BY ABEL SANTORO

ARGENTINA'S FIRST VALVE FACTORY

Radio valve manufacturing got off to a very slow start in Argentina. As late as 1933 no valves were manufactured here, though our electronic industry was making (in small quantities) all of the other electronic components necessary for radio receiver construction. Argentina had to rely on imported valves.

Mr. Teodoro Prieto, a businessman who had began making radio batteries in Buenos Aires in 1922, decided to correct this situation. He and ten other local radio businessmen raised $100,000 to start a new company for the manufacture of valves. Called "Sociedad Anónima Industrial Radiotelefónica Argentina" (S.A.I.R.A.), the firm was founded on November 28, 1933 with Mr. Prieto as president. The Argentine government approved the establishment of the company on April 9, 1934.

The S.A.I.R.A. factory, located on Honduras Street in Buenos Aires City, produced its first valve on July 20, 1934. This valve can be seen today at the Museo de Correos y Telégrafos (Post and Telegraph Museum) of Buenos Aires.

The first valves made by S.A.I.R.A. were the types 80, 47, 58 and 57. Then the factory tooled up to make types 43, 78 and 77. By 1935, the firm was also manufacturing types 2A5, 30, 12Z3, 35, 24A, 32 and 34.

Founder and President, Teodoro Prieto.

At the beginning, the factory employed only twenty workers. By the end of 1935 there were a hundred and thirty, mostly women. Production was 700 valves a day, and the capital stock of the company was valued at $400,000. In September 1936 the production reached 1,200 valves a day. The capital stock was $500,000 and all American types of receiving valves were being manufactured.

The total demand for valves in Argentina in 1936 was 5,000 valves a day. The valves made by

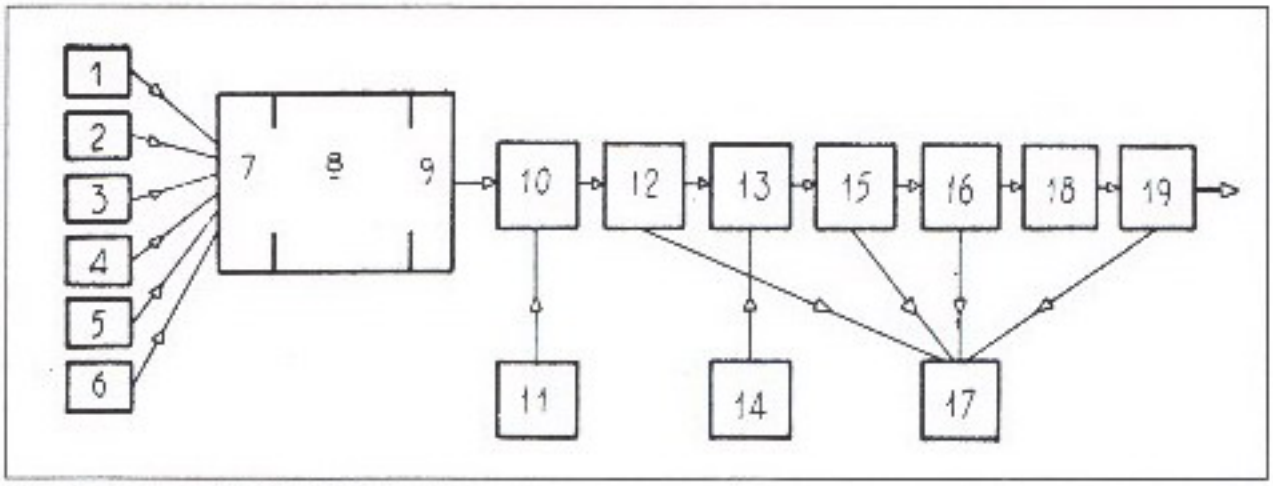


Fig. 1. Layout of the S.A.I.R.A. plant.

AUTHOR'S ADDRESS: (IAR) CASILLA DE CORREO NO.5, VILLA ELISA (1894), BUENOS AIRES, ARGENTINA

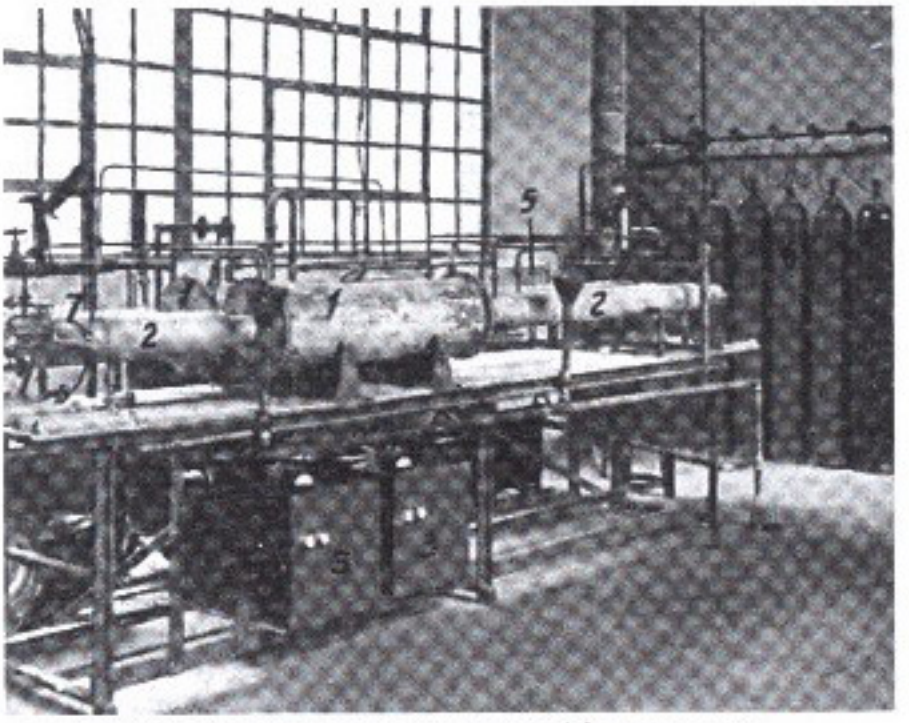


Fig. 2. Main parts of hydrogen furnace used for outgassing.

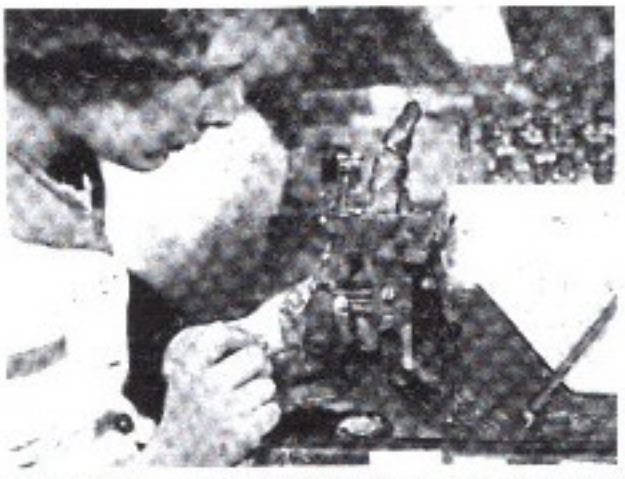
S.A.I.R.A. were of good quality and lower priced than their imported counterparts. Defective units were replaced immediately at no cost, making the brand very well accepted by consumers.

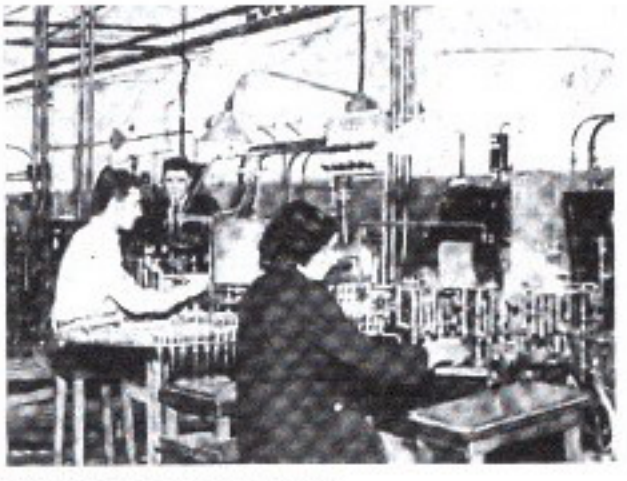
The drawing in Figure 1 shows the layout of the plant. Parts for filaments, cathodes, grids, anodes, shielding, and mica spacers were kept at locations (1) through (6). The outgassing of internal parts was carried out at (7). After assembly (8) and quality control (9), the bulbs [stocked at (11)] were installed at location 10 and exhausted at (12). Assembly of the bases, which were stocked at (14) was done at (13). Cathodes were activated at (15) and the first electrical control tests made at (16). At (18) a control check for proper cleaning was carried out and additional electrical tests were done at (19). Laboratory facilities were at location (17).

The hydrogen furnace for the outgassing of internal components is seen in Figure 2. The anodes, grids, shielding and other small parts were placed in molybdenum containers and heated to 1,200 degrees Kelvin in a hydrogen atmosphere. Heating was continued for between 5 and 15 minutes depending on the size and mass of the materials. The hydrogen was supplied by the cylinders at (6), then dried in a potassium hydroxide chamber (4) *[number not clear, but apparently this is behind the chamber at (1)—Ed]* and purified by being passed over red-hot copper plates (at 5). The outgassing was carried out in the chambers at (1), which were heated by resistance elements powered by the transformers at (3). The outgassed elements were stored at (2), where they were allowed to cool slowly.

(continued on page 62)

Fig. 3. Brass pattern for a type 43.

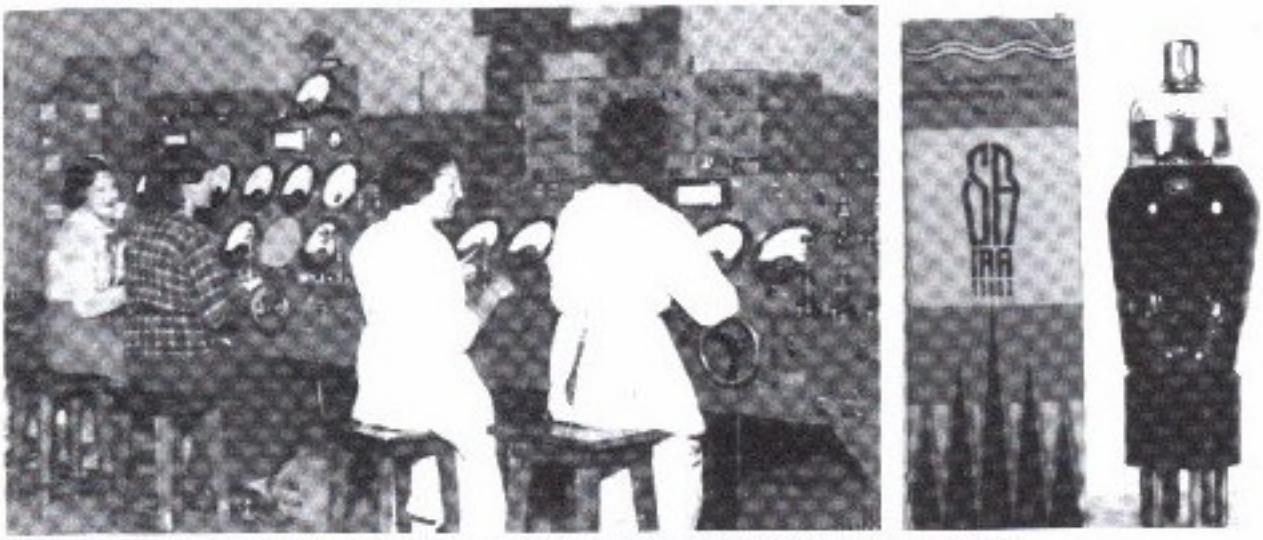




Left: Worker assembling a Type 43. Right: Exhausting and sealing equipment.

in a hydrogen atmosphere, to prevent oxidation. The hydrogen flowing through the system escaped at (7), where it was kept burning to prevent it from collecting with attendant explosion hazard.

The outgassed parts were brought to the assembly department in trays and hand-assembled with the aid of a brass pattern (a different one for each type of valve, of course). The brass pattern for a type 43 (looking down at the top of the valve) is shown at Figure 3. Assembly tools included a small spot-welding machine, the brass pattern, tweezers, and a magnifying glass. The various parts were placed into the pattern which held them in exact position. Next the mica lower supporter was installed. The parts were now



Left: The final electronic testing station. Right: Typical S.A.I.R.A. valve and box.

welded to the valve stem wires. Later, the pattern was retired and the upper mica element support was installed.

After appropriate quality control, the valve was sealed and exhausted. "Welding" of the glass bulb to the stem, and subsequent exhausting of the bulb, was done in a rotating machine. Exhausting was done first by mechanical vacuum pumps and followed up with mercury diffusion pumps. While the bulb is still being exhausted, the bulb was heated by a gas flame, and the elements inside by an induction coil, to make sure that all components are outgassed. The finished valves were subjected to strict electronic tests before being packed in cartons.

The S.A.I.R.A. factory closed down about 1939, during a very healthy period for the Argentine electronic industry, soon after it was taken over by the Phillips Company of Eindhoven, Holland.

ACKNOWLEDGEMENTS

(1) Revista Telegráfica Electrónica, Editorial Arbó, Buenos Aires.

(2) Sr. Raúl José Petrucci, Director del "Museo Radiofónico de Boulogne," Buenos Aires.

Note: All photos were taken in the S.A.I.R.A. factory, Buenos Aires, 1938.