

nected to the board but outside the building, 4s. 2d. a month. The company does not care for business party-work, and has scarcely any, but the rate is as above.

At Omaha (population 185,000) there are four automatic exchanges: A Omaha, 3,500 lines; B Omaha, 3,000 lines: Keith line switches, three-wire system. South Omaha, 1,100 lines; Florence, 110 lines: Keith line switches, two-wire system. There are no party lines, all being individual lines. The A exchange has equipment for 4,000 lines and floor-space for 10,000. The room is 90 ft. by 50 ft. The space occupied is about 80 ft. by 22 ft. The ringing here is *not* automatic. The subscriber has to press a button to ring. The staff here consists of—

	Dollars.
1 wire-chief	90
2 information clerks	60
1 record clerk	30
1 complaint clerk	30
4 day switchboard-men at 90, 65, 60, 50 dollars	265
1 night switchboard-man	40
1 apprentice	35

Total operating per month 550 = £1,375 per annum.

There are also 4 trouble-men for outside at £15 12s. 6d. a month each, and 2 men repairing telephones at £14 11s. 8d. each per month. It will be interesting to compare annual costs again, from these actual figures, with a most approved type of common-battery manual board.

Manual C.B. board, first cost for 3,500 lines at £3 (this is placing it lower than before, as it is smaller) = £10,500, plus £2,300 for erection, or about 13s. 4d. a line = £12,800. Automatic will cost, say, £5 a line = £17,500, plus £2,300 to erect = £19,800. Difference, £7,000.

Automatic annual charges:—

	£
£7,000 interest and depreciation at 4 per cent. and 8 per cent. = 12 per cent.	840
Operating-costs as shown	1,375
Dials, 3,500 at £1 each = £3,500; at interest 4 per cent., depreciation 12 per cent. = 16 per cent.	£560
Dial maintenance at 1s.	175
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Total 2,950

Manual costs:—

	£
1 wire-chief	225
2 switchboard, trouble, and frame men, and cord-repairing, &c., £180 and £160	340
44 operators at £70	3,080
3 monitors at £110	330
2 supervisors at £160	320
1 observation clerk	100

£4,395

Difference in favour of automatic = £1,445 per annum.

The trouble-men and telephone-repairers would be required for either type of exchange.

But this is not all. The automatic system will work into other exchanges at practically the same cost. The manual would require B boards, space for them, and operators, and this method of working would reflect itself in the A boards, and more positions and more operators would be required there owing to each operator being slowed down owing to the existence of B boards.

Council Bluffs is a city of 35,000 people across the Missouri, five miles from Omaha. The telephone system is *manual* and is owned by a different "Independent" company, which agrees to intercommunicate. A charge of 5d. is made for each communication. Heavy charges are levied by the Bridge authorities for supporting the cable across the Missouri. As showing how easily one system can work into another, it may be mentioned that an automatic subscriber at any of the Omaha exchanges rings direct into Council Bluffs, a lamp lights there, and the connection is taken up and completed. A Council Bluffs subscriber requiring an automatic subscriber in Omaha rings in the ordinary way, and the operator at Council Bluffs, who has a dial, completes the connection automatically.

The automatic office at South Omaha was visited. The building is two storied, brick, and much too large. There are 1,100 lines. The ringing in this exchange is automatic. Three men are engaged here, and one for line and instrument trouble. Their total monthly salaries are 285 dollars, or £59 7s. = £712 4s. per annum. Repairs are effected by the trouble-men at a small bench at the end of the switch-room. The B office has 3,000 lines, and has one man less than the A office already referred to. These exchanges had not been paying; the stock was heavily watered; the company was placed in the hands of a receiver, and is now recovering itself. They stated they paid their way and put away about £3,500 a year. The engineer informed me they had put in a manual board at St. Joseph's—population 55,000—in 1910, and that they now regret it was not automatic. He said he would not install anything but automatic now after the experience he has had of its working. A number of calls were made and conversations held. The speech was good in all cases. Calls took from four to seven seconds, according to the number called, to complete the dial movements. This agrees with results got at San Francisco and Los Angeles, and later at other places. Lincoln, seventy-eight miles