

which, owing to its high tariffs, had had no marked success. SAT's first telephone exchange was opened at Oxtorget in Stockholm on October 31 and by the end of the year 785 subscribers were connected to the network. This was the start of the quite incredible growth of telephone service in the capital. In 1885 Stockholm had more telephones than any other European city and has since retained its place among world cities in the highest telephone density bracket.

Cedergren and Lars Magnus Ericsson collaborated extremely closely from the start. High-quality and low-priced telephone equipment from Ericsson's workshop contributed to SAT's rapid success. The company's first order was for switchboards and no less than 500 telephone sets. Cedergren's future orders were never for smaller quantities and SAT became LME's largest customer.

### The carbon granule microphone

The wall telephone became a major LME product. It was improved in the course of the years by the introduction of new and better components, and several variants were produced to suit customers' desires. The main improvement was in the transmitter. D.F. Hughes, in Great Britain, had in 1878 published his investigation of the variations of resistance in loose electrical contacts. He proposed an arrangement with loose carbon rods, which he called a microphone. But it was not until Hunnings invented the carbon granule microphone in 1881 that a microphone for practical use could be constructed. Hunnings' microphone consisted of a fixed carbon electrode, a carbon diaphragm, and between them a chamber filled with small carbon granules. The impingement of sound on the diaphragm pressed it with varying force against the carbon granules, thus changing the electrical resistance through the mass of granules.

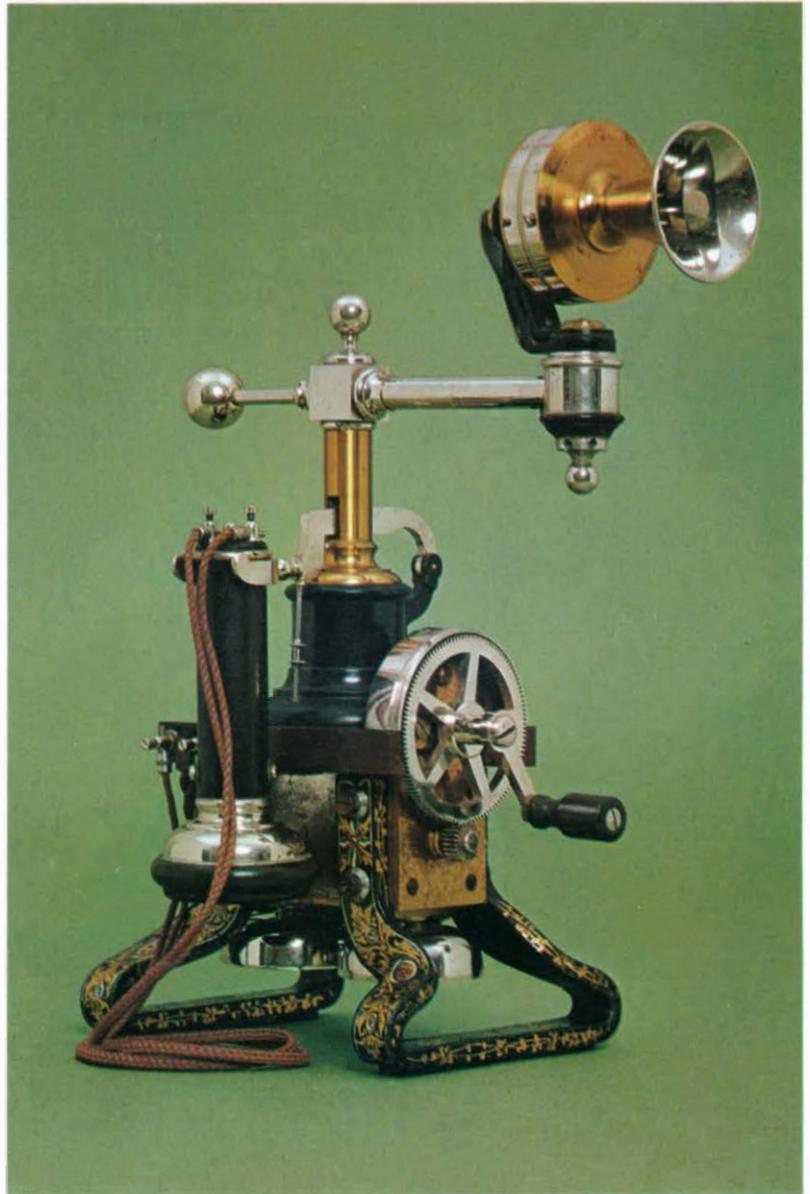
Lars Magnus Ericsson first designed a carbon rod microphone, which was used instead of the helical microphone for a few years in the mid-eighties. He followed this up with a carbon granule microphone patented in 1888. To prevent the granules from becoming too closely packed together, the carbon granule chamber was divided into a number of smaller chambers. In 1903 the star microphone was designed. This contained six sector-shaped chambers and was to be LME's standard microphone for nearly half a century.

The characteristics of the carbon granule microphone are greatly dependent on the quality of the carbon granules. Over the years LME has done much work on developing suitable grades by processing of the raw material—British anthracite.

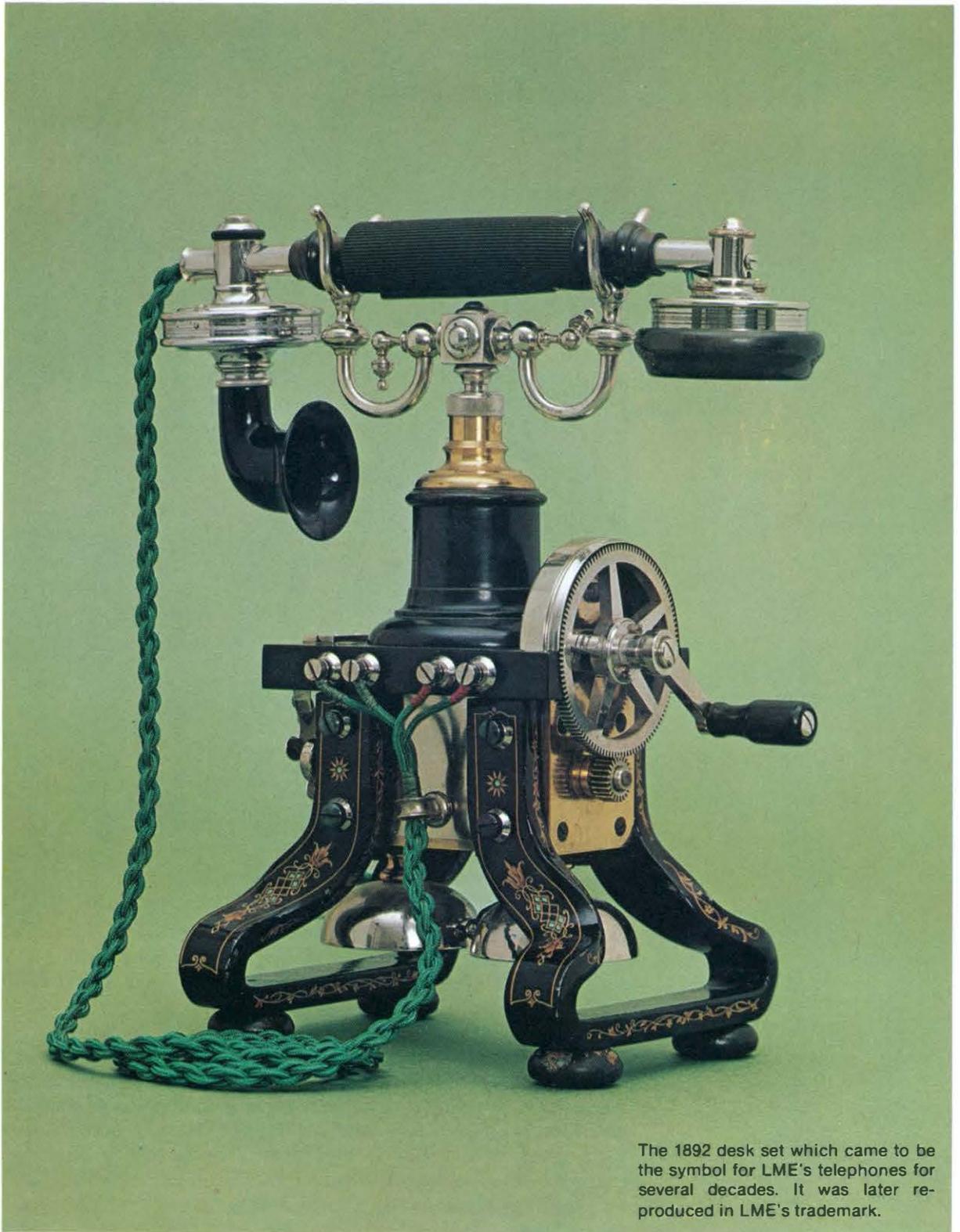
### The 1884 desk set

Lars Magnus Ericsson also worked on the creation of a practical desk set. In 1884 appeared the first version of the unique instrument

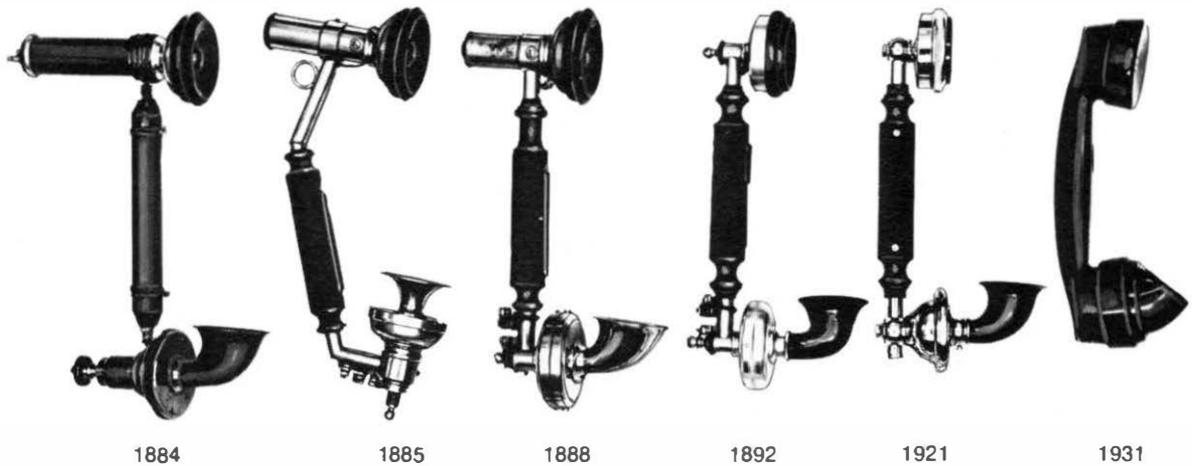
LME's desk telephone, mid-1880s.



that in due course was to become the symbol for LME telephones all over the world. In this telephone the technical functions were given chief consideration. Ericsson designed it as a purely electro-mechanical construction without protective case. The generator magnets served as base for the set and its other components. At that time telephone sets still had a separate receiver and fixed microphone.



The 1892 desk set which came to be the symbol for LME's telephones for several decades. It was later reproduced in LME's trademark.

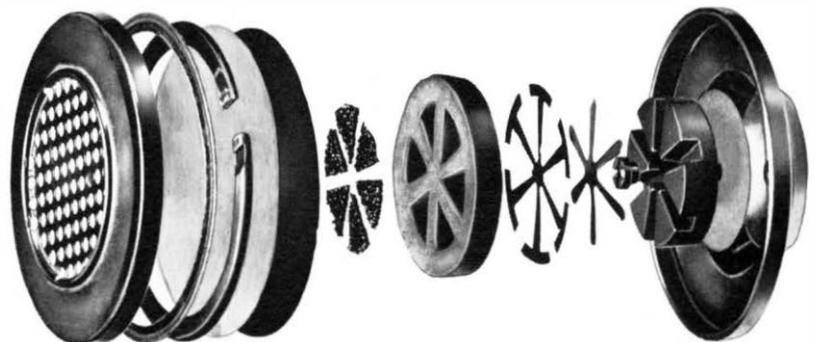


The development of the handset from 1884 to 1931.

### The handset and the 1892 telephone

LME's next major contribution to telephone-set development was the handset. The idea of combining receiver and microphone through a handle—into a handset—came up in Sweden in the early eighties. Abroad the operators at some exchanges had been given a similar device. The first handsets made by Lars Magnus Ericsson were intended for switchboards. But he was all the time working on the development of a handset suited for subscribers. This he produced in 1892, using a newly designed receiver with ring magnet in an earcap and a carbon granule microphone. As the handset lay in a cradle-shaped hook, the telephone had a natural structure and was convenient to use. It was the world's first subscriber's telephone with handset and proved an outstanding success.

Handsets were also successively introduced on wall telephones.



LME's star microphone, 1903.