrichter (physicist). Mr. Horaczek told us there were only five lamp factories in Austria - Osram, Watt Gl. Elec. Ges., Adele Pasut, Hermann Leopolder and Allgemeine Gluhlampenfabriks AG. These five are now getting together in order to organise the Austrian lamp industry and make it independent of all outside influences. This is handled by the Wirtschafts Gruppe for the Electrical Industry under Hofrath Schonthal and Ing. Helmer.

REPORT V.

Kapsch und Sohne, Vienna XII, Johann Hofmannplatz 9

1/295
7/129

Black List No. 1/295 - Visited 15th November 1945

Very little was to be seen at this target. It has two factories about a quarter of a mile apart. One of these (the larger) has been badly damaged by bombing and the other, although intact, has been cleared of plant and machinery by the Russians who removed 956 machines and all raw material. Machine tools had been removed by the firm to Attersee in Upper Austria and these are intact. At Litschen, near Gmund in Lower Austria, they have a condenser factory which is still in working order and the Russians have given permission for this to be brought back to Vienna.

The firm's chief activities were:-

- (a) Telephone and telegraph equipment, the manufacture of switchboards and automatic systems which they did for the Post Office, and the manufacture of a 2 channel carrier-telephone system (5,500 and 11,000 c/s) which they did for military use.
- (b) Small portable radio transmitter-receiver which they made for the Army.
- (c) Condenser manufacture, of which there was a wide variety of types, both electrolytic and paper, suitable for telephone equipment.
- (d) Battery manufacture, the principal types being small dry batteries for flash lamps and large dry batteries for local battery use in telephone switchboards.

During the war 3,000 people were employed, but only 200 are working now. As far as it could be ascertained, the design of all the above products was quite normal and this, coupled with the state of the target, did not justify any lengthy technical investigation.

REPORT VI

Watt Glulampen Fabrik - Grinzingerstrasse, 147, Wien XIX

Visited 14th November 1945

1/356

This is a 100% subsidiary of Tungram Ujpest. Mr. Fischman had been there last week on his way to Sweden. Tungram itself is owned to the extent of 55% by G.E. of America and the R.C.A. The present Public Administration is in the hands of the following:-

Ing. Franz Otto
Dir; Rudolf Lechner
Dir; Franz Winkler.

the remaining 45% being held as follows:- 17% by Hungary; 10% by Philips of Holland; 13% by Germany (Osram) and 5% by G.E.C. and B.T.H., England.

Watt claims that they used to make 35,000 lamps per day but can now produce only 25,000. They have been bombed out of their factory in the XX District, but were equipping the factory in Heiligenstadterstrasse where they can produce 35,000 lamps per day. Most of the information was given to us by Mr. Winkler, who is the present administrator. The machines did not seem quite ready to start production, but one unit was practically completed. They claim it can make 950 lamps per hour. The stem maker was a 48-head machine with automatic feed and electrodes and rods, and can produce 1,500 per hour. The sealing and exhaust machines were at a rate of 950/1000 per hour. It has automatic transfer from the sealing to the exhaust machine. All machines seemed in good condition and appeared to be well built. They all came from Ujpest. The automatic mounting machine requires two operators, one to place the filaments in grooves on a copper plate and the other to feed the stems. It was no different in principle from other automatic mounting machines we have seen, the coils were fixed to the electrode by suction and then clamped, and the rest of the process was similar to most others. They have five of these machines in the factory, but it would appear that they are unlikely to want more than two. They are also equipping one floor for valve production. The man in charge of this was Ing. Fritsch. He stated that they were getting ready for production of two types only, but from what we could see, we were not very impressed with the equipment. Ing. Fritsch says they make all the components themselves. They have given up production of volume controls, which is in the hands of Ing. Hauke, but at the present moment they are finishing off a few thousand parts they have in stock.

REPORT VII

Elin & Schorch A.G. - Museumstrasse 3 (Making Elix Lamps)

Visited 15th November, 1945

The management is in the hands of Dir; Siegert, Dir; Spooner and Dr Kohlruss. Dr. Siegert stated that up to 1938 they were owned by Kredit Anstalt Bankverein, but are now controlled by the State. Their factory in the XXI District has been destroyed by bombs, but they have one unit working in Gmunden (obtained from Osram). This is only making 800 lamps per day at the moment. He stated that the lamp business was only 4-5% of their total production (they made a wide variety of valved, locomotives transformers etc.) They used to make approximately 3 million lamps per annum. Their lamp works manager is Ing. Bloech. He has been with the company for 5/6 years. They are moving whatever they have left of their factory to Liesing, and hope to be ready there in 3/4 months. Chemicals such as Nitrogen and Argon, Phosphor-pentoxide and Titanium Fluoride are not available in Austria, but they can get their tungsten and molybdenum from Reutte in the Tyrol, and glass from Inwald & Stolzle. Karl Primas is now manager of their Gmunden factory. Ing Neuman has been arrested.

The total capacity of all the Austrian lamp factories was stated to be 16 million lamps. Consumption is 6-8 million lamps. As the Elin had been bombed and lost their machines, Osram were compelled to give up their latest and most modern unit to them, and this is now working in Gmunden. The machine they have left on hand in working order represent about 60% of their pre-war plant.

REPORT VIII

+Langfelder & Putzker, Schumangasse 45, Wien XVlll

Visited 12th November 1945

We saw Mr. Adolf Putzker. Jr., who claims to be the sole proprietor. Up to the 12th March he employed 250 people - 170 women and 80 men.. At the present moment they employ 15 men and 7 women and 4 people in the office. Their office building has been completely destroyed by a bomb; their main factory has a 4 ft wide hole from the ceiling to the basement caused by a bomb which did not explode. He claims to have worked in two shifts, from 6-2 and from 2 - 10, and has nine gang presses. His peak production per month was 3 million Edison screw caps, 2-3 million M.E.S., $\frac{1}{2}$ million B.C. and $\frac{1}{2}$ million specials such as Goliath projectors, etc. He claims that he is ready to start production directly gas becomes available. He has six vitrifying machines. He pays his girls 50-60 Pfennigs per hour, and his skilled men 1.50 Marks per hour.

Brass. The price of brass is 1.20 to 1.40 Marks per kilo and he used 7 kilo per 1,000, which is approximately 8-9 marks. Vitrate is costing him 35 Pfennings per kilo and he uses $2\frac{1}{2}$ kilo per 1000 caps. His gang presses are made by Kiercheis in Sachsen Aue. He does not use any multi stage tools on his single presses. He has stagger feed on his gang presses but he does not use it, his reason being that it causes too much wear on the tools and frequent breakdowns. His gang presses produce 50 shells per minute. The thread cutting machine is attached to the gang press and works at the same speed. The rivets are made automatically but are inserted on foot presses.

Furnaces. are made of Chamotte Steine, which have to be replaced every four weeks. The vitrite used is lump vitrite and the flame which comes in from the top plays against the side of the container and the vitrite melts into a kind of tub made of these bricks. As soon as the liquid glass reached the top of the tub it overflows and runs out of a groove. The glass stream is about 3-4 millimetres thick and a cutter diverts the glass at a speed adjusted by the operator by means of a lever. They have not used brass for some time but .20 seems to be the thickness of brass they specify, and they do not worry about tolerances as long as the brass is not thinner. He claims that he could take up production immediately he can get gas, and also that he has 12 tons of metal which he bought but has not been able yet to get transport to Vienna.

M.E.S. Caps. The shells are stamped out in several stages and the final cutting and threading operation is on a machine with automatic feed consisting of four pieces of stout wire, hooked at the end, which pick up periodically these shells and drop them in a groove into the machine. The vitrifying is done with clear glass and all by hand.

The following targets were also visited, but the activities of the firms did not justify any serious technical investigation:-

Report IX

Minerva Radio - W Wohleven & Co., Vienna VII, Zieglergasse
9 - 11. Black List 1/296. 1/296

Visited 15th November 1945 - 80% machines removed, at present employs 83 people. Some materials. No gas or coal but current supply good.

Small radio assembler, now carrying out radio set repairs

Report X

Medek & Schorner, Vienna XII, Kufteingasse, 32.

Visited 15th November 1945

A small firm making precision electro-mechanical equipment such as coin operated automatic machines. This firm was stated to be making a special split R.F. condenser for the Gee Jammer "Feuerzunge". All that remained of this activity was number of parts stored in the loft, sufficient to make up 14 condensers. 40 people were working on the premises; during the war 600 had been employed.

Report XI

Mix & Genest. Vienna VI. Mariahilferstrasse 47

Visited 16th November 1945

1/384

An I.T & T associate, whose factory is in the Russian Zone, but was stated to be untouched and in good condition by the Manager, Anton Wegscheider. Manufacturers of telephone and telegraph equipment.

REPORT XI1

Radio Fabric, Ingelen, Vienna XVll, Bersteiggasse, 36-8. 1/294

Black List No. 1/294. Visited 16th November, 1945

A small radio firm, now employing 120 against 450 during the war, who are now using old materials which they have available to make and repair radio receivers. They have limited facilities for making their own carbon resistors and silvered mica condensers. Being in possession of a press and material, the firm are making a number of electric hot-plates.

CONCLUSION

Practically the entire electrical and radio industry of Austria is situated in Vienna because up to 1918 the whole Austro-Hungarian Monarchy, with nearly 50 million people, was supplied from there. After the occupation of Austria by Germany, specialisation of certain factories was introduced. There was not sufficient time to modernise the plants completely but the number of people employed in the industry was more than doubled. The industry under review has suffered considerably by removal of plant by the Russians and by bomb damage. Small and medium sized factories are in a more fortunate position because they escaped the attention of the Russians. The larger manufacturers suggested, therefore, that there should be an equalisation of plant on the basis of 1938, (that is prior to the occupation by Germany); most of these small and medium sized factories have been able to acquire modern machines to cope with sub-contracts. The suggestion is that some of those machines which have been acquired since 1938 should be sold at a fair price to the factories which have suffered most. We understand from various people interviewed that a lot of obstacles were being put in the way of this scheme.

Furthermore it must be pointed out that even if machines are made available, it may take many months before a single machine can be moved owing to the complete absence of any kind of transport.

The quadrupartite demarcation zones, as such, form, of course, the greatest obstacle to any kind of recovery.

Lastly, lack of food, lack of heat, and the absence of any kind of incentive because the worker is not in a position to buy the most primitive needs with the money he earns. It is very apparent that in the whole of Vienna nobody is working.

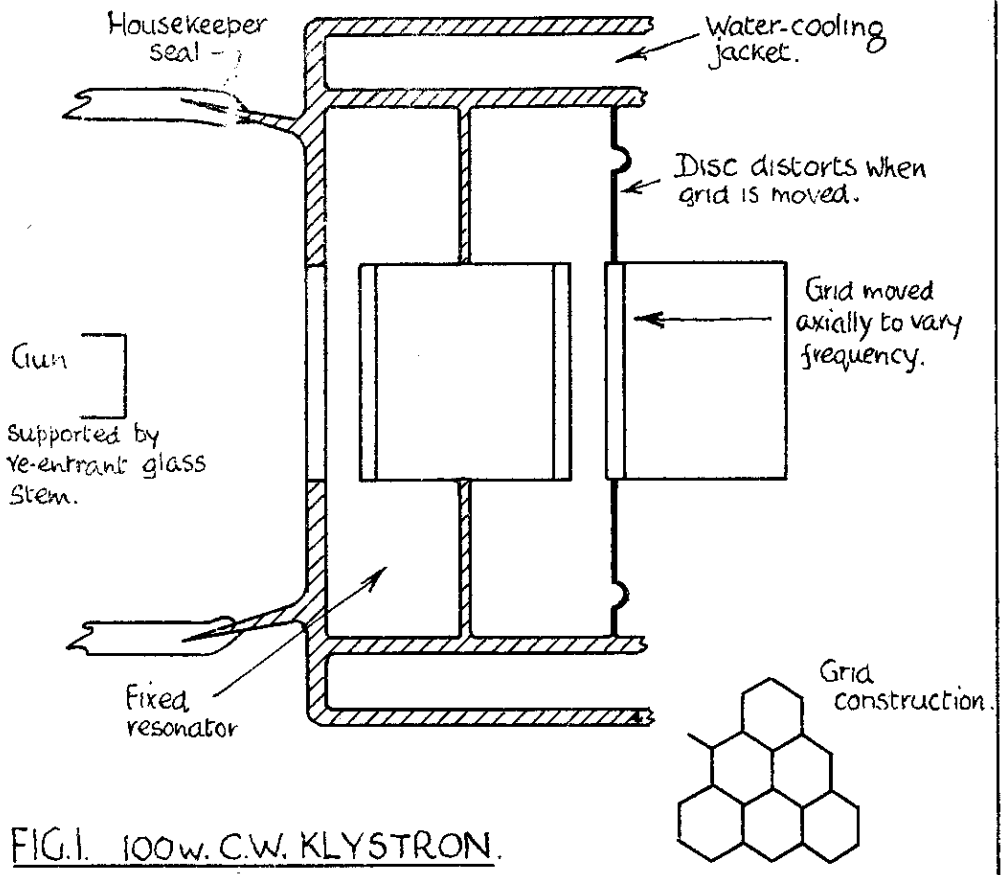


FIG.1. 100w. C.W. KLYSTRON.

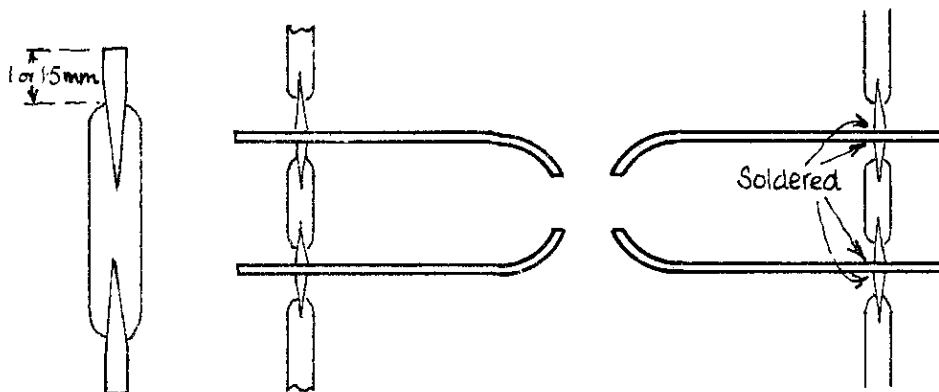


FIG.2. MOD. SEALING TECHNIQUE ON L.O. KLYSTRONS.

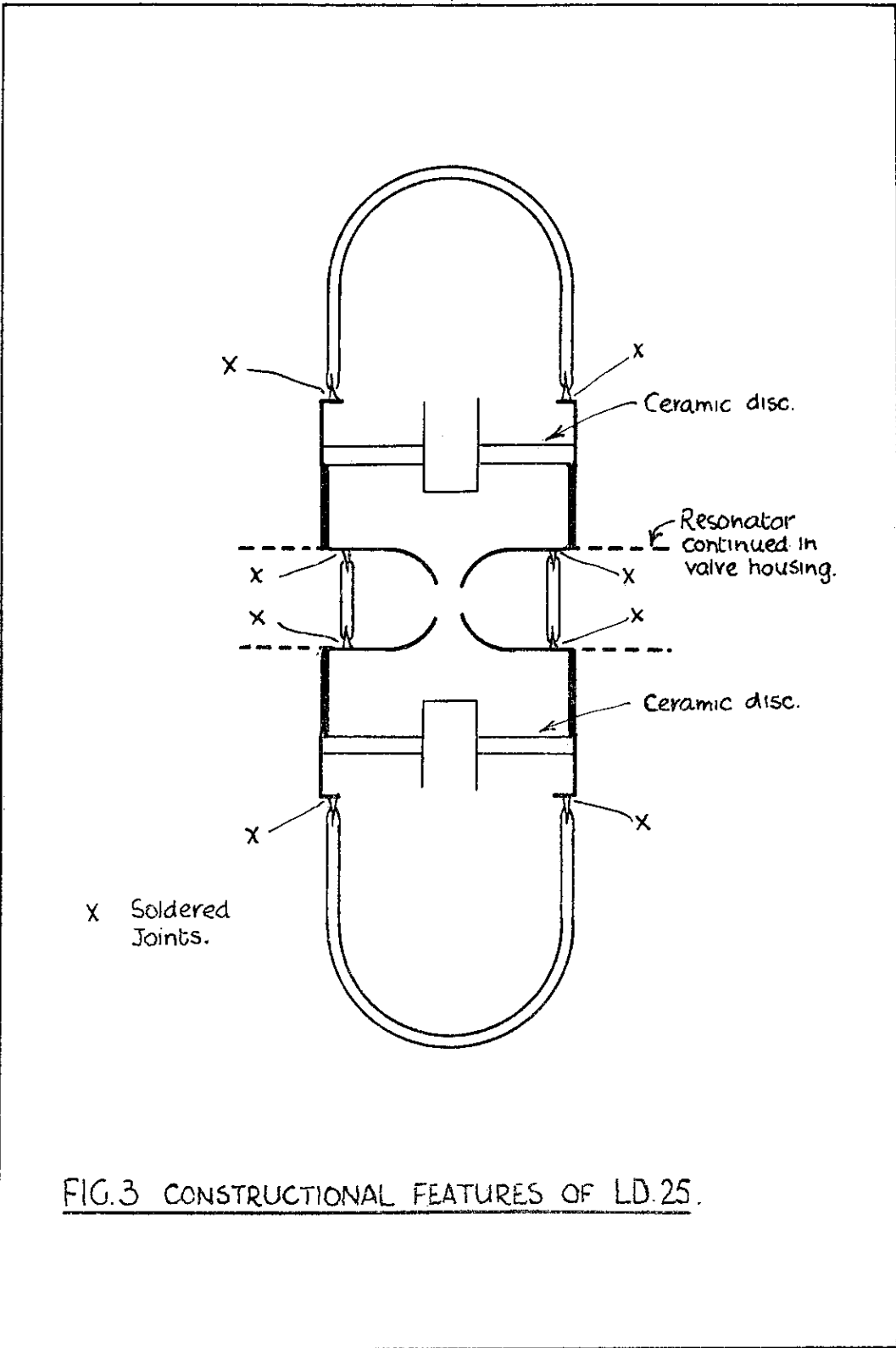


FIG.3 CONSTRUCTIONAL FEATURES OF LD.25.