June 11, 1957 G. SIM 2,795,646

TELEGRAPH TRANSMITTER

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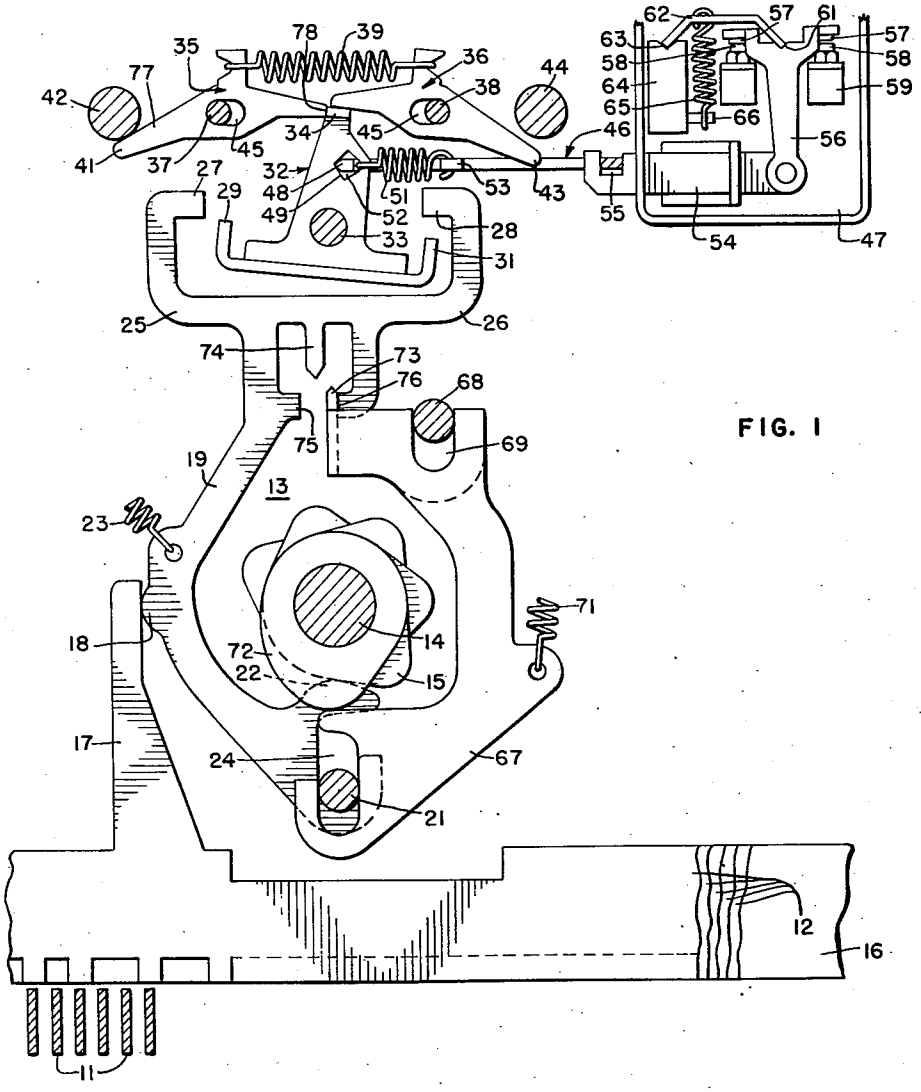

FIG. 1

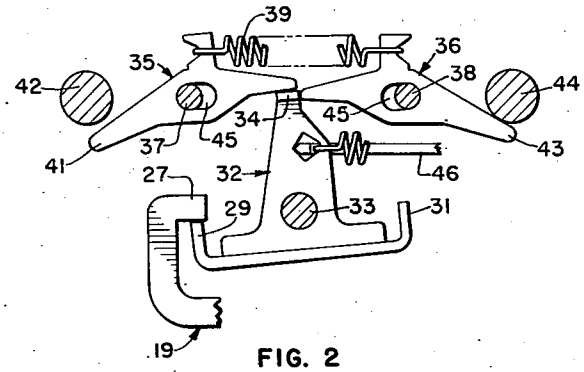

FIG. 2

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TELEGRAPH TRANSMITTER

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5 Claims. (Cl. 178—17)

This invention pertains to telegraph transmitters and more particularly to improvements in cam type transmitters.

The primary object of the invention is to provide facilities for insuring the accurate and stable operation of the transmitter contacts.

Another object of the invention is to provide means for stabilizing the operation of transmitting contacts to thereby eliminate bounce in the selective actuation of said contacts.

Specifically, the arrangement according to the present invention provides in a transmitter having a signal generator comprising a rocker member actuated through the instrumentality of specially conformed interponents by a series of sequentially operable cams, a contact stabilizing device adapted to eliminate bounce and control the rocking action of the rocker arm of the transfer mechanism. The stabilizing device according to the invention comprises a pair of confronting spring loaded elements alternately presentable in blocking or latching relationship with said rocker member.

A better understanding of the invention may be had from the following description, taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is an elevational view of the signal generator embodying the present invention, and

Fig. 2 is a view representing an alternate condition of operation of the device shown in Fig. 1.

In the embodiment shown, the details of the telegraph transmitter which cooperate with the device according to the present invention, but which do not constitute a part of the combination comprising the invention, have not been shown in the drawing and will not be described herein since they are shown and described in United States Patent No. 2,607,848 granted August 19, 1952, to W. J. Zenner, which disclosure is incorporated herein by reference, and made a part hereof.

Briefly, the apparatus embodying the device according to the present invention embraces primarily a base portion which is provided at its forward portion with a keyboard (not shown) of usual form, and which is adapted to house the key levers **11**, shown in section in Fig. 1, and the selector mechanism operated thereby, exemplified by the code bars **12**. Mounted on the base are the signal generator **13** and related parts which are selectively controlled by the aforementioned selector mechanism of which code bars **12** are a part. A motor (not shown) for supplying the power for operating the keyboard transmitter is appropriately mounted on the base portion in position to effect the rotation of the operating shaft **14**. The cyclic rotation of the transmitting cams **15** carried on shaft **14** is governed by a single revolution clutch, as set forth in the aforementioned patent.

Having reference to Fig. 1, the key levers **11** control the setting of code bars **12** permutably. As set forth in said patent, the code bars **12** are normally biased rightwardly by individual springs (not shown), but are held in their leftward position by a bail member (similar

to bail member **48** disclosed in said patent) which bears against suitable shouldered portions on the code bars **12**. The code bars **12** are normally restrained against rightward movement by said bail member under the control of a key controlled trip-off means (not shown) of a nature substantially as disclosed in said patent.

As more fully described in said patent, the clutch for controlling the rotation of shaft **14** is of the single revolution type, and is normally locked against rotation by a release lever (not shown) controlled by a universal bar **16** upon the actuation of a key lever **11**. According to the present invention, each of the code bars **12** is provided with a vertically projecting portion **17**, the upper end of which is adapted to cooperate with a projection **18** of a specially conformed interponent member **19**. Interponents **19** are mounted on a common rod **21** appropriately located below the shaft **14**, and are provided with individual cam follower portions **22** adapted to cooperate with their respective transmitting cams **15**. Interponents **19** are normally biased upwardly and counterclockwise simultaneously by individual springs **23**, said interponents being slotted at **24** to permit vertically reciprocating movement thereof by cams **15**. Cams **15** are helically arranged around shaft **14** to effect the reciprocation of interponents **19** sequentially, in a manner well known in the art.

Each of the interponents **19** is provided at its upper end with a pair of arms **25** and **26**, having inwardly directed and confronting abutting portions **27** and **28**, respectively, adapted to overhang a corresponding pair of abutments **29** and **31** of a rocker or oscillatable member **32** supported pivotally on a pivot rod **33**. Thus, when the code bar **12** is actuated rightwardly in response to a marking condition, its projection **17** will actuate interponent **19** in a clockwise direction to present abutment **27** over the abutment **29** of the rocker member **32**. Then when the interponent **19** is depressed by its cam **15** the rocker member **32** will be rotated to its counterclockwise position, Fig. 2.

Cooperating with the upper extension or latchable portion **34** of rocker member **32**, on opposite edges thereof, are a pair of stabilizing elements or retainer instrumentalities **35** and **36**. Retainers **35** and **36** are supported pivotally on studs **37** and **38**, respectively, and are normally attrahently biased; that is, toward each other, and toward the extension **34** by a common spring **39**. Spring **39** simultaneously functions to impart clockwise bias to retainer **35** thereby tending to bring the tail portion **41** into engagement with a camming out stud **42**, as will presently appear. Similarly, spring **39** also functions at the same time to bring tail portion **43** of retainer **36** into engagement with a camming out stud **44**. Retainers **35** and **36** are provided with slotted holes **45** to permit slidable as well as pivotal motion on their respective studs **37** and **38**.

The rocker member **32** functions through a link **46** to control the transmitting contact assembly contained in the housing **47**. Link **46** is articulated to the rocker **32** in such a manner that the knife edge extremity **48** of link **46** is caused to bear normally in a V-shaped groove **49** by means of a spring **51** distended between the opening **52** in rocker member **32** and a lug **53** on link **46**. The right-hand end of link **46** (as viewed in Fig. 1) is articulated to the operating lever **54** of the contact assembly by engaging a notch **55** therein. Operating lever **54** is connected pivotally to the stem of a T-shaped lever **56**. Each of the arms of the T-lever **56** is provided on its underside with a contact point **57** which cooperates respectively with fixed contact points **58** carried on a bracket **59**. At a point centrally located between the contacts **57**, the swingable T-lever **56** is provided with a V-shaped notch **61** which cooperates with an arm of

a substantially U-shaped member 62, the other arm of which cooperates with a V-shaped notch 63 in a bracket 64 mounted in the housing 47. A spring 65 having one end attached to the member 62 has the other end attached to a spring post 66.

The spring 65 is thus so connected that the member 62 will be urged normally in a clockwise direction (Fig. 1) urging the contact points 57 toward their associated contact points 58. With the notch 61 centrally located, a balanced pressure is exerted with respect to both of the contact points 57. In actual practice the operating lever 56 will normally be held in such a position that only one contact pair 57—58 will be closed at a time. Thus, the operating lever 56 will be in one of its two positions, or moving from one to the other, which causes the T-lever 56 to be positioned in such a manner as to cause one of the contact points 57 to fulcrum about its associated contact point 57. As a change of selection is made in the operating lever 54, under the control of the rocker member 32, as will presently appear, the T-lever 56 will be moved from one position to the other, and as the lever 56 is not pivoted about an external point, it will fulcrum about the contact pair which is desired to be closed.

Also slidably mounted on rod 21 is a detent member 67 which is guided at its upper end by a stud 68 adapted to cooperate slidably with the open ended slot 69. Detent 67 is urged in an upward direction by a spring 71 to normally coact with a cam 72 carried on the shaft 14. Detent member 67 is provided with a knife edge 73 adapted to cooperate with individual knife edges 74 depending from the several interponents 19. Interponents 19 are also provided with stop portions 75 and 76 adapted to cooperate with the knife edge 73 to limit the clockwise and counterclockwise movements of the respective interponents 19.

The timing of cam 72 is such that when the code bars 12 are positioned permutably pursuant to the actuation of a key lever 11, the interponents 19 will be correspondingly positioned in their clockwise and counterclockwise positions to cause stops 75 and 76, respectively, to bear against the knife edge 73, so that during the early part of the cycle of rotation of shaft 14, and hence cam 72, the detent member 67 will be permitted to rise due to the pull of spring 71, to bring the knife edge 73 to its upper position, with depending knife edges 74 disposed on the right or left side of knife edge 73, depending upon the permuted setting of interponents 19. The interponents 19 will therefore be locked against rightward or leftward movement by having the knife edge 73 positioned either between a stop 75 and a knife edge 74, or between a stop 76 or a knife edge 74. The interponents 19 are not, however, locked against vertical movement under the control of cams 15.

In the operation of the arrangement according to the present invention, the stabilizing elements or instrumentalities 35 and 36 are effective pursuant to each oscillation of the rocker member 32 to preclude contact bounce by preventing chatter or bounce between the abutments 27 and 29, or between abutments 28 and 31. The code bars 12 are positioned permutably in response to the initiation of key lever 11, through projections 17, to thereby correspondingly position the interponents 19 in their rightward (clockwise) or leftward (counterclockwise) positions. The timing is such that before the code bars 12 are returned to their leftward position, the cam 72 will have rotated sufficiently to permit the detent 67 to rise to cause the knife edge 73 to cooperate with the right or left side of depending knife edge 74.

While the interponents 19 are thus constrained, the helically arranged cams 15 function to sequentially depress said interponents 19. If an abutment 27 is positioned over the abutment 29, then the rocker member 32 will be rocked in a counterclockwise direction to assume the position shown in Fig. 2. Conversely, if an abutment 28 is positioned over the abutment 31, then the rocker member 32 will be rocked in a clockwise direction to the position shown in Fig. 1.

As shown in Fig. 1, the rocker member 32 is maintained in its clockwise position by the stabilizing device, comprising the attrahently biased or spring loaded elements or instrumentalities 35 and 36; the instrumentality 35 acting under the pull of spring 39 to hold the member 32 in its rightward or clockwise position, while the instrumentality 36 under the influence of spring 39 applies a steadying force to said member 32. Now, assuming that the interponents 19 are constrained for vertical reciprocation, as previously described, and the interponent 19 is in marking position; that is, with its abutment 27 presented over the abutment 29, then under the control of its associated cam 15 the interponent 19 is depressed thereby causing the member 32 to rotate counterclockwise. In thus rotating, the member 32 through its upper extension 34 urges the retainer or instrumentality 35 leftwardly under the constant tension of spring 39. At the same time, the camming surface 77 of retainer 35 coacts with the stud 42 to cause said retainer 35 to rotate in a counterclockwise direction, thus eventually stripping the latched end 78 from the extension 34. By the time this will have occured, the confronting edge 79 of the companion retainer 36 will have dropped behind the opposite (or right) side of extension 34 causing the rocker member 32 to be maintained in its counterclockwise position, as shown in Fig. 2, thereby preventing chatter or bounce of both the member 32 and contacts 64—65.

Conversely, if the member 32 is found in its counterclockwise position when a code bar 15 is in its leftward or spacing position, then the abutment 28 will be presented over the abutment 31 and when the interponent 19 is depressed by its cam 15 the rocker member 32 will be swung to its clockwise position, thereby urging the retainer 36 rightwardly. The camming action between cam surface 79 of retainer 36 and the stud 44 will cause the retainer 36 to gradually become unlatched as it is moved righwardly until finally retainer 35 will cooperate with the extension 34 to maintain the rocker member 32 in its clockwise position shown in Fig. 1.

Although a preferred form of the invention has been disclosed and described, it is obvious that changes may be made in the details set forth without departing from the essentials of the invention.

What is claimed is:

1. In a transmitter, a signal generator comprising a rocker member, a series of sequentially operable cams, an interponent associated with each cam, said interponent having elements operably disposed with respect to said rocker member, means for setting said interponents in accordance with a predetermined code, means for operating said cams to actuate said interponents sequentially, transmitting contact means, means controlled by said rocker member for controlling the actuation of said transmitting contact means, and means for stabilizing said contact means comprising a pair of confronting spring loaded elements alternately presentable in butting relationship with said rocker member.

2. In a transmitter, a signal generator comprising a rocker member, a series of sequentially operable cams, an interponent associated with each cam, said interponent having elements operably disposed with respect to said rocker member, means for setting said interponents in accordance with a predetermined code, means for operating said cams to actuate said interponents sequentially, transmitting contact means, means controlled by said rocker member for controlling the actuation of said transmitting contact means, and means for stabilizing said contact means comprising a pair of spring loaded elements having confronting edges cooperable with said rocker member, whereby upon the oscillation of said rocker member during the sequential actuation of said inter-

ponents said spring loaded elements are alternately presentable in butting relationship with said rocker member.

3. In a transmitter, a signal generator comprising a rocker member, a series of sequentially operable cams, an interponent associated with each cam, said interponent having elements operably disposed with respect to said rocker member, means for setting said interponents in accordance with a predetermined code, means for operating said cams to actuate said interponents sequentially, transmitting contact means, means controlled by said rocker member for controlling the actuation of said transmitting contact means, and means for stabilizing said contact means comprising a pair of a attrahently biased elements having confronting edges cooperable with said rocker member, whereby upon the oscillation of said rocker member during the sequential actuation of said interponents said attrahently biased elements are alternately presentable in butting relationship with said rocker member.

4. In a transmitter, a signal generator comprising a rocker member, a series of sequentially operable cams, an interponent associated with each cam, said interponent having elements operably disposed with respect to said rocker member, means for setting said interponents in accordance with a predetermined code, means for operating said cams to actuate said interponents sequentially, transmitting contact means, means controlled by said rocker member for controlling the actuation of said transmitting contact means, and means for stabilizing said contact means comprising a pair of attrahently biased instrumentalities which are pivotally and slidably mounted, cam means associated with each of said instrumentalities, said instrumentalities having confronting edges cooperable with said rocker member, whereby in response to the conjoint action of said cam means and said rocker member said instrumentalities are alternately presentable in butting relationship with said rocker member.

5. In a transmitter, a signal generator comprising an oscillatable member having a latchable portion, a series of sequentially operable cams, an interponent associated with each cam, said interponent having elements operably disposed with respect to said member, means for setting said interponents in accordance with a predetermined code, means for operating said cams to actuate said interponents sequentially, transmitting contact means, means controlled by said member for controlling the actuation of said transmitting contact means, and means for stabilizing said contact means comprising a pair of attrahently biased instrumentalities, cam means associated with each of said instrumentalities, said instrumentalities having confronting edges cooperable with said latchable portion, whereby in response to the conjoint action of said cam means and said latchable portion said instrumentalities are alternately presentable in butting relationship with said member.

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