

There were three mechanics and a wire-chief attending at this exchange. It cannot be said that the service is ideal, although it may be, and is claimed to be, better than the service formerly given by manual. Working at a high rate operators are liable to repeat the numbers properly and strike them up improperly. Subscribers state that bells ring sometimes and there is no one at the telephone when they answer, and sometimes the conversation is cut off. It was noticed that calls came in during my presence there, and as they did not find an idle operator, owing to all being busy, they lit a lamp on what is called an "overflow" position. There was no person at that position, and two or three lamps were alight there for a few seconds until operators became idle, when the calls again sought the operators. This was a fault not of the system, but rather of the management.

There were no proper statistics of trouble available, as the system had been in operation only a few months. The calling-rate was not high per subscriber. The provision for connecting subscribers of a manual exchange and those of this exchange together were good, being almost purely mechanical. It would take too long to explain the method.

Altogether the impression formed was that it was quite possible to give a satisfactory service by the means adopted.

At Berlin the Siemens-Halske firm had an equipment of 500 in operation throughout their factory, which was, however, full automatic and gave every satisfaction. This, of course, was under the most expert control.

The German Post Office had a 100-line full-automatic board in position, 49 lines of which were in use. The engineer stated it gave entire satisfaction.

Munich, in Bavaria, has two full-automatic exchanges of this system, one at Haidhausen of about 2,000 lines, the other at Schwabing of about 3,000 lines. These were visited. They were accommodated in fine buildings, and the rooms allotted to the apparatus were large and contained space for considerable additional apparatus. The trimness, general cleanliness, and good quality and appearance of the room and apparatus were admirable. The floors were covered with linoleum, beeswaxed, and highly polished. These were the best-looking automatic exchanges that had been met.

The engineers are well satisfied with the system and its operation. The number of automatic lines is to be increased, and the policy is to introduce automatic throughout. It is expected that in a few years there will be 45,000 automatic telephones in use in Munich, and it has been estimated that the saving will then be about £50,000 per annum. There is a great desire to eliminate the operator. This desire was also voiced by prominent engineers in Berlin, and from what information could be obtained it seems also to exist at Vienna.

At Haidhausen there are two switchmen; one helper who takes the switching-section at night; one helper for general cleaning; one helper for information and trouble; two men learning; two men for main frame; three men for outside trouble. These men are paid salaries ranging from £120 to £55 per annum.

At Schwabing there are thirteen men. The number of men in Schwabing and Haidhausen is high for the size of the exchanges. The engineers state they could do with fewer, but the men were there when the installation was put in and they have been continued; besides, it is necessary to teach men, as more automatics are to come along. One man is practically continually going over the banks of the switches cleaning the levels with alcohol and a chamois cloth. This did not appeal to me, but if they have the time it is a safeguard against imperfect contacts. The need of this does not exist in the Western Electric Company's system. The speech is good over the circuits. These are all three-wire circuits, and not the more recent two-wire system.

The following is a statement of existing or proposed installations and additions in the German Empire:—

MUNICH, BAVARIA.

				Number of Lines.	Equipment in 1917 : Lines.
Schwabing—					
First installation, 1909	..	..	..	2,500	
First extension, 1911	..	..	..	500	
Second extension (ordered)	..	..	..	800	
				3,800	5,000
Haidhausen—					
First installation, 1910	..	..	..	1,500	
First extension, 1911	..	..	..	500	
Second extension (ordered)	..	..	..	400	
				2,400	5,000
Residenzplatz—					
Magneto equipment to be replaced by automatic equip-				8,000	10,000
ment (ordered)					
Balmhof—					
Magneto equipment to be replaced by automatic equip-				..	10,000
ment (not yet ordered)					
Three new suburban exchanges, each equipped for ..	..			5,000	
will be erected in the near future	..	..	..	..	15,000
Munich will have in 1917 a total equipment of	..	..	..	..	45,000 lines.

Population of Munich, 600,000.