March 22, 1960 B. HOWARD 2,929,872

TELEGRAPHIC PRINTING APPARATUS

Filed July 6, 1956 2 Sheets-Sheet 1

FIG.1

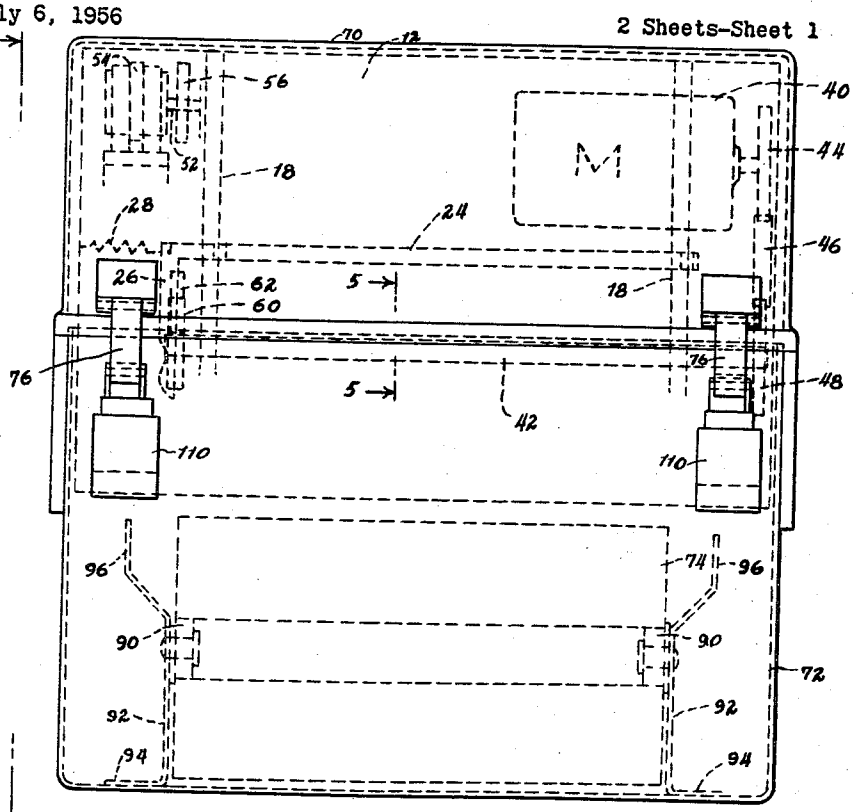


FIG.2

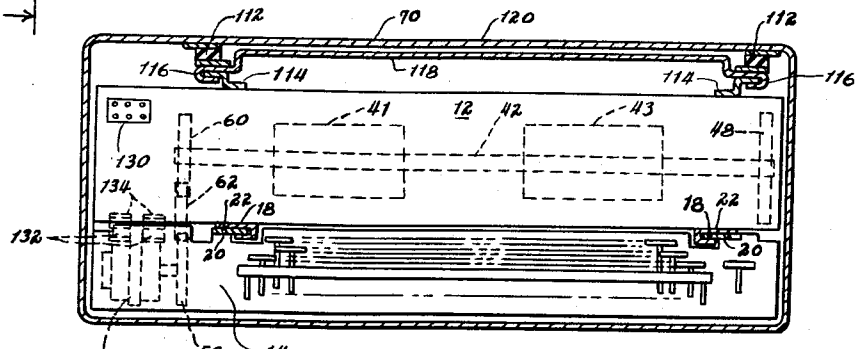
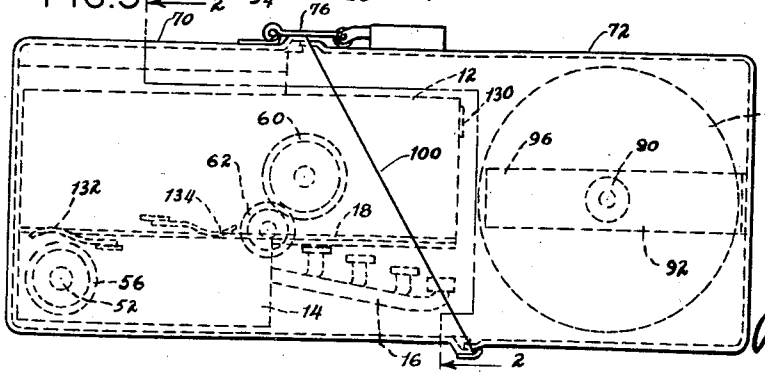


FIG.3



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March 22, 1960 B. HOWARD 2,929,872

TELEGRAPHIC PRINTING APPARATUS

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FIG.5

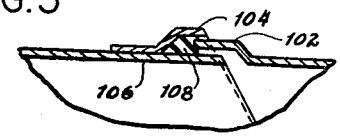


FIG.4

FIG.6

FIG.11

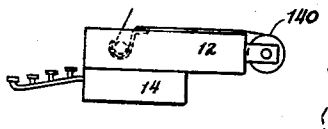


FIG.7

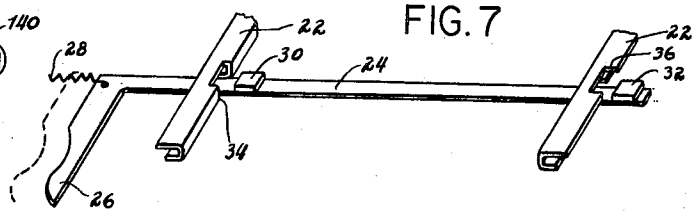


FIG.8

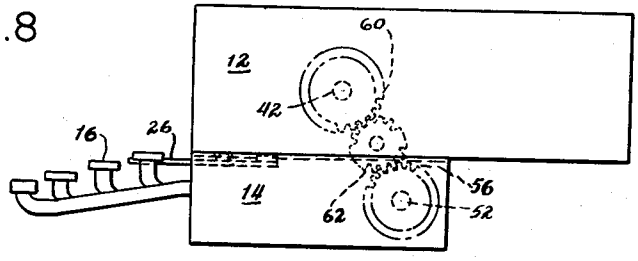


FIG.9

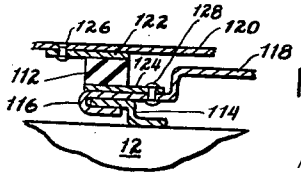


FIG.10

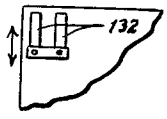
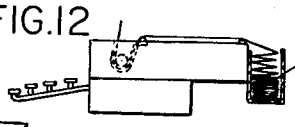


FIG.12



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Patented Mar. 22, 1960

2,929,872

TELEGRAPHIC PRINTING APPARATUS

Bernard Howard, Ramsey, N.J., assignor to Teleprinter Corporation, Hackensack, N.J., a corporation of New Jersey

Application July 6, 1956, Serial No. 596,294

14 Claims. (Cl. 178—17)

This invention relates to telegraphic printing apparatus, and more particularly to a combination of telegraph printer and keyboard transmitter.

The primary object of the present invention is to improve apparatus of the specified character. A more particular object is to provide such apparatus which will be compact and portable when not in use, and yet which provides a fully dimensioned and fully exposed keyboard when in use. A further object is to provide a protective casing with provision for a large paper roll, said paper roll being automatically moved between two different positions, one most favorable for portability when not in use, and the other most favorable for feeding paper into the printer when in use.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, my invention resides in the telegraph printer, keyboard transmitter, and casing therefor, and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings, in which:

Fig. 1 is a plan view of apparatus embodying features of my invention, with the case closed;

Fig. 2 is a transverse section taken approximately in the plane of the line 2—2 of Fig. 3;

Fig. 3 is an end view looking in the direction of the arrows 3—3 of Fig. 1;

Fig. 4 is an opposite end view, with the case in open positon, and with the keyboard exposed;

Fig. 5 is a fragmentary section, drawn to enlarged scale, and explanatory of a detail, this section being taken on the line 5—5 of Fig. 1;

Fig. 6 is a similar view of a modification, and also showing one of the hinges;

Fig. 7 is a perspective view explanatory of the detent mechanism for locking the keyboard in either forward or retracted position;

Fig. 8 is a view like Fig. 4, but with the case removed, and showing gears which are at the remote end;

Fig. 9 is a fragmentary section through one of the shockmounts, drawn to enlarged scale;

Fig. 10 shows slidable electrical contacts for connection between the transmitter and receiver;

Fig. 11 is explanatory of a modification; and

Fig. 12 is explanatory of another modification.

Referring to the drawing, and more particularly to Figs. 3, 4 and 8, I provide a telegraph printer generally designated 12, and a keyboard transmitter generally designated 14, the transmitter being disposed under the printer, and both having substantially the same fore-and-aft dimension. The forward part of the transmitter 14 is the keyboard 16. This may be of full size, with standard keys disposed at stndard spacing, despite the compactness of the complete apparatus. I further provide guide means generally designated 18, perhaps best shown in Figs. 1 and 2. The guide means is disposed between the printer and transmitter, and affords sliding movement of one relative to the other in fore-and-aft direction. Thus the transmitter 14 may be slid wholly beneath the printer 12 for compactness when not in use, as shown in Figs. 1 and 3, and may be slid forward until the keyboard is exposed ahead of the printer when the keyboard is in use, as shown in Figs. 4 and 8.

The transmitter 14 preferably has the same width as the printer 12, as will be seen in Fig. 2. The guide means 18 in the present case comprises horizontal bars or flat strips 20 secured to the transmitter, and channel-shaped or U section ways 22 secured to the printer. The ways face in opposite direction, thus holding the printer and transmitter against side-to-side movement and up-and-down movement, while affording the desired fore-and-aft movement.

The parts are preferably provided with a manually releasable detent means to lock the transmitter in either operative or inoperative position, and in the present case the detent means is associated with the guide means. Thus referring to Fig. 7, I provide a slide bar 24 having a forwardly projecting handle 26, and normally pulled to the left or locking position by a pull spring 28. The bar 24 is slidably mounted on the transmitter directly beneath the ways or channels 22. It is provided with a pair of detent blocks 30 and 32. The closed side of the left channel 22 is cut away or notched, as shown at 34, to receive the block 30, and the open side of the right channel or way 22 is cut away or notched, as shown at 36, to receive the block 32. It will be understood that each of the ways 22 has two such notches, one in forward position, corresponding to the operative position of the transmitter, and the other located nearer the rear of the printer, and corresponding to its retracted or inoperative position. The latter is shown in Fig. 1, in which the bar 24 has moved rearward with the transmitter and is in locking engagement with the guide means 18.

The printer 12 includes and is driven by a motor 40 (Figs. 1 and 4). This is a synchronous motor which is needed to distribute the received code pulses when the latter are recevied directly from a telegraph line, the motor being kept in synchronism with a motor at the remote transmitter. In the present case the motor 40 drives a main cam shaft 42 (Fig. 2) through a train of gearing 44, 46 and 48 (Figs. 1 and 4). The printer in this particular case is generally similar to that disclosed in my copending application Serial No. 432,877, filed May 27, 1954, and entitled "Telegraph Printer," except that in the present case the printer 12 has been disposed flatwise instead of edgewise, for the more compact relationship to the transmitter 14 here shown. As in said copending application, the main shaft 42 drives one or more of two sets of cams, generally designated 41 and 43 in Fig. 2 for the two sets.

The transmitter 14 also is motor driven, in order to feed out code pulses corresponding to the keys of the keyboard. For this purpose the transmitter comprises a shaft 52 (Fig. 1) carrying a series of cams 54, the number of which depends on the number of units or "level" of the code employed. It is most common to employ a five unit or "five level" code, in which case there may be six cams, one of which acts to transmit a synchronizing pulse. The shaft 52 is driven by a gear 56.

In the present apparatus the same motor 40 which drives the printer is used also to drive the transmitter. This saves weight, size, and cost, and also minimizes the synchronization problem. For the present purpose the motor 40 drives a gear 60 meshing with an idler 62 disposed in alignment with the gear 56 of the transmitter. With the particular printer here shown it is convenient to mount gear 60 on the main cam shaft 42 of the printer, but in effect, it is continuously driven by the motor 40. The gear 56 and idler 62 are so relatively located that they come into mesh, as shown in Fig. 8, when the keyboard is slid forward to operative position. (These gears are located at the remote end as viewed in Fig. 8.) When the keyboard is slid back to inoperative position, as

shown in Fig. 3, gear 56 is disengaged from idler 62, which is of advantage in reducing the load on the motor and the wear of parts, when using only the printer.

The printer and transmitter may be left exposed, as shown in Figs. 8, 11 and 12, or may be housed in a suitable case for portability. Such a case is shown in Figs. 1 through 6 of the drawing, referring to which it will be seen that the case comprises a rear portion 70 and a forward portion 72. The rear portion nearly encloses the printer 12 and transmitter 14 when the latter is retracted. The forward portion 72 finishes the enclosure and also houses a paper roll 74. In the present case it is desired to have a large supply of paper, and the roll 74 may have a diameter substantially equalling the combined height of the printer 12 and transmitter 14. The roll is disposed in front of the printer and transmitter when the case is closed, as shown in Fig. 3. However, the forward and rear portions are hinged at the top, as shown at 76, and when the forward part 72 of the case is turned upwardly and rearwardly to open position, as shown in Fig. 4, the paper roll 74 is disposed above and somewhat to the rear of the printer, which is a favorable position for feeding the paper web 78 to the printer. The paper is fed downward around a guide and paper feed roller 80, and thence upward and out of the printer, as shown at 82, where the printed message is visible. The message is printed by cooperation of a hammer 84 and a type cylinder 86, with a carbon or ink tape disposed between paper 82 and hammer 84. This arrangement is described in greater detail in my copending application Serial No. 662,371, filed May 29, 1957.

Reverting to Fig. 1, the paper roll 74 may turn on bearings 90 secured to resilient arms 92 mounted on the front end wall of the case at 94. These arms are extended and bent outwardly, as shown at 96, to facilitate bending the same apart when it is desired to add or remove a roll of paper from the bearings 90.

Reverting to Fig. 3, the parting plane between the forward and rear portions of the case preferably slopes rearwardly and upwardly, as shown at 100. This has the advantage of exposing the top forward portion of the printer, thereby facilitating the feed of paper from the paper roll into the printer, as shown in Fig. 4. This is done without lessening the area of the base on which the apparatus rests during use.

The meeting edges of the front and rear parts of the case may overlap somewhat, as shown at 102 in Fig. 6. For military purposes it may be desired to seal this joint, and a modification for that purpose is shown in Fig. 5 in which the rear part of the case is provided with a double lip 104, 106, between which rubber or like sealing material 108 is secured. The offset edge 102 of the front part of the case then bears against the sealing material 108, thereby sealing the case. It will be understood that the bottom, or the sides of the case near the bottom, are provided with suitable lock means to hold the two parts of the case tightly together, and also that handles, not shown, may be provided to facilitate carrying the apparatus. The hinges shown at 76 (Fig. 6) are preferably of the type having a link and spring connection which pulls the halves of the case together when the case is closed. The spring connection is housed at 110.

The printer is preferably mounted slidably in the case, thereby facilitating removal for servicing. The mount is preferably a shockmount. The resilient material for the shockmount is shown at 112 in Fig. 2, and is drawn to larger scale in Fig. 9. Referring thereto, the printer 12 carries a pair of rails 114 (only one shown in Fig. 9) received in reversely bent channels 116 preferably formed at the side edges of a plate 118. If a resilient mounting is not required the plate 118 may be secured directly to the top wall 120 of the case. If a resilient mount is wanted it is located between plate 118 and top 120. In the present case the resilient material 112 is permanently bonded to metal strips 122 and 124 (Fig. 9). These are offset to opposite sides, as shown, and the projecting part of strip 122 is secured to the top 120, as by spot welding, or rivets shown at 126. Similarly the offset part of strip 124 is secured to plate 118 by spot welding, or by rivets 128. The plate 118 is spaced downward somewhat from the top 120, in order not to interfere with any relative movement afforded by the resilient material 112.

Electrical connection to the printer 12 is made at a suitable socket located at the front of the printer. It is indicated at 130 in Fig. 2. This receives a multiple prong connector or jack which provides connections for power supply to the motor, connections for the reecived telegraph pulses, and connections for the transmitted telegraph pulses. It is common to employ separate lines for reception and transmission, and the connector 130 with six contacts is adequate for this purpose. Of course, the last-named connection should be made to the transmitter, rather than the printer, but for convenience a single connector is used, and a two-pole connection then is made between the printer and the transmitter.

This connection need be made only when the transmitter is pulled forward to operative position, and for this purpose the rear portion of the transmitter near its top surface has a pair of leaf spring contacts indicated at 132 in Figs. 3 and 10. The printer has a mating pair of contacts indicated at 134 in Fig. 3, these being located at the bottom of the printer at a point forward of the contacts 132. The relative position of the pairs of contacts is such that when the keyboard is pulled forward the contacts 132 reach and slide resiliently beneath the contacts 134, thus establishing external connection through the connector 130 (Fig. 2) to the telegraph line of the transmitter.

In the specific apparatus shown the printer is only 2⅜" high, the keyboard is 1½" high, and there is a 1/16" spacing therebetween. The total height is 3 15/16", but the case is made somewhat higher to provide a clearance of ⅛" all around, and to accommodate the shockmounts. Such a case will accommodate a paper roll 4½" in diameter. However, for many purposes, for example, for airplane use, a much smaller roll is adequate because of the short flight time, and an arrangement such as that shown in Fig. 11 may be used.

Fig. 11 shows a variant arrangement of paper roll in which the paper roll 140 is located behind the printer 12. This may be preferred in some cases, particularly when a smaller paper roll than shown in Figs. 1–4 is adequate.

Fig. 12 shows a variant in which paper is supplied from a zig-zag folded stack 142.

It is believed that the construction and method of use of my improved apparatus, as well as the advantages thereof, will be apparent from the foregoing detailed description of the same. It will also be apparent that while I have shown and described my invention in several preferred forms, changes may be made in the structures shown, without departing from the scope of the invention, as sought to be defined in the following claims.

I claim:

1. In combination, a telegraph printer and a keyboard transmitter for a telegraphic two-way communication system, said transmitter being disposed immediately under said printer and both having about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, and guide means on the top of the transmitter and on the bottom of the printer between said printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, whereby the transmitter including its keyboard may be slid beneath the printer for compactness when not in use, and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use.

2. In combination, a telegraph printer and a keyboard transmitter for a telegraphic two-way communication system, said transmitter being disposed immediately un-

der said printer and both having about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, and guide means on the top of the transmitter and on the bottom of the printer between said printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, whereby the transmitter including its keyboard may be slid beneath the printer for compactness when not in use, and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use, and manually releasable detent means to lock the printer and transmitter in desired relative positions.

3. In combination, a telegraph printer and a keyboard transmitter for a telegraphic two-way communication system, said transmitter being disposed immediately under said printer and both having substantially the same width and about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, and guide means on the top of the transmitter and on the bottom of the printer between said printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, said guide means comprising horizontal bars and ways receiving said bars, whereby the transmitter may be slid beneath the printer for compactness when not in use, and may be slid foward until the keyboard is exposed ahead of the printer when the transmitter is in use, and manually releasable detent means associated with the guide means to lock the printer and transmitter in either operative or inoperative position of the transmitter.

4. In combination, a telegraph printer and a keyboard transmitter for a telegraphic printing system, said transmitter being disposed under said printer and both having about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, a driving motor forming a part of said printer and serving to drive said printer, said transmitter having a shaft, a gear in said transmitter for driving said shaft, a gear in said printer driven by said motor, means affording relative movement of said printer and transmitter in fore-and-aft direction, whereby the transmitter may be moved beneath the printer for compactness when not in use and may be moved forward until the keyboard is exposed ahead of the printer when the transmitter is in use, the aforesaid gears of said transmitter and printer being so relatively located that they come into mesh when the keyboard is moved forward to operative position so that the printer motor serves also to drive the transmitter.

5. In combination, a telegraph printer and a keyboard transmitter for a telegraphic printing system, said transmitter being disposed under said printer and both having about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, a driving motor forming a part of said printer and serving to drive said printer, said transmitter having a cam shaft, a gear in said transmitter for driving said cam shaft, a gear in said printer driven by said motor, guide means between said printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, whereby the transmitter may be slid beneath the printer for compactness when not in use, and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use, and manually releasable detent means to lock the printer and transmitter in a desired relative position, the aforesaid gears of said transmitter and printer being so relatively located that they come into mesh when the keyboard is slid forward to operative position so that the printer motor serves also to drive the transmitter, and said gears being moved out of mesh when the keyboard is slid back to retracted position.

6. In combination, a telegraph printer and a keyboard transmitter for a telegraphic printing system, said transmitter being disposed under said printer and both having substantially the same width and about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, a driving motor forming a part of said printer and serving to drive a main cam shaft of said printer, said transmitter also having a cam shaft, a gear in said transmitter for driving said cam shaft, a gear in said printer driven by said motor, guide means between said printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, said guide means comprising horizontal bars and ways receiving said bars, whereby the transmitter may be slid beneath the printer for compactness when not in use and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use, manually releasable detent means associated with the guide means to lock the printer and transmitter in either operative or inoperative position of the transmitter, the aforesaid gears of said transmitter and printer being so relatively located that they come into mesh when the keyboard is slid forward to operative position, so that the printer motor serves also to drive the transmitter, and said gears being moved out of mesh when the keyboard is slid back to retracted position.

7. In combination, a telegraph printer and a case for housing the same, said printer being designed to receive its paper supply from above said case having a rear portion and a forward portion, said rear portion substantially enclosing the printer, said forward portion housing a paper roll disposed in front of said printer when the case is closed, said forward and rear portions being hinged at the top, the arrangement being such that when the case is open the paper roll is disposed above the printer and paper may be fed downwardly therefrom into the printer.

8. In combination, a telegraph printer and a keyboard transmitter and a case for housing the same, said case having a rear portion and a forward portion, said rear portion substantially enclosing the printer and transmitter, said forward portion housing a relatively large paper roll having a maximum diameter approaching the combined height of the printer and transmitter, said paper roll being disposed in front of said printer and transmitter when the case is closed, said forward and rear portions being hinged at the top, and the dividing plane between the forward and rear portions sloping rearwardly and upwardly, the arrangement being such that when the case is open the paper roll is disposed above the printer and paper may be fed therefrom into the printer.

9. In combination, a compact telegraph printer and a keyboard transmitter and a case for housing the same, said transmitter being disposed under said printer and both having about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, a driving motor forming a part of said printer and serving to drive said printer, said transmitter having a shaft, a gear in said transmitter for driving said shaft, a gear in said printer driven by said motor, guide means between said printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, whereby the transmitter may be slid beneath the printer for compactness when not in use and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use, the aforesaid gears of said transmitter and printer being so relatively located that they come into mesh when the keyboard is slid forward to operative position so that the printer motor serves also to drive the transmitter, said case having a rear portion and a forward portion, said rear portion substantially enclosing the printer and transmitter when the latter is retracted, said forward portion housing a paper roll disposed in front of said printer and retracted transmitter when the case is closed, said forward and rear portions being hinged at the top, the arrangement being such that when the case is open the paper roll is disposed above the printer and paper may be fed therefrom into the printer and the transmitter may be slid forward to expose the keyboard.

10. In combination, a compact telegraph printer and a keyboard transmitter and a case for housing the same, said transmitter being disposed under said printer and both having substantially the same width and about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, a driving motor forming a part of said printer and serving to drive said printer, said transmitter having a shaft, a gear in said transmitter for driving said shaft, a gear in said printer driven by said motor, guide means between said printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, whereby the transmitter may be slid beneath the printer for compactness when not in use and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use, and manually releasable detent means to lock the printer and transmitter in either operative or inoperative position of the transmitter, the aforesaid gears of said transmitter and printer being so relatively located that they come into mesh when the keyboard is slid forward to operative position so that the printer motor serves also to drive the transmitter, said gears being moved out of mesh when the keyboard is slid back to retracted position, said case having a rear portion and a forward portion, said rear portion substantially enclosing the printer and transmitter when the latter is retracted, said forward portion housing a paper roll disposed in front of said printer and retracted transmitter when the case is closed, said forward and rear portions being hinged at the top, the arrangement being such that when the case is open the paper roll is disposed above the printer and paper may be fed therefrom into the printer and the transmitter may be slid forward to expose the keyboard.

11. In combination, a compact telegraph printer and a keyboard transmitter and a case for housing the same, said transmitter being disposed under said printer and both having substantially the same width and about the same fore-and-aft dimension, the forward part of said transmitter being occupied by the keyboard, a driving motor forming a part of said printer and serving to drive said printer, said transmitter having a shaft, a gear in said transmitter for driving said shaft, a gear in said printer driven by said motor, guide means between said printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, whereby the transmitter may be slid beneath the printer for compactness when not in use and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use, and manually releasable detent means to lock the printer and transmitter in either operative or inoperative position of the transmitter, the aforesaid gears of said transmitter and printer being so relatively located that they come into mesh when the keyboard is slid forward to operative position so that the printer motor serves also to drive the transmitter, said gears being moved out of mesh when the keyboard is slid back to retracted position, said case having a rear portion and a forward portion, said rear portion substantially enclosing the printer and transmitter when the latter is retracted, said forward portion housing a relatively large paper roll having a maximum diameter approaching the combined height of the printer and transmitter, said paper roll being disposed in front of said printer and retracted transmitter when the case is closed, said forward and rear portions being hinged at the top, and the dividing plane between the forward and rear portions sloping rearwardly and upwardly, the arrangement being such that when the case is open the paper roll is disposed above the printer and paper may be fed therefrom into the printer and the transmitter may be slid forward to expose the keyboard.

12. In combination, a telegraph printer and a case for housing the same, said case having a rear portion and a forward portion, said rear portion substantially enclosing the printer, said forward portion housing a paper roll, said paper roll being disposed in front of said printer when the case is closed, said forward and rear portions being hinged at the top, and the dividing plane between the forward and rear portions sloping rearwardly and upwardly, said printer receiving paper fed downwardly into the forward part of the top of the printer, and the arrangement being such that when the case is open the paper roll is disposed above the printer and behind the forward part thereof so that paper may be fed downwardly from the roll into the printer.

13. In combination, a telegraph printer and a keyboard transmitter and a case for housing the same, said transmitter being disposed immediately under said printer and both having about the same fore-and-aft dimension, the forward part of the transmitter being occupied by the keyboard, and guide means on the top of the transmitter and on the bottom of the printer between the printer and transmitter affording sliding movement of one relative to the other in fore-and-aft direction, whereby the transmitter including its keyboard may be slid beneath the printer for compactness when not in use, and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use, said case having a rear portion and a forward portion, said rear portion substantially enclosing the printer and transmitter, said forward portion housing a paper roll, said paper roll being disposed in front of said printer and slid-back transmitter when the case is closed, said forward and rear portions being hinged at the top, and the dividing plane between the forward and rear portions sloping rearwardly and upwardly, said printer receiving paper fed downwardly into the forward part of the top of the printer, and the arrangement being such that when the case is open the paper roll is disposed above the printer and behind the forward part thereof so that paper may be fed downwardly from the roll into the printer.

14. In combination, a telegraph printer and a keyboard transmitter and a case for housing the same, said transmitter being disposed under said printer and both having about the same fore-and-aft dimension, the forward part of the transmitter being occupied by the keyboard, means affording sliding movement of said transmitter in fore-and-aft direction, whereby the transmitter including its keyboard may be slid beneath the printer for compactness when not in use, and may be slid forward until the keyboard is exposed ahead of the printer when the transmitter is in use, a driving motor forming a part of said printer and serving to drive said printer, said transmitter having a shaft, a gear in said transmitter for driving said shaft, a gear in said printer driven by said motor, the aforesaid gears of said transmitter and printer being so relatively located that they come into mesh when the keyboard is moved forward to operative position so that the printer motor serves also to drive the transmitter, said case having a rear portion and a forward portion, said rear portion substantially enclosing the printer and transmitter, said forward portion housing a paper roll, said paper roll being disposed in front of said printer and slid-back transmitter when the case is closed, said forward and rear portions being hinged at the top, and the dividing plane between the forward and rear portions sloping rearwardly and upwardly, said printer receiving paper fed downwardly into the forward part of the top of the printer, and the arrangement being such that when the case is open the paper roll is disposed above the printer and behind the forward part thereof so that paper may be fed downwardly from the roll into the printer.

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