

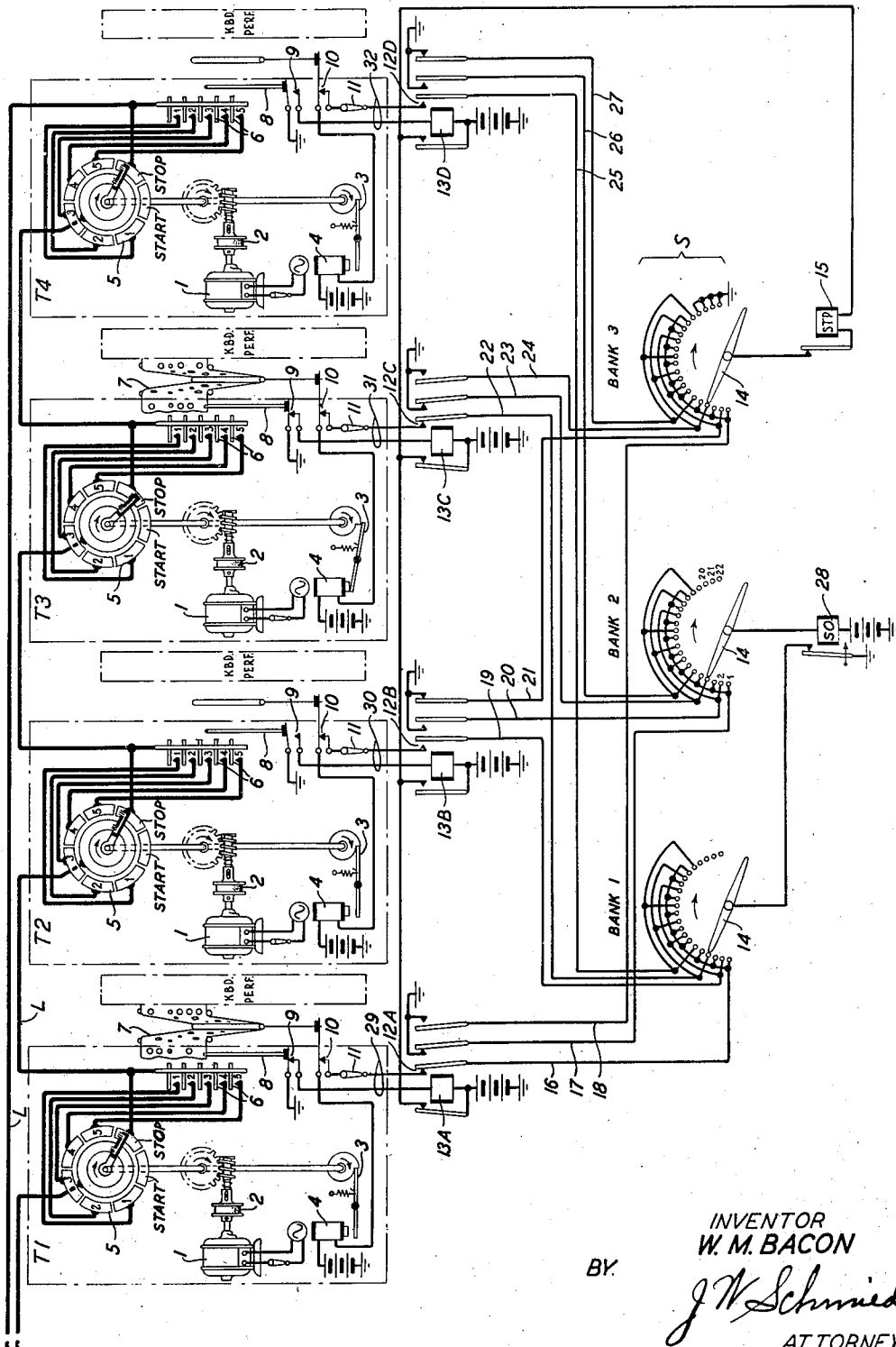
Feb. 20, 1945.

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2,369,935

AUTOMATIC TELEGRAPH TRANSMITTER SYSTEM

Filed May 14, 1942



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2,369,935

AUTOMATIC TELEGRAPH TRANSMITTER
SYSTEM

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Application May 14, 1942, Serial No. 442,910

11 Claims. (Cl. 178—3)

This invention relates to systems wherein a plurality of tape or similarly controlled telegraph transmitters are connected to a line for transmission one at a time and in which one transmitter or certain transmitters may have more frequent opportunities to transmit than another or others.

Systems are known in which a plurality of transmitters are so associated with a line and with each other that one first transmitter has preference so that the others cannot transmit while the storage of the first is provided with transmissible material, and a second has preference over a third and subsequent others, etc. The present system is to be distinguished from such arrangements as it differs in its fields of possible application and mode of operation. Thus, for example, in a system of the prior type wherein many short messages are supplied to the first transmitter to keep it fully occupied for long periods of time and long messages are supplied to subsequent transmitters, the storage of the subsequent transmitters would be filled beyond the practicable limit. In accordance with the system of the present invention, each transmitter will receive occasional opportunities to transmit, whereas in a preference system one transmitter might receive sufficient transmissible material to occupy the line for indefinitely long periods of time. Thus with the present system, short messages may be supplied to one transmitter and long messages to another, and the first could be given more frequent opportunities to transmit, thus preventing undue delay in the transmission of any of the messages.

Furthermore, systems are known in which transmitters are arranged, usually in pairs, in such a manner as to transmit messages in alternation, each beginning when an end-of-message signal stops the other. Such arrangements likewise are inflexible. Thus, in case one transmitter is supplied with or becomes supplied with a series of very long messages, whereas others are supplied with or become supplied with very short messages, the storage of one may become overloaded.

In accordance with an embodiment of the present invention, transmission is shifted from one transmitter to another by absence of tape from the one transmitter which at the moment is transmitting.

Therefore, an object of the invention is to provide transmitter systems of increased flexibility and efficiency and to avoid excessive delays in transmission.

The system may be employed in accordance

with several different routines or office procedures. Before discussing these the system will be described in detail by reference to the drawing in which the essential features are diagrammed in a single circuitual diagram with conventional symbols indicating the mechanical elements.

The principal elements of the system are a plurality of transmitters T1, T2, T3, and T4 having their transmitting contacts included serially in a common line conductor L; a stepping switch S having three banks of contacts and a stepping magnet 15; and interconnecting circuits.

Each transmitter T1-T4 comprises a driving motor 1, which may be common to all the transmitters, a clutch 2, and a start latch 3 to enable the distributors to be released to revolve one cycle for each code combination. A start magnet 4 releases the latch 3. A distributor 5 distributes the successive elements of the code combinations as sensed by tape controlled contacts 6. A tape stepping mechanism (not shown) may be of any usual or known type for stepping the tape forward between the transmission of successive code combinations. The tape 7 is perforated with code combinations to control the sensing pins in their operation of sensing the successive code combinations. A pin 8 which is pressed upwardly by a spring rides along the tape in the sensing head and as long as tape is present in the sensing head the pin 8 is held down and holds the contact 9 closed. A keyboard perforator KBD.PERF. or a reperforator may be provided in connection with each transmitter and when so provided the start magnet 4 may have included in its circuit a contact 10 which is opened by a taut tape. The circuit of the start magnet may also be opened by a manually operable switch 11. Furthermore, the circuits of the respective start magnets 4 may be opened by the respective contacts 12A-12D of the several relays 13A, 13B, 13C, 13D. Each contact 12A-12D is closed only when the associated relays 13A, etc. are energized by closure of their associated contact 9.

The pin 8 is so arranged that insertion of a piece of tape in the sensing head with which the pin is associated depresses the pin and closes the contact 9 and when the tape runs out of the sensing head the pin 8 rises and opens the contact 9.

A switch S is illustrated as a 22-point type with switch arms 14 so arranged that upon stepping from point 22 it steps upon point 1 and proceeds in sequence over points 1 to 22. Other similar types of switches having the same or

other numbers of contacts may obviously be used. A stepping magnet 15 opens its own circuit upon each operation and upon the return of its armature to the released position it actuates the arms 14 one step forward to the next contact. Such a switch, in and of itself, together with its stepping magnet 15, is a known instrumentality.

From the armatures of each of relays 13A, etc. three conductors 16, 17, and 18 lead to the contact points of switch S. Conductor 16 leads to contacts 1, 3, 5, 7, 9, 11, 13, 15, and 17 of bank 1; conductor 17 leads to the corresponding contacts of bank 2 and conductor 18 leads to the corresponding points or contacts of bank 3.

Conductors 19, 20, and 21 extend from the armatures of relay 13B and lead to the second, eighth, and fourteenth points of the respective banks 1, 2, and 3.

Conductors 22, 23, and 24 lead to the fourth, tenth, and sixteenth point or contacts on the respective banks of contacts.

Conductors 25, 26, and 27 lead to the sixth, twelfth, and eighteenth points on the respective banks of contacts.

The unassigned terminals of the No. 3 bank are connected to ground as shown in the drawing. Unassigned terminals 19, 20, 21, and 22 of the other banks are left idle. These unassigned points may be connected to other relays, such as 13A-13D, associated with other transmitters or may be connected to some relays 13A-13D to give some transmitters other turns of transmission. In the specific arrangement disclosed, no transmitter is associated with two immediately succeeding contacts of switch S.

Mechanisms of tape transmitters including sensing pins 8 for closing a contact 9 have been used heretofore and no claim is herein made to novelty in such an arrangement per se except in combination with other instrumentalities as herein set forth.

The condition for operation of a relay 13A-13D is that the associated contact 9 is closed. A path is then closed from battery, left armature of the operated relay or relays 13A-13D, stepping magnet 15, arm 14, contact of bank 3 to an open point at another armature of the operated relay or relays 13A-13D.

When a relay 13A-13D releases this path will be closed from some other left armature of relays 13A-13D (if any is operated) to step the switch arms 14.

The operation will now be described on the assumption that a transmitter T3 is provided with a length of perforated message tape and that the third transmitter T3 is operating and transmitter T1 is provided with additional tape to keep the tape arm down and contact 10 closed.

Transmitter T3 will continue to operate with momentary pauses if contact 10 associated therewith becomes open. At the end of a message or at another suitable interval the operator of the KBD. PERF. of transmitter T3 will transmit several special or feed-out code combinations and cut off the tape with a scissors or break it adjacent the keyboard perforator. Transmitter T3 will then continue to transmit until the tape has passed through the sensing head and transmitted the last significant code combination, whereupon the pin 8 will arise to open the contact 9.

Assuming now that no other contact 9 is closed, then relay 13C releases and nothing further happens except that the slow operating re-

lay 28 will release. The system would then await a supply of tape to some transmitter sensing head. If, however, as we have assumed, an operator has perforated tape with the keyboard perforator of transmitter T1 and has inserted the head end of the tape into the sensing head of the transmitter T1, the release of relay 13C will find relay 13A operated which will close a path from battery upon the armature of relay 13A, over the left front contact of relay 13A, through the stepping magnet 15, the arm 14, the fourth contact of bank 3, the right-hand back contact of relay 13C to ground. This will cause the magnet 15 to operate and immediately release, thereby stepping the switch one step, whereupon the arm 14 will now be connected to the fifth contact of bank 3 which will lead over conductor 18 to the open contact at the right-hand armature of relay 13A.

Slow operating relay 28 will release when relay 13C releases.

When the switch arms 14 pass to the fifth contact of switch S conductor 18 will extend to an open back contact on relay 13A and open the path through the stepping magnet 15; conductor 17 will energize relay 28 which will operate slowly enough to permit the transmitter T3 to settle down into a stop condition and the line L to be closed. Ultimate operation of relay 28 will close a path over conductor 16 so that upon the closure of switch 10 or, if switch 10 is already closed, the transmitter T1, being supplied with tape, will begin to operate.

When the tape runs out of transmitter T1 a similar sequence of operations will take place and if transmitter T2 is then provided with tape transmitter T2 will transmit until the tape runs out of its sensing head whereupon transmitter T1 will have another opportunity to transmit before transmitter T3 and after transmitter T3 has an opportunity to transmit transmitter T1 will then have another test and opportunity to transmit before transmitter T4.

Transmitter T1 has three times as many opportunities to transmit as transmitters T2, T3, and T4 but the ratio may be changed by changing the wiring of switch S or by utilizing the unused nineteenth to twenty-second contacts. These contacts are shown connected only to ground upon bank 3 of the switch to provide a stepping path for the magnet 15. Thus, the wiring could be changed to give transmitter T1, nine turns; transmitter T2, five turns; transmitter T3, three turns; and transmitter T4, one turn per cycle of switch S, or the transmitters T1, T2, T3 could each have five turns and transmitter T4 three turns without utilizing any of the blank contacts on the banks of switch S.

According to one routine of operation, transmitters T1-T4 could each be provided with tape by an operator. These operators and their respective machines could be in the same room or in locations somewhat remote from one another, subject only to the possible limit of extension of the conductor systems 29, 30, 31, and 32. Each operator would be instructed not to hold the line idle for extended periods by allowing her taut contact tape to remain open. In the case of such opening she should cut or break the tape and terminate transmission from her transmitter and its associated distributor.

According to another routine of operation, the keyboard perforators may be replaced by typing or non-typing reperforators which are supplied

with perforated tape by incoming lines or channels and an attendant may cut the tape at appropriate times and places at the ends of messages and rethread it into the associated transmitters at appropriate intervals.

According to another routine of operation, the tapes may be supplied to the several transmitters by manually transporting the tape in pieces or lengths prepared by one or more perforators located at convenient places. Tapes representing short or urgent or short and urgent messages may then be threaded into transmitter T1, for example, and long messages into transmitters T2, T3 or T4. Thus, for example, transmitters T1 and T2 might have assigned to them ten turns each of transmission or opportunity to transmit for each one turn of transmitters T3 and T4 during each complete cycle of the program establishing switch S. Current message tapes could then be supplied to transmitters T1 and T2 and long messages, such as day orders, could be supplied in single sections of the tape to transmitter T3 or T4. Transmitters T3 and T4 would then be given occasional opportunities to transmit the long messages whenever the system would otherwise be idle and yet transmitters T1 and T2 could always be given sufficient numbers of turns of transmitters to clear out all urgent messages. In such case, one attendant could supply tapes to one or more or all of the transmitters perhaps in connection with other duties. The tapes could be punched or prepared by other operators or attendants or it could be taken from reperforators connected with receiving lines and assorted for further transmission.

The stepping switch and associated parts may be considered as a search device for examining said transmitters for transmissible material and initiating transmission when such material is found.

What is claimed is:

1. A telegraph system, a telegraph transmission path, a plurality of storage controlled telegraph transmitters capable of transmitting over said path, a cyclically operable program system and apparatus responsive to the supply of stored signals for each of said transmitters for conditioning said program system, means responsive to the operation of said program system for starting said transmitters one at a time, and circuit connections in said program system for causing one of said transmitters to transmit more frequently during said program than another of said transmitters.

2. A plurality of telegraph transmitters associated with an outgoing line, a system local to said transmitters for cyclically assigning opportunities to transmit to said transmitters, said system comprising means for testing each transmitter for transmissible material, and initiating transmission from it if it is so supplied with transmissible material, at least once during each cycle, and means in said system for testing at least one transmitter more often than another transmitter during said cycle.

3. A plurality of telegraph transmitters associated with an outgoing line, a system local to said transmitters for cyclically assigning to said transmitters opportunities to transmit in accordance with a program, said system comprising means for automatically testing each transmitter for transmissible material and initiating transmission from it if it is so supplied with transmissible material at least once during each pro-

gram cycle, and means in said system for testing at least one transmitter more often than the others during said cycle.

4. A plurality of telegraph transmitters associated with an outgoing line, each said transmitter having a transmitting head for sensing message material incident to transmission thereof, a program system for testing said transmitters for transmissible material and initiating transmission therefrom, when transmissible material is present, in a predetermined succession, means whereby some transmitters are so tested more frequently than others, means controlled jointly by exhaustion of the tape at the transmitting head of a transmitting transmitter and by the presence of transmissible material for some other transmitter for initiating testing of said transmitters.

5. A plurality of telegraph transmitters of the type controlled by perforated tape and each having a tape sensing point associated with an outgoing line, a system local to said transmitters for cyclically assigning opportunities to transmit to said transmitters, said system comprising means for testing each transmitter for perforated tape at the sensing point and initiating transmission from it if it is so supplied with transmissible material at least once during each cycle, and means in said system for testing at least one transmitter more often than another during said cycle.

6. A plurality of telegraph transmitters associated with an outgoing line, a system local to said transmitters for cyclically assigning to said transmitters opportunities to transmit in accordance with a program, said system comprising means for automatically testing each transmitter for transmissible material and initiating transmission from it if it is so supplied with transmissible material at least once during each program cycle, means in said system for testing at least one transmitter more often than the others during said cycle, and means controlled by exhaustion of the transmissible material from any transmitter currently engaged in transmission for initiating a test of another transmitter.

7. A plurality of telegraph transmitters associated with an outgoing telegraph transmission channel, a program system local to said transmitters for cyclically assigning opportunities to said transmitters for the initiating of transmission, means for initiating transmission upon each test of a transmitter if the transmitter is supplied at the instant of test with transmissible material, said program system including a stepping switch having successive contacts associated with different of said transmitters, and means operable upon the termination of transmission from any one transmitter to step said switch when conditioned, and apparatus for conditioning said stepping switch to so step in case some other transmitter is supplied with transmissible material.

8. A plurality of telegraph transmitters associated with an outgoing telegraph transmission channel, a program system local to said transmitters for cyclically assigning opportunities to said transmitters for the initiating of transmission, means for initiating transmission upon each test of a transmitter if the transmitter is supplied at the instant of test with transmissible material, said program system including a stepping switch having successive contacts associated with different of said transmitters, means operable upon the termination of transmission from any one transmitter to step said switch when conditioned,

and apparatus for conditioning said stepping switch to so step in case some other transmitter is supplied with transmissible material, and means to cause said switch to continue to step until it arrives at a contact associated with a transmitter supplied with transmissible material.

9. A telegraph channel of transmission, a plurality of tape controlled transmitters for transmitting telegraph signals over said channel, apparatus local to said transmitters for determining the presence of tape in said transmitters, a stepping switch having a plurality of terminals one of which is assigned to each of said transmitters and a plurality of which are assigned to at least one of said transmitters, apparatus for causing the operation of said transmitters one at a time when said stepping switch engages a terminal assigned to the respective transmitters, control circuits for stepping said switch responsive to said apparatus for determining the presence of tape in each of said transmitters including apparatus for stepping said switch when the tape passes out of an operating transmitter and also including apparatus for stepping said switch past terminals assigned to transmitters not supplied with tape.

10. A system of message transmitters, means for variably and at intervals supplying said trans-

mitters with transmissible material, a hunting system local to all of said transmitters for hunting over said transmitters according to a program whenever any one is supplied with transmissible material and initiating transmission from the first discovered to be so supplied, and means whereby one of said transmitters is examined more frequently than another during said program.

11. A plurality of telegraph transmitters associated with an outgoing line, each of said transmitters having sensing means for sensing stored message material incident to the transmission thereof, a program system for testing said transmitters in predetermined succession for stored message material available for transmission and initiating transmission thereof when stored message material is found to be available for transmission, a stepping switch included in said program system, apparatus responsive to the presence of storage material available for transmission in any of said transmitters for initiating operation of said stepping switch, and means responsive to the operation of any of said transmitters for arresting the operation of said stepping switch.

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