United States Patent [19]

Mero

[11] **3,732,965**

[45] **May 15, 1973**

[54] **TELEGRAPH TRANSCEIVER WITH RETRACTABLE KEYBOARD**

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[73] Assignee: **Extel Corporation,** Chicago, Ill.

[22] Filed: **Mar. 8, 1971**

[21] Appl. No.: **121,843**

[52] **U.S. Cl.** .....**197/186 A,** 197/98

[51] **Int. Cl.** **A41j 29/02**

[58] **Field of Search** .....147/98, 186, 186 A, 147/186 B; 178/17 R, 17 A, 17 B, 17 C, 17 D, 17 E

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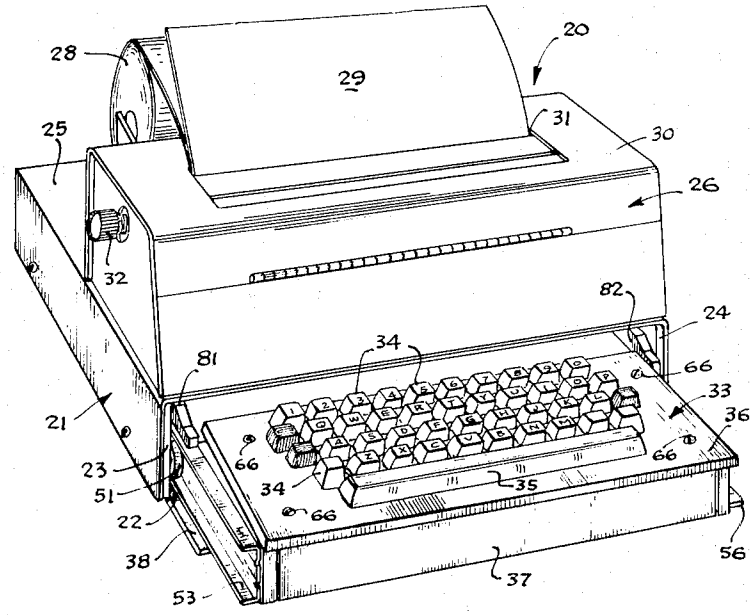
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[57] **ABSTRACT**

A compact, high-speed portable telegraph transceiver having an electrical keyboard movable between an extended operating position projecting outwardly of the front of the base of the telegraph transceiver and tilted at an angle relative to the base, and a retracted storage position in which the keyboard is completely enclosed within the transceiver base and protected against unauthorized use or possible damage.

2 Claims, 10 Drawing Figures



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SHEET 1 OF 3

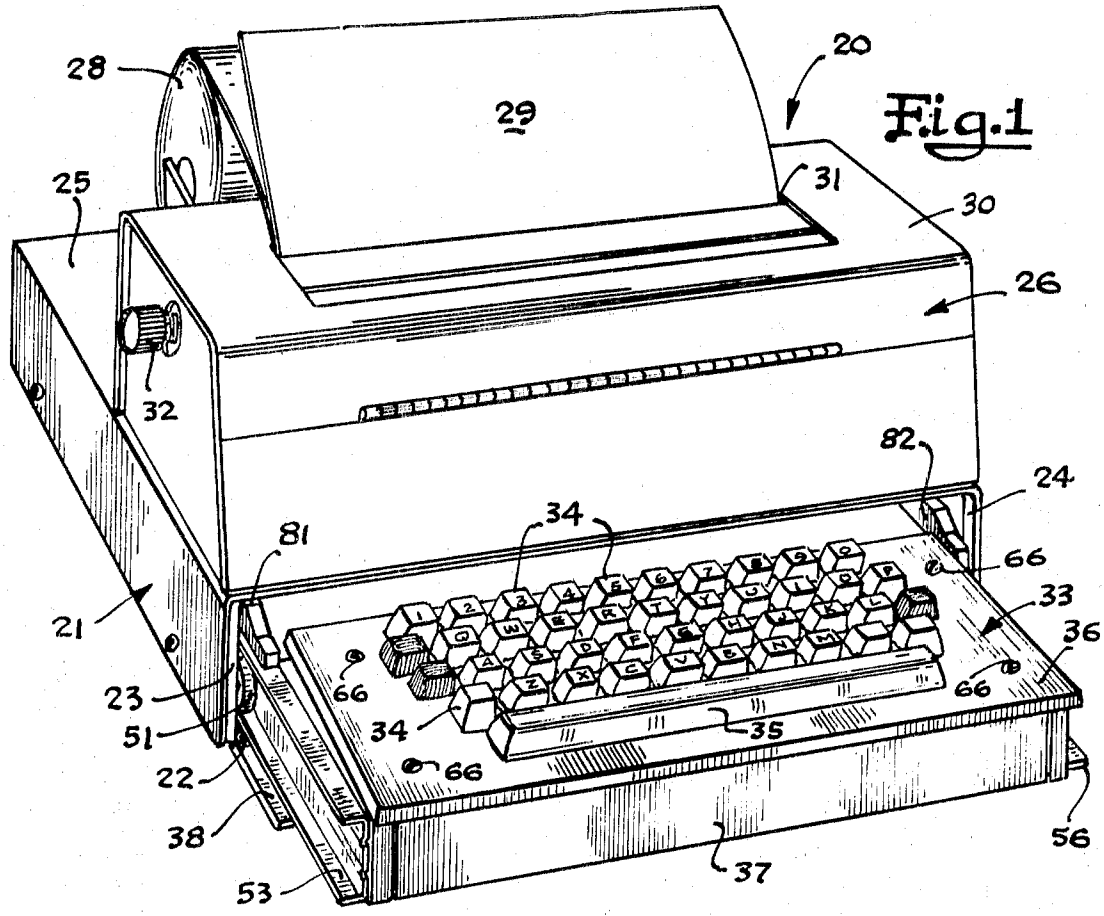


Fig.1

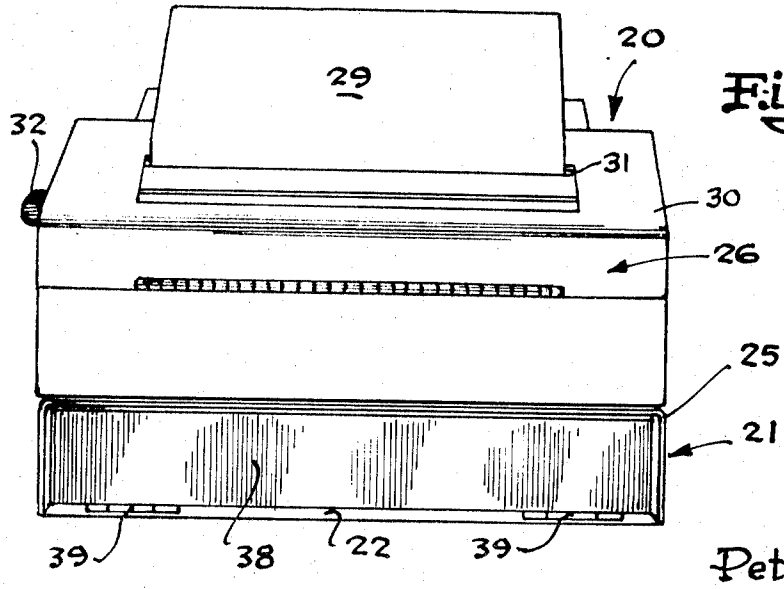


Fig.2

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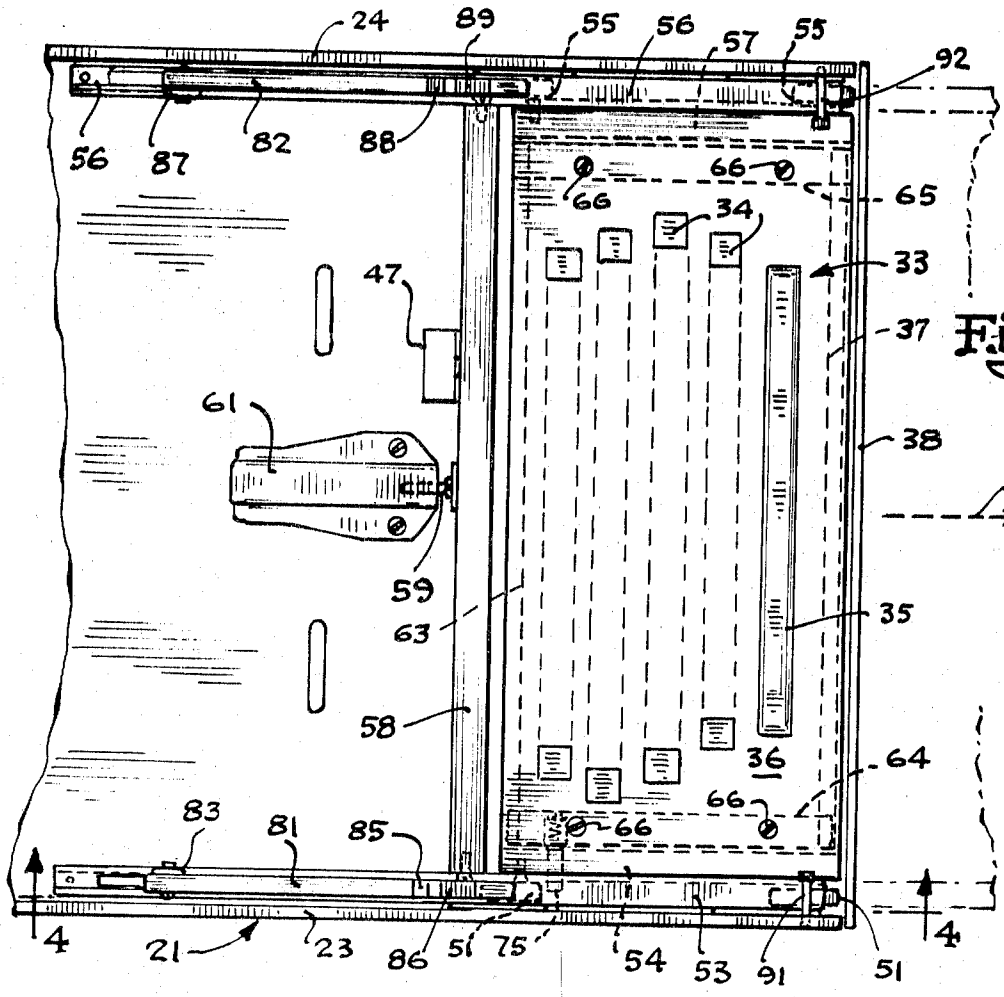
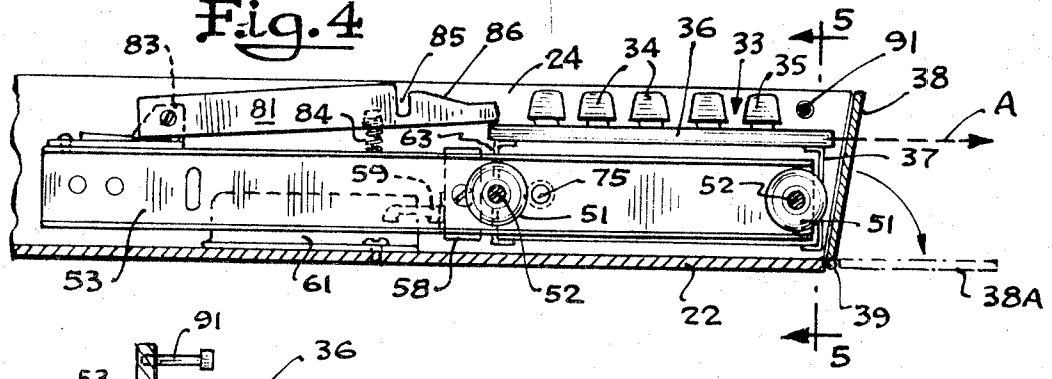


Fig.3

Fig.4



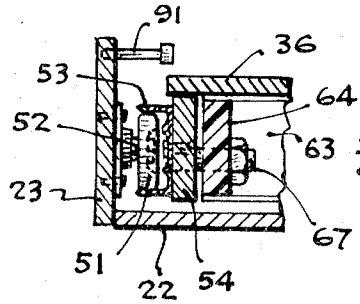


Fig.5

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Fig.6

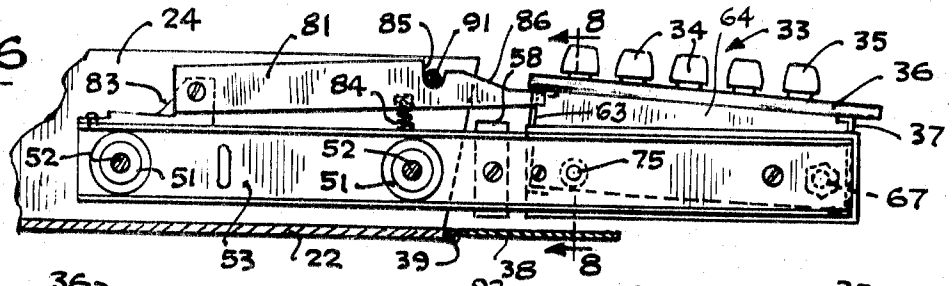
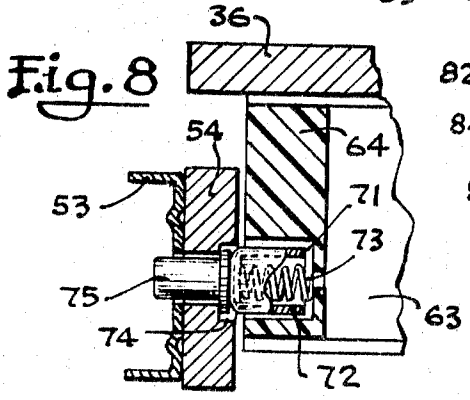


Fig.8



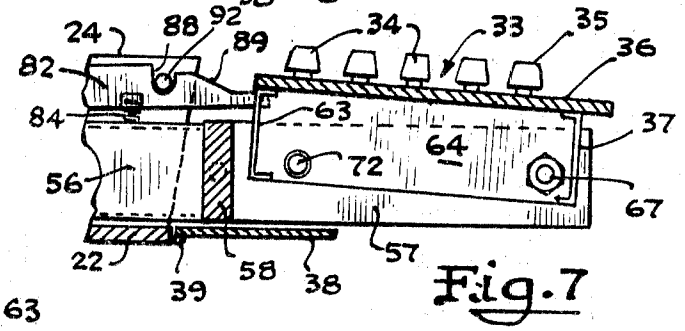


Fig.7

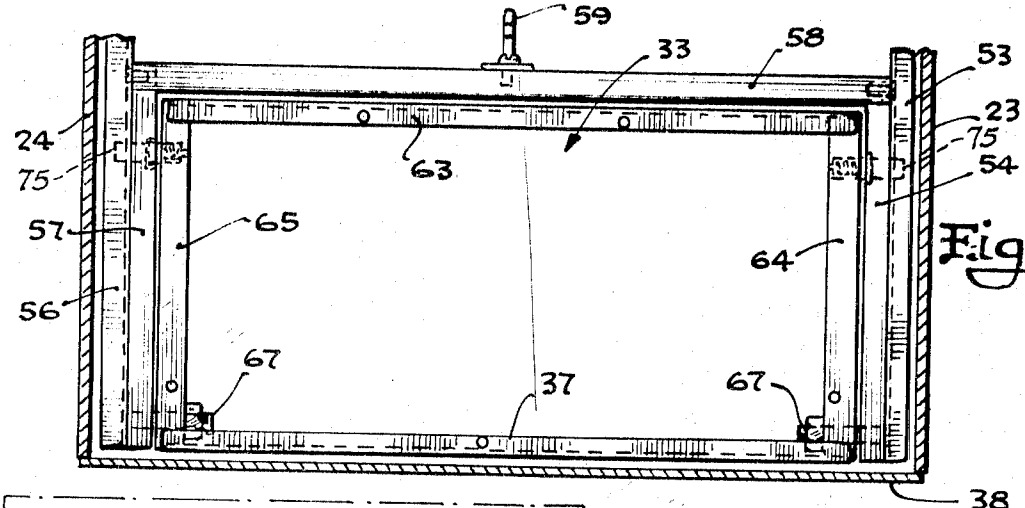


Fig.9

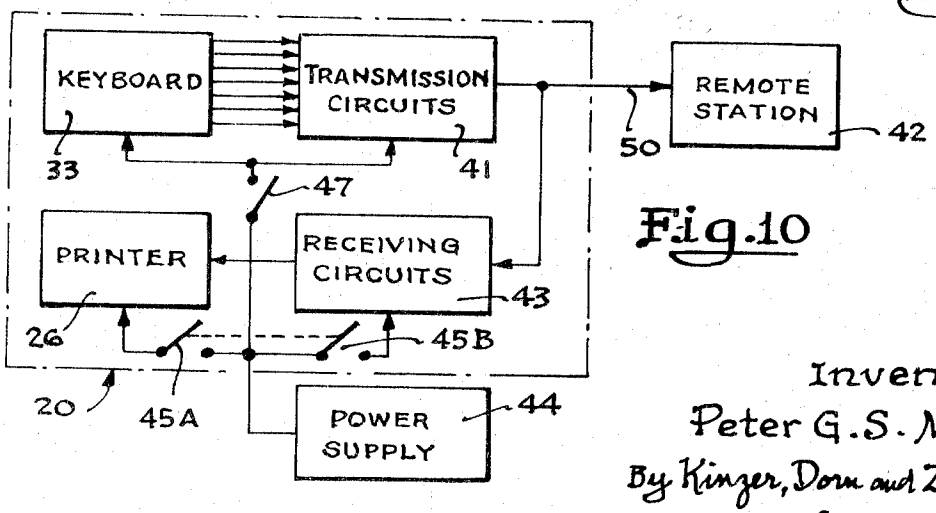


Fig.10

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TELEGRAPH TRANSCEIVER WITH RETRACTABLE KEYBOARD

BACKGROUND OF THE INVENTION

There are numerous applications in which a compact and relatively portable telegraph transceiver can be employed to advantage. In underdeveloped areas, a transceiver of this kind can be utilized as a local telegraph station under circumstances which may require changing the location of the telegraph station at regular or irregular intervals. In major construction projects, including road building and the construction of rail lines, a compact portable telegraph transceiver can afford a means for maintaining continuous written communication with a moving job site. Another application comprises local user stations, such as the offices of commercial and industrial organizations that require substantial telegraph service, with incoming messages predominating, but may be poorly set up for messenger access. In the latter, compact apparatus is highly important, and may permit multiple station installations impractical with conventional size equipment.

In many such applications for telegraph transceiver equipment, it may be necessary or desirable to change the immediate location of the telegraph equipment on relatively short notice, so that portable equipment can be quite advantageous. In virtually all such applications, the telegraph apparatus may be left unattended for substantial periods of time. When no operator is present, with conventional telegraph apparatus there is a substantial possibility that unauthorized personnel may attempt to operate the telegraph equipment or to experiment with it. The danger is increased if children or individuals unfamiliar with mechanical and electrical devices frequent the location of the telegraph equipment. Such persons may actuate the telegraph equipment in a manner that interferes with regular communications and may violate government regulations, furthermore, vulnerable parts of the telegraph apparatus, particularly the keyboard, may be damaged.

SUMMARY OF THE INVENTION

Accordingly, it is a principal object of the present invention to provide a new and improved high-speed telegraph transceiver that is readily protected against unauthorized use and against possible damage to the keyboard that could result from such use.

A specific object of the invention is to provide a new and improved compact high-speed portable telegraph transceiver in which the keyboard is fully retractable into the base of the transceiver to protect the transceiver against unauthorized operation and potential damage.

A specific object of the invention is to provide a new and improved compact high-speed telegraph transceiver with a fully retractable keyboard in which, when the keyboard is extended for operational use, the keyboard is tilted to a desired angle to facilitate its use.

A specific object of the invention is to provide a new and improved compact high-speed portable telegraph transceiver, having a retractable keyboard, that is relatively inexpensive in construction yet convenient and effective in operation.

Accordingly, the invention relates to a compact high-speed portable telegraph transceiver; the transceiver comprises a hollow base with a high-speed telegraph printing mechanism mounted on the base and with receiving circuit means for actuating the printing mechanism in response to a received electrical telegraph code signal, the receiving circuit means also being mounted on the base. The transceiver further comprises transmission circuit means for generating a telegraph code signal in response to electrical character and function signals supplied thereto from an electrical keyboard. An electrical keyboard is included in the transceiver and is electrically connected to the transmission circuit means. Keyboard mounting means are provided for mounting the keyboard on the base for movement between a retracted storage position, in which the keyboard is enclosed within the base, and an extended operating position, in which the keyboard projects outwardly of the front of the base sufficiently to afford full access to the keys of the keyboard. The keyboard mounting means comprises a keyboard support frame including a pair of support rails of generally C-shaped cross-sectional configuration, and two sets of rollers, one set mounted in each side of the base and each set of rollers encompassed by one of the support rails. The keyboard is mounted upon the keyboard support frame with one of the leading and trailing edges of the keyboard pivotally mounted on the aforesaid rails. Means, mounted on the support frame, are provided for supporting the other edge of the keyboard at an angle relative to the rails, when the keyboard is in its extended operating condition, with the trailing edge of the keyboard elevated a predetermined distance above its leading edge. Releasable latch means are provided for latching the keyboard in each of its storage and operating positions.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a high-speed portable telegraph transceiver constructed in accordance with one embodiment of the present invention, showing the keyboard in an extended operating position;

FIG. 2 is a front perspective view of the telegraph transceiver, with the keyboard in a retracted storage position;

FIG. 3 is a plan view of the base of the telegraph transceiver, with the printing mechanism and cover for the base removed and with the keyboard in the retracted storage position;

FIG. 4 is a sectional elevation view of the base of the telegraph transceiver, taken approximately along line 4—4 in FIG. 3;

FIG. 5 is a detail sectional view, taken approximately along line 5—5 in FIG. 4;

FIG 6 is sectional elevation view corresponding to FIG. 4 but with the keyboard in the extended operating position;

FIG. 7 is a detail view, similar to FIG. 6, with an additional part of the keyboard support cut away;

FIG. 8 is a detail sectional view of a latch employed to maintain the keyboard in an inclined alignment, taken approximately along line 8—8 in FIG. 6;

FIG. 9 is a detail bottom view of the keyboard in the retracted storage position; and

FIG. 10 is a simplified block diagram of the electrical components of the telegraph transceiver.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1 and 2 afford external views of a compact high-speed portable telegraph transceiver 20 con-

structed in accordance with a preferred embodiment of the present invention. Transceiver **20** comprises a hollow base **21** that includes a bottom plate **22**, left and right side walls **23** and **24**, a rear wall (not shown), and a cover **25**. The cover **25** is of inverted U-shaped configuration and fits over side walls **23** and **24**. The upper portion of the base cover **25** affords a platform upon which a high-speed telegraph printing mechanism **26** is mounted.

The telegraph printing mechanism **26** preferably comprises a dot matrix printing mechanism of the kind described and claimed in the co-pending application of Walter J. Zenner and Raymond E. Kranz, Ser. No. 71,051, filed Sept. 10, 1970, now U.S. Pat. No. 3,670,861 issued June 20, 1972, and including a printing head as disclosed and claimed in the co-pending application of W.J. Zenner and R. E. Kranz Ser. No. 85,675 filed Oct. 30, 1970. Details of the printing mechanism have not been illustrated in the drawing because they are not critical to the present invention. Other forms of printing apparatus can be utilized as desired. However, the dot matrix printer is particularly advantageous because it is inherently small in size and light in weight, yet efficient in operation and capable of sustained, efficient operation in a rugged environment.

A roll of paper **28** is mounted on the rear portion of base **21**, on cover **25**, behind printing mechanism **26**. The paper web **29** extends from roll **28** into printing mechanism **26**, through an opening **31** in the top cover for the printing mechanism **26**, and around a platen (not shown). The paper web **29** projects outwardly of the top of printing mechanism **26** after having received an imprint in printing mechanism **26**. The paper web **29** may be advanced across the platen by actuation of a knob **32** that is connected to the roller platen of the printing mechanism **26**; during normal operation, line feed advancement of the paper web **29** is effected by a suitable line feed mechanism incorporated in the printing mechanism **26**.

Transceiver **20** further comprises an electrical keyboard **33** including the usual complement of keys **34** and a space bar **35** mounted upon a keyboard support plate **36** (FIG. **1**). A front keyboard frame member **37** projects downwardly from the front of the keyboard support plate **36** and protects the lower portions of the keyboard **33**.

Transceiver **20** further comprises keyboard mounting means for mounting keyboard **33** on base **21** for movement between a retracted storage position, shown in FIG. **2**, in which the keyboard **33** is completely enclosed within base **21**, and an extended operating position, shown in FIG. **1**, in which keyboard **33** projects outwardly of the front of base **21** sufficiently to afford full access to the keys **34** of the keyboard **33**. The mounting means for keyboard **33** are described more fully hereafter in connection with FIGS. **3** through **9**. When keyboard **33** is in its retracted storage position, the front of base **21** is preferably closed by a closure member or door **38** mounted on the leading edge of the bottom wall **22** of base **21** by appropriate means such as a pair of hinges **39**. A lock (not shown) may be provided for door **38** if desired.

The basic electrical and operational components of transceiver **20** are shown in block diagram form in FIG. **10**. As shown in FIG. **10**, keyboard **33** is electrically connected to the transmission circuits **41**. Transmission circuits **41** comprise suitable encoding circuits and a distributor for generating a telegraph code signal in response to electrical character and function signals supplied thereto from keyboard **33** upon actuation of keys **34**. Preferably, the transmission circuits **41** are mounted in the rear portion of the transceiver base **21**, behind keyboard **33** (see FIG. **1**). The transmission circuits **41** are coupled, by an appropriate transmission line or other communication link **50**, to a remote station **42**, and thus afford a means for sending a telegraph message to station **42**.

Transceiver **20** further comprises receiving circuit means, shown as receiving circuits **43** (FIG. **10**) for actuating the printing mechanism **26** in response to a received electrical telegraph code signal. In this instance, the received signal originates at remote station **42** and is transmitted to transceiver **20** over link **50**. Transceiver **20** is connected to an external power supply **44**. The power supply **44** is connected to printer **26** and to receiving circuits **43** through ganged switches **45A** and **45B**. The power supply **44** is also connected to keyboard **33** and transmission circuits **41** through a switch **47**. Switch **47** may be controlled by the position of keyboard **33**, as described hereinafter.

The basic operation of transceiver **20** can readily be understood from FIGS. **1, 2** and **10**. When transceiver **20** is functioning as a receiver, keyboard **33** may be located in its retracted storage position within base **21** as shown in FIG. **2**. Any telegraph signal received from remote station **42** (FIG. **10**) is supplied to receiving circuits **43**, which actuate printing mechanism **26** to reproduce the telegraph message on paper web **29** (FIG. **2**). Operation can continue indefinitely, with all received messages being printed without requiring the attendance of an operator, as long as the power supply switches **45A** and **45B** (FIG. **10**) are closed. Thus, if the operator finds it necessary to leave transceiver **20** for an extended period of time, or if there is no regular assigned operator, as in circumstances where transmission is on a limited and irregular basis, transceiver **20** serves as an effective receiver without requiring attendance to its operation. Individual messages reproduced on the paper web **29** c can be torn off and passed on to interested parties, with no special skill required.

During any period in which transceiver **20** functions as a remote unattended receiver, as described above, keyboard **33** can be left in its retracted storage position, masked from view by the door **38** on base **21**. Unskilled and unauthorized personnel have no particular temptation to use the transceiver **20** for transmission of messages, since the keyboard **33** is not accessible and is well concealed. Thus, interference with operation of the telegraph system or potential damage to keyboard **33** are effectively eliminated. If considered necessary, the door **38** of base **21** can be provided with a lock to afford positive protection against unauthorized access to the keyboard **33**.

When it becomes necessary or desirable to send a message from transceiver **20** to remote station **42** (FIG. **10**), keyboard **33** is withdrawn from base **21** to its extended operating position as shown in FIG. **1**. Transceiver **20** is provided with latch means, described more fully hereinafter, for releasably locking the keyboard **33** in the extended position. With the keyboard **33** extended, the transceiver **20** is ready for actuation of transmission circuits **41** to send a telegraph message to a remote station such as station **42** (FIG. **10**). Preferably, the transceiver **20** is provided with an interlock to

actuate power switch 47 to closed condition and energize keyboard 33 and transmission circuits 41 whenever keyboard 33 is in its extended operating position (FIG. 1). The same interlock operates to open switch 47 (FIG. 10) when the keyboard 33 is returned to its retracted storage position, giving further assurance against accidental operation of the keyboard 33.

The keyboard mounting means for keyboard 33 can now be considered in detail. The mounting means for the keyboard 33, and the releasable latch means used to latch the keyboard 33 in its storage and operating positions, are shown in FIGS. 3 through 9.

As shown in FIGS. 3 and 4, a pair of rollers 51 are mounted upon shafts 52, the shafts 52 projecting inwardly as cantilever shafts from the side wall 23 of base 21. Rollers 51 are engaged by an elongated C-shaped support rail 53. A mounting block 54 is affixed to the forward end of support rail 53, as shown in FIGS. 3, 4, 5 and 9.

At the opposite side of base 21, a pair of rollers 55 are mounted on suitable shafts projecting inwardly of base 21 from side wall 24 directly opposite rollers 51. Rollers 55 are engaged by an elongated C-shaped keyboard support rail 56. At the forward end of rail 56, a mounting block 57 is affixed to the rail 56. A bar 58 is mounted between support rails 53 and 56, behind mounting blocks 54 and 57. At the center of bar 58, a latch lug 59 is mounted on the bar 58 (FIGS. 3 and 4). The latch lug 69 engages in a toggle latch mechanism 61.

Latch mechanism 61 is a spring actuated device of known construction and may, for example, conform to the construction shown in U.S. Pat. No. 2,637,576. When lug 59 is inserted into latch mechanism 61, moving from right to left opposite arrow A, as seen in FIGS. 3 and 4, the lug 59 is engaged by latch mechanism 61 and is firmly locked in position against any attempt to move the lug 59 in the direction of arrow A. To trip latch mechanism 61, lug 59 is again moved from right to left through a short distance; this releases the latch mechanism 61 and permits free movement of lug 59 and of the bar 58 and rails 53 and 56 to which it is connected, to the right in the direction of the arrow A.

Keyboard 33 includes a lower framework upon which the keyboard support plate 36 is mounted. This lower frame for the keyboard 33 comprises the front frame member 37 and a corresponding rear frame member 63; frame members 37 and 63 are C-shaped channel members as best shown in FIG. 7. A side frame member 64 extends between frame members 37 and 63 at the left-hand side of keyboard 33, adjacent mounting block 54. A similar side frame member 65 extends between frame members 37 and 63 at the other side of the keyboard 33, adjacent mounting block 57. The keyboard support plate 36 is affixed to frame members 64 and 65 by appropriate means such as the screws 66. Thus, frame members 37, 63, 64 and 65 afford a rigid rectangular framework underneath the support plate 36 of the keyboard 33.

The front end of the keyboard side frame member 64 is pivotally mounted upon mounting block 54 by means of a pivot pin 67, as shown in FIGS. 5, 6 and 7. A similar pivot connection is provided between the front end of keyboard frame member 65 and mounting block 57. Keyboard support plate 36 extends over the two mounting blocks 54 and 57, and is normally aligned flush with the tops of the two mounting blocks 54, 57 when keyboard 33 is in its retracted storage position (FIGS. 4 and 5). When the keyboard 33 is extended to its operating position, as shown in FIGS. 6 and 7, the rear edge of the keyboard 33 is tilted upwardly, pivoting about pin 67 and a corresponding pivot pin on the opposite side of the transceiver 20. Thus, when moved to its extended position, keyboard 33 can be inclined at an appropriate and convenient angle for manual actuation of keys 34 and space bar 35.

There is a latching mechanism to maintain keyboard 33 in the desired inclined alignment for manual operation when the keyboard 33 is in its extended operating position. This latching mechanism comprises two latches located at opposite sides of the keyboard 33; one of the latches is shown in detail in FIG. 8. As shown in FIG. 8, there is a recess 71 formed in the keyboard side frame member 64, near its inner end. A small latching plunger 72 is mounted in recess 71 and is urged outwardly thereof by a compression spring 73. Plunger 72 is aligned with a recess 74 in mounting block 54, in which an actuator plunger 75 is mounted. A corresponding construction is used at the opposite side of the keyboard 33.

When keyboard 33 is pivoted to the inclined alignment shown in FIGS. 6 and 7, the two small latching plungers 72, urged outwardly by the springs 73, engage in the recesses 74 and lock the keyboard 33 at the desired inclination for effective and convenient manual operation. When it is desired to return the keyboard 33 to its storage position, the two actuator plungers 75 are depressed, driving the locking plungers 72 out of the recesses 74 and allowing the keyboard 33 to return to its normal horizontal alignment, level with the tops of the mounting blocks 54 and 57.

For effective operation, it is also desirable to afford a positive latch to maintain keyboard 33 in its extended operating position. The latching mechanism utilized for this purpose comprises a pair of latching levers 81 and 82 (FIG. 3). As shown in FIG. 4, the inner end of lever 81 is pivotally mounted on a bracket 83 that is affixed to support rail 53. The outer end of lever 81 is biased upwardly by a spring 84. The upper surface of lever 81, at its outer end, forms a slot 85 with an inclined cam surface 86 located ahead of the slot 85. Lever 82 is similar in construction, being pivotally mounted at its inner end on a bracket 87 affixed to support rail 56. The leading end of lever 82 includes a slot 88 preceded by a cam surface 89, as shown in FIG. 7.

To extend keyboard 33 to its operating position, starting from the retracted storage position shown in FIG. 4, the door 38 is opened to the position 38A and the keyboard 33 is first moved a short distance in a direction opposite to arrow A to release latch mechanism 61. The spring action of latch mechanism 61 starts the keyboard 33 moving in the direction of arrow A, with support rails 53 and 56 rolling along rollers 52 and 55. If the spring impetus is insufficient, the operator can pull on the keyboard 33 to complete the movement of the keyboard 33 to the extended position shown in FIGS. 6 and 7.

As the keyboard 33 moves outwardly of base 21 in the direction of arrow A, the cam surfaces 86 and 89 on latching levers 81 and 82 engage two latch pins 91 and 92 mounted on side walls 23 and 24 of base 21 as shown in FIG. 3. When the two latch pins 91 and 92 engage the cam surface 86 and 89, respectively on the latch levers 81 and 82, the latch levers 81 and 82 are

depressed until the pins **91** and **92** come into alignment with the latch lever slots **85** and **88.** When this alignment is reached, the latch levers **81** and **82** are driven upwardly by their springs **84,** reaching the alignment shown in FIGS. **6** and **7** with the latch pins **91** and **92** maintaining keyboard **33** in the desired extended position. Once this position is reached, the operator is able to pivot keyboard **33** to the desired inclined operating position, in which it is latched as described above.

When keyboard **33** is to be returned to its retracted storage condition, the first step is to depress the elevation latch actuator plungers **75** (FIG. **8**), releasing keyboard **33** to return to horizontal alignment with support rails **53** and **56.** The operator then depresses the front ends of the latching levers **81** and **82** which are readily accessible (FIG. **1**). This moves the latch levers **81** and **82** free of pins **91** and **92.** The operator pushes the keyboard **33** in a direction opposite to arrow A (FIGS. **3** and **4**) back to its retracted storage position. As the keyboard **33** moves inwardly, with its support rails **53** and **56** moving along rollers **51** and **55,** the latch lug **59** is brought into engagement with latching mechanism **61.** At the same time an interlock switch **47** mounted in base **21** is engaged by bar **58,** opening the power supply connection to keyboard **33** and to the transmission circuits **41** of transceiver **20** (FIGS. **3** and **10**). Latch mechanism **61** engages lug **59** and holds the keyboard **33** in the desired storage position. The front cover **38** of base **21** can then be closed and the transceiver **20** is back in the storage condition illustrated in FIG. **2.**

I claim:

1. In a compact, high-speed portable telegraph transceiver comprising a hollow base, a high-speed telegraph printing mechanism, mounted on said base, receiving circuit means for actuating said printing mechanism in response to a received electrical telegraph code signal, mounted on said base, transmission circuit means for generating a telegraph code signal in response to electrical character and function signals supplied thereto from an electrical keyboard, mounted on said base; and an electrical keyboard, having a plurality of keys electrically connected to said transmission circuit means, the improvement comprising:

keyboard mounting means for mounting said keyboard on said base for movement between a retracted storage position in which said keyboard is enclosed within said base and an extended operating position in which said keyboard projects outwardly of the front of said base sufficiently to afford full access to the keys of said keyboard;

said keyboard mounting means comprising a keyboard support frame including a pair of support rails of generally C-shaped cross-sectional configuration and two sets of rollers, one set mounted in each side of said base and each set of rollers encompassed by one of said support rails;

said keyboard being mounted upon said keyboard support frame with one of the leading and trailing edges of said keyboard pivotally mounted on said rails;

means, mounted on said support frame, for supporting the other edge of said keyboard at an angle relative to said rails, when said keyboard is in its extended operating condition, with the trailing edge of said keyboard elevated a predetermined distance above its leading edge;

and releasable latch means for latching said keyboard in each of said storage and operating positions.

2. A compact, high-speed portable telegraph transceiver, according to claim **1,** and further comprising keyboard power means for supplying electrical power to said keyboard, and electrical interlock means for disconnecting said keyboard from said power means whenever said keyboard is in its retracted storage position.

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