

July 11, 1939.

C. R. DOTY

2,165,237

COMMUNICATION SYSTEM

Filed Dec. 23, 1936

2 Sheets-Sheet 1

FIG. 3.

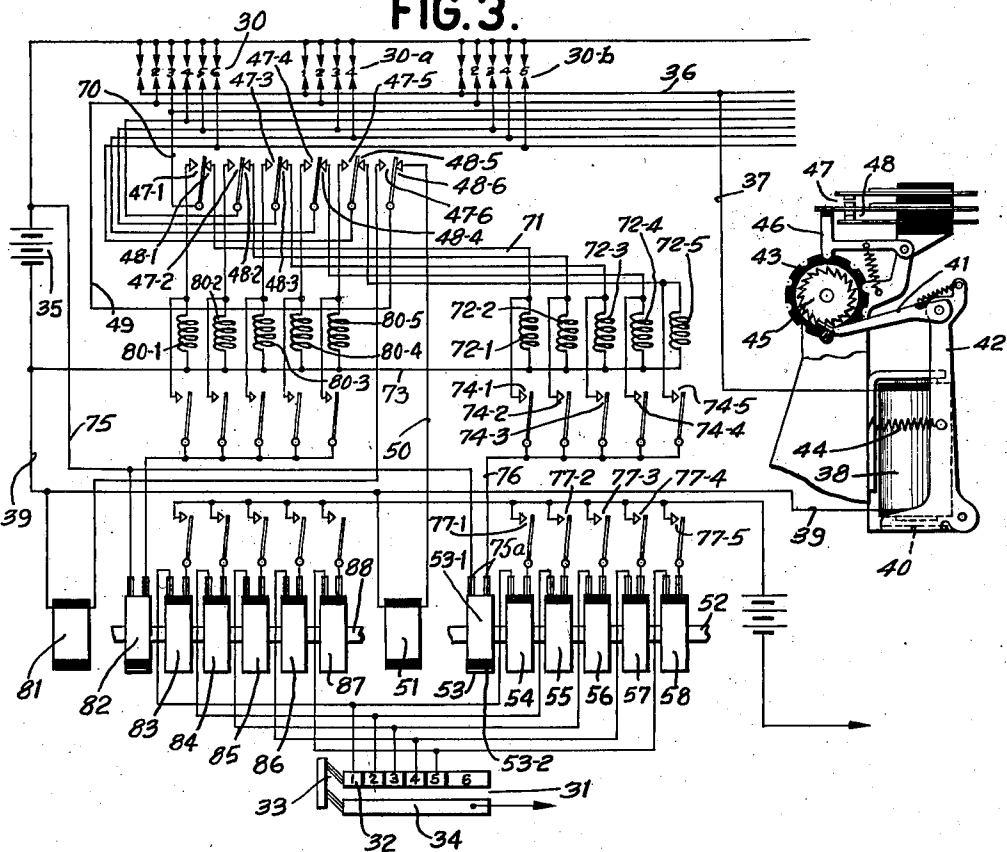
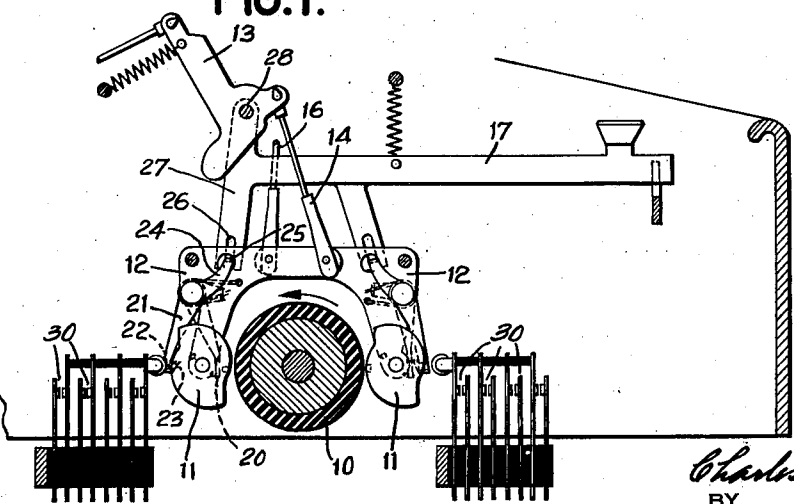


FIG. 1.



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2 Sheets-Sheet 2

FIG. 4.

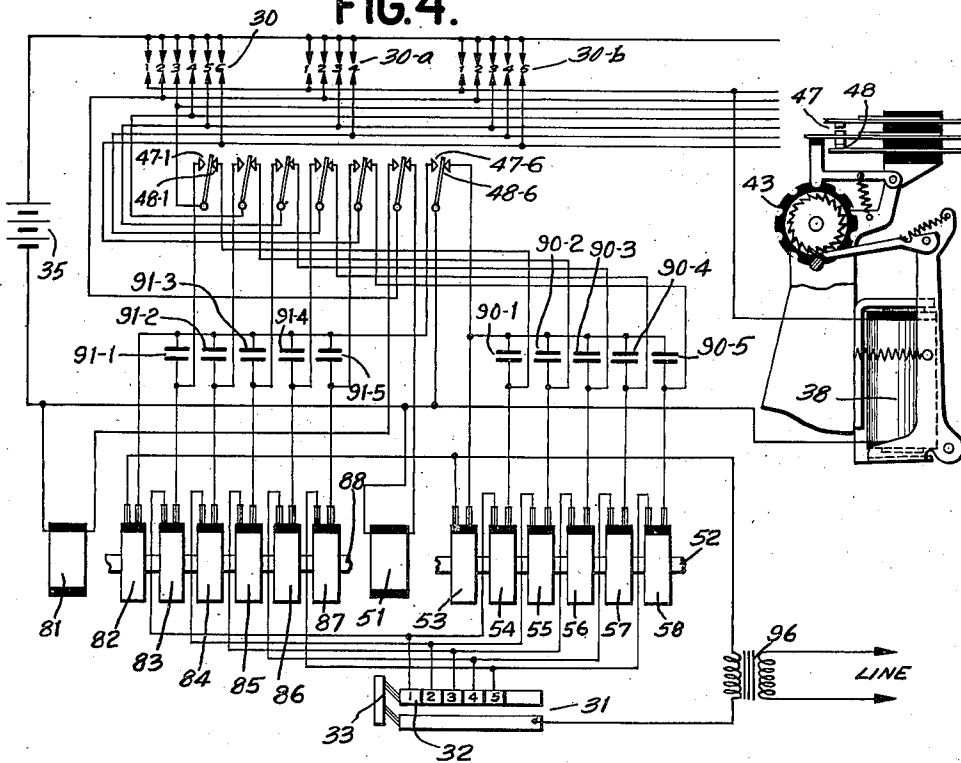
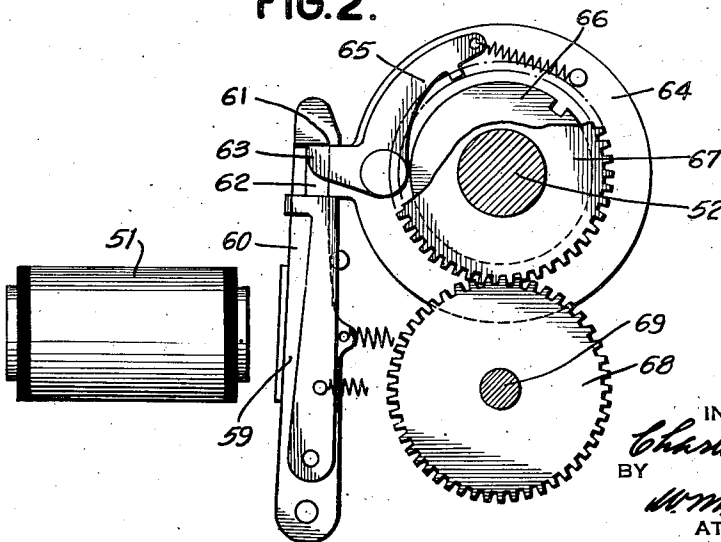


FIG. 2.



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COMMUNICATION SYSTEM

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9 Claims. (Cl. 178—79)

This invention relates to communication systems and particularly to synchronous printing telegraph systems in which signal storage means are provided to increase the rate of transmission of the character signals.

An object of the present invention is to provide signal storing means which are operated alternately by the character keys so that one group of said storing means may be energized during the timed interval the other group of storing means is effective to impart the stored signal to the transmission line.

Various other objects and advantages of the invention will be obvious from the following particular description of one form of mechanism embodying the invention or from an inspection of the accompanying drawings; and the invention also constitutes certain new and useful features of construction and combination of parts hereinafter set forth and claimed.

In the drawings:

Fig. 1 is a fragmentary sectional view of one type of tele-typewriter.

Fig. 2 is a detail view of a controlling clutch.

Fig. 3 is a schematic circuit diagram embodying one form of the invention.

Fig. 4 is a modified circuit diagram embodying another form of the invention.

Referring to the drawings, and in particular to Fig. 1, one type of tele-typewriter is shown and in the embodiment illustrated in the drawings, well known means are provided for actuating the type bars (not shown) by power operated devices comprising a power driven roller 10.

A cam 11 is pivoted on one arm of a bell crank lever 12 pivoted in the frame, the other arm of which is operatively connected with one arm of a bell crank lever 13 by means of link 14. The other arm of lever 13 is connected to the type bars (not shown) in a well known manner and fully disclosed in the aforesaid application.

The lever 12 is actuated by the cam 11 when the latter engages the driven roller 10 to be operated thereby. The engagement of the cam 11 with the power roller is controlled by means of the key lever 17 in a manner which will now be described.

The cam 11 is resiliently engaged by a spring-pressed arm 20 which tends to turn it into engagement with the power driven roller or stop 21 on a lever 22 pivoted on the bell crank 12 and normally arranged in the path of a lug 23 on the cam. When the lever 22 swings to move its stop out of the path of the lug, the arm 20 swings the cam into engagement with the power roller

to be actuated thereby to swing the bell crank 12 to actuate its connected mechanism.

The lever 22 has an arm 24 which is provided with an offset projection 25 at its end which projects laterally through an opening in the bell crank 12 and engages the bifurcated lower end 26 of an arm 27 of a key lever 17 pivoted on the common rod 28.

It is obvious then that depression of a key lever 17 releases the revolubly mounted cam 11 to engage and be actuated by power roller 10 in turn operating bell crank 12 and its attached links to cause the associated mechanism, such as the key bars and other operating mechanisms, to be operated.

In addition to actuating the several type bars and connected mechanisms, the revolubly mounted cams are adapted to make and break circuits which may be employed in the transmitting units by operating the associated group of contacts indicated at 30, the purpose of which will be understood as the description progresses.

It will be understood that the usual number of key bars and power devices with their associated mechanisms are provided, but only one of them is shown for the sake of clearness.

Referring now to Fig. 3, the operation of the impulse storage device will now be explained. A rotary distributor 31 is shown and provided with a plurality of conducting segments 32 which are traversed by a continuously rotated brush 33, and a common conducting ring 34 which is connected to one side of the transmission line. A similar rotary distributor is provided at the receiving station and operated in synchronism with the transmitting distributor shown in the figure so as to properly control a receiving tele-typewriter unit thereat in a manner well known, and since the receiving circuit forms no part of the invention, and the system as a whole based on the Baudot type of system which is well known in the art, it is believed that further description thereof is not necessary in the present instance. The combinational code signal impulses are initiated by the various cam operated group of contacts 30, 30-a, etc. An additional pair of contacts is provided in each said group of contacts, for example, contacts 30-1 and 30-2. Let it be assumed that a corresponding key bar 17 is depressed to operate the said group of contacts 30-1 to 6 momentarily.

A circuit is then established through the operated contact 30-1 from the positive terminal of battery 35, contacts 30-1, conductors 36 and 37, magnet coil 38, conductor 39 to the negative ter-

minal of the battery, energizing said coil. Energization of the said coil attracts the armature 40 to position the pawl 41, which is pivoted on extension member 42, to the right as viewed in the figure. The pawl is not effective to rotate the cam wheel 43 until the coil 38 is deenergized whereupon the armature 40 is restored in the normal position as shown by means of spring 44 thereby causing the pawl 41 to actuate the associated ratchet wheel 45 and attached cam wheel 43 one step so that the follower arm 46 rests upon the high portion of the cam wheel to maintain contacts 47 closed and contacts 48 open. Energization and deenergization again of the said coil is then effective to position the cam wheel so that the follower arm 46 rests on the low portion of the cam wheel to close contacts 48 and open contacts 47. A plurality of contacts is provided to be operated by the said cam wheel and are shown as indicated by the reference characters 47-1 to 6 and 48-1 to 6.

Continuing now with the assumed example, the circuit established through contact 30-1 was just traced and described to energize the magnet coil 38, but ineffective at the present moment to operate the associated contacts 47 and 48. A circuit through contact 30-2 is also established from the positive terminal of battery 35 to conductor 49, contact 48-6, conductor 50, clutch magnet 51, common return conductor 39 to battery 35, energizing the said clutch magnet 51, thereby effecting rotation of shaft 52 and the conducting rings 53 to 58 secured thereto. Any well known coupling means may be employed to rotate the shaft 52, one form thereof, shown in Fig. 2, comprising an armature 59 associated with the magnet 51, said armature provided with an extension arm 60 and stop 61, so that when the magnet is deenergized, the stop 61 is positioned in the path of the fingers 62 and 63 which protrude from the dog supporting member 64 and dog 65 respectively. The said member 64 is secured to the shaft 52 and pivotally supports the dog 65. A single tooth driving gear 66 is rotatably mounted on the shaft 52 and has secured thereto a gear 67 adapted to engage the gear 68 mounted on shaft 69. The shaft 69 which drives the gear 66 continuously may be the same shaft supporting and driving the transmitting distributor brushes 33. It is seen from the description just set forth that upon energization of magnet 51, the pivoted armature 59 is attracted and rotated partially in a counterclockwise direction so as to release the said fingers 62 and 63 permitting the spring-actuated dog 65 to engage the gear 66 and the single tooth therein when advanced to the dog thereby rotating the shaft 52 and the conducting rings 53 to 58.

Continuing with the assumed example, another circuit is established through contact 30-3 from the battery 35 to conductor 70, contact 48-1, conductor 71, coil of relay 72-1 and common conductor 73 to the said battery energizing said relay. Through the associated contact 74-1, now closed, a holding circuit is established from battery 35, conductor 75, conducting segment 53-1 of ring 53, conductor 76, contact 74-1, coil of relay 72-1 and conductor 73 to battery 35 maintaining the said relay energized until the insulated segment 53-2 engages the associated brushes 75a connected to conductors 75 and 76 to break the said holding circuit.

Similarly, through the contacts 30-4, 30-5, 30-6 and contacts 48-2, 48-3 and 48-5,

relays 72-2, 72-3 and 72-5 are energized and holding circuits established therefor through contacts 74-2, 74-3 and 74-5 and the conducting segment of conducting ring 53. Energization of the said relays in addition to operating the said contact 74, also operates the contacts 77-1, 77-2, 77-3, and 77-5.

It was mentioned that the distributor brushes 33 and gear 66 are rotated continuously, and that upon energization of the magnet 51 the dog 65 (Fig. 2) is released; however, the shaft 52 is not rotated until a predetermined point in the distributor brush cycle is approached; that is, before the brush 33 completely traverses the segment 32-6, the single tooth of gear 66 is advanced so that the released dog can engage the tooth to rotate the shaft 52 and conducting rings 53 to 58. It is to be noted that the brushes associated with conducting rings 54 to 58 normally engage the insulated segments of the said rings and not until the rings are rotated are the conducting portions of the rings engaged. As the distributor brush 33 engages the segment 32-1, the brushes associated with rings 54 to 58 engage the conducting segments thereof so that the character signal impulses are transmitted to the line in accordance with the operated relays 72-1 to 5, namely, in the assumed example, relays 72-1, 72-2, 72-3 and 72-5 are energized, operating the contacts 77-1, 77-2, 77-3, and 77-5, permitting signal impulses to be imparted to the line as the distributor brush traverses segments 32-1, 32-2, 32-3 and 32-5. Immediately after the brush 33 traversed the segment 32-5, the insulated segment 53-2 of ring 53 engages the associated brushes to open the described holding circuits for relays 72-1, 72-2, 72-3 and 72-5, and immediately thereafter the insulating segments of the rings 54 to 58 engage the associated brushes. Also at this same time, the dog 65 is released from the driving gear 64 due to the positioned armature 59 which as mentioned is in the path of the tails or fingers 62 and 63 to effect disengagement of the clutch in a manner well known.

The said cam actuated contacts 30 are closed for a short timed interval, therefore, immediately after the cam completed its half revolution, the magnet 38 is deenergized to step ahead the cam wheel 43 to operate the contacts 47 and 48. Continuing with the assumed example, upon deenergization of the magnet contacts 47 would now be closed and contacts 48 opened. It is seen therefore that the contacts 30 are now connected to contacts 47-1 to 6 and upon depression, let us say, of the same key bar to operate contacts 30-1 to 6, relays 80-1, 80-2, 80-3 and 80-5 are operated, in addition to the energization of magnet 38 and clutch magnet 81. Operation of clutch magnet 81 is effective to start rotation of the shaft 88 and the conducting rings 82 to 87 in exactly the same manner as just described, said shaft and rings operated in the same timed relation with the distributor brushes 33, so that the relays 80-1, 80-2, 80-3 and 80-5 are maintained to store the combinational character impulses and later imparted to the line as the distributor brush 33 traverses the segments 32.

The relays 72 and 80 are energized in combination to correspond to the character code combinations thereby imparting the code signals to the transmission lines. It is seen therefore that as one group of relays is imparting the stored signals to the line, the other group of relays can be energized to set up the character signals to 75

be stored, thus effecting a faster rate of transmission of the character signals.

Referring now to Fig. 4, an impulse storage system similar in principle to the one just described is shown; however, the groups of condensers 90 and 91 are used in place of the group of relays 72 and 80 shown in Fig. 3. The principle of operation is exactly the same as set forth hereinabove so that the following brief description of operation is believed to be sufficient. Let it be assumed that the character key bar to operate the group of cam controlled contacts 30—1 to 6 is depressed. A circuit through contact 30—1 is then established to energize the magnet 38, the group of transfer contacts 47 and 48 are not operated at this moment, but only upon deenergization of the magnet. Through contact 30—2 a circuit is established to energize the clutch magnet 51 to effect rotation of the shaft 52 and conducting rings 53 to 58. Through contact 30—3 a circuit is established to charge condenser 90—1. The holding circuits described hereinbefore are dispensed with; therefore, it is to be noted that conducting ring 53 is normally positioned so that the insulating segment engages the associated brushes and is effective only to provide a discharge path for the group of condensers. Similarly, condensers 90—2, 90—3 and 90—5 are charged. Upon opening of the contacts 30—1 to 6, the transfer contacts 47 and 48 are operated and clutch magnet 51 is deenergized to position the associated armature stop in the path of the clutch dog. The said clutch engaged as the brush 33 traversed the latter section of segment 32—6 effecting rotation of the rings 53 to 58 to provide discharge paths for the individual condensers charged so that upon traversing the individual distributor segments 32, the brush 33 completes the individual discharge paths to energize the output transformer 96 and thereby imparting the combinational impulses to the transmission line. Upon depression of the said key again the group of condensers 91 are charged in a similar manner to be discharged at a later interval as the distributor brush completes the individual discharge paths to impart the stored signals to the said transmission line.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is as follows:

1. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart character signals to a transmission line, groups of impulse storing means, and means controlled by the initiating means to connect alternately the groups of the storing means with the said initiating means and distributor means.

2. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart signals to a transmission line, a predetermined number of circuits associated with said distributor means, groups of signal storing means, and means controlled by the initiating

means to connect said storing means alternately with the said predetermined number of circuits to effect transmission of the character signals initiated.

3. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart signals to a transmission line, groups of signal storing means, and circuit controlling means connecting the said storing means and distributor means, said circuit closing means controlled by the initiating means effecting transmission of the character signals initiated.

4. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart signals to a transmission line, groups of signal storing means, and circuit controlling means controlled by the said initiating means and operated in a predetermined timed relation with respect to said distributor means to connect the said storing means and distributor means effecting transmission of the initiated character signals.

5. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart signals to a transmission line, groups of signal storing means, circuit controlling means controlled by the initiating means connecting the said storing means and distributor means, and means to connect alternately said storing means with the said distributor means to effect transmission of the character signals initiated.

6. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart the signals to a transmission line, groups of impulse storing means comprising electrostatic devices and means controlled by the initiating means to connect alternately the groups of said devices with the said initiating means and distributor means.

7. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart the signals to a transmission line, a plurality of impulse storing means, and means controlled by the initiating means to connect certain of said storing means alternately with the said initiating means and distributor means.

8. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart the signals successively to a transmission line, a plurality of impulse storing means comprising condensers, and means controlled by the initiating means to connect certain of said condensers alternately and periodically with the said initiating means and distributor means.

9. A communication system of the character described comprising, in combination, means to initiate character signal impulses, distributor means to impart the signals successively to a transmission line, a plurality of impulse storage relays, and means controlled by the initiating means to connect certain of said relays alternately and periodically with the said initiating means and distributor means.

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