

UNITED STATES PATENT OFFICE.

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AUTOMATIC TELEPHONE-EXCHANGE.

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To all whom it may concern:

Be it known that I, ALMON B. STROWGER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Automatic Telephone-Exchanges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in automatic, telephonic, telegraphic, and other electrical exchanges.

The object is to provide means whereby a person at one station may make connection with any other station in the system, by the aid of electrical appliances, without the assistance of an operator at the central station.

A further object is to provide means of the above character which shall be reliable and adapted to general use.

With these ends in view my invention consists in certain features of construction and combination of parts, as will be hereinafter described and pointed out in the claims.

The same general plan is adopted as in the systems now in use, in that of having a principal or central station, (central office,) and a number of sub-stations, the said sub-stations being placed in electrical connection with each other at the central office by and through line-wires, which line-wires, for the sake of brevity, will be designated "phonic" wires, (introducing the ancient obsolete form,) but differ in that of having, in addition to the said phonic wires, a series of wires (one or more) to operate the hereinafter-described mechanisms located at the central office. At the sub-stations are the appliances which are used to transmit and receive communication, as telephones and keys. At the central office are arranged in methodical order as many switch-cylinders, with their attendant mechanisms, as there are sub-stations. The above-mentioned phonic wires trend within the central office in close proximity to each cylinder. From each phonic wire and attached thereto wire terminals, connectives, or "legs" extend to the inside of each cylinder, there being as many connectives attached to each phonic wire as there are sub-stations.

With this brief outline, I will proceed to more fully describe my invention and elucidate its workings by the aid of the accompanying drawings.

Figure I represents in a perspective view my invention, showing at a distant sub-station one telephone and its exchange device at the central office, also the main-line wires connecting the central office with the sub-station. Fig. II represents four of such devices as is represented by Fig. I, showing the manner in which the cylinders are connected, also the trend of the electrical current from one sub-station to another through the central office. Fig. III is a plan view of a series of cylinders, line-wires, and connectives, showing the normal position of the circuit-closers. Fig. IV is a sectional view showing the magnets, levers, and pawls by which the device is operated. Fig. V is a detail view of the ratchet-wheels and pawls for operating the same. Fig. VI is a sectional view of the cylinders, showing more clearly the construction of the circuit-closer and feather-and-groove attachment.

Referring to the drawings by letter, A represents a hollow cylinder constructed of glass, wood, or any other suitable substance which is a non-conductor of electricity, supported in any well-known or approved manner. The cylinders are provided with perforations *a*, arranged in transverse and vertical rows.

B represents the wire connections extending from the inside of the cylinder through the perforations *a* to the main-line wires N and is attached thereto. Their use is to conduct the electricity, when in contact with the circuit-closing needle C C', to and via the line-wires N to the desired sub-station. The terminals of said connectives within the cylinder are shown at *b*, Fig. VI. In this last-named figure the circuit-closing arm is represented in parts, in which C is the circuit-closing sleeve and is firmly attached to the lower end of the sleeve-rod D. Within this circuit-closing sleeve is closely fitted the circuit-closing needle C', held in such a manner as to be in perfect electrical contact with the wire-terminal *b* by the spring *c*. The rod D, (see Fig. VI,) is located along the axle-line of the cylinder and is free to rotate and move longitudinally. The lower end of the