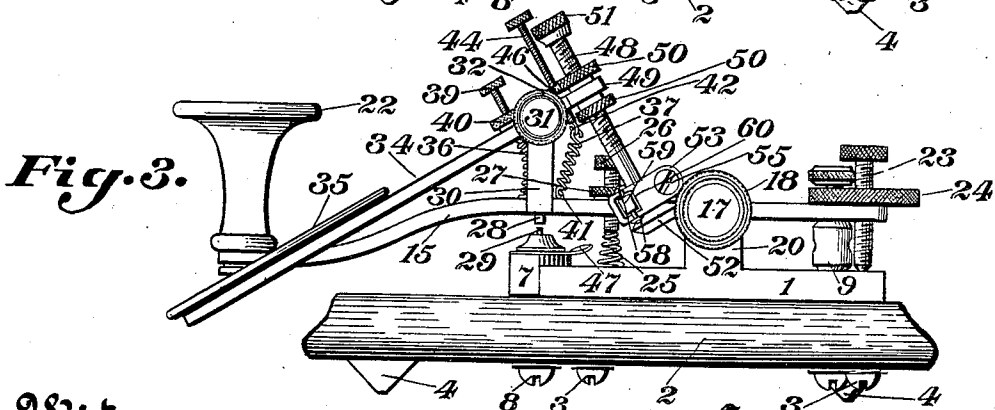
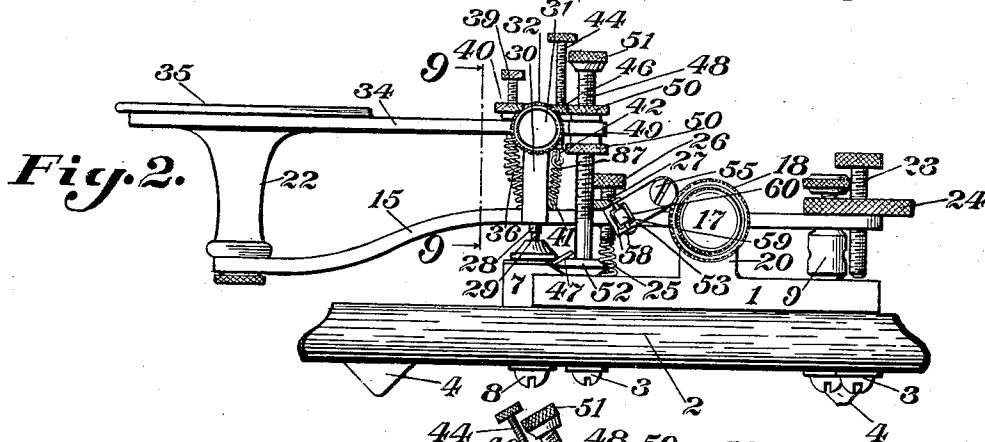
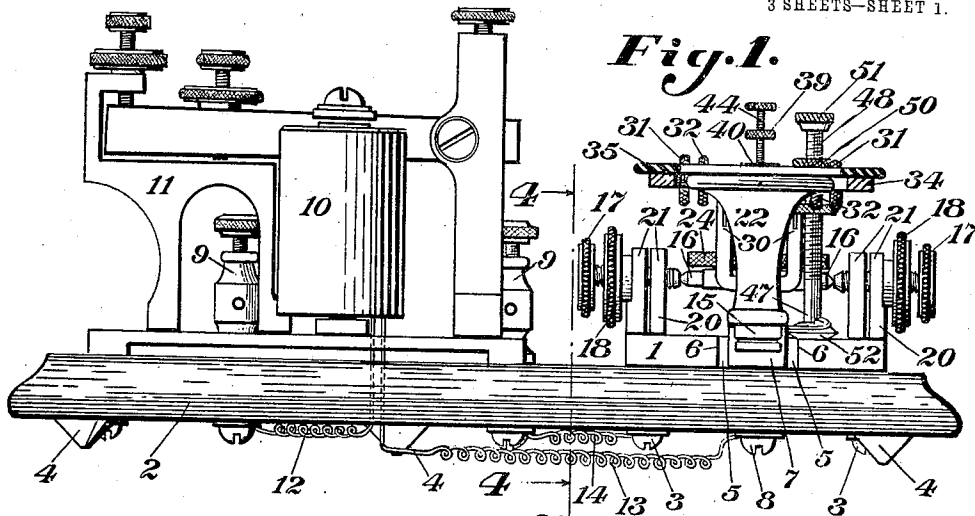


1,017,398.

Patented Feb. 13, 1912.

3 SHEETS—SHEET 1.



Witnesses:

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Harry H. Peiss.

Inventor:
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By Hugh K. Wagner,
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J. E. FOLSOM.
TELEGRAPH KEY.
APPLICATION FILED JAN. 16, 1911.

1,017,398.

Patented Feb. 13, 1912.

3 SHEETS—SHEET 2.

Fig. 4.

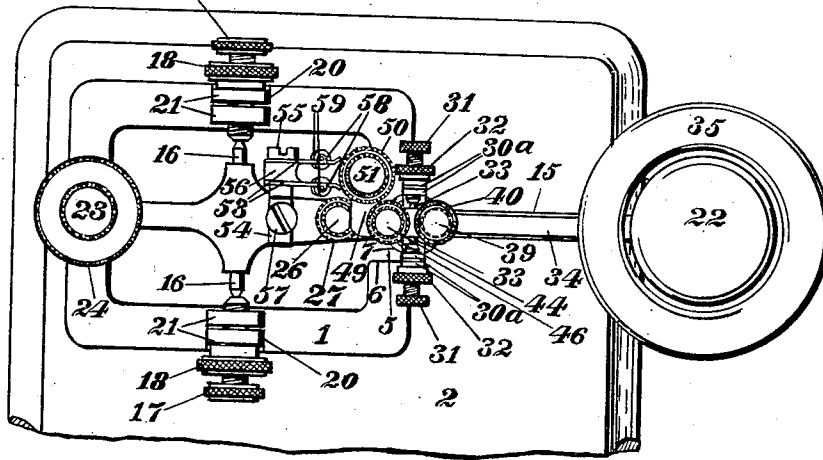
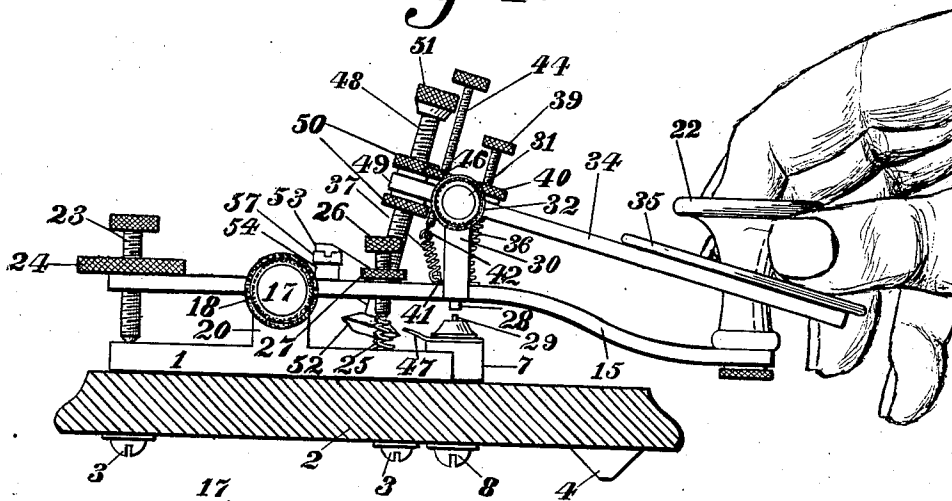


Fig. 5.

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1,017,398.

Patented Feb. 13, 1912.

3 SHEETS—SHEET 3.

Fig. 6.

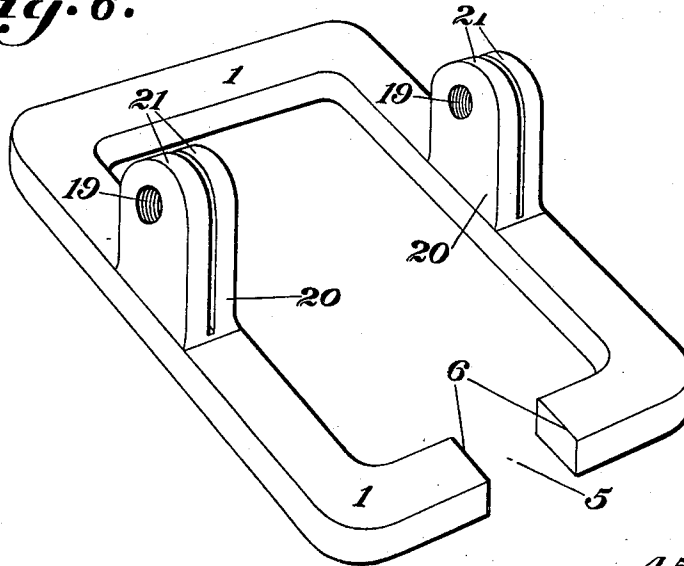


Fig. 7.

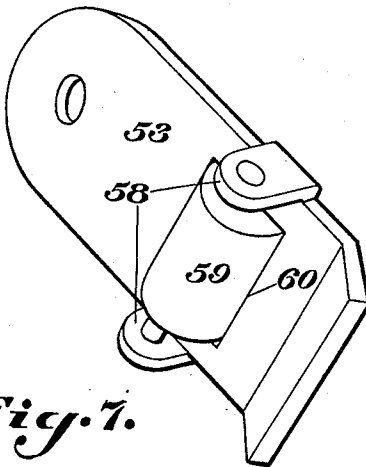


Fig. 9.

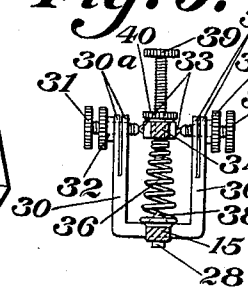
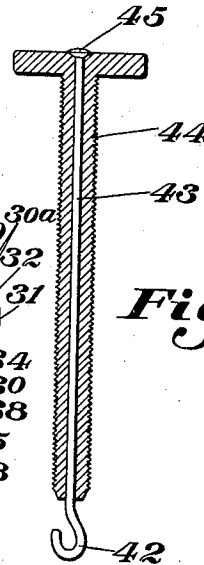


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN E. FOLSOM, OF ST. LOUIS, MISSOURI.

TELEGRAPH-KEY.

1,017,398.

Specification of Letters Patent.

Patented Feb. 13, 1912.

Application filed January 16, 1911. Serial No. 602,842.

To all whom it may concern:

Be it known that I, JOHN E. FOLSOM, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Telegraph-Keys, of which the following is a specification.

This invention relates to telegraph instruments and has for its chief object to provide a telegraph-key which is so constructed that the circuit is opened automatically by the mere grasping of the button on the operating lever, and, by the releasing of the button on the operating lever, the circuit is closed automatically.

Another object of the present invention resides in the provision of means for holding the automatic switch in position to maintain the circuit open for the purpose of sending long messages.

Further, this invention consists of the novel features of construction and arrangement of parts hereinafter more fully described and set forth in the claims.

In the accompanying drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a front elevation of a telegraph instrument having my improved telegraph-key in connection therewith; Fig. 2 is a side elevation of the telegraph-key, the automatic switch being shown in its normal position to maintain the circuit closed; Fig. 3 is a side elevation of the telegraph-key, the automatic switch being depicted in the locked position to maintain the circuit open for the purpose of sending a long message; Fig. 4 is a sectional view on the line 4—4, Fig. 1, the automatic switch being illustrated in the position in which same is held by the operator's hand that grasps the operating button; Fig. 5 is a top plan view of the telegraph-key; Figs. 6, 7, and 8 are detail views, on an enlarged scale, of some of the parts of the telegraph-key; and Fig. 9 is a sectional view on the line 9—9, Fig. 2.

The metal frame 1, which supports the parts of the telegraph-key, is secured to the base 2 by means of screws 3, or the like, that preferably extend through said base from the lower side thereof, said base being constructed of wood or any other suitable insulating material and having feet 4 attached thereto in the usual manner. Said frame is preferably formed in the shape of a rec-

tangle, and a part of the front side of same is cut away to leave an open space or gap 5 between the ends 6. A post 7 is located in the space or gap 5 and is secured to the base 2 by means of a screw 8, or the like, that preferably passes through said base from the lower side thereof. Said post is relatively thinner than the distance between the ends 6 so that sufficient space is left between said post and said ends, in order to prevent any possible short circuit. By this arrangement, the necessity of using insulation to prevent a short circuit between post 7 and either end 6 of frame 1 is obviated. The terminals of the "line" (not shown in the drawings) are attached in the usual manner to a pair of binding-posts 9 fastened to base 2 by any suitable means. One of the binding-posts 9 is electrically connected to one of the coils of the electromagnet 10 of sounder 11 by means of a wire or conductor 12 and the other coil of said electromagnet is electrically connected to the screw 8 by means of a wire or conductor 13, thereby charging the post 7. A wire or conductor 14 connects the other binding-post 9 with one of the screws 3 and thereby charges the frame. The sounder 11 is secured to the base 2 by any suitable means, and may be of any desired type.

The operating lever 15 bears a pair of oppositely-disposed trunnions 16 journaled in the usual manner in depressions in the ends of a pair of adjustable screws 17, said screws bearing the usual lock-nuts 18 and passing through screw-threaded openings 19 in a pair of lugs 20 borne by frame 1. Each lug 20 is divided into two thin parts 21 in which the screw-threaded openings 19 are formed, and, when the lock-nut 18 on the screw 17 that passes through the openings 19 is tightened against one of the parts 21, the pressure of said lock-nut against the outer part 21 tends to force that part toward and against the inner part, thus causing the threads of the openings in both parts to bind against the threads of the screw. In consequence, the screw will be held in place and will be prevented from working loose in said openings. Rigid bearings are thus maintained for the trunnions 16 so as to prevent the so called "wabbling" or "wig-wag" motion of the operating lever that is common in other and old style telegraph-keys.

A button 22, which is formed of any suit-

able insulating material is attached to the forward end of lever 15, and an adjustable screw 23 bearing a lock-nut 24 extends through a screw-threaded opening in the rear end of said lever. The screw 23 extends above the rear part of frame 1 and limits the upward movement of the forward end of the operating lever 15, such movement being produced by the pressure of spring 25, when the circuit is opened in the manner hereinafter described, and, also by actuating the operating lever for the purpose of sending a message, answering a call, or for any other reason. An adjustable screw 26 bearing a lock-nut 27 extends through a screw-threaded opening in lever 15 and not only holds the spring 25 in place, but affords a means for regulating the pressure of same. The forward part of lever 15 extends over the post 7 and bears a platinum point 28, which is located directly above a platinum point 29 borne by said post. So long as the platinum point 28 does not touch the platinum point 29, the circuit is broken, but, each time the forward end of lever 15 is depressed, the platinum point 28 is thereby moved into contact with the platinum point 29, whereby the circuit is closed, being bridged over from the frame 1 to the post 7, or vice versa, by means of said lever.

When the telegraph-key is not in use, it is necessary to keep the "line" closed so that the operator at any station can be called or messages can be sent over the "line" to any station, and, for this reason, instrumentalities about to be described are provided for opening the "line" automatically when the operator takes hold of the button 22, and, also, for closing the "line" automatically, when the operator releases the button 22.

The operating lever 15 bears a pair of arms or uprights 30 containing screw-threaded openings to receive a pair of adjustable screws 31 bearing lock-nuts 32. The screws 31 are located opposite each other and contain depressions in the ends thereof to form bearings for a pair of trunnions 33 borne by lever 34. The upper portion of each arm 30 is divided into two parts 30^a through which a screw 31 passes, and, when the lock-nut 32 on said screw is tightened, a binding action upon the threads of the screw similar to that described in connection with the parts 18 and 21 will be produced. The lever 34 extends longitudinally over the forward part of lever 15, and is bent to encircle the button 22, in order to support a ring 35 which is formed of any suitable insulating material, said ring being fastened to the upper side of the bent part of lever 34 and being arranged to encircle the button 22. A compression spring 36 and a tension spring 37 are arranged to hold

the lever 34 normally in position to cause the ring 35 to register approximately in the plane of the top surface of button 22, so that, when the button 22 is grasped in the usual manner, the operator's thumb depresses the ring 35, which, in turn, depresses the forward end of the lever 34, but, when the operator releases said button, the springs 36 and 37 cause the lever 34 to return to its initial position. When the operator takes hold of the button 22 as just described, the tendency of the springs 36 and 37 to return the lever 34 to its initial position causes the ring 35 to hold the operator's thumb against the rim of the button 22, thereby affording a grasp for the operator's thumb, so that the necessity of gripping said button as firmly as has been heretofore customary is obviated, and, also, that the forward end of the operating lever can be moved up and down by means of the operator's thumb alone without the aid of the fingers. The lower end of the compression spring 36 is coiled loosely about a projection 38 on lever 15 and is thereby held in place, and the upper end of said spring is coiled tightly about the threads of an adjustable screw 39, which passes through a screw-threaded opening in lever 34, said screw bearing a lock-nut 40 for holding same firmly in place. The screw 39 is located in front of the trunnions 33, and affords a means for adjusting the pressure of spring 36. The lower end of the tension spring 37 is attached to a hook 41 borne by lever 15, and the upper end of said spring is fastened to a hook 42 borne by the lower end of a pin or rod 43. Said pin or rod extends longitudinally through an opening in a hollow screw 44, which passes through a screw-threaded opening in lever 34, and bears a head 45 that rests upon the upper end of said screw. Said screw 44 is located behind the trunnions 33, and bears a lock-nut 46, by means of which same is held in place. When the screw 44 is turned, the pin or rod 43 moves longitudinally therewith without rotating and thereby regulates the tension of spring 37, without turning or twisting same.

A leaf spring 47 is fastened to the post 7 by any suitable means and is arranged to project over an end 6 of the frame 1 without touching same. A screw-threaded rod 48 passes through a screw-threaded opening in an arm 49 borne by the rear end of lever 34 and bears a pair of lock-nuts 50 for holding same firmly in place, one of said lock-nuts being located above and the other beneath said arm. A knob 51 is detachably secured to the upper end of rod 48, and affords a means for turning same, and the lower end of said rod bears a button 52, which is preferably formed integrally therewith. The rod 48 extends downwardly from arm 49,

and is so adjusted that, when the lever 34 is held in its normal position, as hereinabove described, the button 52 projects between and in engagement with the leaf spring 47 and said end 6 of frame 1, thereby not only closing the circuit, but holding the forward end of lever 15 down, so as to hold the platinum point 28 in contact with the platinum point 29. By this arrangement, the circuit is closed by two points of contact, viz., by the engagement of button 52 with leaf spring 47 and said end 6 of frame 1 and, also, by the engagement of the platinum point 28 with the platinum point 29. When, however, the lever 34 is depressed in the manner hereinabove described, the arm 49 raises the rod 48 and thereby withdraws the button 52 from between the leaf spring 47 and the end 6 of frame 1, with the result that spring 25 forces the forward end of lever 15 upward, whereby the platinum point 28 is raised out of engagement with the platinum point 29 so as to open or break the circuit automatically. After the button 22 is released, as hereinabove described, the lever 34 returns abruptly to its initial position due to its momentum resultant from the sudden expansion of spring 36 and contraction of spring 37, so as to reengage the button 52 with and between the leaf spring 47 and the end 6 of frame 1, thereby closing the circuit automatically as before. One edge of the leaf spring 47 is preferably bent upwardly, and the rim of button 52 is beveled annularly on both sides thereof, so that said button can readily enter the space between said spring and the end 6 of frame 1. The lever 34 and the parts attached thereto add additional weight to the forward end of lever 15 and thus renders the operation of lever 15 less tiresome to the operator than the levers on the telegraph-keys now in use.

A pair of springs 53 is secured to a member 54 by a screw 55, or the like, said springs being spaced apart by means of a block 56, and said member being fastened to lever 15 by a screw 57 or other suitable means. Each spring 53 is provided with a pair of lugs 58 in which the ends of an anti-friction roller 59 are journaled, and contains an opening 60 through which said roller extends, the roller 59 of one spring 53 being located opposite the roller 59 of the other spring 53. The springs 53 are located on opposite sides of the path of movement of rod 48, but, when the operator takes hold of the button 22 and thereby depresses lever 34, as hereinabove described, said lever does not raise said rod sufficiently to pass between rollers 59. Whenever it is desired to send a long message or to use the lever 15 in the usual manner of operating an ordinary telegraph-key, the forward end of lever 34 is depressed to its full extent, whereby the rod 48 is caused to pass between the rollers 49 and is thereby

held in the position depicted in Fig. 3, until the operator raises the forward end of said lever 34.

The operation of the device is as follows: If it is desired to use the telegraph-key for the purpose of answering a call, sending a message, or for any other reason, the operator takes hold of the button 22 in the usual manner and, by so doing, depresses the forward end of the lever 34, thereby opening the circuit automatically. When through using the telegraph-key, the operator releases the button 22 and thereby allows the lever 34 to return to its initial position, with the result that the circuit is closed automatically, as hereinabove described, thereby preventing the "line" from being left open by thoughtlessness or any other reason on the part of the operator. When the instrument is used in the same manner as an ordinary telegraph-key or for sending a long message, the forward end of the lever 34 is depressed until the rod 48 passes between rollers 59, which, in turn, hold said lever in its depressed position until the operator raises the forward end of said lever.

I claim:

1. In a telegraph-key, the combination of a pivoted key bar, a conductor located beneath said bar, a lever pivoted to said bar and adapted to hold same normally in engagement with said conductor, said lever being arranged to be actuated by the operator's hand taking hold of the key, and means for returning said lever to its initial position when said key is released.

2. In a telegraph-key, the combination of a pivoted key bar, a conductor located beneath said bar, a lever pivoted to said bar and adapted to hold same normally in engagement with said conductor, said lever being arranged to be actuated by the operator's hand taking hold of the key, and means for returning said lever to its initial position when said key is released, said return movement being automatic.

3. In a telegraph-key, the combination of an open-ended frame electrically connected with one of the terminals of a circuit, a conductor located in the opening in the end of said frame and being electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, and means borne by said bar for holding same normally in contact with said conductor.

4. In a telegraph-key, the combination of an open-ended frame electrically connected with one of the terminals of a circuit, a conductor located in the opening in the end of said frame and being electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, and means borne by said bar for holding same normally

in contact with said conductor, said means being adjustable.

5. In a telegraph-key, the combination of an open-ended frame electrically connected with one of the terminals of a circuit, a conductor located in the opening in the end of said frame and being electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, and means borne by said bar for holding same normally in contact with said conductor, said means being adapted for making and breaking an electrical connection between said frame and said conductor.

6. In a telegraph-key, the combination of an open-ended frame electrically connected with one of the terminals of a circuit, a conductor located in the opening in the end of said frame and being electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, a lever pivoted to said bar and having a finger piece at its outer end, a member borne by said lever for holding said bar in contact with said conductor, and means borne by said conductor for holding said member in contact with said frame.

7. In a telegraph-key, the combination of an open-ended frame electrically connected with one of the terminals of a circuit, a conductor located in the opening in the end of said frame and being electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, a lever pivoted to said bar and having a finger piece at its outer end, a member borne by said lever for holding said bar in contact with said conductor, means borne by said conductor for holding said member in contact with said frame, and means for holding said lever normally in position to hold said member in engagement with said holding means.

8. In a telegraph-key, the combination of an open-ended frame electrically connected with one of the terminals of a circuit, a conductor located in the opening in the end of said frame and being electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, a lever pivoted to said bar and having a finger piece at its outer end, a member borne by said lever for holding said bar in contact with said conductor, means borne by said conductor for holding said member in contact with said frame, and means for holding said lever normally in position to hold said member in engagement with said holding means, said member being adjustable.

9. In a telegraph-key, the combination of a pivotally-mounted key bar, a switch pivoted to said bar for opening and closing the

circuit, means for holding the switch normally in position to close the circuit, said holding means comprising a tension and a compression spring both of which springs are interposed between said bar and switch and act directly thereupon, and means for adjusting said springs.

10. In a telegraph-key, the combination of a pivotally-mounted key bar, a lever pivoted to said bar, a member borne by said lever for normally closing the circuit, and a pair of leaf springs attached to said bar and adapted to hold said member in position for breaking the circuit.

11. In a telegraph-key, the combination of a pivotally-mounted key bar, a lever pivoted to said bar, a member borne by said lever for normally closing the circuit, a pair of leaf springs borne by said bar, and anti-friction rollers borne by said springs for holding said member in position for breaking the circuit.

12. In a telegraph-key, the combination of an open-ended rectangular frame electrically connected with one of the terminals of a circuit, a conductor located in the opening in the end of said frame and being electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, a lever pivoted to said bar and having a finger piece at its outer end, a member borne by said lever for holding said bar in contact with said conductor, means attached to said conductor for holding said member in contact with said frame, means for holding said lever normally in position for closing the circuit, and means for holding said member in position for breaking the circuit.

13. In a telegraph-key, the combination of a pivoted key bar having a pair of split arms containing screw-threaded openings, adjustment screws passing through the openings in said arms, a switch pivotally supported by said screws for closing and breaking the circuit, and locking means for said screws.

14. In a telegraph key, the combination of an open-ended frame electrically connected with one of the terminals of a circuit, a conductor located in the opening in the end of said frame and electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, a lever pivoted to said bar, and a member carried by said lever for holding said bar in contact with said conductor, said member having a portion thereof arranged to simultaneously engage said conductor and said frame.

15. In a telegraph key, the combination of a frame electrically connected with one of the terminals of a circuit, a conductor located adjacent said frame and electrically connected with another terminal of the circuit, a key bar pivotally attached to said

frame and extending over said conductor, a lever pivoted to said bar, and a member carried by said lever for holding said bar in contact with said conductor, said member 5 having a portion thereof arranged to simultaneously engage said conductor and said frame.

10 16. In a telegraph key, the combination of a frame electrically connected with one of the terminals of a circuit, a conductor located adjacent said frame and electrically connected with another terminal of the circuit, a key bar pivotally attached to said frame and extending over said conductor, a 15 lever pivoted to said bar, a spring carried by said conductor, and a member carried by said lever for holding said bar in contact with said conductor, said member having a portion thereof arranged to simultaneously 20 engage said spring and said frame.

25 17. In a telegraph key, the combination of a pivotally-mounted key-bar, a switch pivoted to said bar for opening and closing the circuit, and a tension spring and a compression spring for holding the switch normally in position to close the circuit both of which 30 springs are interposed between said bar and switch and act directly thereon.

35 18. In a telegraph key, the combination of a pivotally-mounted key-bar, a switch pivoted to said bar for opening and closing the circuit, a tension spring and a compression

spring for holding the switch normally in position to close the circuit both of which 35 springs are interposed between said bar and switch and act directly thereon, and means for holding said switch in position to open the circuit.

19. In a telegraph key, the combination of a pivotally-mounted key-bar, a lever pivoted 40 to said bar, a member carried by said lever for opening and closing the circuit, means associated with said lever for normally holding said member in position to close the circuit, and a pair of leaf springs attached to 45 said bar and adapted to engage said member for holding same in position for breaking the circuit.

20. In a telegraph key, the combination of a pivotally-mounted key-bar, a lever pivoted 50 to said bar, a member carried by said lever for opening and closing the circuit, a tension spring and a compression spring connected with said lever for normally holding said member in position to close the circuit, and a 55 pair of leaf springs attached to said bar and adapted to engage said member for holding same in position for breaking the circuit.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 60

JOHN E. FOLSOM.

Witnesses:

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