

B. F. BELLOWS.
TELEGRAPH TRANSMITTER.
APPLICATION FILED JULY 29, 1907.

Patented Nov. 9, 1909.
3 SHEETS—SHEET 1.

939,383.

Fig. 1.

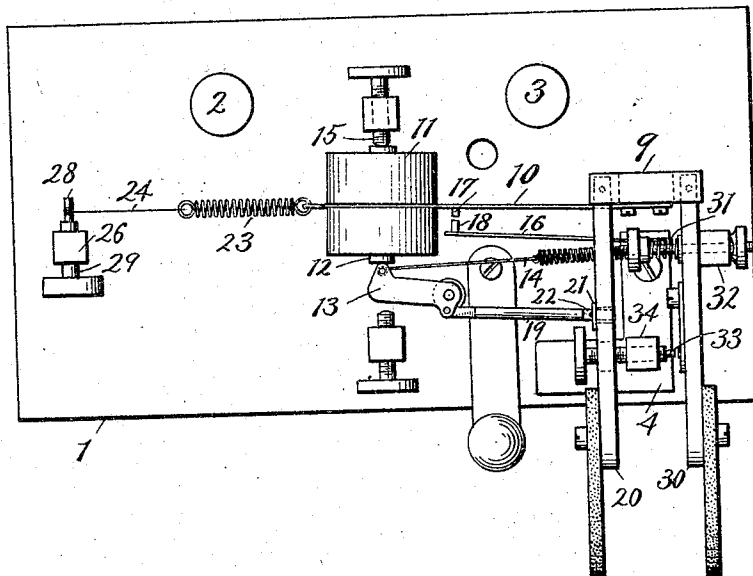
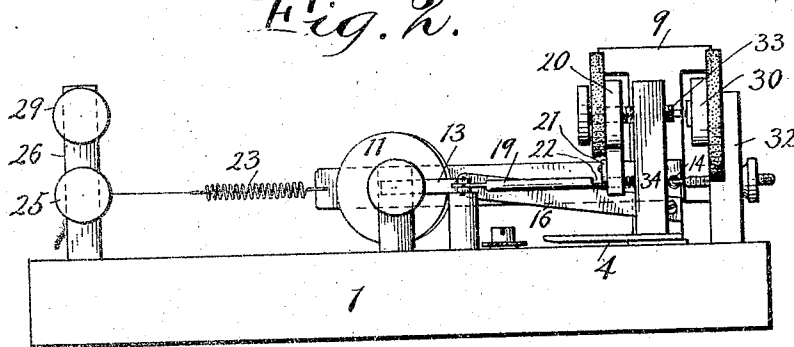


Fig. 2.



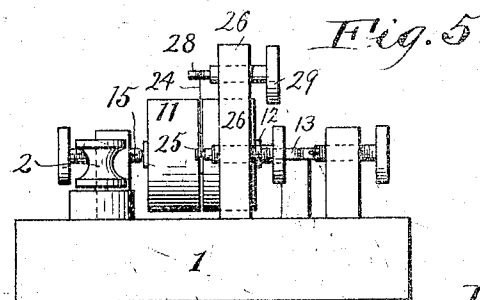
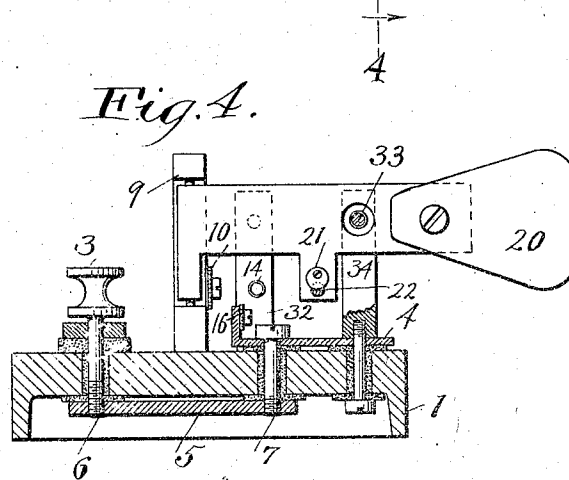
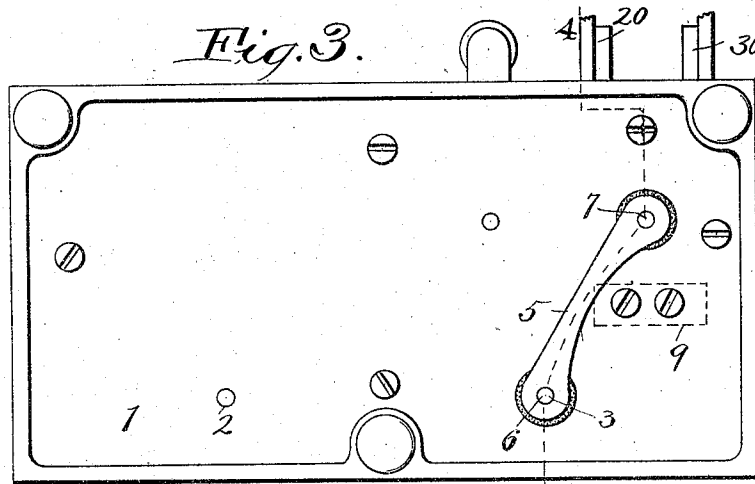
Witnesses.
E. B. Gilchrist.
X B. Sullivan.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. BELLOWS, OF CLEVELAND, OHIO.

TELEGRAPH-TRANSMITTER.

939,383.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed July 29, 1907. Serial No. 336,105.

To all whom it may concern:

Be it known that I, BENJAMIN F. BELLOWS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Telegraph-Transmitters, of which the following is a full, clear, and exact description.

The object of this invention is to provide a novel and efficient telegraph transmitter of the semi-automatic type,—that is to say of the type in which a succession of short electrical impulses,—as many as required—may be produced on the telegraph line wire by a single movement of an operating lever or key.

The invention may be summarized as the combinations of parts hereinafter described and pointed out definitely in the claim.

In the drawing, Figure 1 is a plan view of a telegraph transmitter embodying my invention. Fig. 2 is a front elevation thereof. Fig. 3 is a bottom plan view. Fig. 4 is a sectional view in the plane indicated by line 4—4 on Fig. 3. Fig. 5 is an elevation from the left end of Fig. 1.

In the drawing 1 represents the base of the instrument. This base, and many of the other parts of the device are preferably made of metal so as to be electrical conductors.

2 and 3 are the two binding posts to which the terminals of the telegraph line wire may be connected. The binding post 2 is electrically connected with the base, while binding post 3 is insulated therefrom. This binding post 3 is, however, electrically connected with a plate 4, which is secured upon but insulated from the base,—the electrical connection being through a bar 5, and the screws 6 and 7.

10 represents a vibrator which, in the form shown, is a thin metal reed which is fastened at one end to a suitable standard 9, secured to and electrically connected with the base 1. A weight 11 is secured to this vibrator. This vibrator has within itself the inherent capacity for continued vibration for a considerable time, when said vibration is once initiated. It is evident that when the vibrator is pushed to one side of the position in which it would normally come to rest, energy for initiating the vibration is imparted to it. The means shown for so moving the vibrator to one side of its normal position, consists of a bell crank lever 13, one arm of which engages with a sound deadening pad

of leather 12 secured to the face of the weight 11. A contractile coiled spring 14 exerts its force to move the bell crank lever in that direction which pushes the vibrator 10 to one side of its natural position, and against a dead stop 15, which is in the form of an adjustable screw. A flat metal contact spring 16 is made fast at one end to a projection on the plate 4, being thereby insulated from the base. Two contacts 17 and 18 carried respectively by the vibrator 10 and the spring 16 are separated when the vibrator is held in the restrained position which is to one side of its natural position, but will be brought into contact every time the vibrator swings away from its restrained position. Every time these contacts meet the line wire circuit will be closed, and will remain closed as long as these contacts touch each other. Inasmuch as the vibrator 10 is vibrating with considerable rapidity, the duration of time when these contacts are touching will be short. Therefore the electrical impulse produced will be short and will produce what telegraphers call a "dot".

20 represents a key lever, which is pivoted on a vertical pivot to the standard 9. A link 19 connects an arm of the bell crank lever 13 with the key lever 20. The connection between this link and lever may be of any suitable sort; but a suitable connection is made through a disk 21 attached to the lever which projects into a notch 22 in the link, the end of the link entering a hole in said lever. By pushing the lever 20 to the right the link is moved so as to cause lever 13 to rock and release the vibrator 10 from restraint. It thereupon begins to vibrate, and causes a dot impulse during each vibratory excursion, until a sufficient number of impulses have been produced. Then the operator releases the lever 20, whereupon spring 14 swings lever 13 and the latter, by engaging with the vibrator, stops its vibration and pushes it back against the dead stop 15.

Because of great differences in the sending and in the receiving ability of different operators, and because of differences in the character of the current on the line wire, it is essential, in order that an instrument may have some universality of usefulness, that it be capable of certain kinds of adjustment. Means may be provided for varying the rapidity with which the vibrator 10 will vibrate, and for varying the duration of each dot impulse produced by that vibra-

tion. This latter variation causes the instrument to send light or heavy according to the operator's desire, and the requirements of the current. In order that both of these adjustments may be easily and quickly made, a coiled spring 23 is connected at one end with the end of the vibrator 10. A flexible cord or thread 24 is connected with the other end of this spring 23. It is then extended in substantial alinement with the vibrator under the end of a screw 25 which is adjustable through a post 26. This screw has a groove in it in which the thread lies, and the thread is connected to and capable of being wound upon the end 28 of a shaft 29 which may also be turned in the post 26.

In order to change the rapidity with which the vibrator 10 may vibrate, the thread 24 may be wound upon the shaft 28, thereby increasing the tension of spring 23, the result being to increase the rapidity with which vibrator 10 will vibrate. By turning this shaft 29 in the other direction the cord is unwound and spring 23 is allowed to contract, and this causes the vibrator 10 to vibrate more slowly. In order to vary the duration of the dot impulses produced by the vibration so as to make them light or heavy, one may screw the screw 25 in or out as required. This will carry the thread along with it and will vary the direction in which the pull of that thread is exerted through spring 23 upon the vibrator. If the end of the spring is carried to the left, as shown in Fig. 5, the sending will be made correspondingly light. If moved in the other direction, it will be correspondingly heavy.

For making the "dash" impulses on the line wire, an independent lever 30 is employed. It is pivoted on a vertical pivot of the standard 9, and lies close to and parallel with the lever 20. A spring 31 of a well known sort holds this lever normally against the stop 32. By pushing the lever to the left against the force of this spring, the lever is brought into contact with the end of a screw 33 which is adjustable through a post 34 on plate 4, and thereby the circuit of the main line is completed.

To use the described instrument for sending the Morse alphabet, the operator pushes the key 30 to the left and holds it against screw 33 long enough to make a dash impulse on the line wire,—the circuit of which is thereby closed. To make a succession of dot impulses the operator pushes the lever 20 to the right and holds it over, in opposition to the force of the spring 14, until the vibrator 10 has made the required number of vibratory excursions, each of which produces a dot impulse on the main line.

The described construction is simple and durable. It may be adjusted very quickly and easily to vary the rate of dot making and render the dots light or heavy as required. Moreover, the construction is one which permits the device to be made so small that it may be conveniently carried by the operator from place to place.

Having described my invention, I claim: In a telegraph transmitter, the combination of a vibrator, a key lever, spring actuated means under the control of the key lever for deflecting the vibrator from its normal position, a contact carried by said vibrator, a spring arm fixed at one end and having near its other end a contact point opposed to the contact point on the vibrator, the vibrator and said spring being electrically connected with opposite terminals of a telegraph circuit, a second key lever adjacent to the first mentioned lever, a contact associated with the second key lever and adapted to be engaged thereby by a movement of said key lever toward the first mentioned key lever, a spring acting upon the second key lever to move it away from the first mentioned key lever, a stop limiting said movement; said key lever and contact being electrically connected with opposite terminals of the same telegraph circuit specified.

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

BENJAMIN F. BELLows.

Witnesses:

ROY SOTLER,
ARTHUR J. B. HUDSON.