

Dec. 12, 1933.

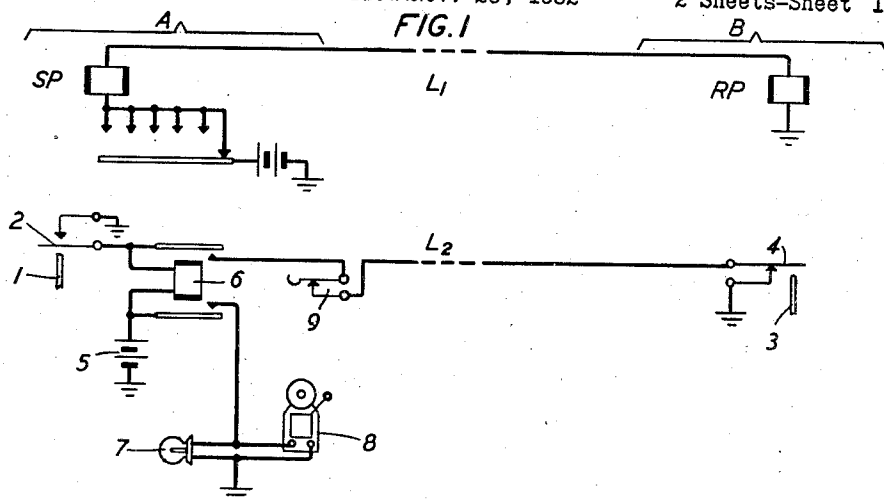
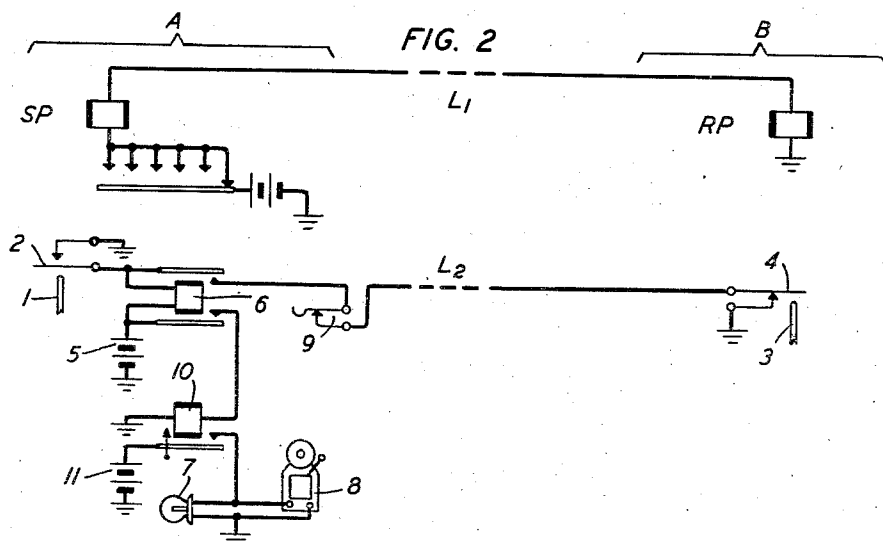
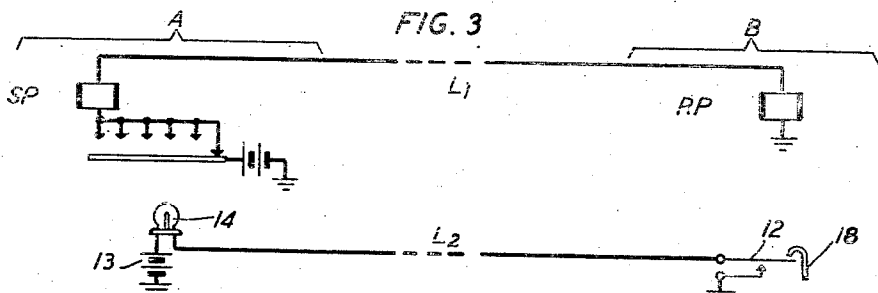
E. F. WATSON

1,939,613

PRINTING TELEGRAPH SYSTEM

Filed Nov. 26, 1932

2 Sheets-Sheet 1



INVENTOR
E. F. WATSON
BY *g e f o l e*
ATTORNEY

Dec. 12, 1933.

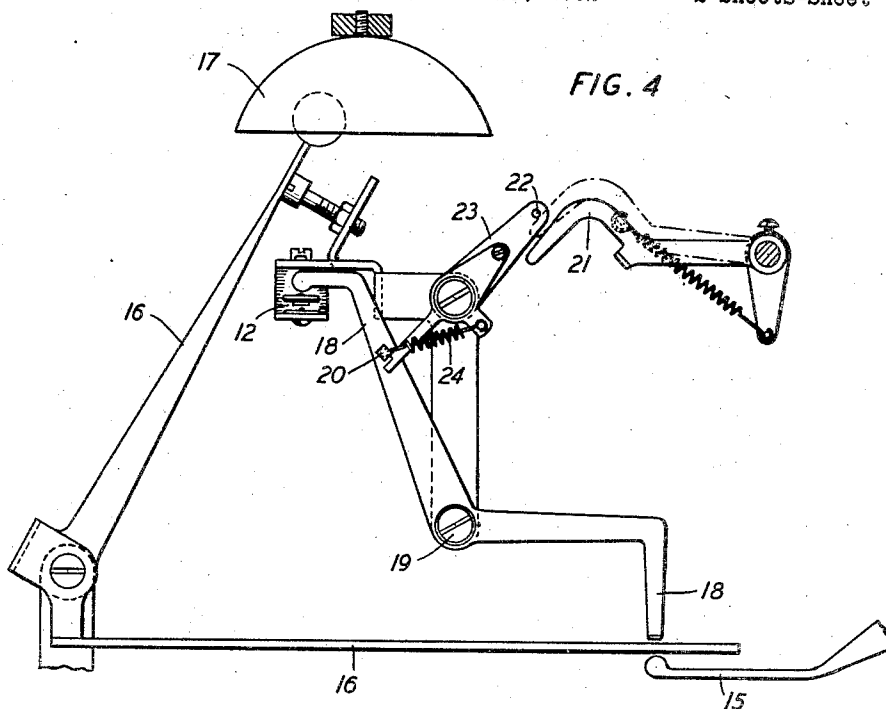
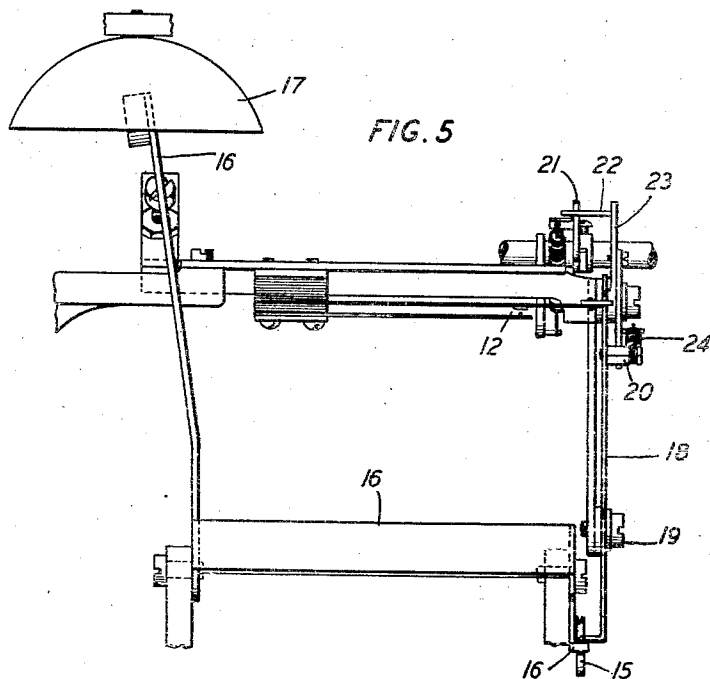
E. F. WATSON

1,939,613

PRINTING TELEGRAPH SYSTEM

Filed Nov. 26, 1932

2 Sheets-Sheet 2



INVENTOR
E. F. WATSON
James H. Watson
ATTORNEY

UNITED STATES PATENT OFFICE

1,939,613

PRINTING TELEGRAPH SYSTEM

Edward F. Watson, Larchmont, N. Y., assignor
to American Telephone and Telegraph Com-
pany, a corporation of New York

Application November 26, 1932
Serial No. 644,511

9 Claims. (Cl. 178-2)

This invention relates to printing telegraph systems and more particularly to printing telegraph systems which employ answer-back arrangements.

5 It is an object of this invention to provide an arrangement for warning an operator at a sending printing telegraph station that the receiving printing telegraph station is not functioning properly.

10 In printing telegraph systems, there often is a possibility that an operator might send messages to another station at which the printer motor could not be started due, perhaps, to some local circuit trouble. Normally, the sending operator would have no immediate knowledge of the fact that these messages had not been received. In order to obviate this contingency, it is necessary to employ some arrangement for informing a sending operator that the receiving station is not functioning properly.

15 In accordance with this invention, a simple and inexpensive arrangement is provided in a printing telegraph system for checking the operation of the receiving station. Whenever a sending operator wishes to know if a receiving station is functioning properly, the operator transmits a preassigned signal by means of the sending teletypewriter. In transmitting this signal, the sending teletypewriter causes the operation of a contact at the sending station and at the receiving station. These contacts are so adjusted that the contact at the receiving station opens before the one at the sending station closes. It also remains open for a longer period than the contact at the sending station remains closed so that the receiving contact is not again closed until the sending contact is opened.

20 When this preassigned signal is transmitted, the closing of the contact at the sending station closes a circuit to operate a relay, the locking circuit of which is connected to the receiving station and to the receiving contact. If the receiving station is functioning properly, this contact will be opened at this time so that the relay will not lock up and will release as soon as the sending contact is reopened. This relay carries another contact which is connected to a circuit containing an alarm signal, such as a bell, lamp, or buzzer. When the receiving station is functioning properly, the alarm will merely operate momentarily. This provides a check upon the operability of the apparatus at the sending station. If the receiving station is not functioning properly, its contact will not be operated. This causes the relay to lock up after it has been

operated and causes the steady operation of the alarm signal, thereby notifying the sending operator of the improper functioning of the receiving station.

The invention will now be explained with reference to the drawings, in which:

Figure 1 represents a preferred embodiment of the invention;

Fig. 2 represents a modification of the arrangement shown in Fig. 1;

Fig. 3 represents an alternative arrangement of the invention;

Fig. 4 is a side view of apparatus used in the arrangement shown in Fig. 3; and

Fig. 5 is a front view of the apparatus shown in Fig. 4.

In Fig. 1 the operator at station A transmits information to station B by sending signals from sending-printer SP out over line L_1 to receiving printer RP.

Whenever the operator at station A wishes to know if receiving printer RP is functioning properly, she sends a preassigned signal, such as a bell signal. This preassigned signal will operate the function bail (not shown) of sending printer SP and cause pull bar 1 to move upward thereby closing contact 2. This special signal will also, if receiving printer RP is functioning properly, operate the function bail (not shown) of receiving printer RP and cause pull bar 3 to move upward thereby opening contact 4. Contacts 2 and 4 are so adjusted that contact 4 will open before contact 2 and remain open for a longer period than contact 2 remains closed.

When contact 2 closes, a path is closed from battery 5 through relay 6 and contact 2 to ground thereby energizing relay 6 and causing its operation.

The operation of relay 6 closes a path from battery 5 through the lower armature of relay 6 and then through both lamp 7 and buzzer 8 to ground thereby lighting lamp 7 and ringing buzzer 8. Relay 6 in operating also closes a path from battery 5 through the energizing winding of relay 6, upper armature of relay 6 and contact 4 to ground thus providing relay 6 with a lock-up circuit.

As stated above, if receiving printer RP is functioning properly, contact 4 will open before contact 2 closes and remain open for a longer period than contact 2 remains closed. Since relay 6 is ordinarily operated only during the time contact 2 is closed, it can be seen that it does not normally lock up. During the brief interval of time in which contact 2 is closed and relay 6 is

energized, lamp 7 will be lit and buzzer 8 will be operated. This momentary operation of the alarm arrangement serves as a check upon the operability of the apparatus at station A.

5 In case receiving printer RP does not function properly and it does not properly operate contact 4, then relay 6 will be provided with its locking circuit as explained above. The alarm arrangement will now be operated continuously until contact 4 opens thereby notifying the operator at
10 sending station A of the improper functioning of receiving station B.

In actual practice, there might be a plurality of receiving stations similar to station B connected to one sending station comparable to station A. These receiving stations could be divided
15 into groups, each group having a common buzzer such as buzzer 8, and each receiving station having an individual lamp and relay, such as lamp 7 and relay 6. In this case, the operation of buzzer 8 would serve to locate a group
20 of receiving stations and the lighting of lamp 7 would identify the particular station which was not functioning properly.

25 After the operator at sending station A has ascertained the identity of the particular receiving station B which is improperly functioning, she may wish to open the locking-up circuit of relay 6 in order to avoid annoyance caused by
30 buzzer 8 and to conserve battery 5. Also, in case another receiving station should fail to operate properly, there might be some difficulty in becoming aware of the ringing of its buzzer, if another buzzer should be ringing at the same
35 time. To open the locking-up circuit, the operator simply operates manual restore key 9. If desired there may be such a key on the line going to each individual receiving station so that the alarm arrangement at sending station A can
40 still be operated by any other receiving station which is not functioning properly.

A modification of this arrangement is shown in Fig. 2. The purpose of this modification is to remove the check upon the operability of the apparatus at station A and to allow the alarm
45 arrangement to operate only when receiving printer RP is not functioning properly. This modification includes the addition to the apparatus at station A of relay 10, which is of the slow-to-operate type, and battery 11. As shown in Fig.
50 2, relay 10 is inserted in the path leading from relay 6 to lamp 7 and buzzer 8. Relay 10 is normally unoperated and its operating delay is slightly greater than the time interval during
55 which contact 4 is opened in response to the transmission of the special signal.

In Fig. 2, when contact 2 closes in response to the transmission of the special signal, relay 6 will operate as described above. When relay 6
60 operates, it closes a path to ground from battery 5 through the lower armature of relay 6 and through relay 10 to ground.

If receiving printer RP is functioning properly, contact 4 will be opened for a time interval
65 which is slightly longer than the time during which contact 2 remains closed. Since relay 10 has an operating delay as described above, it will remain unoperated because of the opening of contact 2.
70

However, if receiving printer RP is not functioning properly, relay 6 will lock-up as has been described above. Then, when relay 10 finally operates, current from battery 5 will light lamp
75 7 and ring buzzer 8 thereby notifying the oper-

ator at station A of the presence of trouble at the receiving station B.

It should be understood that, in Figs. 1 and 2, manual restore key 9 may be located at other positions, contacts 2 and 4 may be operated by
80 other means, that there may be a plurality of receiving stations, that the warning signal may be given by means of a bell, and that it is not necessary to use both a lamp 7 and a buzzer 8; all of which may be done without departing from
85 the scope of this invention.

An alternative arrangement of the invention is shown in Fig. 3. It can be seen from Fig. 3 that this arrangement employs no extra relay and only one special contact 12 which is normally opened. When the operator at station A transmits a preassigned signal, such as a bell
90 signal, contact 12 will be closed by means which will be described later. The closing of contact 12 closes a path from battery 13 through signal lamp 14 and contact 12 to ground. The closing of this
95 path will light lamp 14. The operator at station A can open contact 12 by transmitting another preassigned signal, such as any character or spacing impulse, by means which will be de-
100 scribed later. When contact 12 is opened, the path from battery 13 to ground will be opened thereby extinguishing lamp 14. Any failure of lamp 14 to light or to go out at the proper time
105 is an indication to the operator at station A that apparatus at either sending station A or receiving station B, or both, is not functioning properly.

It is to be understood that the arrangement shown in Fig. 3 may be modified without departing from the scope of the invention. For ex-
110 ample, contact 12 may be designed to be normally closed, or to be closed in response to the transmission of a character or spacing impulse, or to be opened in response to the transmission of a bell signal. Lamp 14 may be designed to be
115 lighted in response to an opening of contact 12, by some such means as removing ground from the lower part of contact 12 and putting ground into circuit with contact 12 by adding a contact
120 to the top of contact 12. Some other signal device, such as a bell or buzzer, may be used instead of lamp 14.

Fig. 4 and Fig. 5 illustrate how contact 12 may be operated by apparatus located at receiving
125 station B. The following description is given to illustrate the invention and it is to be understood that the invention is not to be restricted to this particular form of apparatus.

When the operator at sending station A transmits some preassigned signal, such as a bell signal, function ball 15 of receiving printer RP will
130 push up one end of bell lever 16 which will cause the other end of bell lever 16 to ring bell 17. When function ball 15 pushes up one end of bell lever 16, it also pushes up one end of lever 18. Since lever 18 is pivoted by means of pivot 19,
135 when one end of lever 18 is pushed up, the other end will be pushed down thereby closing contact 12. Lever 18 will be held in this position by means of mechanical latch 20.
140

Upon the transmission by the operator at station A of another preassigned signal, such as a character or spacing impulse, lever 21 will be made to rock up and down. When lever 21 goes
145 upward, it will strike peg 22 thereby forcing one end of lever 23 to go up. When one end of lever 23 goes up, its other end will go down thereby disengaging mechanical latch 20. Due to the force of spring 24, the top end of lever 18 will
150 now be pulled up thereby opening contact 12.

Lever 18 will be held in this position by spring 24 until another bell signal is received.

These arrangements are illustrative of the operation of the invention and will serve to assist in interpreting the claims. The claims are not to be restricted to the precise construction described above, but are intended to include all changes and modifications employing the principles and features of operation of the invention.

10 What is claimed is:

1. A printing telegraph system comprising in combination a telegraph line, a first printing telegraph station having a teletypewriter connected to one end of the line, a second printing telegraph station having a teletypewriter connected to the other end of the line, alarm apparatus at the first station for warning an operator at that station of the improper functioning of the teletypewriter at the second station, and instrumentalities at the second station for preventing the operation of the alarm apparatus when the teletypewriter at the second station is functioning properly.

2. A communication system comprising in combination a first transmission station having a teletypewriter, a second transmission station having a teletypewriter, a transmission line connecting the two teletypewriters, instrumentalities for informing the operator at the first station of the improper functioning of the teletypewriter at the second station, said instrumentalities comprising an alarm device located at the first station, a circuit for operating the alarm device, said circuit extending from the first station to the second station, a contact for opening and closing the circuit, said contact being located at the second station, and instrumentalities at the second station for operating the contact in response to the reception by the teletypewriter at the second station of a special signal transmitted over the transmission line by the teletypewriter at the first station.

3. A communication system comprising in combination a first printing telegraph instrument, a second printing telegraph instrument, a first transmission line connecting the two instruments for the transmission of significant current variations, a normally open second transmission line connecting the two instruments for obtaining a check upon the capability of the second instrument to correctly receive the current variations transmitted over the first transmission line by the first instrument, and an arrangement for closing the second transmission line in response to the proper reception by the second instrument of a check signal transmitted to it over the first transmission line by the first instrument.

4. A communication system comprising in combination a first teletypewriter, a second teletypewriter, a first transmission line connecting the two teletypewriters for the transmission of significant current variations, a normally open second transmission line connecting the two teletypewriters for obtaining a check upon the capability of the second teletypewriter to correctly receive the current variations transmitted over the first transmission line by the first teletypewriter, an alarm device connected to the second transmission line, and an arrangement for momentarily closing the second transmission line for operating the alarm device in response to the proper reception by the second teletypewriter of a check signal transmitted to it over the first transmission line by the first teletypewriter.

5. A communication system comprising in com-

bination a first teletypewriter, a second teletypewriter, a first transmission line connecting the two teletypewriters for the transmission of significant current variations, a normally open second transmission line connecting the two teletypewriters for obtaining a check upon the capability of the second teletypewriter to correctly receive the current variations transmitted over the first transmission line by the first teletypewriter, an alarm device connected to the second transmission line and located near the first teletypewriter, and an arrangement for closing the second transmission line and for operating the alarm device in response to the proper reception by the second teletypewriter of a check signal transmitted to it over the first transmission line by the first teletypewriter.

6. A communication system comprising in combination a first teletypewriter, a second teletypewriter, a first transmission line connecting the two teletypewriters for the transmission of significant current variations, a second transmission line connecting the two teletypewriters for obtaining a check upon the operability of each teletypewriter, an alarm device connected to the second transmission line, a relay connected to the second transmission line for operating the alarm device in response to the transmission and reception of a check signal transmitted by the first teletypewriter over the first transmission line to the second teletypewriter, and a normally open locking-up circuit for the relay, said locking-up circuit being closed whenever the check signal is not properly received by the second teletypewriter.

7. A communication system comprising in combination a first printing telegraph instrument, a second printing telegraph instrument, a first transmission line connecting the two instruments for the transmission of significant current variations, a normally open second transmission line connecting the two instruments for obtaining a check upon the operability of the two instruments, an alarm device connected to the second transmission line, an arrangement for closing the second transmission line in response to the transmission and reception of a special signal sent by the first instrument over the first transmission line to the second instrument, a relay connected to the second transmission line for operating the alarm device, and a normally open locking-up circuit for the relay, said locking-up circuit being closed whenever the special signal is not properly received by the second instrument.

8. A communication system comprising in combination a first printing telegraph instrument, a second printing telegraph instrument, a first transmission line connecting the two instruments for the transmission of significant current variations, a normally open second transmission line connecting the two instruments for obtaining a check upon the operability of each instrument, an alarm device connected into the second transmission line, an arrangement for momentarily closing the second transmission line in response to the proper reception by the second instrument of a check signal transmitted to it over the first transmission line by the first instrument, a relay connected into the second transmission line for operating the alarm device, and a normally open locking-up circuit for the relay, said locking-up circuit being closed whenever a check signal is not properly received by the second instrument.

9. A printing telegraph system comprising in combination a telegraph line, a first printing telegraph station having a teletypewriter connected to one end of the telegraph line, a second printing telegraph station having a teletypewriter connected to the other end of the line, an alarm device located at the first station for informing an operator at that station of the improper functioning of the teletypewriter at the second station, and instrumentalities for operating the alarm device in response to a failure of the teletypewriter at the second station to operate in response to significant current variations transmitted to it over the telegraph line by the teletypewriter at the first station. 80

EDWARD F. WATSON.

10	85
15	90
20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150