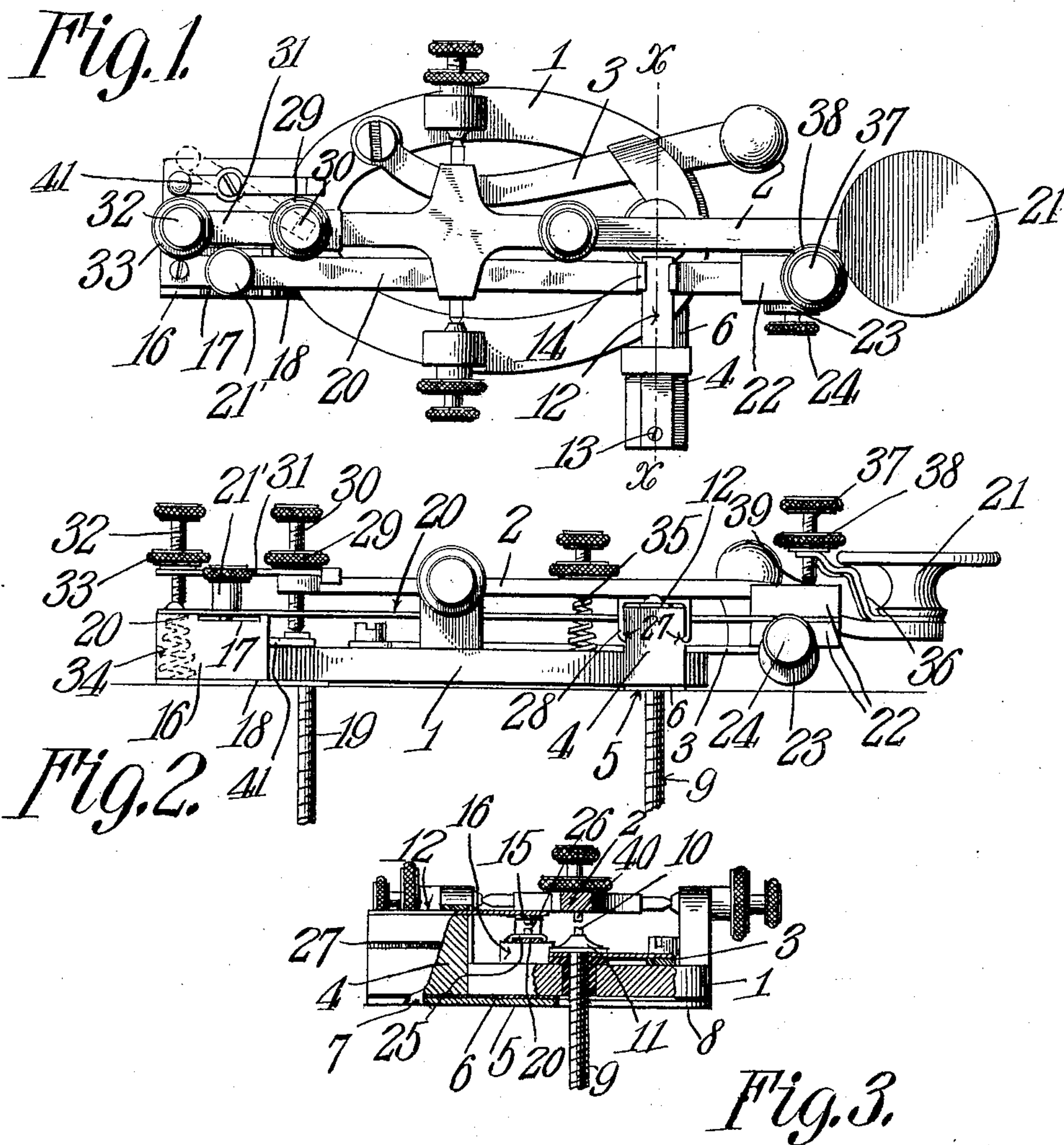


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TELEGRAPHIC KEY OR TRANSMITTER.  
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Patented Feb. 9, 1909.



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# UNITED STATES PATENT OFFICE.

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## TELEGRAPHIC KEY OR TRANSMITTER.

No. 912,029.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, HARLIE O. PUTT, a citizen of the United States, residing at Millbury, in the county of Wood and State of Ohio, have invented a new and useful Telegraphic Key or Transmitter, of which the following is a specification.

This invention has reference to improvements in telegraphic keys or transmitters, and is designed to produce a key in which the long contacts representing dashes are made by the closing of the circuit in the usual manner while the short contacts representing dots are automatically produced when the key contacts are open by the raising of the knob of the key.

In accordance with the present invention the key lever is depressed in the usual manner for the dashes, but when raised another set of contacts is actuated to cause any desired number of rapid closures of the circuit to produce the dot impulses, and this number of closures which may occur is entirely within the volition of the operator.

The invention comprises essentially, in addition to the usual transmitter structure, a circuit terminal which may be located to one side of the usual contact points and in conjunction with this circuit terminal is another circuit terminal carried by a spring capable of rapid vibration when once set in motion, and this last-named spring and contact, as well as the first-named supplemental contact, are arranged to complete the circuit when they are brought together, suitable platinum points being employed like those usually provided on the transmitter key. Furthermore, provision is made for the several adjustments necessary for the new conditions present to suit the desires of different operators, and also for the proper operation of the attachments to the key.

In carrying out the invention a key lever of the ordinary type is provided with a spring operating in opposition to the usual spring so that the key lever may be adjusted to a position of equilibrium from which it may be moved to complete the circuit in the usual manner and to which position it will return when relieved from the pressure of the finger of the operator. But at the same time this key lever is capable of a further movement in opposition to the movement producing the closure of the circuit, and the usual back-stop may be adjusted to limit this extra movement.

The spring carrying the supplemental contact for the production of the dot impulses is provided with a weighted end, in conjunction with which there is provided another back stop carried by the knob end of the key lever so that when the key lever is depressed in the normal operation of closing the circuit the spring-carried contact participates in this movement without, however, closing any circuit. When the key lever is returned to its normal neutral position the spring-carried contact follows it, but still does not close the supplemental circuit. When, however, the key lever is elevated to the extent permitted by its back-stop and against the action of the equalizing spring, then the weighted spring carrying the supplemental contact is free to move to a greater extent than before, and the supplemental back-stop carried by the knob end of the key lever is under these conditions out of its path, so that the weighted spring will continue its free movement and the supplemental contacts will ultimately be brought together. This serves to arrest the movement of the spring, but the weighted end has already carried it beyond its neutral point and the reaction will cause the spring to separate the supplemental contacts to a greater extent than under normal conditions when the reaction of the weight is again effective but in the opposite sense, and the spring is caused to travel in the first direction until the supplemental contacts again close the circuit. This movement will continue for an appreciable length of time and the time is ample to permit a number of closures of the circuit sufficient to encompass the longest number of dot impulses included in any code signal.

In the ordinary process of telegraphing, each dot signal necessitates a downward movement of the hand of the operator the same as a dash signal requires, except with the dash signal there is a slight pause before the hand of the operator is again raised. In the present invention the hand of the operator moves downward as before to cause the dash signal but on the up-stroke the hand is held stationary, slightly lifting the key until its regular back-stop arrests further lifting movement, and the weighted spring with the supplemental contact will cause a rapid succession of dot impulses to be sent to line and the number of these dot impulses will depend upon the desire of the



operator. The fatigue of telegraphic transmission is thus very largely reduced since the numerous dot impulses are entirely cut out so far as the movements of the operator's hand are concerned. Because of this and because these dot impulses may be sent with far greater rapidity than when the hand of the operator participates in the movements, the speed of transmission is correspondingly augmented, while the new movements necessary for the sending of messages by the improved key or transmitter are readily learned.

The improvements may be in the form of attachments to ordinary keys without changing the structure of the latter in the slightest, or they may be built into keys originally.

The invention will be best understood from the following detail description taken in connection with the accompanying drawings forming a part of this specification, in which drawings,—

Figure 1 is a plan view of a telegraphic transmitter with the attachments applied. Fig. 2 is a side elevation of the same. Fig. 3 is a cross section on the line  $x-x$  of Fig. 1, with parts in elevation.

Referring to the figures, there is shown the base 1 of an ordinary telegraphic transmitter key, upon which is mounted the key lever 2 in the usual manner, and the usual cutout switch or lever 3 is likewise shown. In fact, the key does not differ in any respect from that of the ordinary commercial form of telegraphic transmitter of the leg pattern and, therefore, need not be described in detail.

There is provided a block 4 which may be a solid block if so desired, or may be made otherwise, and this block carries a plate 6 which may be of suitable insulating material. As shown in Fig. 3, the sheet 6 is secured to the block 4 by means of screws 7 which serve to put the plate 5 in electrical connection with the block 4. The plate with the insulation extends to one side of the block 4 and is therefore provided with a longitudinal slot 8 extending from one edge a sufficient distance into the body of the plate and insulating sheet 6. The plate 5 is designed to be introduced under the base 1 of the key so as to straddle the threaded leg 9 carrying the usual terminal point 10 on the head or anvil 11, and the slot 8 is of such size that the sides of the plate 5 may make electrical contact with the leg 9. This plate 5 is of sufficient area to form a support for the front of the base 1, and when the instrument is screwed to a table by the usual thumb screw applied to the leg 9 the plate 5 is firmly clamped in place, thus securing the block 4 in proper relation to the base 1.

Fast on top of the block 4 is a leaf spring 12 secured by a screw 13 and extending nearly to the key lever 2, at which point

the spring terminates and there carries a clip 14 terminating on the under side in a platinum or other point 15, such as is used upon telegraphic keys and corresponding to the contact point 10. At the back of the base 1 there is another block 16 which may be similar to the block 4, except that upon the upper edge there is formed a recess 17. This block is provided with a bottom extension 18 which may be made in one piece with the block or may be separately secured thereto, and this extension 18 is introduced under the base 1 and straddles the other threaded leg 19 of the instrument and is clamped to the table when the instrument is fastened by the usual thumb screw applied to the leg 19.

Fast upon the block 16 is the rear end of a spring blade 20 extending nearly to the knob 21 of the key lever. Passing through the spring 20 at a point about midway of the length of the slot 17 is a thumb screw 21' entering the block 16, and the arrangement is such that by screwing up or unscrewing the thumb screw 21 the front end of the spring blade 20 may be elevated or depressed. The front end of the spring blade 20 carries a weight which may be in the form of two blocks 22, one on each side of the blade and secured thereto in any appropriate manner.

Fast to the lower block 22 is a disk 23 secured to the block by means of a thumb screw 24 passing eccentrically through the disk 23 and tapped into the block. By this means the disk 23 may be made fast to the block in any position of adjustment around the axis of the screw 24. The purpose of this arrangement will appear further on.

Fast on the spring blade 20 is a clip 25 carrying a contact point 26, so located as to be in close relation to the point 15 on the spring 12.

The block 4 is provided with longitudinal side grooves 27, one on each side and in substantially the same plane, and these grooves receive the ends of a saddle clip 28 so arranged as to engage over the spring 12 and cause the contact end thereof to be rendered stiffer when the clip is moved toward it, and when the clip is moved away from the free end of the spring, it is made effectively longer and more elastic. Thus the clip 28 serves to vary the elasticity of the spring as may be desirable.

Fast on the rear end of the lever 2 by means of the clamp nut 29 of the back stop screw 30 is a plate 31 carrying on its rear-most end a set screw 32 and clamp nut 33 therefor, and this screw 32 has under its control a spring 34 like the usual spring 35 of the key but operating in opposition thereto since it is on the opposite side of the trunnions of the key.

Secured to the front end of the key lever



2 by the knob 21 is a bracket 36 carrying a back-stop screw 37, and its set nut 38. The lower end of the back-stop screw 37 may be provided with an elastic or other buffer piece 39.

The two springs 34 and 35 are so adjusted that the key lever is in a normally neutral position, say about horizontal, in which position the terminal point 10 and its counterpart 40 carried by the key lever are in the proper relation suited to the individual operator so that on a downward movement of the key these two terminals or points 10 and 40 will come in contact and so complete the circuit to line in the usual manner. The spring blade 20 is so adjusted and the back-stop screw 37 is also so adjusted that in this position of the parts the blocks 22 will just engage said back-stop 37 and the eccentric disk 23 is so adjusted that it will strike the table upon which the key is mounted, when the contacts 10 and 40 are in engagement to complete the circuit at this point. With a key so adjusted telegraphic messages may be sent in the usual manner. Now by adjusting the back-stop screw 30 so that when the lever 2 is in a position of equilibrium this back-stop is out of contact with the base it will permit a further upward movement of the knob end of the key lever. Then the knob end of the key lever may be lifted by the hand of the operator so that the key lever has a longer path to travel than under ordinary use. When the key lever is depressed to complete the circuit between the contacts 10 and 40 and is then lifted to the full extent permitted by the back-stop 30, then the resiliency of the spring blade 20 which is bent when the key is depressed will cause the blocks 22 to travel upward, and thus being unresisted by the back-stop 37 now lifted out of their path, will by their inertia carry the spring blade beyond the neutral point until the resistance of the spring blade to further bending overcomes the inertia, and these blocks will then return toward the depressed position and again fly upward and so the spring blade is vibrated for a considerable number of times.

The clip 28 is properly adjusted on the spring 12 and the range of movement of the spring is such that the contact 15 is in operative relation to the contact 25 when the spring blade is free to vibrate, as described, and the circuit will be closed for short periods of time intermittently so long as the spring blade 20 is permitted to vibrate and has a sufficiently extensive range of oscillation.

Now, assume that the parts are all suitably adjusted and it is desired to send telegraphic messages. The depression of the key lever will cause dash signals to be sent, and when the key lever is elevated to the uppermost limit of its travel, then the vibra-

tory action of the spring blade 20 will cause dot signals to be sent, and these dot signals will follow one another in rapid succession and continue so long as the key lever is in the elevated position, and the oscillatory movement of the spring blade is sufficient to close the circuit between the contacts 15 and 25. Suppose the operator desires to send the letter "B" which is represented by a dash and three dots in the Morse code. For this purpose the key lever is depressed and the contact between the points 10 and 40 is held closed for a sufficient length of time to produce the dash and then the key lever is raised to its fullest extent, which allows the vibrator or spring blade 20 to operate to produce three separate closures of the circuits between the contacts 15 and 25 when the key lever may be brought to its neutral position and the vibratory action then no longer closes its own circuit. If the operator should desire to send the letter "A" which is represented in the Morse code by a dot and a dash, he raises the key lever to its fullest extent, permitting the vibrating spring blade to close the circuit once through its own terminals and then the key lever is depressed to its fullest extent to close the circuit between the regular terminals 10 and 40 and there held for the requisite length of time to produce a dash. Suppose the operator wishes to send the signals corresponding to the numeral "6" in the Morse code. Then he would simply raise the key lever to its fullest extent and allow the vibrator to close the circuit successively for six times and thereby produce six successive dots, which is the Morse code signal for the numeral 6. The key lever is then released and allowed to move spontaneously to its neutral position under the action of the two springs 34 and 35, thus cutting out the vibrator from further action at that time.

By adjusting the disk 23 so as to contact with the table or more properly to very nearly touch the same when the contacts 10 and 40 are brought together undue vibration of the weighted end of the spring or vibrator is prevented and the dot signals are thereby more easily controlled. By adjusting the elasticity of the spring 12 constituting the back contact spring for the dot circuit closer and also adjusting the tension of the spring blade 20, the operator may send light or heavy by making the supplemental contact either light or heavy.

Should the operator desire to cut out the vibrating feature for any reason and use the transmitter in the ordinary way, he has but to throw a lever 41, on the block 16, or on the key base, thus throwing its free end under the screw 30, thus preventing the knob end of the lever from rising high enough to release the vibrator. The structure has been thus far described as an attach-



ment to keys ordinarily in use, but it can as well be built directly into the key when the keys are first manufactured, as is readily apparent.

5 The purpose of the structure is to minimize the number of movements of the hand of the operator necessary for the sending of telegraphic code signals, and this is accomplished by cutting out all movements of the  
10 dot impulses. The operator depresses the key for the production of the dash signals and produces the dot signals on the return movement of the key, which movement is necessary any way since even were he to  
15 produce a dot in the ordinary manner the key must be returned to the up position after making a dash before the dot can be produced. Where dots and dashes follow one another and where a number of dots  
20 occur the movements necessary for the production of the dots are practically all eliminated and it is but seldom that an extra movement is necessary for the production of the dot signals. The result is that the operator  
25 is saved the extra work and fatigue and the speed of sending is increased over what is possible with an ordinary transmitter key.

What is claimed is:—

30 1. An attachment for telegraphic transmitters including a spring fixed at one end and at the other end carrying a weight and adapted to be attached to the transmitter with the weighted end adjacent to the key  
35 end of the key lever of the transmitter, a terminal carried by said spring between the fixed end and the weight, a back terminal for the spring carried terminal, means for adjusting the spring independent of the  
40 weight for determining the relation of the two terminals as to their normal extent of separation, and means on the key end of the key lever for engaging the weighted end of the spring.

45 2. An attachment for telegraphic transmitters including a spring fixed at one end and at the other end carrying a weight adjacent to the key end of the transmitter key lever, a terminal carried by said spring between the fixed end and the weight, a back  
50 terminal for the spring carried terminal, means for adjusting the spring independent of the weight for determining the normal extent of separation of the two terminals,  
55 means for determining the extent of movement of the spring carried terminal away from the back terminal at will, and means on the key end of the key lever for engaging the weighted end of the spring.

60 3. An attachment for telegraphic transmitters comprising a set of circuit closing terminals, means for causing the alternate closing and opening of said terminals under the control of the key end of the regular

transmitter key lever, and means for limiting the movement of the key lever, at will, to hold the circuit closing terminal in in-operative relation.

4. In a telegraphic transmitter, means for normally maintaining the key lever of the  
70 transmitter in a neutral position, an elastically mounted contact, a back stop carried by the key lever in position to engage the mounting of the elastically mounted contact, and another contact in the path of the  
75 elastically mounted contact.

5. A telegraphic transmitter provided with a key lever, oppositely acting springs for said key lever, for maintaining the latter normally in a neutral position, a spring  
80 blade having a fixed support at one end and weighted at the other end, a contact carried by said spring blade between the fixed end and the weighted end, another contact in the path of the contact carried by the blade, and  
85 a back stop carried by the key end of the key lever in operative relation to the weighted end of the spring blade.

6. A telegraphic transmitter provided with a key lever, oppositely acting springs  
90 for said key lever for maintaining the latter normally in a neutral position, a spring blade having a fixed support at one end and a weight at the other end with the weighted end adjacent to the key end of the  
95 key lever, a contact carried by said spring blade between the fixed end and the weighted end, another contact in the path of the contact carried by the blade, a back stop carried by the key end of the key lever  
100 in operative relation to the weighted end of the spring blade, and means carried by the weighted end of the spring blade for limiting its movement in the direction to carry its contact away from the correspond-  
105 ing back contact.

7. An attachment for telegraphic transmitters comprising an elastically mounted terminal adjacent to the key end of the key lever, another supplemental terminal in the  
110 path of the elastically mounted terminal and means carried by the key of the key lever for moving the elastically mounted terminal away from its supplemental terminal on the movement of the key lever to the closed circuit position.

8. An attachment for telegraphic transmitters including a spring fixed at one end and at the other end carrying a weight and adapted to be attached to the transmitter  
120 with the weighted end adjacent to the key end of the key lever of the transmitter, a terminal carried by said spring between the fixed end and the weight, an elastically mounted back terminal for the spring carried terminal, means for adjusting the spring independent of the weight for determining the relation of the two terminals as to their  
125



normal separation, and means on the key end of the key lever for engaging the weighted end of the spring.

9. An attachment for telegraphic transmitters including a spring fixed at one end and at the other end carrying a weight and adapted to be attached to the transmitter with the weighted end adjacent to the key end of the key lever of the transmitter, a terminal carried by said spring between the fixed end and the weight, an elastically mounted back terminal for the spring carried terminal, means for adjusting the elasticity of the mounting for the back terminal, means for adjusting the spring independent of the weight for determining the relation of the two terminals as to their normal separation, and means on the key end of the key lever for engaging the weighted end of the spring.

10. A telegraphic transmitter provided with a key lever, oppositely acting springs for said key lever for maintaining the latter normally in a neutral position, a spring blade having a fixed support at one end and weighted at the other end, a contact carried by the spring blade, another contact in the path of the contact carried by the blade, a back-stop carried by the key lever in operative relation to the spring blade, means car-

ried by the spring blade for limiting its movement in the direction to carry its contact away from the corresponding back contact, comprising an eccentrically mounted disk carried by the spring blade, and a set screw for securing said disk in any position of adjustment.

11. An attachment for telegraphic transmitters comprising a supplemental spring, means for coupling the same to the key lever of the transmitter in opposition to the regular key lever spring, a spring blade, means for supporting one end of the same, a weight carried by the other end of the spring blade, an adjustable stop for the weights for limiting their movement in one direction, a back-stop carried by the key lever in the path of the weights when moved in the other direction, a contact carried by the spring blade, and an adjustable contact having a fixed support and in operative relation to the blade carried contact.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HARLIE OGDEN PUTT.

Witnesses:

C. F. MARTIN,  
C. MARTIN.