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TELEGRAPH TRANSMITTER
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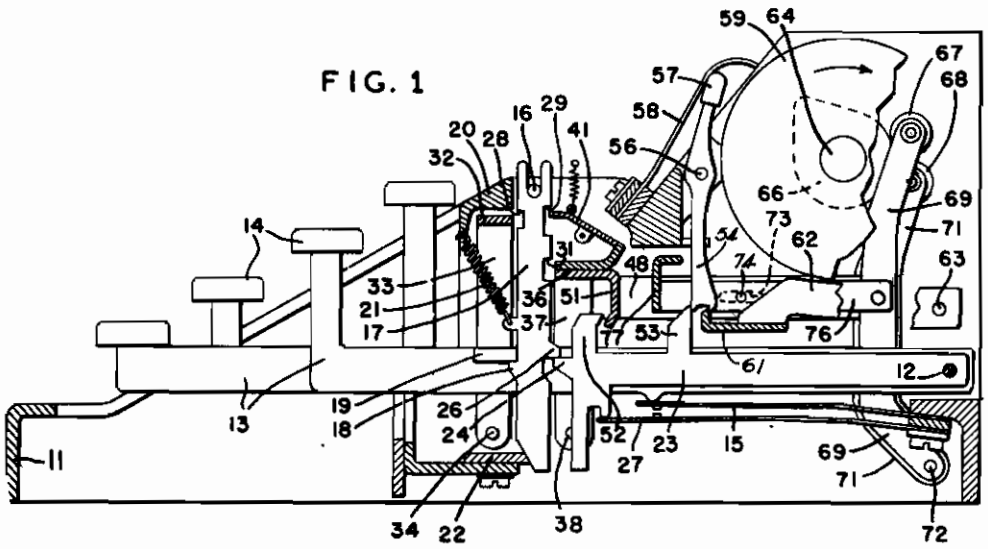
FIG. 1



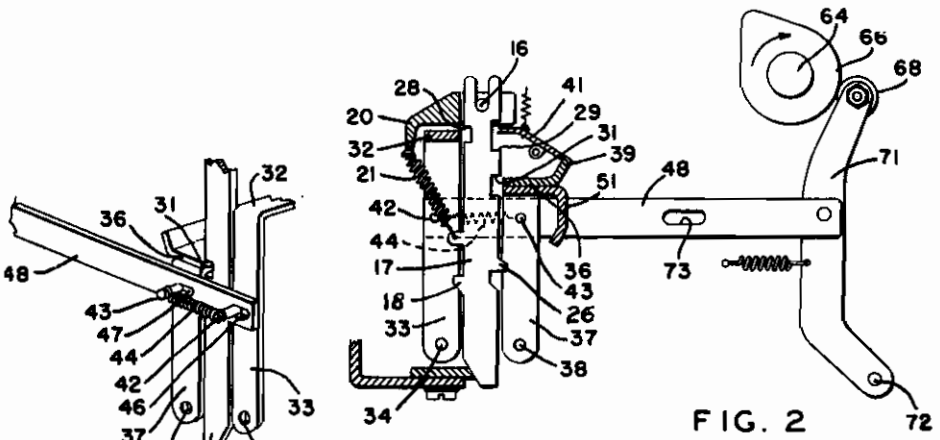


FIG. 2

FIG. 4

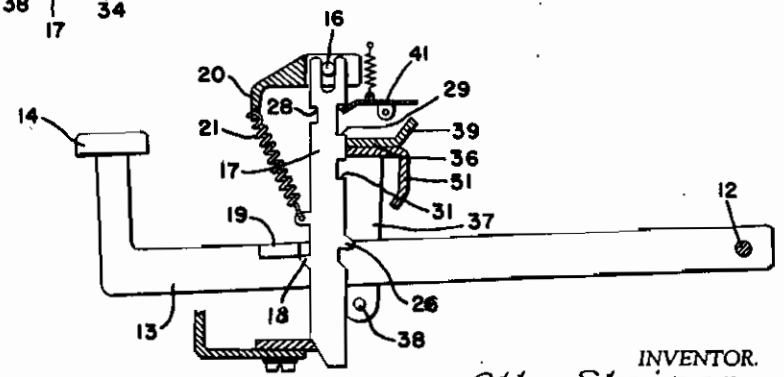


FIG. 3

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ALIEN PROPERTY CUSTODIAN

TELEGRAPH TRANSMITTER

Otto Steiner, Berlin-Spandau, Germany; vested in the Alien Property Custodian

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This invention relates to printing telegraph apparatus and particularly to keyboard controlled signal transmitting mechanism.

More specifically, the invention pertains to the transmission of facsimile telegraph signals.

An object of the invention is to provide a keyboard controlled facsimile telegraph signal transmitter in which the finger keys may be operated in overlap relation, any finger key being depressible before the transmission of the signal initiated by the previously depressed finger key has been completed.

Another object of the invention is to provide a keyboard controlled facsimile telegraph signal transmitter in which each finger key directly controls a selectable signal transmitting element individual thereto.

In the operation of keyboard devices, it is desirable to afford the operator as much freedom with regard to the timing of successive finger key operations as possible. This enables operators whose normal speed of operation may vary widely or whose timing may be irregular to operate the keyboard devices without special training or practice. When a keyboard transmitter device is so arranged and timed that a key lever may not be depressed until the transmission of the signal represented by a previously depressed key lever has been completed or substantially completed an operator may be obliged to adopt a regular or rhythmic touch considerably at variance with that operator's normal key lever operating technique and such compulsion may be a source of annoyance to the operator and possibly a source of errors in keyboard manipulation. This is particularly true if the system is designed to operate at a relatively low signaling frequency. The obligation to employ a rhythmic keyboard technique may be minimized by so arranging the keyboard transmitter that as soon as the transmission of a signal combination has been initiated so that it may proceed to conclusion without further control from the keyboard mechanism, a second key lever may be depressed and the selective condition controlled thereby stored so that at the conclusion of transmission of the previously initiated signal combination, the transmission of the signal combination represented by the stored selective condition will follow immediately. Thus the keyboard mechanism is free to be operated during a large percentage of each interval allotted to the transmission of the signal combination and the keyboard transmitter approaches, in freedom of operation, the well known typewriter.

According to the present invention each key lever is arranged to rock into operated position a signal transmission controlling lever individual to the key lever. The signal transmission controlling lever becomes latched in operated position and the keyboard mechanism becomes locked so that another key lever may not be immediately depressed. The signal transmission controlling lever withdraws one of two detents from blocking relation to a transmitting contact lever which, however, remains held by a second detent. Each of the transmitting contact levers is normally held by the two detents in position to hold an associated transmitting contact out of engagement with a transmitting drum. The drum is provided with circumferential rows of conductive and nonconductive areas in alignment with each of the transmitting contacts. Upon engagement of one of the transmitting contacts with its associated circumferential row of conductive and nonconductive areas and rotation of the drum a succession of signaling impulses will be generated in accordance with the arrangement of conductive and nonconductive areas and the impulses will be impressed upon a communication channel to which the transmitter is connected.

The transmitting drum may be rotated in start-stop manner or continuously and the shaft by which it is rotated is provided with a cam the first function of which is to release the second of the two detents holding the transmitting contact lever in normal position. Upon release of the second detent, the transmitting contact lever permits the transmitting contact to engage the circumferential alignment of conductive and nonconductive areas with which it is aligned at the proper point on the surface of the drum regardless of whether the drum has just been set in rotation or has been rotating continuously to effect the transmission of the combination of impulses from beginning to end thereof. Immediately following the release of the transmitting contact lever by retraction of the second detent, the cam performs its second function which is to unlock the keyboard mechanism. The unlocking of the keyboard mechanism places it in condition for the depression of another key lever and a key lever may be depressed while the transmission of impulses of the preceding code combination is in progress. If such key lever is depressed its associated signal transmission controlling lever will be rocked to operated position and latched there and the keyboard mechanism will become locked and remain locked until the

timing cam again performs its two functions, namely, the unlocking of the transmitting contact lever to be selected which, it may be added, is accompanied by restoration of the previously selected transmitting contact lever, and unlocking the keyboard mechanism to permit the operation of another key lever.

For a complete understanding of the invention, reference may be had to the following detailed description to be interpreted in the light of the accompanying drawing, wherein

Fig. 1 is an elevational view partly in section showing the keyboard facsimile transmitter according to the present invention;

Fig. 2 is an elevational view partly in section showing details of the keyboard locking mechanism;

Fig. 3 is an elevational view partly in section showing the relation of certain elements when a key lever is depressed; and

Fig. 4 is a fragmentary perspective view supplementing the showing of the locking mechanism in Fig. 2.

Referring now to Fig. 1 the reference numeral 11 designates the supporting frame of the keyboard transmitter according to the invention. A cylindrical rod 12 extending across frame 11 from one side of the keyboard transmitter to the other, and appearing at the right of Fig. 1, pivotally supports a plurality of key levers 13. Leaf springs 15 secured to the frame 2 of keyboard transmitter 11 engage the lower edges of the key levers 13 and urge the key levers to their uppermost positions. Each of the key levers 13 is provided at its foremost end with a finger key 14.

Intermediate the front and rear of the transmitter and extending from side to side above the key levers 13 is a cylindrical rod 16 which receives the bifurcated upper ends of vertically disposed slides or push bars 17. There are as many slides or push bars 17 as there are key levers 13 and each slide 17 extends downwardly past its associated key lever 13 in close proximity thereto. Each slide 17 is provided with a forwardly extending lug or projection 18 and a laterally extending projection 19 of the key lever overlies the lug 18. A tension spring 21 is distended obliquely between each slide 17 and a frame member 20 and urges the slides upwardly and in clockwise direction as viewed in Fig. 1 so that their bifurcated portions rest against the bar 16 and their lower ends rest against a stationary bar 22 secured to the frame 11 of the transmitter.

In addition to the key lever 13 the cylindrical rod 12 also pivotally supports signal transmission controlling levers 23 of which there is one beside each key lever 13. At the foremost end (left-hand end as viewed in Fig. 1) each of the signal transmission controlling levers 23 is provided with a projection or lug 24 which underlies a rearwardly extending lug or projection 26 of the associated slide 17. The signal transmission controlling levers 23 are urged in clockwise direction to bring their projections 24 into abutting relation with the projections 26 of slides 17 by leaf springs 27 secured to the frame 11 of the transmitter in the same manner as springs 15.

The slides 17 are provided with notches, one on the front edge (left-hand edge as viewed in Fig. 1) designated 28, and two on the rear edge designated 29 and 31. All of the slides 17 are identical so that when they are in their normal positions resting against the cylindrical bar 16 all of the notches 28 are aligned transversely of the transmitter, all of the notches 29 are aligned and all of the notches 31 are aligned.

The alignment of notches 28 is adapted to receive a lock bail 32 extending across the entire bank of slides 17 and supported at its opposite ends by arms 33 pivoted at 34. Similarly, the alignment of notches 31 is adapted to receive a lock bail 36 which extends across the bank of slides 17 and is supported at its opposite ends by arms 37 pivoted at 38. Lock bail 36 is provided with a blade 39 extending obliquely upwardly toward the rear of the transmitter from the rearmost edge of the lock bail 36 and the blade 39 normally abuts the rearmost edge (right-hand edge as viewed in Figs. 1 and 3) of a universal bail 41 which is in the form of a pivoted vane extending across the bank of slides 17 and having its foremost edge, which is the left-hand edge as viewed in Figs. 1 and 3, disposed in the alignment of notches 29. Universal bail 41 is shown in Fig. 1 in its normal position and in Fig. 3 in its operated position and when it is in the normal position it holds the lock bail 36 clear of the rear edges of the slides or push bars 17.

At least one of the arms 33 which supports the lock bail 32 is provided with a laterally extending pin 42 (Figs. 2 and 4) and the adjacent one of the arms 37 which supports lock bail 36 is provided with a laterally extending pin 43. A tension spring 44 interconnects the pins 42 and 43 so that lock bail 32 is urged to the right as viewed in Figs. 1 and 2 seeking to enter the alignment of notches 28 and the lock bail 36 is urged to the left seeking to enter the alignment of notches 31.

The pins 42 and 43 carried by the lock bail supporting arms 33 and 37 respectively, are disposed in elongated slots 46 and 47 respectively in a link 48. Link 48 extends to the rear of the transmitter (to the right as viewed in Figs. 1 and 2) and is operable by a cam operated lever, as will presently appear, which normally holds link 48 in its foremost position (left-hand position as viewed in Figs. 1 and 2). Spring 44 urges pin 42 to the right-hand end of slot 46 and pin 43 to the left-hand end of slot 47. Pin 42 does in fact engage the right-hand end of slot 46 when link 48 is in its normal position and in this position the link 48 holds lock bail supporting arm 33 in position to hold lock bail 32 clear of the alignment of notches 28. Pin 43 does not normally engage the left-hand end of slot 47 but is held toward the right of slot 47 by universal bail 41 which holds lock bail 36 clear of the alignment of notches 31.

Upon the depression of any one of the key levers 13 its laterally extending projection 18 engages the underlying projection 18 of the associated slide 17 and depresses the slide, which movement causes spring 21 to become distended. As will be observed by reference to Figs. 1, 2 and 3 the lower left-hand edges of the slides 17 slope rightwardly so that as the slide 17 is depressed it is also rocked counterclockwise by engagement of the sloping portion of its left-hand edge with the stationary bar 22, and the counterclockwise rocking movement is sufficient to cause projection 18 to move out from underlying relation with the laterally extending projection 36 of the key lever. Upon the escape of projection 18 from projection 19 the slide 17 is at once restored by spring 21 to normal position.

Since the foremost edge of universal bar 41 is disposed in the alignment of notches 29, the depression of one of the slides 17 will cause universal bar 41 to be rocked counterclockwise thus withdrawing the rearmost edge of the universal bar from blocking relation to upwardly extending blade 39 associated with lock bail 36. Thus, lock bail 36 is no longer held free of the slides 17 and it

seeks to enter the alignment of notches 31, the slot 47 accommodating movement of the pin 43 by spring 44. Since at this time one of the slides 17 is out of normal position, it will block out lock bail 36 from entering the notches 31 and will continue to block it out until the operated slide 17 has been restored to normal position by spring 21. When the slide 17 has returned to normal position, lock bail 36 is no longer blocked out of the notches 31 and under the influence of spring 44 and the freedom afforded by slot 47 it enters the alignment of notches, thus locking against depression all of the slides 17 which thereby individually block operation of the key levers 13.

It will be apparent that when slide 17 is depressed to its lowermost position by its associated key lever 13, the signal transmission controlling lever 23 associated with the depressed slide 17 will be rocked into extreme counterclockwise position. Lock bail 36 is provided with a depending flange 51 which is bent forwardly obliquely at its lower edge. Each signal transmission controlling lever 23 is provided with an upwardly extending arm 52 the upper end of which extends rearwardly obliquely toward the flange 51 of lock bail 35. The relationship of arm 52 to flange 51 is such that the obliquely extending portion of arm 52 will just clear the lower edge of flange 51 as lever 23 is depressed. The apparatus may even be arranged so that when lever 23 is rocked to extreme counterclockwise position its arm 52 will cam lock bail 38 slightly to the right as viewed in Fig. 1, bail 36 immediately returning to engagement with the edge of the depressed slide 17 when arm 52 of the operated lever 23 has been drawn clear of flange 51. Thus flange 51 will block the return path of arm 52 of lever 23 and when lock bail 35 has entered the alignment of notches 31 the lower edge of flange 51 will fully overlie the upper end of arm 52 of lever 23 and will maintain lever 23 in operated position, which is its counterclockwise position.

Each of the signal transmission controlling levers 23 is also provided with an upstanding arm 53 the upper end of which is normally presented to the left and in blocking relation to one of two projections at the lower end of a transmitting contact lever 54 of which there is one associated with each of the signal transmission controlling levers 23. The transmitting contact levers 54 are pivoted at 56 and each lever 54 carries at its upper end an insulating cap 57 which engages an individual transmitting contact spring 58. When the lever 54 is in normal position it holds the contact spring 58 out of engagement with a facsimile signal transmitting drum 59. The transmitting drum 59 may be similar to that shown in Patent 2,046,328 granted July 7, 1936 to Edward E. Kleinschmidt et al. Drum 59 may be rotatable continuously or may be operable upon the start-stop principle, being released for one revolution upon each operation of a key lever 13 in well-known manner.

As previously mentioned each of the transmitting contact control levers 54 has two latching or detent projections at its lower end, one of which is normally blocked by the projection 53 of the associated signal transmission control lever 23. The other of the detent projections is normally engaged and blocked by a bail 61 carried by arms 62 pivoted at 63. Shaft 64, to which transmitting drum 59 is fixed, has secured thereto a cam 66. The periphery of cam 66 is engaged by follower rollers 67 and 68 carried by cam follower levers 69 and 71, respectively, pivoted at 72. Cam follower lever 71 pivotally engages the rearmost end (right-hand end as viewed in Figs. 1 and 2) of the link 46 which engages, by means of slots 46 and 47, the pins 42 and 43 respectively, carried by the lock bail arms 33 and 37, respectively, all as previously described. Intermediate its ends the link 46 is provided with an elongated slot 73 through which extends a pin 74 carried by a link 76 which is pivotally connected to the cam follower lever 69. By virtue of slot 73 and pin 74 link 76 is supported in the desired position and either of the links 46 and 76 may be moved independently of the other.

One of the arms 62 which supports bail 61 has a sloping surface disposed in the path of pin 74, so that when link 76 is moved rightwardly as viewed in Fig. 1 pin 74 will engage the sloping surface of arm 62 and will cam the arm in counterclockwise direction, thus withdrawing bail 61 from blocking relation to the transmitting contact levers 54. Upon the return of link 76 and its pin 74 bail 61 is permitted to return to normal position as by springs (not shown). Link 76 supports at its foremost end (left-hand end as viewed in Fig. 1) a restoring bail 77 which engages all of the transmitting contact levers 54 as link 76 is moved to its operated position and holds them in position to be latched by the projection 53 of the signal transmission control lever 23 and by the bail 61.

The operation of the keyboard mechanism has heretofore been described up to the point where one of the signal transmission control levers 23 has been depressed and held in the operated position by the depending flange 51 of lock bail 36, which has also locked all of the slides 17, the upstanding projection 53 on the operated signal transmission control lever 23 having been withdrawn from blocking relation to its associated transmitting contact lever 54, which remains held by bail 61. Regardless of whether the transmitting cylinder 59 operates upon the start-stop principle, in which case the position of cam 66 may be taken as indicating the stop position, or whether the transmitting drum 59 rotates continuously, the secondary hold upon the selected transmitting contact lever 54; namely, that of bail 61 will not be released until cam 66 has operated follower lever 69. As the apex of cam 66 approaches follower roller 67, the roller will be moved rightwardly as viewed in Fig. 1 and follower lever 69 will be rocked in clockwise direction. Pin 74 will be moved rightwardly and will cam bail arm 62 in counterclockwise direction thus withdrawing bail 61 from blocking relation to all of the transmitting contact levers 54. However, restoring bail 77 is also moved rightwardly since it is carried by link 76 which carries pin 74, so that the selected one of the transmitting contact levers 54 and all others will be held by bail 77, all except the selected one of the transmitting contact levers also being blocked against clockwise rotation by the projections 53 of unselected signal transmission control levers 23.

As the apex of cam 66 passes roller 67, follower lever 69 is permitted to return to its normal or extreme counterclockwise position. Such return is accompanied by movement of restoring bail 77 leftwardly as viewed in Fig. 1 and return of arms 62 which support bail 61 to extreme clockwise position. Since the purpose of cam follower lever 69 controlled by cam 66 is to control the ultimate release of a transmitting contact

lever 54 and therefore the timing of the engagement of a contact 58 with drum 59 as well as to effect the restoration of a previously selected transmitting contact lever 54, it is necessary that the bail 61 shall not move into blocking relation to the transmitting contact levers 54 until the restoring bail 77 has returned toward its normal position a sufficient distance to permit the selected one of the transmitting contact levers 54 to escape from the bail 61; that is, for the selected one of the transmitting contact levers 54 to have moved sufficiently in clockwise direction that its secondary latching projection at the lower end thereof will have moved slightly to the left, as viewed in Fig. 1, of the position in which bail 61 blocks the secondary projections of the unselected transmitting contact levers 54. This operating requirement necessitates that bail 61 shall not have returned to blocking relation to the transmitting contact levers 54 until restoring bail 77 shall have been drawn clear of the unselected levers 54. This relationship may be established by properly selecting the distance that pin 74 shall travel before it engages the sloping portion of bail supporting arm 62 and the slope of the surface which pin 74 engages.

It will be apparent that since bail 61 does not move into blocking relation to unselected ones of the transmitting contact levers 54 until restoring bail 77 has been drawn clear, the bail 61 will be drawn out of blocking relation to the transmitting contact levers 54 before bail 77 engages those levers during clockwise movement of cam follower lever 69 by cam 66. The distance through which transmitting contact levers 54 or a selected one of them may move clockwise to engage rightwardly moving bail 77 at the instant that bail 61 is withdrawn should not be enough to permit the associated transmitting contact 58 to come into engagement with drum 59, unless the drum is provided in the peripheral portions which a transmitting contact 58 would engage at the time with non-signal transmitting areas, so that no false signals will be applied to the communication channel.

As will be observed by reference to Fig. 1 the cam follower rollers 67 and 68 are very close together and since both are operated by cam 66 the operation of cam follower lever 71 will lag only slightly behind that of cam follower lever 69. The cam follower lever 71 moves its link 48 rightwardly as viewed in Fig. 1 to withdraw lock bail 36 clear of the alignment of notches 31 in slide 17, and to draw lock bail 32 into the alignment of notches 28 on the opposite sides of slide 17. When cam follower lever 71 has been rocked to extreme clockwise position by the apex of cam 66, lock bail 36 has been retracted into position where its obliquely extending blade 39 is blocked by universal bail 41. The reason for locking the slides 17 by means of the lock bail 32 at the time that lock bail 36 is withdrawn is that the operation of cam follower lever 71 overlaps the operation of cam follower lever 69 and bail 61 may be out of blocking relation to the transmitting contact levers 54 at the time that lock bail 36 is drawn free of slides 17. If at this critical instant another of the key levers 13 should be operated its associated transmitting contact lever 54 would immediately be released by its signal transmitting control lever 23 and permitted by restoring bail 77 to move clear of the blocking position of bail 61 then in process of returning to normal position. Thus, two transmitting contacts might be permitted to engage the drum 59 at the same time, resulting in superposed unintelligible signals. The lock bail 32 is withdrawn from the alignment of notches 28 to unlock the keyboard mechanism for the next operation upon the return of cam follower lever 71 and link 48 to normal position, lock bail 36 being prevented from moving into locking relation to the slides 17 by universal bail 41. Slot 47 in link 48 permits lock bail 36 to remain stationary while lock bail 32 is moved to normal position.

Upon the restoration of lock bail 36 to normal position its depending flange 51 is drawn clear of the projection 52 of the selected signal transmission control lever 23, which is prevented from returning to its full normal position, however, by its associated transmitting contact lever 54 which has been rocked clockwise by its transmitting contact 58 and therefore interferes with the projection 53 of the signal transmission control lever 23.

As soon as the lock bail 32 has been moved clear of the slides 17, another key lever 13 may be operated to prepare for the transmission of the next signal combination. This will not interfere in any way with the completion of the signal combination which is then in process of transmission by virtue of engagement of one of the transmitting contacts 58 with drum 59, as the only immediate effect will be to depress another of the signal transmission control levers 23 which will be held depressed by the bail 36, which will again lock the slides 17.

If the transmitting drum 59 is operable upon the start-stop principle and another key lever has been depressed, the drum will not be arrested at the completion of a cycle but will continue to rotate for execution of the next cycle and the transmission of the signal combination representing the key lever depressed. If another key lever has not been depressed, the drum 59 will be arrested at the completion of the transmission of the signal combination for the last key lever depressed. If on the other hand the drum 59 rotates continuously, the cam 66 will again operate the cam follower lever 69 whether or not a key lever has been depressed. As the cam follower lever 69 is rocked to extreme clockwise position, bail 61 will be withdrawn from engagement with the bank of transmitting contact levers 54 and restoring bail 77 will be moved rightwardly as viewed in Fig. 1 to restore that one of the transmitting contact levers 54 corresponding to the signal combination just transmitted to normal position with its lower end to the right, as viewed in Fig. 1, of the projection 53 of the associated signal transmission control lever 23. This permits that signal transmission control lever to return to normal position in blocking relation to its transmitting contact lever 54 so that when bails 61 and 77 return to normal position the transmitting contact lever 54 will be held by the bail 61.

Assuming, as previously mentioned, that another key lever had been depressed while a signal combination was being transmitted, the transmitting contact lever 54 associated with that key lever will escape from normal position before the return of bail 61 to normal position, due to the fact that is associated signal transmission control lever 23 is held in depressed or operated position by the depending flange 51 of lock bail 36. Thus, the transmission of another signal combination will be initiated. Immediately after the operation of cam follower 69, cam follower lever 71 will be operated to withdraw lock bail

36 and momentarily lock the slides 17 with bail 32, thereafter to remove bail 32 from locking relation to slides 17. In each cycle of transmitting drum 59, cam follower levers 69 and 71 will be operated whether or not a key lever has been depressed. The effect of operation of cam follower lever 69 if no key lever has been depressed will be merely to disengage bail 61 from and reengage it with transmitting contact levers 54 and to operate restoring bail 77 idly. The only effect of operation of cam follower lever 71 will be to lock momentarily the slides 17 by lock bail 32, since lock bail 36 is held clear of slides 17 by universal bail 41.

Although reference has been made throughout the description to one cam 66, one cam follower lever 69 and 71, it will be understood that since cam follower lever 69 operates bails 61 and 77, both of which extend across the entire bank of transmitting contact levers, and since cam follower lever 71 operates lock bails 32 and 36 which extend across the entire bank of slides 17, it may be found desirable to provide a cam 66 and follower levers 69 and 71, arm 62 for supporting bail 61 and links 48 and 76 at each end of the transmitting drum 59 so that operating power will be applied uniformly at both ends of all of the bails.

OTTO STEINER.