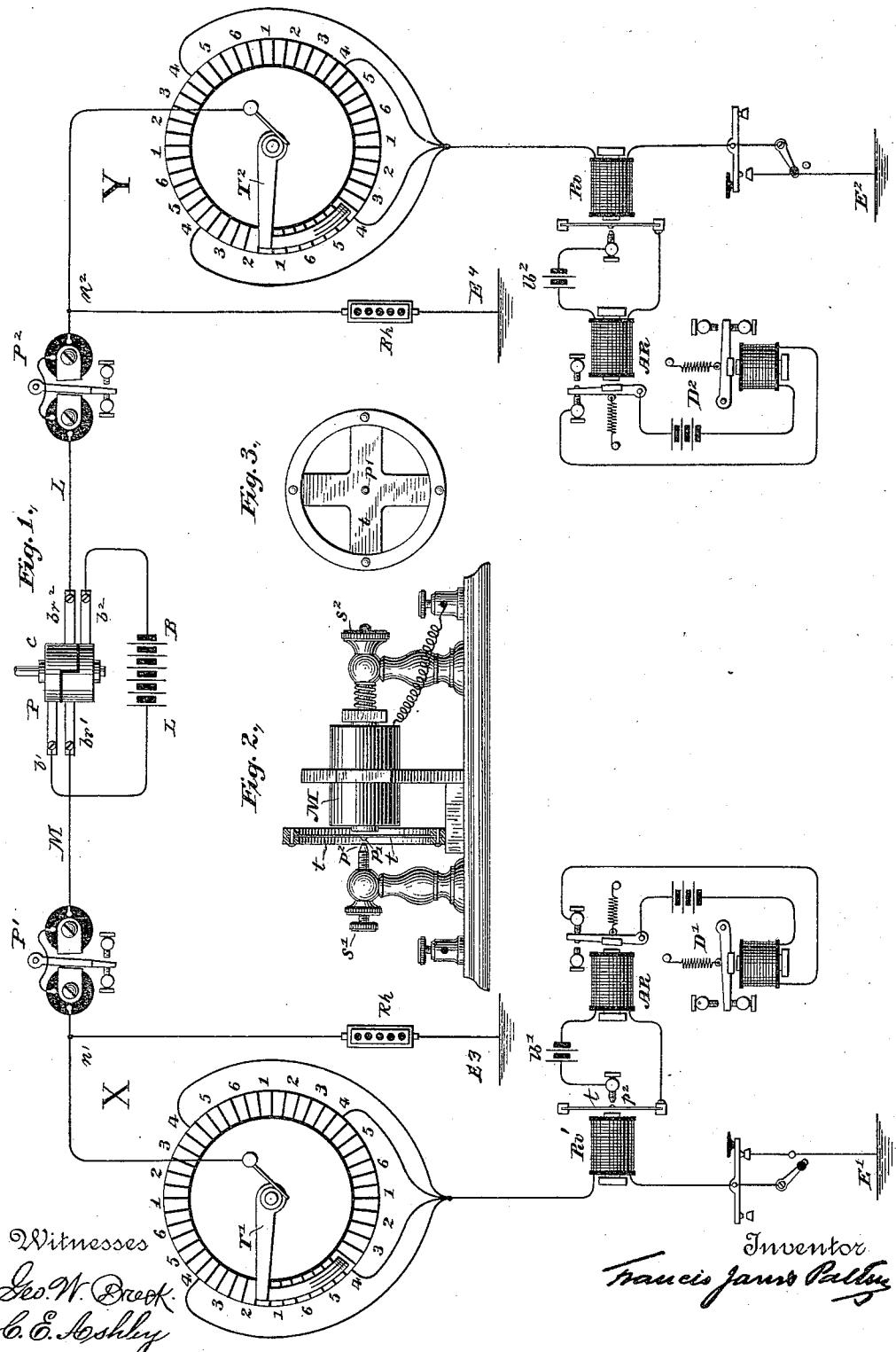


(No Model.)

F. J. PATTEN.  
SYNCHRONOUS MULTIPLEX TELEGRAPHY.

No. 428,224.

Patented May 20, 1890.



# UNITED STATES PATENT OFFICE.

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## SYNCHRONOUS MULTIPLEX TELEGRAPHY.

SPECIFICATION forming part of Letters Patent No. 428,224, dated May 20, 1890.

Application filed January 10, 1890. Serial No. 336,580. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS JARVIS PATTEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sending and Receiving Instruments for Multiplex Telegraphs, of which the following is a specification.

My invention consists in the organization of receiving apparatus designed to produce ordinary Morse signals in a system of synchronous multiplex telegraphy. In such systems the relays are actuated by a series of intermittent impulses, and the object in devising special forms of receiving-instruments is to produce an organization of devices which will respond clearly to such intermittent currents. Ordinary receiving-instruments will chatter or vibrate and the sounder will not produce the signal sent by the key.

In the drawings, Figure 1 represents two terminal stations X and Y, connected by a line-circuit, and there is shown at each end of the line a table of insulated contacts, over which trailers move in unison. These are shown at T' and T<sup>2</sup>, and the main line M L is connected at the two stations to the spindles carrying these trailers, and through them a receiving apparatus to earth at E' and E<sup>2</sup>. Fig. 2 is a view of the receiving-relay, and Fig. 3 is a detail of the armature.

The receiving-relay will first be explained.

Referring to Fig. 2, M is a single-bar magnet whose coils are in the main-line circuit. In front of the magnet is placed a soft-sheet-iron cross supported in the fixed ring, Fig. 3. The center of the cross is opposite the center of the magnet-core, and is provided with a small platinum contact-point p', in front of which is supported an entirely adjustable point p<sup>2</sup>, held by a set-screw s' in a suitable post placed in front of the armature. These two points are normally in contact; but as the armature vibrates under the action of intermittent currents the connection between the two is rapidly broken or interrupted.

While I do not claim anything essentially novel in this particular form of receiving-relay, the manner in which it causes a sounder to respond through the agency of an auxiliary relay will be claimed in this application. To

understand its action, reference will be had to Fig. 1, and the nature of the currents forming a single signal will be explained, and, it will be observed, has one complete set of 5 sending and receiving apparatus at each station thus connected to segment No. 4, station X represented as sending and Y receiving. At some point in the main-line circuit is a revolving pole-changer P C, which constantly 60 reverses a battery L B, so that the main line is constantly charged with currents of reversed direction. As the trailers strike the segments 4 at the two ends of the line the receiving-relays Rv at the two stations receive 65 these intermittent impulses at rapid intervals; but as the relays are neutral the direction of the currents is immaterial. It will only be necessary to describe the action of the receiving apparatus at one end of the line, as at 70 X. The key at X being depressed, an impulse will traverse the receiving-relay Rv every time the trailers strike the segments 4, and the armature-key will be maintained in constant vibration so long as the key remains closed. It 75 practically breaks contact at p<sup>2</sup>, and the armature of auxiliary relay A R is drawn against the back-stop by its spring. This closes the circuit of the sounder D', the armature of which, therefore, remains down while the key is 80 closed. If the key is open, the line is open, and the armature of the receiving-relay rests against the contact-point p', the circuit of the auxiliary relay A R is closed, and the sounder D' is released. The same steps take 85 place in the receiving-instruments at station Y, and thus connection is maintained by ordinary Morse signals.

Having thus described my invention, what I claim, and desire to secure by Letters Patent 90 of the United States, is—

1. In a synchronous multiplex telegraph, the combination of multiplex transmitters connected to distributors and to a main line joining the distributors with an alternating 95 source of electricity located in the main line, and a receiving-relay, one for each transmitter, having a diaphragm-armature with local-circuit connections, substantially as described.

2. In a synchronous multiplex telegraph system, a main line including a source of rap-

idly-recurring alternating impulses of electricity and a pair of distributers, with multiplex transmitters connected to the distributers, and receiving-relays, one for each 5 transmitter, having a diaphragm-armature with local-circuit connections through an auxiliary relay, and a sounder, one for each auxiliary relay, having local-circuit connections therewith, substantially as described.

10 3. In a telegraph system, a main line including an electrical generator which sets up continuously rapidly-recurring alternating impulses, and one or more transmitters and receiving-relays, the receiving-relays having 15 diaphragm-armatures which are kept in continual vibration, in combination with an auxiliary relay for each main-line relay and included in a local circuit with the diaphragm

of the main-line relay, and a local sounder included in a local circuit controlled by the 20 auxiliary relay, substantially as described.

4. A main line including a source of electricity which continuously transmits alternating currents over the line, with a transmitter and a receiving-relay having a diaphragm-armature continuously vibrating, in combination with an auxiliary relay included in a local circuit with the diaphragm-armature and one contact-stop, and a local sounder controlled by the auxiliary relay, substantially as 25 30 described.

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Witnesses:

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