

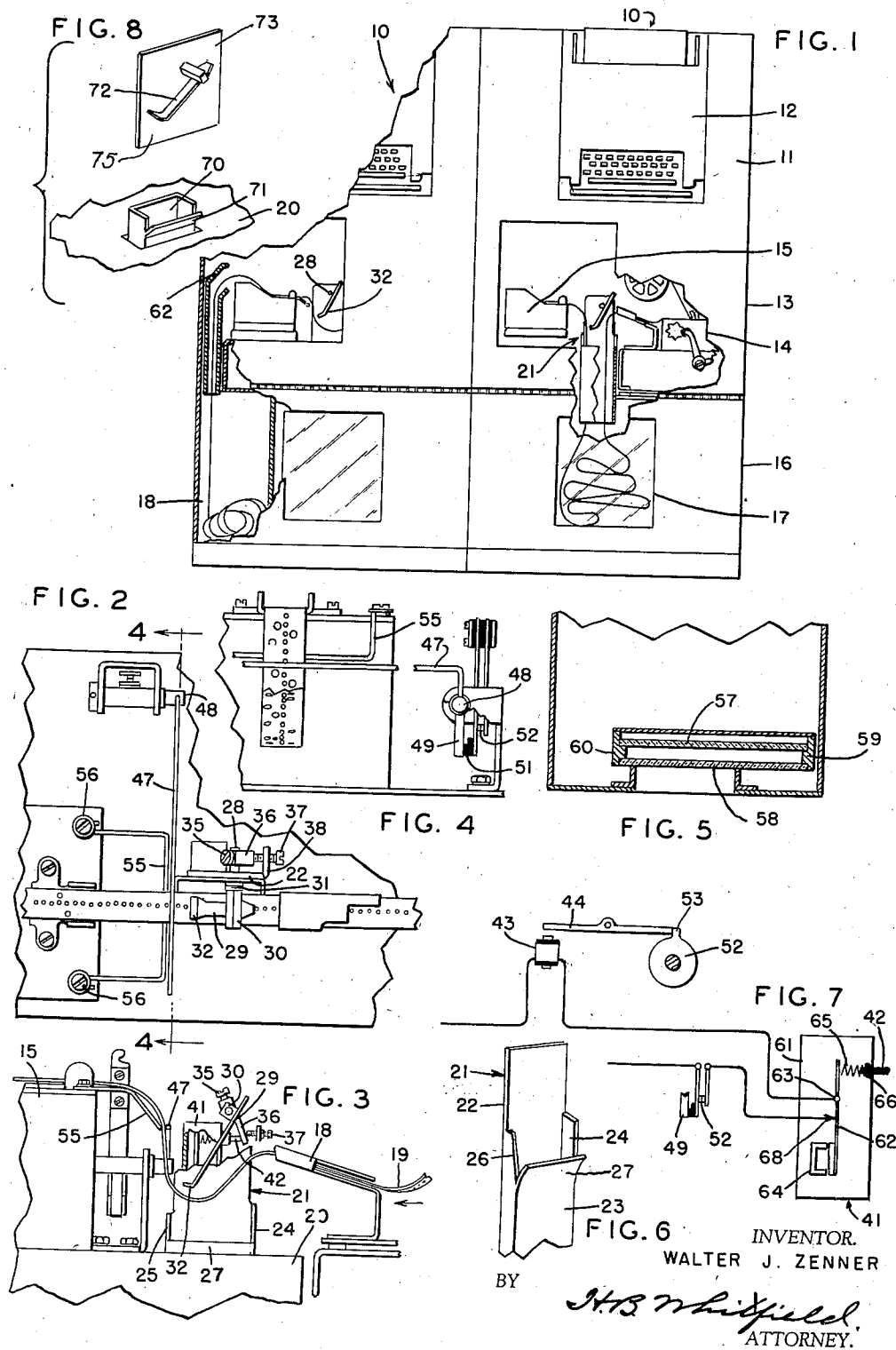
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PRINTING TELEGRAPH APPARATUS

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PRINTING TELEGRAPH APPARATUS

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1 Claim. (Cl. 178—42)

This invention relates to printing telegraph apparatus, particularly to tape feed control devices for signal control tape in connection with a signal transmitter and to storage of tape when delay in transmission is necessary or desirable.

It is customary when employing a transmitter in conjunction with a perforator to place the transmitter adjacent the perforator and to provide a taut tape switch between these units to control mechanism which governs the operation of the transmitter. Such a taut tape switch is shown in Patent No. 1,997,601 granted to A. H. Reiber on April 16, 1935, in which the transmitter is similar to that shown herein but the perforator disclosed therein is of the keyboard type. The printing reperforator disclosed herein is shown in detail in Patent No. 2,255,794 issued to R. A. Lake on September 16, 1941.

In the operation of this type of telegraph apparatus, embodying the use of a tape reperforator and a tape transmitter, a tape feeding condition may occur causing a constant operation of the taut tape switch which controls the mechanism controlling operation of the transmitter. This results in an undesirable operation. The constant starting and stopping of the tape as it is pulled forward by the transmitter may also cause a weakening of the tape and in some instances may actually result in tearing the tape.

In actual practice the transmitter cannot always be operated immediately because a busy condition of the transmitting line may exist. It is, therefore, desirable to provide means whereby the tape coming from the perforating mechanism may be stored until the transmitter is again ready for operation. Another situation wherein it is desirable to store the tape is when it is required that information from several sources be perforated on the same tape. This is accomplished by first connecting the perforator unit in the signal line with a message coming from one station and then immediately thereafter connecting it in the signal line with a message coming from another station, and so on depending upon the number of stations from which the messages are being transmitted. Meanwhile, the transmitter is kept idle until all the messages have been perforated upon the tape, which at this time is allowed to accumulate in a storage receptacle provided by the present invention.

Then, after all the messages have been perforated, the transmitter is started and the several messages are retransmitted in a continuous manner from the same tape, or to save time the transmitter might be started immediately after the next to the last message is received.

An object of the present invention is to provide a signal strip feeding control arrangement to facilitate a smooth feed of strip between units of a telegraph system.

A feature of this invention is the employment of a loop forming switch lever between a telegraph perforating unit and a telegraph transmitting unit which allows a predetermined amount of slack to form before a condition is established to permit the operation of the transmitter.

Another feature of this invention is the provision of a storage receptacle, in combination with a tape controlled mechanism wherein tape may be stored in an untwisted condition until such time that it is desired to use the tape for transmission.

By the present invention, a chute leading to a storage receptacle is positioned between the transmitter and the perforator. Upon the back plate of the chute is mounted a tape loop forming or deflecting switch control means which permits a predetermined amount of slack tape to accumulate before it pivots to a position to close a circuit to the transmitter clutch magnet to thereby allow the transmitter to feed the tape forwardly. When the transmitter starts into operation, the switch control pivots in the opposite direction under the influence of the tape when a taut condition of the tape occurs. When the tape reaches a full taut condition, the loop forming switch control means at this time has moved to a position to operate the plunger of a delayed action switch which effects the breaking of the circuit to the transmitter clutch magnet and thereby stops the operation of the transmitter whereupon slack tape will again accumulate as before and the cycle will be repeated.

The invention may be more readily understood by referring to the following description, taken in conjunction with the following drawing, in which,

Fig. 1 is a front elevational view, partly in section, of the structure according to the present

invention, showing two cabinets of the printing telegraph apparatus employing the present invention;

Fig. 2 is an enlarged plan view partly in section showing the switch control employed in the present invention;

Fig. 3 is a front elevational view partly in section of the switching mechanism shown in Fig. 2;

Fig. 4 is a side view taken on the line 4-4 of Fig. 2;

Fig. 5 is a sectional plan view of the storage receptacle employed in the present invention;

Fig. 6 is a perspective view of the chuteway on which the loop switch control is mounted;

Fig. 7 is a schematic wiring diagram of the clutch control for the transmitter feed mechanism including a schematic view of the delayed action switch disclosed in the present invention; and

Fig. 8 shows a modified form of the chute construction shown in Fig. 6.

Referring to the drawing in Fig. 1, there are shown two telegraph cabinets 10, each one of which is made up of three compartments. In the uppermost compartment 11 is housed a monitor unit comprising a printing perforator 12. In the central compartment 13 of the cabinet there are housed a printing reperforator 14 and a transmitting distributor 15. In the lower compartment 16 there are provided a storage receptacle 17 in which tape may be stored for later transmission and also a receptacle 18 which receives the tape after it has passed through the transmitter.

At the right side of Fig. 3 there is shown a guide 18 which receives the tape 19 as it comes from the perforator unit 14. At the left side of compartment 13 is disclosed the transmitter 15 which transmits messages under the control of the perforated tape as it comes from the perforator 14. Intermediate the perforator and the transmitter, there is removably mounted on the transmitting frame 20 a chuteway 21. Chuteway 21 (Fig. 6) comprises a rectangular member made up of a back plate 22, a relatively shorter front plate 23, and end walls 24 and 25. The end wall 25 is lower than end wall 24 and is provided with a cam surface 26 for a purpose later to be described. A forwardly bent over flange portion 27 is provided on front plate 23 to serve as a cam surface to guide a loop of tape into the chuteway.

Back plate 22 of chuteway 21 has mounted thereon a freely rotatable shaft 28 whose frontwardly extending portion carries a loop forming switch lever 29 which in the present case is welded to the enlarged square portion 30 of the shaft but of course could be attached to the shaft in any convenient manner. The shaft 28 passes through the interior of the bushing 31 which is threaded to the back plate 22 of the chuteway 21. The loop lever 29 terminates in a laterally bent lower end portion 32 which is adapted to engage the tape 19. As shown in Fig. 3, the end 32 of the loop switch lever 29 is bent in the same direction as tape movement so that little frictional resistance is offered to the moving tape. At its rear portion, shaft 28 has attached thereto, by means of the set screws 35, a switch engaging lever 36. Levers 29 and 36 are so balanced on shaft 28 that lever 36 normally tends to pivot in a counterclockwise direction, as viewed in Fig. 3, against an adjustable stop screw 37 which is mounted to the bent over portion of a bracket 38 (Fig. 2) which is attached to the back

plate 22 of the chuteway. Lever 29 is much longer than lever 36, the result being that its extremity 32 moves a greater relative distance than the switch engaging portion of lever 36. This is due to the fact that, although both levers are pivoted on the common shaft 28, extremity 32 of lever 29 moves through a greater arc than the switch engaging portion of lever 36. As is clearly shown in Fig. 2, lever 36 is located on shaft 28 at the rear of back plate 22 of the chuteway while the loop lever 29 is located on shaft 28 at the front of the back plate. In the path of lever 36 on back plate 22 is mounted a delayed action switch 41 operable by a contact controlling plunger 42.

The delayed action switch 41 employed in the present invention is shown in detail in Fig. 7. The switch is enclosed in a box-like member 61 in which is mounted a contact engaging lever 62 which is pivoted at 63. A permanent magnet 64 normally tends to hold the lever in a clockwise direction as viewed in Fig. 8. In engagement with the upper portion of the contact engaging lever 62 is a coiled spring 65 which is mounted between the upper portion of lever 62 and the collar 66 of plunger 42 which extends outwardly from the box-like member 61 as shown in the drawing. Adjacent to the contact engaging lever 62 is mounted a contact 68 which is in circuit with the clutch control magnet 43 shown in Fig. 7.

As the tape becomes taut, the loop forming lever 29 is lifted upwardly and thereby causes the switch engaging lever 36 to move away from the stop screw 37 into engagement with the plunger 67 of the delayed action switch. As the loop lever rises, the switch engaging lever 36 continues to press against the plunger 42 placing the coil spring 65 under a progressively increasing compression until enough force has been built up by the spring to overcome the holding force of the permanent magnet 64. When this condition occurs, contact engaging lever 62 swings in a counterclockwise direction to break its engagement with contact 68 and thereby break the circuit to the clutch control magnet 43 thus causing the stoppage of the transmitter 15. Inasmuch as the perforator may continue to operate and feed out tape, the loop lever 29 is now allowed to swing in a reverse or counterclockwise direction deflecting the tape downwardly and thereby allowing lever 36 to move similarly in a like direction. The plunger 42, therefore, is permitted to move to the right, as viewed in Fig. 7, and as it does so the compressive force of coiled spring 65 is progressively reduced until a point is reached where the force exerted by the coiled spring 65 is overcome by the force of the permanent magnet 64. At this time, permanent magnet will attract the contact engaging lever 63 and permit it to swing in a clockwise direction to again close the contact 68 and, therefore, to again close the circuit to the clutch control magnet 43 to permit a resumption of transmission by the transmitter 15. As the tape again becomes taut, the cycle of operation just outlined will be repeated. It is thus seen that the delayed operation of the lever 63 permits the loop lever 29 to move an appreciable distance in either direction before the contact 68 is opened or closed depending upon the direction of movement of the loop forming lever 29. This has a decided advantage over an ordinary make and break type of switch which opens and closes almost immediately upon its operation without enabling any appreciable movement of its actuating member. It will be observed that in view of the fact that

loop lever 29 must travel a considerable distance before the contacts of the delayed action switch 41 are opened or closed, depending upon the direction of movement, there is not a constant making and breaking of the circuit to the transmitter clutch magnet 43 shown in Fig. 7. The breaking of the circuit occurs only after a predetermined number of characters are perforated on the tape 19 by the perforator 14. For instance, by the present invention, it might be arranged that six characters be perforated on the tape 19 before a sufficient amount of slack forms in the tape to permit the loop lever 29 to pivot in a counter-clockwise direction (Fig. 3) and allow the contacts of the delayed action switch 41 to be closed to start transmission. Therefore, a comparatively smooth feeding of tape from the perforator to the transmitter results and the transmitter 15 does not constantly jerk the tape forward and cause a continual chattering of the armature 44 of the clutch magnet 53 as occurs in the usual taut tape switch.

To the left of chuteway 21, as viewed in Figs. 2 and 3, there is shown a taut tape lever 47 which is attached to shaft 48 and has an extending portion 49 (Fig. 4) engageable with insulating portion 51 of contacts 52 to normally maintain the contacts 52 closed. The contacts 52 are in series with the contacts of the delayed action switch 41 as shown in Fig. 7, and together therewith controls the clutch magnet 43 which operates the armature lever 44 to control the rotation of cam clutch member 52 which governs the operation of the transmitter. It will be seen then that when delayed action switch 41 is closed and contacts 52 are likewise closed, a circuit will be completed to magnet 43 which will attract armature lever 44 to move it out of the path of projection 53 of cam clutch 52 to permit the cam clutch to rotate and thereby drive the feeding mechanism of the transmitter.

The forwardly extending portion of lever 47 is mounted directly adjacent and parallel to the front portion of yoke 55 which is mounted to the transmitter frame by screws 56 so that together the contact lever 47 and yoke 55 define a narrow passageway through which the tape 19 passes to the transmitter. If the tape for any reason becomes twisted it will lift up tape lever 47 which will allow contacts 52 to open and break the circuit to the control magnet 43 to thereby stop rotation of the feeding mechanism. The tape will not become twisted in the storage receptacle 17 as the storage receptacle is especially designed to prevent twisting. However, at times the storage receptacle is not used and the tape is permitted to hang over the front of the cabinet causing twists to develop in the tape in some instances.

As already explained, there is shown in the drawing, Fig. 6, chuteway 21 which includes end walls 24 and 25. Wall 25 which is shown at the left in Fig. 3 is somewhat lower than the end of loop lever 29 and is provided with a cam surface 26 which slopes toward the rear of the chuteway as shown in Fig. 6. The purpose of having the wall 25 lower than the loop lever 29 and providing it with a cam surface is to insure that when the transmitter is started and a loop of tape approaches the extremity 32 of the loop lever 29, the tape will be cammed inwardly against the back portion of the chuteway and positively engage the extremity 32 of the loop lever 29. As has been previously stated, it sometimes occurred in prior practice that when transmission started, the loop of tape rose up on the outside of the

loop lever and failed to contact therewith. Thus the transmitter would continue to feed the tape forwardly and eventually would break it after a certain amount of tape had been fed and the tape became taut. It can be seen that if the wall 25 was above the lower end of loop lever 29, a loop of tape might remain out of the path of the loop lever 29 and would not engage it when transmission started from the transmitter 15. The front plate 23 of the guideway does not extend higher than the flange 27 of the front plate in order that the switch controlling device mounted on the chuteway may be readily accessible to an operator.

Chuteway 21 leads downwardly to a storage receptacle 17 which is made up of glass partitions 57 and 58 (Fig. 5) and end walls 59 and 60. The glass partitions are spaced just far enough apart to accommodate a width of tape. The purpose of providing glass partitions is to render the accumulated tape visible to an operator and to reduce the friction between the edges of the tape and the sides of the receptacle so that as the tape accumulates it will slide freely down the sides of the receptacle with its edges maintained perpendicular to the glass partitions. Thus, the tape will not tend to become twisted in the storage receptacle. As has been previously pointed out, the storage receptacle 17 is provided to store the tape 19 when line conditions do not permit the immediate operation of the transmitter or when it is desirable to perforate a message compiled from several sources on one tape. A chuteway 62 is provided to the left of the transmitter for guiding the tape into a receptacle 18 as it comes from the transmitter.

Fig. 8 discloses a modification of the present invention in which the chuteway 21 disclosed in Fig. 6 is replaced by a chuteway 70 which extends only to the top of frame 20 and has formed on its upper extremity a bent over flange portion 71 which acts to guide a loop of tape into the opening of the chuteway. Spaced above the top of the transmitting frame 20 there is suitably mounted a plate 75 which is in vertical alignment with and slightly to the front of the back wall of chuteway 70 and carries a loop control switch device similar to the loop control device previously described. The loop control lever 72 is equivalent to the loop lever 29 hereinbefore mentioned and is positioned directly over the opening in the chuteway 70 so that as slack is formed in the tape, the tape will be deflected downwardly into the opening of the chuteway.

By the present invention there is provided a very efficient feeding arrangement for feeding tape from a perforator to a transmitter to insure that the feeding of the tape is carried out in a smooth manner with the tape maintained in an untwisted condition. This invention also provides a very convenient storage receptacle in which tape may be stored and retained in an untwisted condition until it is desired to transmit a message or series of messages.

Various changes and modifications may be made in the structure embodied in the present invention without departing from the spirit and scope of the invention.

What is claimed is:

In a tape control device for printing telegraph apparatus, a first tape feeding means, a second tape feeding means, a tape guideway between said first and second tape feeding means for guiding a loop of tape in a predetermined direction, said guideway including a back plate and

end walls, a tape loop forming switch control means mounted directly over said guideway, said control means being effective under two different tape loop conditions and comprising a frame, a shaft journaled on said frame, a loop lever mounted on said shaft, said loop lever being normally effective under one of said loop conditions invariably to direct the tape into said guideway, a switch engaging lever also mounted on said shaft, a switch carried by said frame in the path of said switch engaging lever for controlling said second feeding means, said loop lever being re-

sponsive, under both said loop conditions, to taut and slack conditions of tape to control said switch lever to operate said switch thereby to control said second feeding means, one of said end walls being lower than said loop lever when said lever is in its lower position, and camming means on said lower end wall effective under the other of said loop conditions for automatically guiding the tape into a position under said loop lever invariably to effect switch controlling functions under said other of said loop conditions.

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