Sept. 14, 1943. M. E. HANSON 2,329,531

TELEGRAPH TRANSMITTER

Filed May 5, 1942

Fig. 1

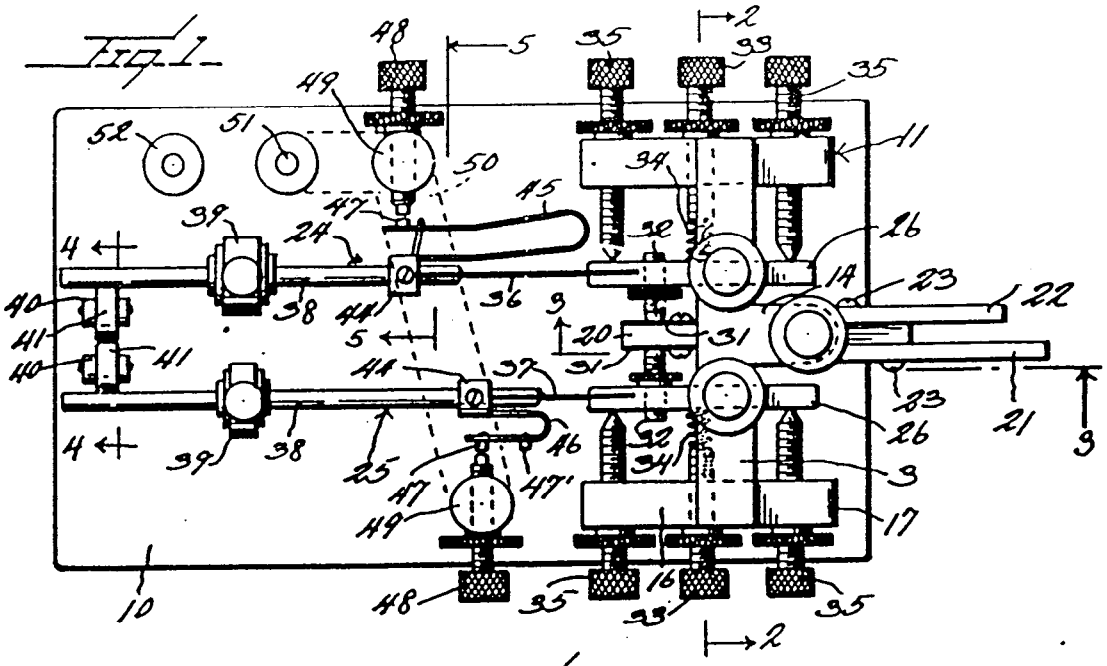


Fig. 5

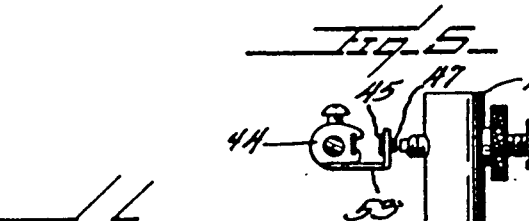


Fig. 2

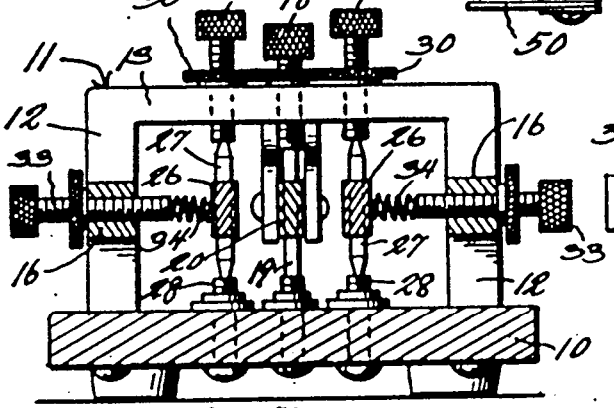


Fig. 3

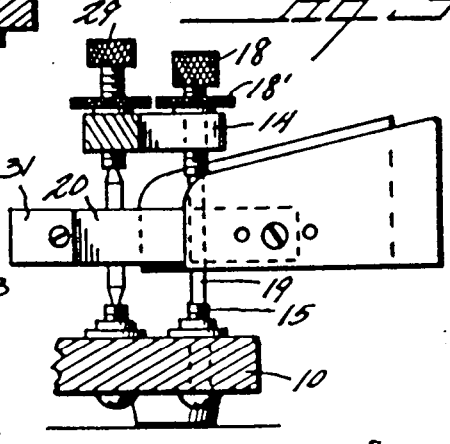
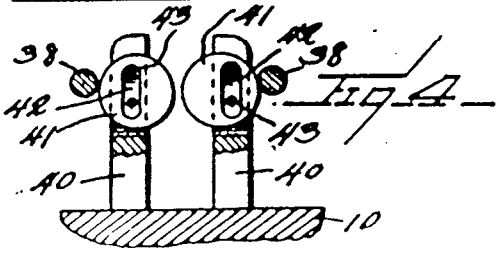


Fig. 4



Inventor

Melvin E. Hanson

By Coleman & Lawson

Attorneys

UNITED STATES PATENT OFFICE

2,329,531

TELEGRAPH TRANSMITTER

Melvin E. Hanson, Huntington Beach, Calif.

Application May 5, 1942, Serial No. 441,828

2 Claims. (Cl. 178—82)

This invention relates generally to telegraphers' keys and pertains particularly to keys of the type wherein dot and dash messages are sent automatically by sudden checking of the movement of a vibrator spring.

An object of the present invention is to provide a telegraph wherein a single key member or arm is employed for selectively imparting movement to adjacent pivotally mounted arms to which are connected contact carrying vibrator springs, whereby, by regulating the vibration period of each spring, both dots and dashes may be sent entirely automatically.

Another object of the invention is to provide a key construction employing a novel arrangement of a control key with respect to a pair of oscillating arms whereby actuation of the control key in one direction will effect the oscillation of one arm and oscillation of the other arm is effected by oscillating the control key in the opposite direction.

Still another object of the invention is to provide in a telegraph key employing a pair of vibrating contact carriers, means for varying the vibration period of each contact carrier, and a novel means for damping the carrier when the control key is moved out of operative conection therewith.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing, it being understood, however, that the invention is not to be considered as limited by the specific illustration or description but that such illustration and description constitute a preferred embodiment of the invention.

In the drawing:

Figure 1 is a view in top plan of the telegraph key embodying the present invention.

Figure 2 is a transverse section taken on the line 2—2 of Figure 1.

Figure 3 is a longitudinal section taken on the line 3—3 of Figure 1.

Figure 4 is sectional view taken substantially on the line 4—4 of Figure 1.

Fig. 5 is a transverse section taken on line 5—5 of Fig. 1.

Referring more particularly to the drawing, the base of the telegraph or transmitter is indicated generally by the numeral 10. This base may be made of metal or of any other suitable material.

At one end of the base there is mounted an inverted substantially U-shaped frame which is indicated generally by the numeral 11. This frame comprises the spaced vertical legs 12 and the horizontal bar 13 which connects the upper ends of the legs, as shown in Figure 2.

Integral with the bar 13 at the transverse center thereof is the short rearwardly extending stud 14 through which is formed vertically a threaded screw passage, not shown. Directly beneath the passage of the stud 14 the base 10 supports a foot bearing 15 which is aligned with the aperture of the stud for the purpose hereinafter described.

Each of the legs 12 has formed integrally therewith, in spaced relation with the base 10, the forwardly and rearwardly extending aligned studs 16 and 17, respectively, and the studs of one side are at the same elevation as those at the other side.

Threaded through the stud 14 is a key pivot screw 18, the lower end of which is suitably recessed, not shown, to receive the pointed upper end of the key pivot shaft 19, the lower end of which engages in the foot bearing 15, as shown in Figure 3. This shaft passes through and is secured to the short horizontally disposed key bar 20 and this bar has secured against the opposite faces of the rear end portion thereof the two key wings 21 and 22 which are adjustably secured to the key bar by screws 23. The right hand wing 22 is set slightly forwardly of the left hand wing 21, as shown in Figures 1 and 3, the wing 21 being engaged by the operator's thumb while the other wing is engaged by the forefinger. This offset relation of the wings makes possible the actuation of the key bar with a maximum of comfort.

The numerals 24 and 25 designate dash and dot producing oscillating arms, respectively. At the rear end of each arm is a shank 26 which is disposed at one side of and in spaced parallel relation with the key bar 20. These shanks are in the form of short bars and each extends through the frame 11 and is oscillatably supported upon a vertical pivot shaft 27. These shafts rest at their lower ends upon foot bearing screws which are threaded through the bottom or base of the instrument and are indicated by the numeral 28, while at their upper ends they are pivotally coupled with the adjustable pivot screws 29 which are threaded through the bar 13. Each of these pivot screws carries a lock nut 30 by which it is held in the necessary position of adjustment. The key pivot screw 18 is likewise secured by a locking nut which is indicated by the numeral 18'.

Upon each side of the key bar 20, at the forward end of the bar, is secured a contact plate 31

and each arm shank 26 carries forwardly of its pivot 27 a stop screw 32 which bears against the adjacent contact plate 31, as shown in Figure 1. Thus it will be seen that when the key bar 20 is oscillated on its pivot shaft 19 a lateral thrust will be given thereby to the adjacent arm shank 26 to swing the forward ends of the same laterally.

The frame 11 carries at each side the horizontal spring tensioning screw 33 which is positioned slightly forwardly of the pivot for and in the horizontal plane of the adjacent arm shank 26. Between the inner end of each screw 33 and the adjacent arm shank 26 is interposed an expansion spring 34 which engages against the side of the adjacent bar 26 and urges it to move toward the key bar 20.

Upon opposite sides of the spring tensioning screw are the horizontal movement limiting screws 35 which are threaded through and supported by the studs 16 and 17, as shown in Figure 1. The rear limiting screw for each arm shank 26 has the rear end of the shank constantly pressed thereagainst, while the forward screw 35 has its end slightly spaced from the forward end of the arm shank.

The forward end of the shank 26 of arm 24 has secured thereto one end of a relatively long ribbon spring 36, while the opposite arm 25 has the forward end of the shank portion 26 connected with an end of a shorter ribbon spring 37. These springs at their forward ends are connected with bars 38 which are supported by these springs for horizontal oscillatory movement. These bars 38 carry balance weights 39 which are adjustably secured on the bars as shown.

Between the forward ends of the weight bars 38 are disposed two posts 40 each of which is bifurcated at its upper end and in the bifurcation of each post is disposed a braking or damping device in the form of a metallic disk 41 which is slotted, as indicated at 42, and has extending through the slot thereof the two pins 43 which are disposed one above the other and extend across the bifurcation of the post. The bars 38 bear against these damping devices, as shown in Figure 1, and such devices, being suspended slightly off-center and bearing lightly against the bars 38 cause the arms to always get the same start on each initial movement.

Mounted upon the rear end portion of each bar 38 is an adjustable member 44 which has secured to its outer side one leg of a horizontally disposed, substantially U-shaped contact carrying spring. The spring carried by the arm 24 is indicated by the numeral 45, while the spring carried by the arm 25 is of materially less length than the spring 45 and is indicated by the numeral 46.

The ribbon spring 36 may be a little more than twice the length of the spring 37 and also the spring 45 is about twice the length of the spring 46. The spring 45 is the dash sending transmitter of the instrument, while the spring 46 is the dot sending transmitter. Each of these springs is a contact spring and carries at the extremity of the free leg thereof a contact 47 which is adapted to have intermittent contact with the contact screw 48 mounted upon and extending through the terminal post 49 which is mounted on and insulated from the base 10.

The terminal posts 49 are electrically coupled together by a current carrier disposed beneath the base and shown in dotted outline in Figure 1, such carrier being indicated by the numeral 50, and this carrier is in turn electrically connected with the terminal post 51 which is mounted on and insulated from the base 10. Adjacent the post 51 is a second terminal 52 which is electrically connected with the base. These terminal posts 51 and 52 serve for the connection of current carrying wires with the instrument.

In the present instrument a single key piece only is employed, this being the bar 20 having the wings 21 and 22 attached thereto. By oscillating this bar upon the pivot 19 it will be seen that lateral thrust may be alternately given to the forward ends of the shanks 26 of the two arms 24 and 25. Because of the construction of these two arms it is possible to automatically send dashes as well as dots. In sending "dots" the operator forces the wing 21 of the key to the right which swings the forward end of the bar 38 away from the damping device and brings the forward end of the shank 26 of the arm 25 in contact with the forward stop screw 35. This sets up vibrations in the springs 37 and 46 so as to cause the contact 47 to rapidly make and break engagement with the adjacent screw 48, thus causing a series of "dots" to be sent along the wire in a known manner. These "dots" will continue to be sent until the resistance and friction overcome the vibration and provided the operator holds the key in the position to which it was initially put. The same action is obtained by forcing the key unit to the left by applying the necessary pressure to the wing 22, except that because of the length of the springs 36 and 45 the vibrations are slower or more prolonged so that the period of contact between the contact piece 47 of the spring 45 and the adjacent terminal screw 48 will be longer.

Because of the novel construction of the present instrument it will be readily apparent that there is no chance of sending a dot where a dash is intended, or of sending a dash where a dot is intended, and by providing the single key upon an oscillation pivot, working between the shanks of the two arms, it will be readily seen that the desired movement can be imparted to the arms with a minimum of motion of the fingers.

In order to provide for an increasing of the operating or sending speed of the dot sender, there may be provided a second contact upon the spring 46, as indicated at 47'. This second contact is placed near the bend of the spring and because of its position serves to increase the spring tension or resistance between the contact screw and the point of contact on the spring in such a manner that with proper adjustment of the weight 39 on the arm bar 38 it is possible to cover fully the speed range of the key from the position of highest speed with weight on and speed or rate of vibration with the weight off. In an ordinary type of vibrating bar that is designed to form dots there is a severe or extreme jump in speed when the weight is removed. With this type of contact spring carrying the two points 47 and 47', one at the tip of the free arm of the spring and the other at a position near the bend of the spring, when a slight increase in speed is desired over that obtained when the weight is adjusted for highest speed while on the vibrating bar, the weight may be slid out of the way and the contact spring 46 shifted forwardly along the bar until the second contact point is opposite the contact screw 48. The spring 46 is then locked in position and the weight readjusted on the bar for the slight increase desired. This, together with the readjustment of the contact screw not only does away with the sharp in-

crease or jump in speed but provides a much higher frequency of vibration if such is desired and greater range of speed.

In addition to the foregoing, by providing the two contact points upon the spring, another contact may be brought into use quickly should the operator be confronted with a "bad" or missing point at a critical moment, as a result of point corrosion or burning from arcing between the key points. This is a situation which sometimes develops. While this advantage is not of such great importance as the advantage to be had from the provision of the second contact so as to provide for changing the operating or sending speed, it will be apparent that it is a very desirable feature.

Another advantage of the present sending device is its flexibility or variableness of operation or performance. The instrument may be adjusted for "tape" sending, by which is meant a perfect relationship between the dots and dashes as internationally recognized, and may also be adjusted according to the personal preference of the operator. Many operators could send a maximum of twenty-five words per minute with the key adjusted for tape sending, but if the dashes were slowed down slightly in relation to the dots they could increase their speed by, perhaps, ten to fifteen words per minute. This is a distinct advantage over a key that permits no resiliency in adjustment or is not variable. Also, under certain conditions, such as atmospheric (static crashes) and interference from radio stations on or near the same frequency, a receiving operator may request that the sending operator adjust his speed for "heavy" dots and form his dashes in a "heavy" manner so as to enable the code signals to carry through better. With other types of sending instruments this could only be done where the dashes are formed individually and by a separate movement of the hands, whereas with the present instrument such "heavy" dots may be sent automatically after the necessary adjustment of the instrument has been made.

The adjustable member 44 carrying the spring arm 45 also carries the laterally and upwardly extending movement limiting finger 53, as shown in Figure 5, which engages across the outer side of the free portion or leg of the spring 45. This serves to make variable the tension of the dash contact spring against the contact screw 48 by providing a stop for the dash contact spring and, in conjunction with the spring and the adjacent contact screw, makes it possible to obtain the proper relationship between these various parts to dampen or brake extra vibration of the contact spring when the key bar 20 is released.

What is claimed is:

1. A telegraph transmitter comprising a base, a substantially U-shaped inverted frame disposed vertically on the base and having spaced side posts and a transverse top bar, a pair of spaced parallel arms each having a rear shank portion, an intermediate vibration spring and a forward bar connected with the spring, one of said vibration springs being at least twice as long as the other spring, vertical pivot means connecting each arm shank between the frame bar and the base, a horizontally disposed key bar between said shanks, a vertical pivot means connecting the key bar between the frame bar and base, means upon an end of the key bar facilitating its oscillation between said shanks, means adjacent the other end of the key bar facilitating application of lateral thrust selectively to the arm shanks to facilitate oscillation of the arms, a member adjustably secured to each arm bar, a horizontally disposed substantially U-shaped spring secured at one end to that member supported upon the arm having the shorter vibration spring, a substantially U-shaped horizontally disposed spring secured at one end to the other member and having a materially greater length than the first spring, a contact carried adjacent the other end of the longer U-shaped spring, a fixed contact screw operatively positioned with respect to the contact of the longer U-shaped spring, a fixed contact screw operatively positioned adjacent the free end of the shorter U-shaped spring, a pair of contact members carried upon the free end of the shorter U-shaped spring for selective coaction with the adjacent fixed contact by shifting of the adjustable member carrying the shorter U-shaped spring, said U-shaped springs and fixed contacts being upon the remote sides of the carrying arms.

2. A telegraph transmitter as set forth in claim 1, including a laterally and upwardly extending finger carried by the adjustable member carrying the longer U-shaped spring and extending across the remote side of the free end of the said longer U-shaped spring to limit movement of the contact thereof toward the adjacent fixed contact under the inherent resilient action of the spring.

MELVIN E. HANSON.