May 29, 1934. E. F. WATSON 1,960,360

PRINTING TELEGRAPH SYSTEM

Filed May 12, 1933

FIG. 6

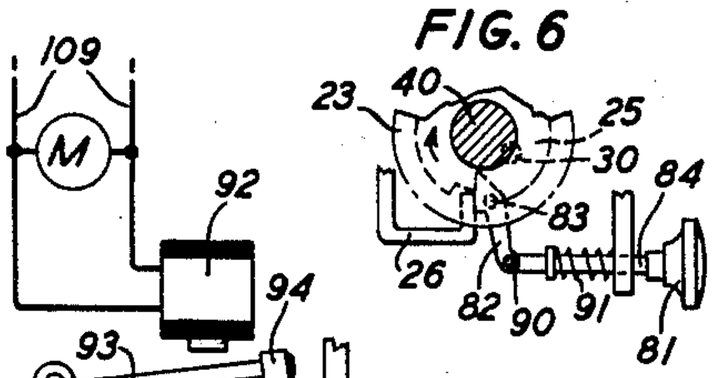


FIG. 1

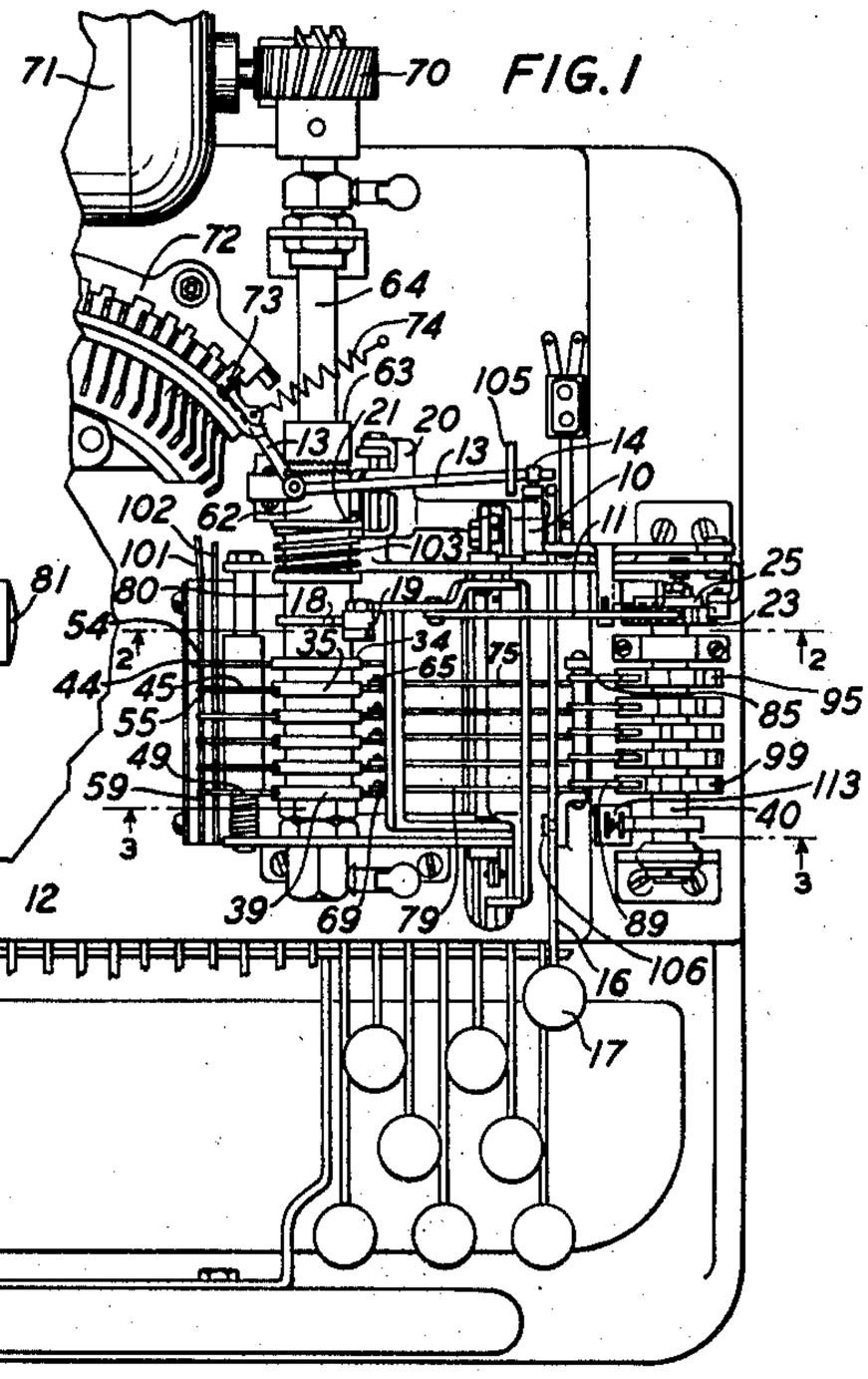


FIG. 5

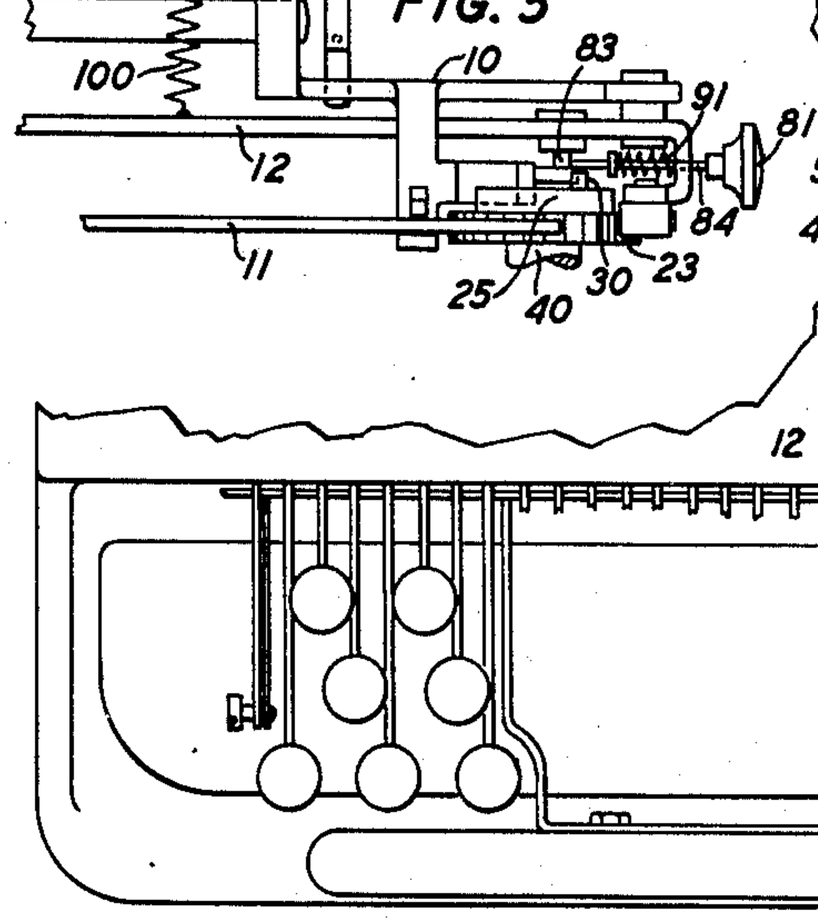


FIG. 2

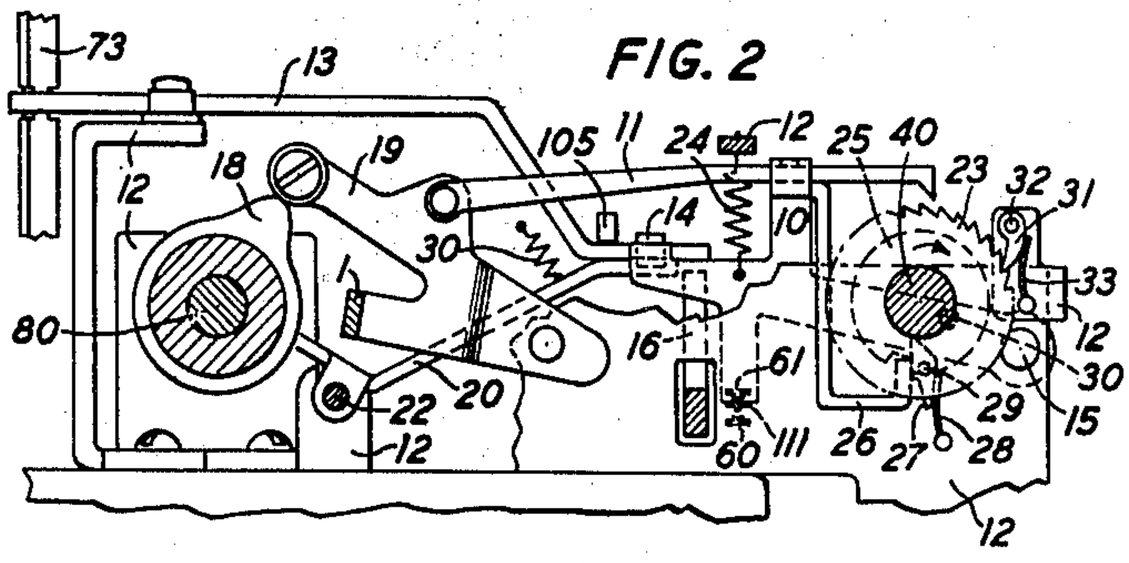


FIG. 4

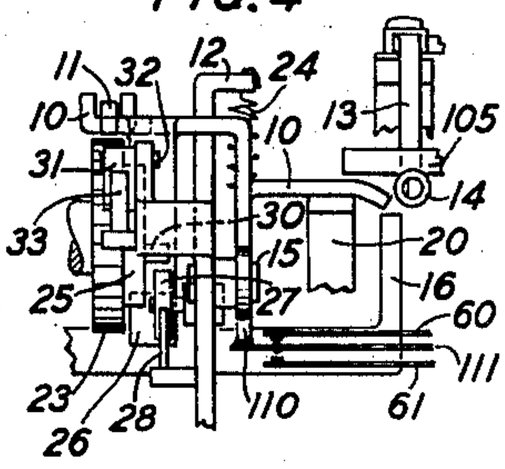
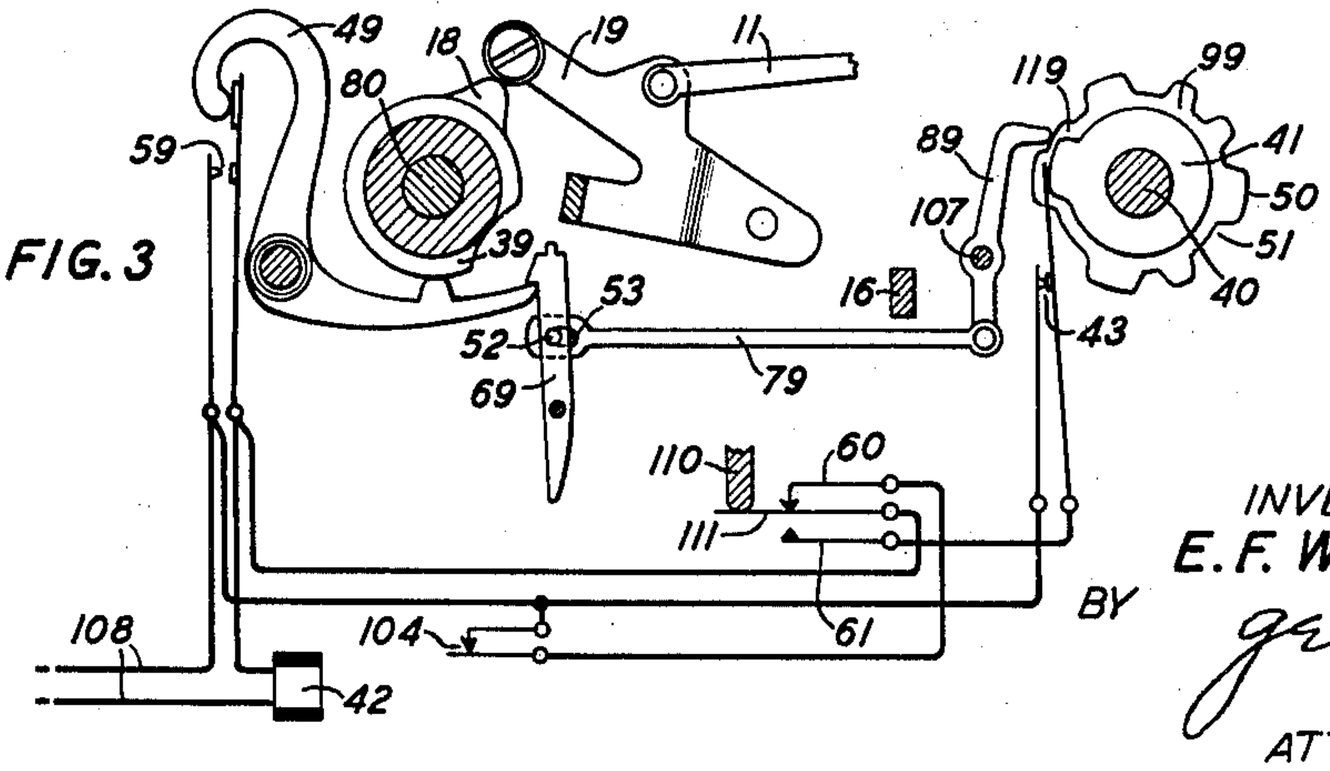


FIG. 3



INVENTOR
E. F. WATSON
BY
ATTORNEY

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1,960,360

UNITED STATES PATENT OFFICE

1,960,360

PRINTING TELEGRAPH SYSTEM

Edward Fisk Watson, Larchmont, N. Y., assignor to American Telephone and Telegraph Company, a corporation of New York

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14 Claims. (Cl. 178—4)

This invention relates to printing telegraph systems and more particularly to an answer-back device employed in connection therewith.

An object of this invention is to transmit automatically predetermined signals from a remotely controlled printer.

Another object of this invention is to provide means for informing a calling subscriber in a printing telegraph or other signaling system of the identity of the responding station.

Another object of this invention is to apprise a calling subscriber that connection has been established to the correct called station.

Printing telegraph systems usually comprise a plurality of subscribers' stations capable of interconnection with each other by means of exchanges. Some of these stations have facilities for sending and receiving messages, while others have merely provision for the reception of messages only. At times the sending of messages to unattended receiving stations is desirable. For this purpose, means are usually provided by which either the operator at the central switchboard or the calling subscriber can start the motor at the called station. Frequently, the calling subscriber desires to know before transmitting the message if connection has been established with the desired called station.

In accordance with this invention, an answer-back designation is automatically transmitted from the answering station either upon the reception of an inquiring signal from the calling station or whenever the motor at the called station is remotely started.

In general, the invention comprises an arrangement employed in connection with the sending mechanism of the regular printer. The arrangement, whether actuated by the signal from the calling station or by remotely starting the motor is adaptable to both sending-receiving printers and receiving-only printers. An auxiliary set of discs is located in close proximity with the contact cams. These discs, one for each of the contact cams, are mounted on a common shaft. In addition to the discs, an indent wheel and ratchet wheel are likewise mounted on the shaft. A pawl attached to the locking loop of the printer keyboard or contact mechanism is so arranged that it is capable of engaging the ratchet wheel and revolves the ratchet wheel one notch for the transmission of one set of impulses by the sending cams. Levers in contact with the peripheries of the discs control and determine the position of locking means. Locking means control instrumentalities for the transmission of signals over the line. The peripheries of the discs are such that the desired message is transmitted over the line and are so arranged that the predetermined message can be sent during one complete revolution of the discs. The proportional circumferential surface of the peripheries of the discs equivalent to that of one notch of the ratchet wheel corresponds to the set of impulses for one character. Other means may be employed for the movement of the shaft other than that of the ratchet wheel and pawl. For example, gears may be supplied which turn the disc synchronously with the transmission of each set of impulses. When the locking means of the printer are actuated after the transmission of each set of impulses, the pawl moves the ratchet wheel over one notch. As a result of this latter action the discs are moved for the transmission of another set. In this manner, the complete answer-back message is transmitted. Means actuated by the movements of a lever are provided for causing the pawl to engage the ratchet wheel. The movement of this lever is produced by the inquiring signal from the calling station. Other means result in the disengagement of the pawl from the ratchet wheel at the completion of one revolution of the shaft.

While the described device is adaptable to stations at which the motor has already been started, by an alternative method it may be employed at stations at which the motor is remotely controlled by the calling station. This feature is accomplished by means which start the answer-back mechanism whenever the motor is started. When either modification is employed, the transmission of the answer-back message may be deferred until the motor has attained sufficient speed. Means at each station for disconnecting the answer-back mechanism whenever it is so desired and means for transmitting the answer-back signal regardless of whether the keyboard is rendered inoperative are also provided.

A better understanding of the invention may be obtained by reference to the accompanying drawing in which:

Fig. 1 shows a plan view of a fragment of a telegraph typewriter in which the essential parts necessary for an understanding of the invention are illustrated;

Fig. 2 is a sectional view, slightly enlarged, of the device of Fig. 1 along the line 2, 2 thereof;

Fig. 3 is a view partly in section of the device

of Fig. 1 along the line 3, 3 thereof together with a schematic of apparatus and circuit associated with the parts shown:

Fig. 4 is a side elevation of the mechanism shown in Fig. 2;

Fig. 5 illustrates a modification of the invention by which the answer-back mechanism is actuated when the motor is started;

Fig. 6 is a view of a portion of the modified mechanism shown in Fig. 5.

Referring to Fig. 1, the numerical designation 12 represents the main frame of the telegraph typewriter. A plurality of rotatable contact cams 35 to 39 are fixedly mounted on a rotatable shaft 80. Shaft 80 is rotated by driven clutch member 62 and driving clutch member 63 by the shaft 64 geared to the printer motor 71 by the gear 70. A plurality of contact levers 45 to 49 in engageable relation respectively with contact cams 35 to 39 open and close respectively a plurality of transmitting contacts 55 to 59. The opening and closing of these contacts in various combinations transmit over a line circuit in ordered sequence a code of impulse representing each character of a message. One of the contacts from each pair 55 to 59 form an integral part of the bus bar 101, while the other of each pair of contacts are an integral part of bus bar 102. Both bus bars are connected in series with the line circuit. Fixedly mounted on the rotatable shaft 80 is a throw-out cam 21. A spring 103 the convolution of which surrounds the shaft 80 affords sufficient bias so that the driven clutch member 62 engages with the driving clutch member 63 whenever the clutch throw-out lever 20, normally in engagement with the throw-out cam 21, is disengaged therefrom. Locking means comprising a plurality of locking levers 65 to 69 are associated respectively with contact levers 45 to 49. Each of the locking levers controls its respectively associated contact lever by either allowing the contact lever to close its corresponding contact when the cams revolve or preventing that contact lever from dropping into the indent of the associated sending cam whereby the contact remains open. A stop-start cam 34 with its associated contact 54 is also shown. The printer motor 71 is driven at a constant speed and when the clutch throw-out lever 20 is disengaged from the throw-out cam 21, driven clutch member 62 engages with driving clutch member 63. The contact cams are rotated and the contacts corresponding to the contact levers which are unlatched by their respectively associated locking levers close, while those that are latched remain open. A series of impulses in ordered sequence corresponding to the desired character to be transmitted is sent over the line circuit. The impulses sent by one revolution of the shaft 80 represent a single letter of a message. The apparatus above described is well known to those skilled in the art.

Fixedly mounted on rotatable shaft 40 are five discs 95 to 99, the peripheries of which are irregular. The discs 95 to 99 are in engageable relation respectively with the locking levers 65 to 69 by means of their respectively associated indent levers 85 to 89 and levers 75 to 79. Ratchet wheel 23 is fixedly mounted on the shaft 40. The pawl 11 is in engageable relation with and rotates the ratchet wheel 23. The rotation of the ratchet wheel 23 by the pawl 11 produces a corresponding rotation of the discs 95 to 99. The pawl is actuated by the movement of the locking loop 19. The locking loop cam 18 produces a rocking motion of the locking loop, one movement for the complete rotation of the shaft 80 or the transmission of one character. As a result of the movement of the locking loop, the ratchet wheel steps the shaft 40, the radial distance corresponding to one notch of the ratchet wheel for each character transmitted. The pawl 11 is normally not in engagement with the ratchet wheel 23 being held in an inoperative position by means of an element 10.

In Figs. 2 and 4, the details of the construction of the answer-back mechanism are more clearly shown. The pawl 11 rests upon the element 10. When the element 10 is moved in a downward position, the pawl engages the ratchet wheel 23. In engageable relationship with the element 10 is the clutch throw-out lever 20. Both the throw-out lever 20 and the element 10 are normally biased in an upward position respectively by the spring 30 and 24. Both springs are attached to the framework 12. A downward motion of element 10 disengages the clutch throw-out lever 20 from the throw-out cam 21. This latter disengagement results in the rotation of the shaft 80. After a partial rotation of the shaft, the locking loop 19 moves from the elevations of the periphery of the locking loop cam 13. The locking loop latches the locking levers 65 to 69 in a manner well known in the art. When the combination of impulses corresponding to one character has been transmitted, the shaft 80 having completed one revolution, the locking loop 19 again rests on the elevation of the locking loop cam 18. In its movement upward the locking loop moves the pawl 11 in a direction to the right thereby rotating the ratchet wheel 23 one notch.

Fixedly mounted on the shaft 40 is an indent wheel 25. An indent lever 26 attached to element 10 is normally inserted in the indent of wheel 25. A member 27 secured to the framework 12 by pivot 29 and biased in a clockwise direction by the spring 28 provides a latching means whereby the indent lever 26 is held out of the indent of wheel 25 when the lever is withdrawn from the indent of the wheel. The insertion of the indent lever in the indent of wheel 25 prevents the rotation of the shaft 40. When element 10 is pushed downward, the indent lever 26 is prevented from being reinserted in the indent of wheel 25 by the member 27. The shaft 40 is thereby free to move. A cog 30, located on the cross-sectional face of wheel 25 at some distance from the indent, rotates the member 27 in a counter-clockwise direction. This action releases the indent lever 26 so that it rests on the periphery of the wheel 25. When the indent is again reached, after one complete rotation of wheel 25, the indent lever 26 will fall in the indent of the wheel. The shaft 40 as a result ceases to rotate. This construction affords the operation of one complete revolution of the shaft 40 by the downward movement of the element 10. The downward motion of element 10 is produced by the forward motion of the roller 14 on the end of the pull bar 13 shown in Fig. 1. The bar 105 (Fig. 4) forming an integral part of the framework 12 guides the pull bar 13. Means for preventing the downward movement of element 10 when the operation of the answer-back mechanism is not desired comprises a lever 16 pivoted to the framework 12 by the pivot 106 (shown in Fig. 1).

A depression of the key 17 swings the lever 16 in an upward position which in turn prevents the downward motion of element 10.

In Fig. 3, the construction of the rotatable answer-back means and the locking means is more fully illustrated. Mounted on the shaft 107 are levers 85 to 89. One of the contact levers 89 is shown in this figure. It rests on the periphery of disc 99. To the disc contact lever is attached an intermediate lever 79. Lever 79 is connected to the locking lever 69 by means of the pivot 52. A groove 53 is provided in the intermediate lever 79 through which the pivot 52 is passed. By constructing the groove 53 of sufficient size, play is allowed for the locking lever 69 to move in the sending of any desired message by the regular transmission apparatus of the printer. The contact cam 39 closes the contacts 59 by the engagement of contact lever 49 with the indent of the contact cam. This engagement depends upon whether the locking lever 69 is latched or unlatched.

In order to avoid the sending of signals as a result of the accidental operation of a key, or other instrumentality employed for transmitting messages, a number of printing telegraph systems provide disabling means for preventing, when desired, the transmission of signals from the keyboard. In Fig. 3, the disabling means comprise the circuit contacts 104. The closing of contacts 104 shunts the circuit contacts 54 to 59. Means for transmitting the answer-back signal regardless of the condition of the disabling means comprise the contacts 60 and 61 together with the armature 111. The bar 110 which is actuated by the element 10 determines the position of the armature 111. A downward movement of the element 10 produces a corresponding movement of bar 110 and results in the engagement of armature 111 and contact 61. When the armature 111 engages contact 60, the disabling means prevents the transmission of signals over the line. However, when the armature 111 engages the contact 61, the disabling means is rendered ineffectual.

The sending of messages in a number of printing telegraph systems is predicated upon the transmission of signals or impulses in ordered sequence at definite intervals over the line. The motor at the transmitting station must therefore rotate at a uniform speed. When initially started, motors employed in these systems do not revolve at a speed necessary for efficient transmission. A predetermined number of revolutions of the motor is required before the motor revolves at the desired speed. To provide for the time required for the motor when initially started to attain sufficient speed before the transmission of the answer back signal, the periphery of cam 41 fixedly mounted on the shaft 40 controls contact 43. When the answer back mechanism is started the closing of contact 43 prevents the transmission of any signal over the line by short circuiting the sending contacts 55 to 59. The opening of contact 43, however, permits the sending of the answer back message over the line. The periphery of cam 41 is so constructed that the motor must revolve a predetermined number of revolutions before the contact 43 is opened.

When contact 43 is closed and bar 110 pushed in a downward position so that the armature 111 is in engagement with the contact 61, no signal passes over the line circuit 108. When the contact 43 is opened, however, as a result of the depression in the cam 41, the impulse from the contact 59 is transmitted over the line circuit.

The periphery of the disc 99 is irregular corresponding to the desired impulse to be transmitted by the contact 59. When the closing of contact 59 is desired, an elevation on disc such as shown at 50 is used, whereas when it is desired to have the contact remain open, a depression such as shown at 51 is employed. When the disc 99 has an elevation such as 50, the lever 89 moves in a counter-clockwise direction. This action in turn moves the intermediate lever 79 to the right. The trip lever 69 is rotated in a clockwise direction. When the contact cam 39 rotates, the elevation of the contact lever 49 falls in the depression of the contact cam 39 whereby the contact 59 is closed and an impulse sent over the line circuit 108. When the lever 89 rests on a depression such as 51 of the disc 99, the lever 89 is rotated in a clockwise direction on its pivot 107. This action moves the intermediate lever 79 to the left. Intermediate lever 79 actuates locking lever 69 in a counter-clockwise direction. In this position the locking lever 69 latches the contact lever 49 so that the elevation of the contact lever does not fall in the depression of the contact cam 39. Contacts 59, therefore, remain open and no impulse passes over the line.

In Fig. 3, the section of the device is shown before the actuation of the answer-back mechanism. It will be observed that the lever 89 rests upon an elevation 119 of the disc 99 which is intermediate in height between the elevation 50 and the depression 51. The height of the elevation together with the groove 53 afford means whereby the answer-back mechanism will not interfere with the locking means during transmission of messages from the teletype-writer keyboard.

The operation of the answer-back mechanism is initiated by sending a certain series of impulses over the line which actuate the selection bars 72 (shown in Fig. 1). The end of pull bar 13 biased by spring 74 falls momentarily into the alignment of slots and the bar rotates in a clockwise direction. The roller 14 on the other end of the pull bar moves element 10 downward. This action lowers the pawl 11 into engagement with the ratchet wheel 23. Simultaneously, lever 26 is withdrawn from the indent in wheel 25 and caught by the member 27. The clutch throw-out lever 20 by the downward movement of the element 10 is disengaged from the clutch throw-out cam 21. This latter action results in the engagement of driving clutch member 63 with driven clutch member 62. The contact cams 35 to 39 and locking loop cam 18 then start rotating. The downward movement of the element 10 produces a corresponding movement of the bar 110. As a result of this action armature 111 engages with contact 61. However, due to closed contacts 43, no impulse is sent over the line. After the contact cams have completed one revolution, the upward movement of the locking loop 19 moves the ratchet wheel 23 over one notch by means of the pawl 11. The peripheries of the discs 95 to 99 are irregular to correspond to the desired set of impulses to be transmitted. An elevation which is sufficiently high to actuate the respectively associated locking levers in an unlatched position causes the transmission of an impulse, while a depression insuring the latching of the contact lever

by its respectively corresponding locking lever results in no impulse being sent over the line. No impulses pass over the line circuit 108, however, since the contact 43 remains closed. As a result of the rotation of shaft 40 the elevation of the cam 41 is passed after several rotations of the contact cams. When this occurs, the contacts 43 become disengaged thus removing the short circuit from the sending contacts. The impulses then pass over the line circuit to the calling station. After a partial rotation of the shaft 40, the cog 30 moves the member 27 in a counter-clockwise direction whereby the lever 26 is released. The lever 26 then rests on the periphery of indent wheel 25. When the shaft 40 has rotated one complete revolution, lever 26 is forced in the depression of the indent wheel 25. Element 10 is moved upward. The upward movement of element 10 disengages the pawl 11 from the ratchet wheel 23 and engages the throw-out clutch lever 20 with the throw-out clutch cam 21. As a result, clutch driving member 63 is disengaged from clutch driven member 62. The contact cams stop rotating and the machine is in a condition for the transmission or reception of any desired message. The calling station subscriber who does not desire the answering-back mechanism on his own machine to operate, depresses his key 17 thus preventing the downward movement of element 10 by the upward movement of the bar 16.

Another modification provides for the actuation of the answer-back mechanism whenever the motor at the called station is started. The details of this feature are shown in Figs. 5 and 6. Instead of the pull bar of the mechanism described above, a lever 93 is provided with a roller element 94 similar to the roller 14 on the pull bar. The lever 93 is biased by the spring 100 in a clockwise direction. The prevention key mechanism comprises a lever 84, a spring 91, the convolution of which surrounds the lever 84, the spring biasing this lever to the left, a member 82 attached to the lever 84 by the pivot 90, the indent holder also being pivoted to the framework by the pivot 83 and a knob 81 for manually controlling the movement of lever 84. The member 82 is so constructed and pivoted that a counter-clockwise movement releases the indent lever 26. The downward movement of the element 10 actuates the rotation of the answer back discs for one complete revolution in a manner similar to that described above. Several methods of starting the motor of a telegraph typewriter remotely are well known and are not described here. When the motor M of the called station is not energized, the element 10 is in a downward position due to the clockwise bias of spring 100 creating a pressure of the roller element 94 of the lever 93. As a result of the downward position of the element 10, the indent lever 26 remains out of the depression of the indent wheel 25 and is latched out of the depression by member 82. The pawl 11 is engaged with the ratchet wheel 23 and the throw-out clutch lever 20 is disengaged from the throw-out clutch cam 21. The answer-back mechanism is ready to start functioning upon the starting of the motor. An electromagnetic device 92 is connected in parallel with the motor circuit 109.

When the motor is started either remotely or locally, electromagnet 92 attracts the lever 93 rotating it in a counter-clockwise direction. The answer-back mechanism then operates in a manner described above. The indent lever 26 releases from the indent holder by the cog 30 and ceases to operate after one complete revolution of the shaft 40. Referring to Fig. 3, the elevation on cam 41 is so constructed that the answer-back impulses are not transmitted over the line until the printer motor has attained a speed sufficient for the efficient transmission of these impluses. When the motor is stopped, the lever 93 is released from the magnet 92, the roller element 94 moves the element 10 downward and the device is in condition for the transmission of another answer-back message.

If it is desired to start the motor without the transmission of the answer-back signal the knob 81 of the prevention key is pulled to the right while turning the switch to start the motor. This action rotates member 82 in a counter-clockwise direction around the pivot 83. The holder releases the indent lever 26 and that lever is forced in the indent of wheel 25 upon the upward movement of member 10. When the motor is started, the magnet 92 is energized whereby the lever 93 is with its roller 94 rotated in a counter-clockwise direction. The element 10 moves upward and the indent member 26 falls in the depression of wheel 25. The answer-back mechanism is thereby prevented from operating.

What is claimed is:

1. In a printing telegraph system comprising two stations, a line connected therebetween, a plurality of circuit contacts at one of said stations and locking means associated therewith, said locking means controlling said circuit contacts for the transmission of impulses over said line, transmitting means, said transmitting means controlling said locking means, a rotary answer-back device at said station directly connected to said locking means for transmitting a predetermined signal over said line in response to a signal from the other of said stations the operation of said device being independent of said transmitting means.

2. In a printing telegraph system comprising a calling station, a called station, a line connected therebetween, a plurality of circuit contacts at said called station and locking means associated therewith, said locking means controlling said circuit contacts for the transmission of a signal over said line, transmitting means, said transmitting means controlling said locking means, an answer-back device at said called station comprising a plurality of rotatable cams connected directly with said locking means, said rotatable cams being actuated by a signal from said calling station the operation of said device being independent of said transmitting means.

3. In a printing telegraph system comprising a station, a line connected thereto, a plurality of circuit contacts at said station and locking means associated therewith, said locking means controlling said circuit contacts for the transmission of a signal over said line, transmitting means, said transmitting means controlling said locking means, a device at said station for transmitting an answer-back signal comprising a plurality of rotatable cams directly connected with said locking means, said rotatable cams being actuated by a signal on the line and means at said station for preventing the transmission of said answer-back signal when desired the opera-

tion of said device being independent of said transmitting means.

4. In a printing telegraph system comprising a calling station, a called station, a line connected therebetween, a plurality of circuit contacts at said called station, a locking lever associated with each of said contacts, said locking lever controlling its respectively associated circuit contact, transmitting means, said transmitting means controlling said locking levers for the transmission of a message over said line, an answer-back device at the said called station for the transmission of a predetermined message, said device comprising a disc directly associated with each of said locking levers and in engageable relation therewith, the periphery of said disc operating its respectively associated locking lever, the periphery of said disc being irregular in form to correspond to the desired predetermined message to be transmitted and means responsive to a signal from the said calling station for rotating said discs and continuing the rotation during the transmission of said predetermined message the operation of said device being independent of said transmitting means.

5. In a printing telegraph system comprising a calling station, a called station, a line connected therebetween, a plurality of contacts at said called station, a locking lever associated with each of said contacts, the opening and closing of said contacts being determined by the position of said locking lever, transmitting means, said transmitting means controlling said locking levers for the transmission of a message over said line, an answer-back device at said called station comprising a disc directly associated with each of said locking levers, the periphery of said disc being irregular in form and controlling the position of its respectively associated locking lever, means responsive to a signal from said calling station for the rotation of said discs for one revolution and means for discontinuing the rotation thereafter the operation of said device being independent of said transmitting means.

6. In a printing telegraph system comprising a calling station, a called station and a line connected therebetween, a plurality of circuit contacts for producing a series of impulses in ordered sequence over the line, a locking lever associated with each of said circuit contacts, the position of each of said levers determining the opening and closing of its respectively associated contact, transmitting means, said transmitting means controlling said locking levers for the transmission of a message over said line, an answer-back device comprising a disc corresponding to and in engageable relation with each of said locking levers, the periphery of each of said discs controlling the position of said locking levers, said periphery being irregular in form to correspond to a desired predetermined answer-back signal to be transmitted, means responsive to a certain signal from said calling station for causing the rotation of said disc and means for continuing the rotation for one complete revolution and for discontinuing the rotation thereafter the operation of said device being independent of said transmitting means.

7. In a printing telegraph system, an answer-back device comprising contact cams, a motor for rotating said cams, locking levers associated with each of said contact cams, circuit contacts controlled by said contact cams and said locking levers, a disc associated with each of said locking levers, the periphery of said disc determining the operation of said locking lever, means responsive to a predetermined signal for rotating said motor for causing the rotation of said disc when said motor is started, means for deferring the transmission of said answer-back message until said motor has rotated a predetermined number of revolutions, and means for completing the transmission of the answer-back message.

8. In a printing telegraph system, comprising a calling station, a called station and a line connected therebetween, an answer-back device at said called station comprising contact cams, a motor for driving said cams, a locking lever associated with each of said contact cams, circuit contacts controlled by said contact cams and said locking levers for the transmission of the message over the line, a disc associated with each of said locking levers, the periphery of each of said discs being irregular in form and determining the operation of its respectively associated locking lever, means responsive to a signal from said calling station for starting said motor, means actuated by the starting of said motor for causing the rotation of said discs, means for deferring the transmission of said answer-back signal until said motor has revolved a predetermined number of revolutions, means for continuing the rotation of said discs for the completion of one revolution, and means for discontinuing the rotation of said discs thereafter.

9. In a printing telegraph system comprising a calling station, a called station and a line connected therebetween, an answer-back device at said called station comprising a plurality of contacts, a contact cam, a contact lever, and a locking lever associated with each of said contacts, the opening and closing of each of said contacts being controlled by the engagement of its respectively associated contact cam and contact lever, the engagement of said contact cam and contact lever being determined by the position of its associated locking lever, transmitting means, said transmitting means controlling said locking levers for the transmission of a message over said line, an answer-back device comprising a disc associated with each of said locking levers, the periphery of said disc being irregular in form and in engageable relation with its respectively associated locking lever, stepping means for the rotation of said discs, means for rotating said discs upon the reception of a certain signal from said calling station, means for continuing the rotation of said discs for one revolution, means for discontinuing the rotation thereafter, and means at said called station for preventing the transmission of the answer-back signal when desired, the operation of said device being independent of said transmitting means.

10. In a printing telegraph system comprising two stations and a line connected therebetween, one of said stations comprising a remotely controlled device for transmitting an answer-back signal to the other of said stations, an instrumentality, transmission means actuated by said instrumentality for sending signals over said line, disabling means for rendering said transmission means inoperative, and means for transmitting said answer-back signal independent of said disabling means.

11. In a printing telegraph system comprising two stations and a line connected therebetween,

one of said stations comprising a remotely controlled device for transmitting an answer-back signal to the other of said stations, a keyboard, transmission means actuated by the keys of said keyboard for sending signals over said line, disabling means for rendering said transmission means inoperative and means for transmitting said answer-back signal independent of said disabling means.

12. In a printing telegraph system, a rotary answer-back device, a motor for rotating said device, and means for deferring the transmission of an answer-back signal until said motor has rotated a predetermined number of revolutions.

13. In a printing telegraph system comprising a station and a line connected thereto, said station comprising contact cams, a motor for rotating said cams, locking levers associated with each of said contact cams, circuit contacts controlled by said contact cams and said locking levers, means for transmitting a signal over said line, said means controlling said locking lever, and a device for transmitting an answer-back signal, said device being actuted by the starting of the rotation of said motor and said answer-back signal being transmitted by the opening and closing of said contacts.

14. In a printing telegraph system comprising a station and a line connected thereto, said station comprising a rotary answer-back device, a motor for rotating said device, means responsive to a signal over said line for starting said motor, means responsive to the starting of said motor for actuating said answer-back device and means for deferring the transmission of an answer-back signal until said motor has rotated a predetermined number of revolutions.

EDWARD F. WATSON.