

ELECTRO-MECHANICAL TELEPHONE EXCHANGE.

This, as its name indicates, is a telephone exchange or switch capable of being manipulated from a distant station by means of electricity. Its object is to give each subscriber perfect control of his connecting device at the central office, thereby dispensing with the services of attendants; that is, the subscribers themselves do all that is to be done in calling up any other telephone.

The mechanism by which this is accomplished is illustrated by Figs. 1, 2, and 3. Fig. 1 represents all there is at the subscriber's office, consisting of the usual telephone apparatus and three or more keys, as required, marked from left to right as release, units, tens, hundreds, etc. Fig. 2 represents one of the switching machines at the central office, consisting of a switch disk having a hundred or more terminal contact points, with its accompanying machinery. Fig. 3 represents a complete central station, the machines and batteries being placed upon shelves along the sides of the room.

The machines at the central office are provided with mechanism by means of which the various connections are made.

On shelves at the central office are as many of these machines as there are telephones or subscribers. Each machine belongs, as it were, to its particular telephone, and is distinguished by the same number, No. 1 machine belonging to No. 1 telephone, and to that only; nor can No. 1 machine be manipulated from any other telephone. The wires connecting the keys with their respective magnets are termed manipulating wires, to distinguish them from the telephone wires.

The telephone wires, which enter the central office in one or more cables, are also numbered to correspond with the number of the wire terminals of the machine.

Calling up is effected as follows: Suppose that telephone No. 25 wants telephone No. 123. No. 25 presses his hundreds key once, tens key twice, units key three times. No. 25's connecting arm is then on the twenty-third contact point of the second row of wire terminals; that is, on the one hundred and twenty-third contact point.

To signal subscriber No. 123, or call him to his phone, No. 25 rings his bell, which operation also rings No. 123's bell. Conversation may then be carried on in the usual manner, after which the ear phones are hung up and No. 25 presses his release key, thereby actuating the release magnet, allowing the arm to return to normal position, by means of the weight seen at the left in Fig. 2.

In machines having over one hundred contact points, the contact arm has another motion by which it is enabled to reach any desired row. By using the thou-



Fig. 1.—TELEPHONE WITH KEYS ATTACHED.

sands and tens key the contact arm jumps over ten rows, or ten points in a row, as the case may be.

A private wire device connected with this system insures perfect privacy of conversation, so that not even a person at the central office can hear what is said. At the same time, if either party is wanted, his bell may be rung, notifying him that he is wanted, which call he may answer or not, at pleasure.

Among the points of superiority of this system over the old may be mentioned: a great saving in cost of a telephone system, particularly in large towns; the expense of operators required in the ordinary exchanges, both day and night, is entirely avoided; the costly and troublesome switch board is also unnecessary; instantaneous connection; no cutting off conversation by operators at the central office; and disconnecting by the pressure of a single key.

It is claimed that instruments of ten thousand connections can be as readily and easily manipulated as one of one hundred.

The Strowger Automatic Telephone Exchange, of Chicago, was incorporated November 18, 1891, under the laws of the State of Illinois, M. A. Meyer being president, A. B. Strowger vice-president, J. Harris secretary.—*Electrical World.*

Salt Water Distribution in Cities.

The Olympic Salt Water Company has received its first installment of 25 per cent of the iron pipe which is to furnish sea water for San Francisco from the ocean, and it is now laid out along Post Street, from the new Olympic Club building to Van Ness Avenue. The pipe has been much delayed by a process of painting with paraffine, as the wax had to be imported from the East. The directors of the company expect to have the pipe laid very rapidly, now that a start has been made, and hope to be pouring the salt water into the city early next year. The scheme is to establish a large pumping station near the Cliff House and erect engines capable of hoisting 3,000,000 gallons of water every twenty-four hours to a large reservoir near Forty-third and Point Lobos Avenue, which is nearly 300 feet above the city base level. The pipes will be 12, 14, and 16 inches in diameter, made of cast iron and coated with asphaltum and paraffine. A system of mains and division pipes will be run all over the city, terminating at the foot of Third Street, where the water will discharge into the bay. If the water be not used, the whole 3,000,000 gallons must pass through the sewers to flush them everyday. The water will be used for a large number of baths and tanks all over town, besides being put into private houses, used for sprinkling the streets, subduing fires, and furnishing small motors with power. There will be about six miles of pipe necessary to bring the water in. The new Olympic Club will be the first establishment furnished with the salt water.

The plan originated with the Olympic Club members, who made estimates and procured the franchise.—*Pacific Lumberman.*

Bags Instead of Barrels for Sugar.

The Philadelphia *Record* states that "the Sugar Trust has contracted with John T. Bailey for 5,000,000 bags to take the place of barrels for the shipment of refined sugars. The bags will be delivered in New York, New Orleans, and Boston, as well as in Philadelphia. This is by far the greatest bag contract ever made in the United States. Philadelphia is the center of this important industry. The trust's reason for the change from barrel to bag is that the bag costs and weighs considerably less than its old-time competitor. The weight of the bag is only 1½ pounds, that of the barrel 23 pounds. Thus the difference in freight alone for carrying refined sugar to its destination would pay several times over for the bag. In this view of the innovation the bag really costs the trust nothing, but comes to its hand with a profit ready made. The

barrel's successor is a plain burlap bag with a light muslin bag inside. This is the worst blow the local cooperage industry has ever experienced, and almost wipes out that business in Philadelphia. Flour now goes to Europe in bags, and is retailed in the same way. Sugars brought here from the West Indies and Hamburg come exclusively in bags, which, after being cleaned, are used up for paper stock. The Spreckels were the first to introduce the bag business in the East. The trust saw the advantage at once and took immediate steps to have its output shipped in the cheaper way as soon as it gained control of the refineries."

California Gold.

The days of rich pockets and nuggets are by no means over in California. For instance, a few weeks ago they got \$10,000 out of a pocket in the Stow mine, Forbestown, Butte County, and the mine since made a clean-up of \$20,000. Henry Miller, of Magalia, in the same county, found a little pocket in his claim from which he took out in a few minutes \$580. Ed. Gilbert found in his drift mine, near Butcher Ranch, Placer County, a nugget worth \$2,300. It was about ten inches long way, from three to seven inches in width, and from an inch to an inch and a half in thickness. The whole surface was very irregular. Its beauty consisted of having the formation of crystallized quartz, with clear-cut corners, the sides of whose cubes shone with dazzling brilliancy at any angle from which a person viewed it. The mine has been worked more or less since 1856. Louis Page and partners at Bald Mountain, Tuolumne County, after working a tunnel for nineteen

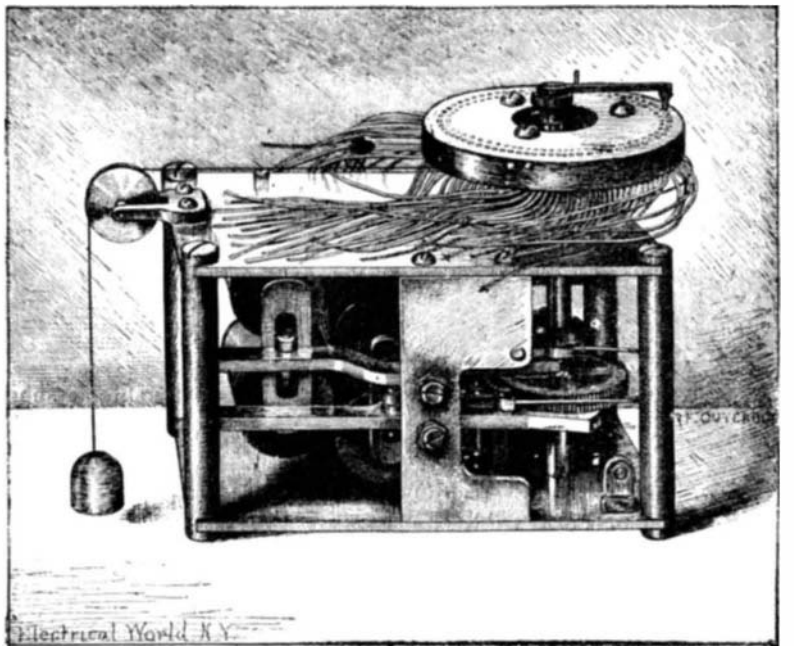


Fig. 2.—THE SWITCHING MACHINE

months, have struck several very rich pockets, where they have found nuggets worth \$40, \$80, and \$140, and lots more in sight.

These are only a few instances seen in our exchanges in the past week or so, and there are, doubtless, others not chronicled. There are thousands of Chinese working in the mines of the State, but no one ever knows what they get; and in the richer claims run by white men little is said of the product. The gold mining interests of California are becoming better recognized than they have been of late years. The northern counties are only partly prospected, and even in the older mining regions there is room for discovery. There are many mines being worked steadily by private parties which are paying handsomely, but as no stock is for sale, very little is said of them in the public prints.—*Min. and Sci. Press.*

Preparation of Wool.

In all branches of the woolen industry it is an indispensable fundamental condition that the wools to be worked up are subjected to good factory washing, such as is generally known. The wool must be perfectly free from grease and suint and must after washing have neither a smeary nor harsh feel; after drying, when compressed in the hand, it must readily and with elasticity open (after quickly opening the hand) and expand like feathers.

For dyeing piece goods in light colors all wools are unsuitable which have a darker yellow or gray tint. For light, delicate colors are also all mixtures of art wools with other wools equally unsuitable, and finally a wool material is to be rejected which by various diseases of the sheep is contaminated with corruption, abrasions of skin, particles of blood, etc. Tar tips and seal wax from marking the sheep in the flocks are also apt to cause stains upon the goods. Defective wools and such as have no clear appearance are only suitable for dark colors.

The fulling is good only if, besides closeness of the felt, the washing is perfect, so that all alkalies and particles of grease have been removed from it.



Fig. 3.—TELEPHONE CENTRAL OFFICE.