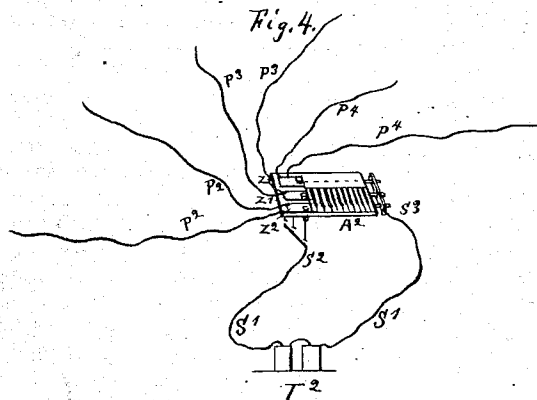
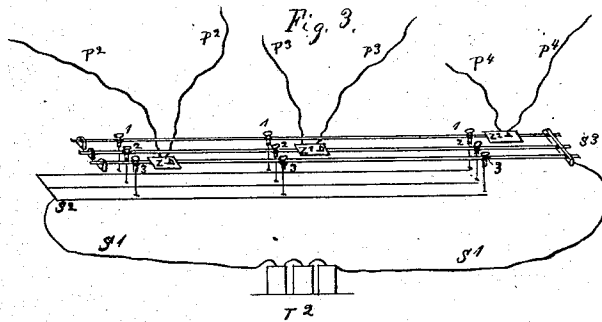


M. GALLY.,

Automatic-Telegraphic Apparatus.

No. 158,927.

Patented Jan. 19, 1875.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN AUTOMATIC TELEGRAPHIC APPARATUS.

Specification forming part of Letters Patent No. **158,927**, dated January 19, 1875; application filed May 11, 1874.

To all whom it may concern:

Be it known that I, MERRITT GALLY, of Rochester, in Monroe county and State of New York, have invented certain new and useful Improvements in Telegraphic Apparatus; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Figure 1 is a front view of an instrument showing the principal features of the invention. Fig. 2 is a plan of the transmitting, the interval, and the tripping circuits. Fig. 3 shows the arrangement of circuit $S^1 S^1$ for a number of instruments at a single office; Fig. 4, the same as Fig. 3, the several instruments in connection with a single manipulator.

In ordinary automatic telegraphy much loss of time and labor is occasioned by the disconnected steps through which the message must pass in its preparation before it is actually transmitted upon the line. Two or three operators are usually employed, with different instruments, upon a single message, one to perforate the message-strip, another to wind the strip upon the bobbin, and a third to adjust the bobbin to the transmitter and transmit the message.

The delay occasioned by rehandling is especially apparent with short messages assigned to different destinations; and as a large proportion of telegraphic business is done in "ten-word" messages to be separately transmitted, the causes of delay mentioned become prominent.

The objects of my invention are, first, to perform automatically the changes mentioned in the preparation and transmission of messages, or to so connect the instruments as to bring them all into one, or under the control of a single operator; and, secondly, to especially adapt the instruments used not only to single, but also to "multiplex" telegraphy.

In Fig. 1, A B represent a perforating device, which is only partially shown, as any kind of perforator or instrument for otherwise preparing the message-strip may be used to prepare the strip N for the transmitter.

All the other devices of Fig. 1 except A B

belong to the transmitting or receiving portion of the instrument.

From the perforator A B the strip N passes directly to the transmitter, the first part of which is the wheel C and tripping circuit-connector D E.

This device must not be confounded with devices for holding the strip N from moving while the punches are acting. This is not its office, and the perforator A B (partially shown) is supposed to be furnished with all such needed apparatus, aside from the device C D E, which is rather used to trip the transmitting apparatus F G H at such times as it has entirely used the message matter which has been accumulated at Q.

Whenever the accumulated message-strip at Q becomes entirely used the strip N becomes taut, in direction of the dotted line, between C and H, and the strip, lifting the light wheel D, closes a local circuit at E, through magnet K, and, acting upon lever J, lifts wheel F from wheel H by raising lever G, and thus stops the transmitting movement until it is again started by the action of magnet L through the circuit $S^1 S^1$. This circuit $S^1 S^1$, when for multiplex telegraphy, is the interval-circuit, and is governed by an interval-pulsator, or is closed and broken by the operator at desirable intervals, as the case may be.

This circuit may also lead to other instruments at the same office connected with other telegraphic lines, as shown in Figs. 3 and 4, in which P^2 , P^3 , and P^4 represent different telegraphic lines with instruments at the same station. The several instruments are represented at $Z^1 Z^2$, either transmitters or receivers, or both combined.

Fig. 4 represents the same with a single manipulator, A^2 , for all the transmitters or receivers, or for any desirable number of them. The circuit $S^1 S^1$ goes to all the instruments through S^3 , and to their points for connection through S^2 .

It will be seen from the figures that an operator at any one of the instruments may connect the circuit $S^1 S^1$ through any other of the instruments, or the one at which he is immediately operating, by making connection at 1, 2, or 3, as the case may be.

The wires 1 2 3 may be connected directly with lever J of their respective instruments, and a slight movement of the wire act mechanically upon the lever, instead of using Lattery T², if so preferred. For example, if a number of lines or branch lines come into an office, I make the circuit S¹ S¹ of each instrument in the office extend to other instruments, so that an operator engaged upon one line can, without leaving his position, control the transmission or receiving of messages on other lines than the one on which he is directly operating. Thus he may have accumulated message matter in a number of instruments for a number of lines without opportunity to transmit any of them. While he is manipulating one instrument, if the time-signal is given for another instrument, he can, without leaving the work on which he is engaged, set off the other message by the simple connection of its instrument-circuit S¹ S¹.

He may pass from one instrument to another and accumulate message matter as each case demands or his time allows, and still always be ready to transmit from any at the proper signal without leaving his position. Instead of the circuit S¹ S¹, a mechanical connection may be made from one instrument to another, and I do not wish to limit myself in the invention to a mere electric connection for this purpose, when connecting instruments at a single station. The wheel W represents the instrument motor, and may be driven by any desired power. The circuit P¹ P¹ represents the transmitting or main-line circuit. It will be seen that the perforating operator can accumulate his message-strip, and whenever opportunity comes for its transmission, the accumulation will be taken up by the transmitter while he goes on perforating, either by the action of an interval pulsation or the simple connection of the circuit S¹ S¹ by the perforating operator. For single telegraphy the operator can always make his own connections, when opportunity is given on the line for his accumulated matter. For multiplex or interval telegraphy the circuit S¹ S¹ may be connected with the main line, and operated by interval pulsations, with direct or reversed currents, as described in my former patents; but in the present case I show another plan of working the circuit, as will be seen in Fig. 2. With speedy recorders, the accumulation, consuming considerable time of the perforating operator, may be taken up by the transmitter during a very short interval. These short intervals will need to recur to each instrument only at comparatively remote periods, say ten words, more or less. This will allow a number of operators along a line to be constantly accumulating matter, which, at certain recurring intervals, will be taken up and passed on to the line in their proper order, if a line-pulsator is used for marking the proper intervals. Very great accuracy, however, is required in the adjustments of the instruments. If a number of operators

can be successfully employed simultaneously and constantly preparing message matter, all to be transmitted upon the single line, a second line-wire can be afforded to mark the intervals, and, being entirely independent in its action of the transmitting-line, can be made to mark the intervals with perfect accuracy, with no necessary devices for unison. In Fig. 2 I show two circuits for the entire line—P¹, the transmitting circuit-wire, and S¹ the interval circuit-wire. Each circuit may have its own battery or be alternately thrown on to one battery by an alternating circuit-closer, as shown at X R T. These circuits correspond to the circuits of Fig. 1, marked with like letters.

The instrument shown in Fig. 1 is used for recorder by substituting chemically-prepared paper in place of the message-strip, if electrochemical record is desired. Any kind of registering or sounding device may, however, be used.

The perforator may be made to act by adjustment upon different strips leading to different connected transmitters, all furnished with accumulations at different times, with but one set of keys; or a single manipulation may be made to punch a number of strips of like character simultaneously, leading to different transmitters for different lines. I reserve such constructions, however, for future application.

In the instrument, Fig. 1, the wheel F is driven by the motor W. The lever G rocks upon a pivot at *n*. Wheel H is driven by friction from wheel F when the wheels are in contact. Lever J acts upon lever G by cam action, as shown at *a b*. Lever J is pivoted at *h*, and is furnished with armatures *d* and *f* for the electro-magnets K and L. I is an ordinary stylus, through which the circuit current of P¹ passes to wheel H. The tripping-circuit, which is automatically closed at E, is represented by M' M'. The circuit S¹ S¹, when closed by the perforating operator, passes to an ordinary hammer-key, arranged with the keys of the perforator.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a perforator for preparing message matter for telegraphic transmission, and with a transmitter therefor, of an intermediate device, controlled in certain operations by the paper passing from the perforator to the transmitter, and in turn controlling the transmitter in its action, substantially as and for the purpose specified.

2. The transmitting or receiving mechanism, in combination with the circuit S¹ S¹, operated substantially as and for the purpose specified.

3. The combination, with a series of instruments connected to the same or to different circuits, of an electrical or mechanical connection, for controlling any or all the instruments from any one thereof, substantially as specified.

4. The tripping-circuit M' M', with connector E, by means of which the transmitting or receiving movement is interrupted by the tension of the ribbon N, substantially as specified.

5. The combination, with a main-line transmitting wire and instruments therefor, of an additional line-wire, for controlling the instru-

ments of the transmitting-line as to their intervals of transmission, substantially as specified.

MERRITT GALLY.

Witnesses:

JOHN THOMSON,
JOHN HAY.