

Classification.—The telegraph, like other inventions, has been considerably developed, resulting in numerous systems. A classification of these various systems, to be comprehensive, must be made from several points of view, as with respect to:

1. The kind of circuit, as

- a. Ground return;
- b. Metallic.

2. The method of operating the circuit, as

- a. Closed;
- b. Open.

3. The transmitting capacity.

- a. Single Morse line;
- b. Diplex.

- c. Duplex {
 - single current or differential;
 - double current;
 - polar;
 - bridge;
 - high pressure "leak";
 - high efficiency;
 - city line;
 - short line.

- d. Quadruplex. {
 - gravity battery;
 - Jones;
 - Field;
 - Davis-Eaves or Postal quad;
 - single dynamo;
 - metallic circuit;
 - Gerritt Smith;
 - Western Union;
 - British post office.

- e. Multiplex {
 - synchronous.

- f. Phantoplex.

4. The method of receiving, as

- a. Non-recording
- b. Recording {
 - by perforations;
 - by printing.

The Morse Single Line System.—This ordinarily includes a battery for supplying a low tension current and a line wire connecting two or more stations serving to establish a circuit between them; a return connection to the battery, formed either by another wire or by the earth to a transmitting key, and a sounder or recording apparatus at each station.

Ques. How does this system operate?

Ans. On depressing the transmitting key at the sending station, the electric circuit is completed in a manner corresponding to a predetermined code of signals; these signals are transmitted along the wire by the electric current to the distant receiving station, where they are reproduced by the electro-magnetic action of the sounder or receiver.

Ques. On what does the operation of the telegraph depend?

Ans. It is possible, because of the fact that an electro-magnet can be magnetized and demagnetized with great rapidity on respectively making and breaking the magnet circuit, the magnetic action thus obtained being used to operate a sound producing mechanism so that the various combinations of "dots" and "dashes" representing the letters of the alphabet are indicated audibly.

Ques. What circuits are included in the term "Morse single line?"

Ans. Those that are so equipped and operated that transmission is carried on in one direction only at a time.

Ques. What instruments are necessary on a Morse single line of short length?

Ans. A key and sounder at each station.