

W. E. MILLER, SR.  
TELEGRAPHIC TRANSMITTER.

APPLICATION FILED FEB. 10, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

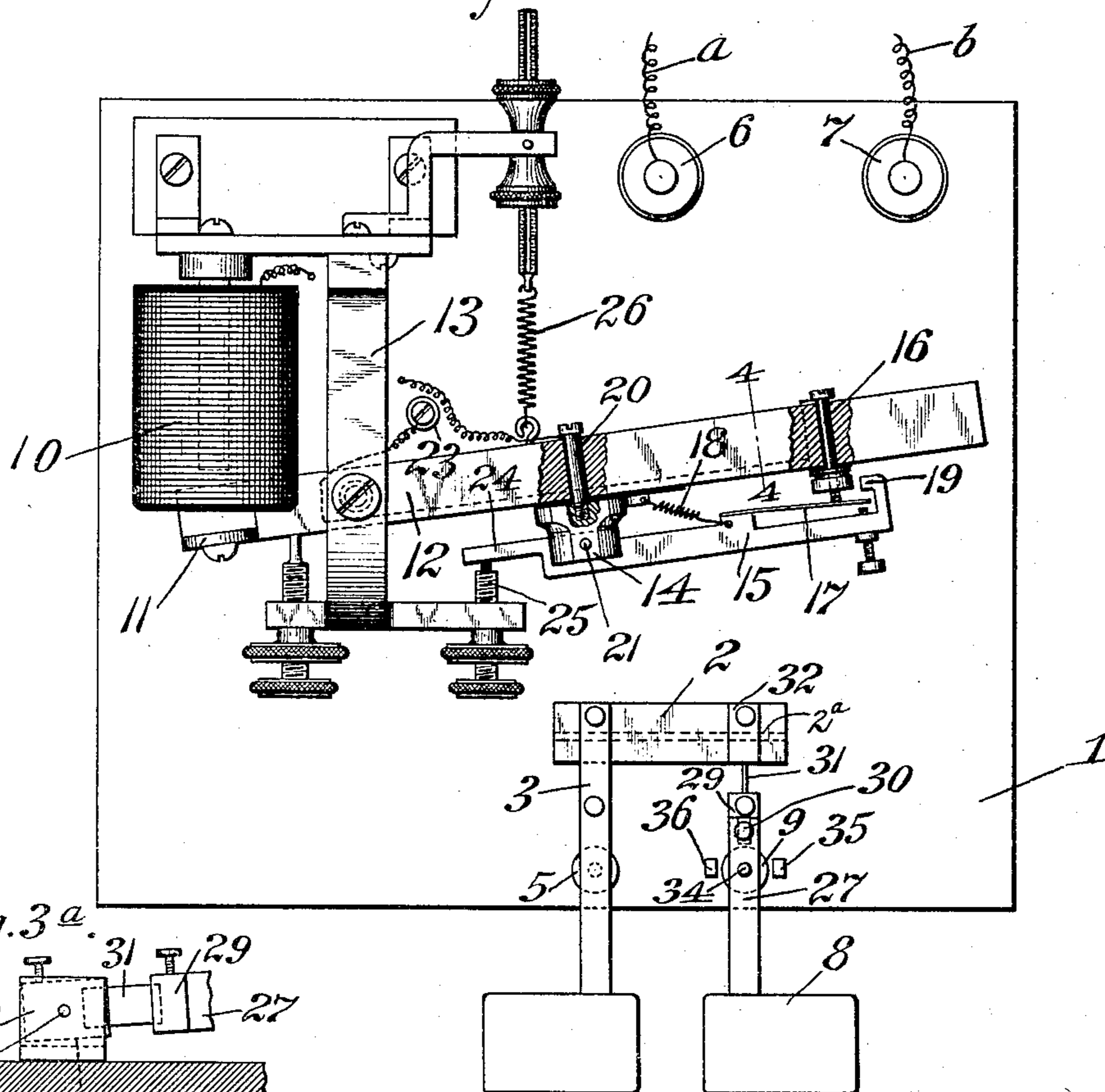


Fig. 3<sup>a</sup>.

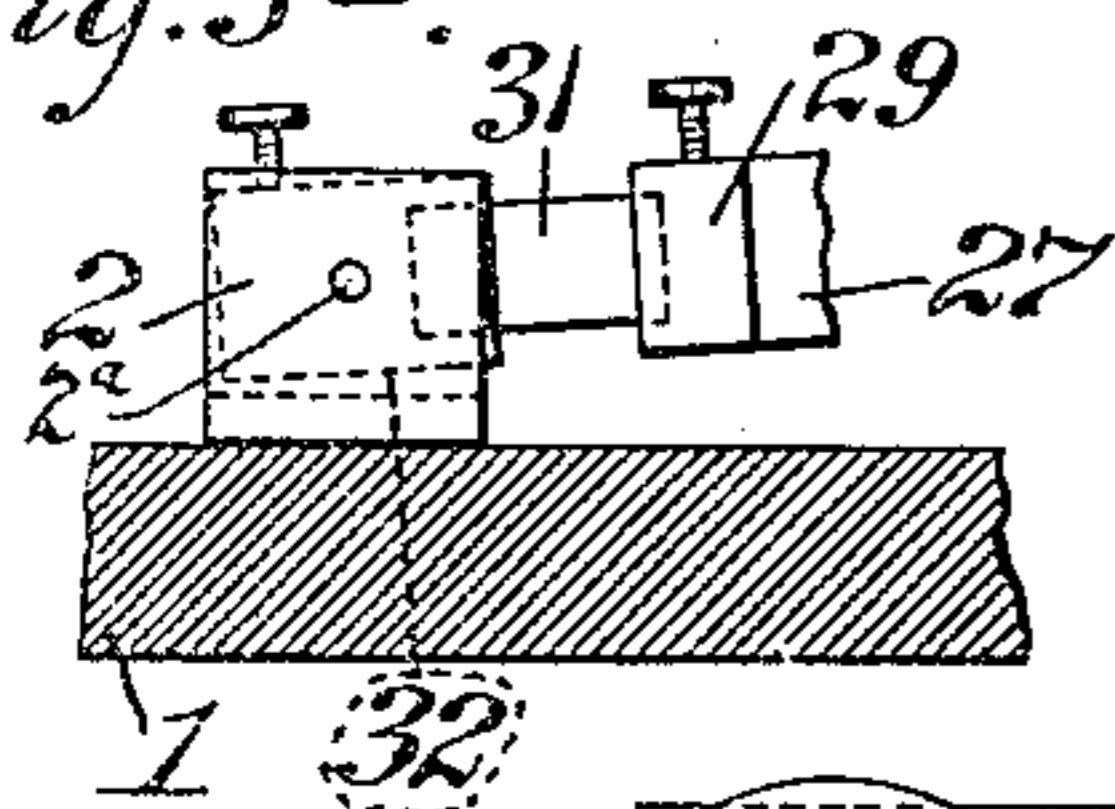


Fig. 2.

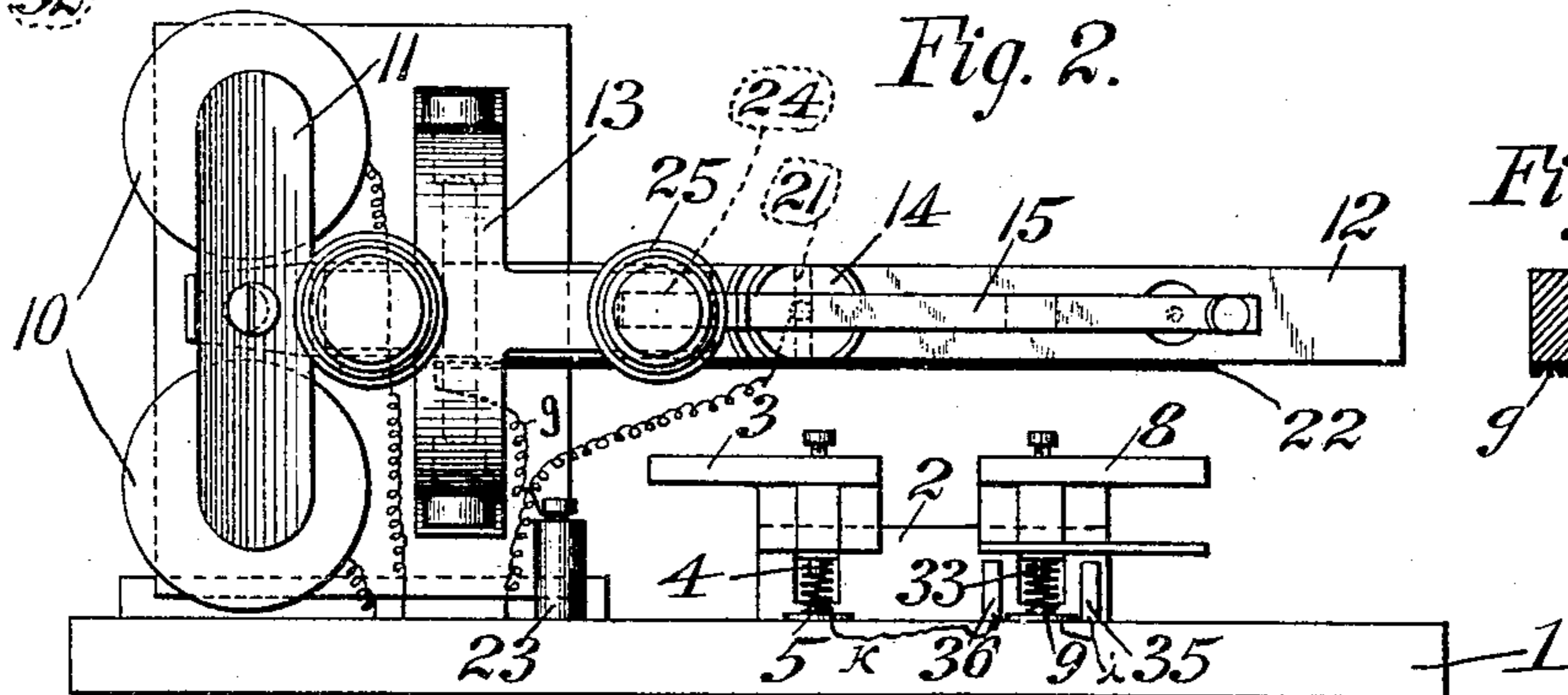
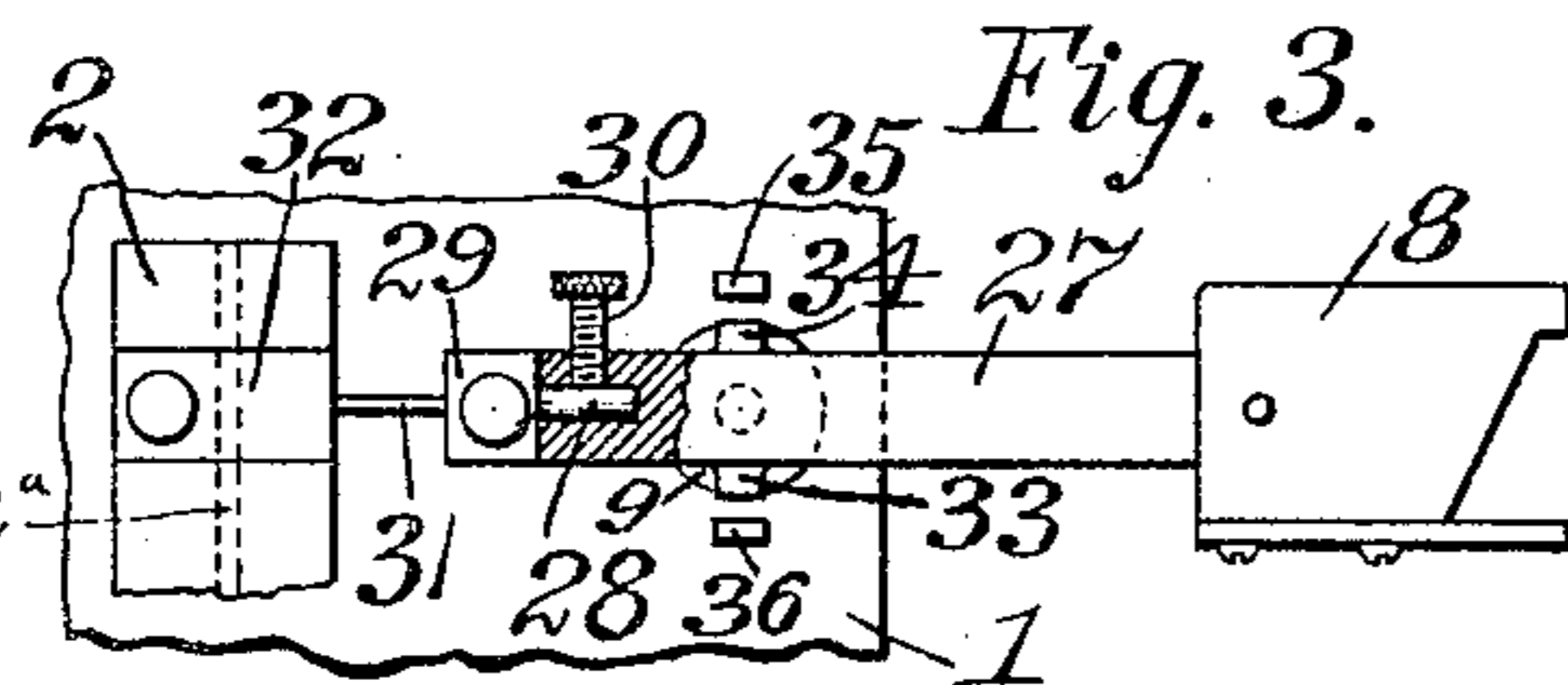


Fig. 4.



Fig. 3.



Witnesses:  
H. Weisbrod  
Giles Munn

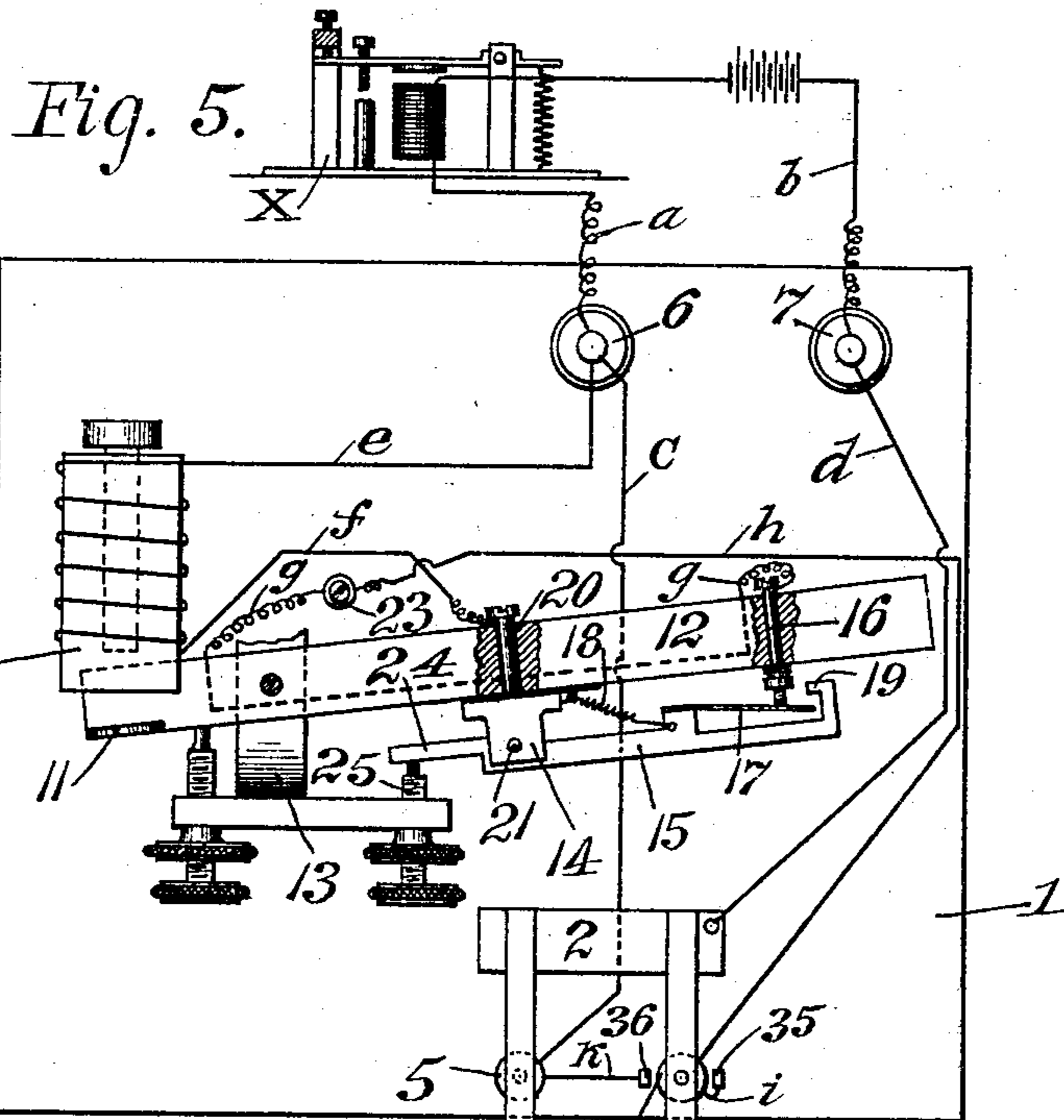
Inventor:  
William E. Miller Sr.  
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TELEGRAPHIC TRANSMITTER.

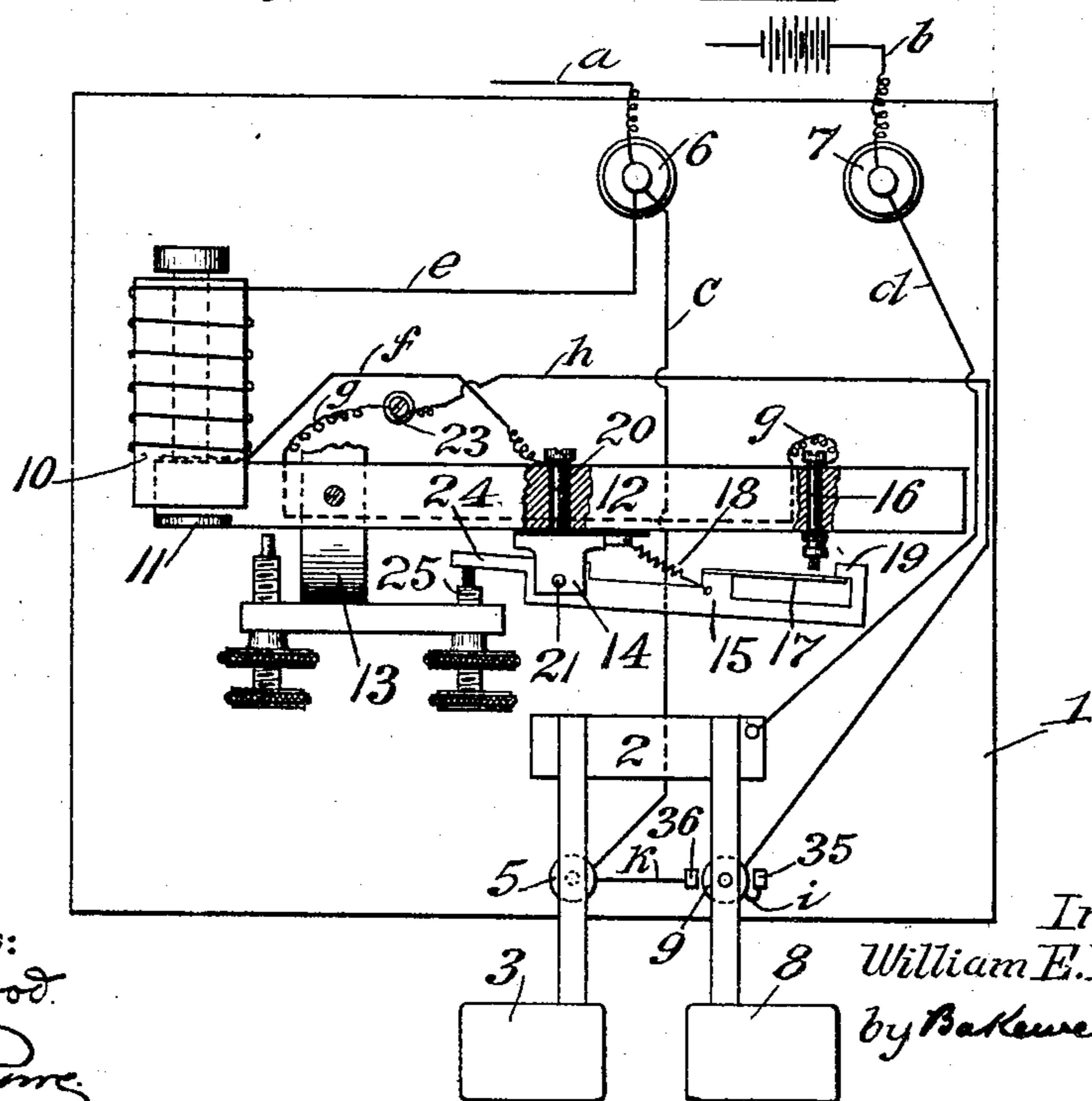
APPLICATION FILED FEB. 19, 1904.

NO MODEL.

2 SHEETS—SHEET 2.



*Fig. 6.*



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*W. Weisbrod.*  
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# UNITED STATES PATENT OFFICE.

WILLIAM E. MILLER, SR., OF ST. LOUIS, MISSOURI, ASSIGNOR OF TWO-FIFTHS TO LUMAN M. STRONG, OF ST. LOUIS, MISSOURI.

## TELEGRAPHIC TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 764,815, dated July 12, 1904.

Application filed February 19, 1904. Serial No. 194,382. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. MILLER, Sr., a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Telegraphic Transmitters, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view, partly in section, of an instrument constructed in accordance with the present invention. Fig. 2 is a front elevation of the same. Fig. 3 is a fragmentary top plan view, partly in section, illustrating one of the keys with its finger-piece and the shank carrying the same turned at right angles to the position in which said finger-piece and shank are illustrated in Fig. 1. Fig. 3<sup>a</sup> is a fragmentary side elevation of a portion of the same. Fig. 4 is a transverse sectional elevation of the armature-lever on about the line 4-4 of Figs. 1 and 2, and Figs. 5 and 6 are diagrammatic views.

This invention relates to telegraphic transmitters, one object being to provide a positively-acting and simple mechanism in such a transmitter whereby a succession of dots can be automatically sent; and a further object is to provide a transmitter with a key of such character that it can be caused to operate in lines at an angle to each other, so that the operator can vary the character of the movement by which the key is operated and can thus get relief from the strain resulting from continued muscular exertion of one character.

To these ends and also to improve generally upon apparatus of the character indicated the invention consists in the various matters hereinafter described and claimed.

Referring now more particularly to the drawings, 1 indicates a base upon which is mounted a metallic block or key-support 2, a key 3 of well-known construction being pivotally mounted upon said block and carrying the usual contact-point 4, adapted to cooperate with the customary contact-point 5, sup-

ported upon the base. The binding-posts 6 and 7 are connected to the line-wires *a* and *b* in the usual manner, the binding-post 6 being connected by the wire *c* with the terminal 5 and the conducting-block 2 being connected to the binding-post 7 by the wire *d* in the customary manner, so that the key 3 is an ordinary telegraph-key adapted to be operated in the customary and well-understood manner, the circuit, including the wires *a* and *b*, controlling a receiving instrument or sounder X, as is well understood.

In the present instrument, although the key 3 can be used for transmitting both dots and dashes in the same manner in which any other usual key is employed, it is employed only for the purpose of transmitting dashes, the key 8 being used when dots are to be transmitted. This key 8 is pivotally connected to the block or key-support 2 and cooperates with the terminal 9 upon the base 1, so that when the key is depressed the key itself forms an electrical connector between said terminal 9 and the block 2.

Suitably mounted upon the base 1 is an electromagnet 10, whose armature 11 is carried upon one arm of the lever 12, this lever being pivotally supported in any suitable manner, as upon the support 13. Supported upon said lever 12, but insulated therefrom, is a block 14, upon which is pivoted an auxiliary lever 15, and also carried by said lever 12 and insulated therefrom is a terminal 16, here shown as a pin extending through the lever 12, the forwardly-projecting end of this pin or terminal being adapted to contact with a suitable portion of the auxiliary lever 15, this portion being here shown as a plate-spring 17, so that when the auxiliary lever is in what may be termed its "normal" position good contact is effected between the spring 17 and the terminal 16, as shown in Figs. 1 and 5. A spring 18 yieldingly holds this auxiliary lever in such normal position and tends to return the auxiliary lever to such position whenever it is moved therefrom. Preferably a finger 19 upon the auxiliary lever extends in front of the free end of the spring 17, so that as the

said auxiliary lever is rocked upon its pivot to move the contact-bearing end of said lever away from the terminal 16 said finger engages said spring 17 and insures the separation of  
5 said spring from the terminal 16.

Referring now more particularly to the diagrams Figs. 5 and 6, the binding-post 6 is connected by the wire *e* to one pole of the coils of the electromagnet 10, and the other pole of  
10 said coils is connected by the wire *f* to a conducting-pin 20, which, although insulated from the lever 12, is carried thereby and extends therethrough, said pin making electrical connection with the pivot-block 14. The aux-  
15 ilary lever 15 is, through its pivot-pin 21, in electrical connection with said pivot-block, the spring 17 being of course in electrical connection with the auxiliary lever 15, of which it forms a part. The pin 16 is connected by  
20 the wires *g* and *h* with the before-mentioned terminal 9, with which the key 8 coöperates, the wire *g* being preferably for a portion of its length carried upon a strip of insulation 22, suitably secured upon the lever 12, so that  
25 although the pin 16 is located near the outer end of the arm of the lever 12 the wire *g* is carried along the lever 12 to a point near the pivot of the lever and then connects with the binding-post 23, with which the wire *h* is also  
30 connected, it thus being necessary for only a short length of the wire *g* to extend between the binding-post 23 and the movable lever to which the wire is connected.

The block 2, upon which the keys 3 and 8  
35 are pivoted and with which they are in electrical contact, as is well understood, is, through the wire *d*, at all times in electrical connection with the binding-post 7, while with the parts in their normal positions the binding-post 6  
40 is in electrical connection with both the terminal 5 (which coöperates with the key 3) and the terminal 9, (which coöperates with the key 8,) this connection with the terminal 9 being effected through the wire *e*, the coils of the mag-  
45 net 10, the wire *f*, the pin 20, the pivot-block 14, the auxiliary lever 15, its spring-plate 17, the pin 16, and the wires *g* and *h*. When, then, the key 8 is depressed and brought into elec-  
50 trical contact with its coöperating terminal 9, the circuit is completed and the magnet of the sounder X is energized in a manner which is well understood. The completion of this circuit of course also energizes the magnet 10,  
55 thus causing the lever 12 to be rocked upon its pivot, as the armature 11 of said magnet is carried upon one arm of said lever. As the lever 12 rocks upon its pivot the arm 24 of the lever 15 is engaged by some suitable ob-  
60 struction, such as the set-screw 25, carried by the before-mentioned lever-support 13, so that in the movement of said lever 12 toward its attracted position the lever 15 is rocked upon its pivot and the circuit is broken be-  
tween the terminals 16 and 17, as clearly shown

in Fig. 6. The magnet 10 thus immediately 65 becomes deenergized, and the lever 12 under the influence of its spring 26 returns to its normal position, (shown in Figs. 1 and 5,) the spring 18 returning the auxiliary lever 15 to  
70 its normal contact-making position as soon as said lever 12 rocks sufficiently. Thus the key 8 being held in its depressed position the circuit is immediately recompleted and a second impulse or dot is sent over the line, the  
75 circuit being again broken, however, as soon as the lever 12 rocks into its attracted position. Therefore as long as the key 8 is held depressed a series of dots will be automatically transmitted, the circuit being automatically  
80 positively broken by reason of the action of the set-screw 25 upon the arm 24 of the auxiliary lever 15. To send dashes, the key 3 is operated in the usual manner.

Preferably the key 8 is of such character 85 and is so related to proper coöperating terminals that it can be caused to transmit the necessary electrical impulses by either vertical or horizontal movement, it being also possible to employ the key 8 for the purpose of sending  
90 dashes. In order to effect this, the shank 27 of the key 8 is provided in what may be termed its "inner" end with a socket in which is received a cylindrical pin 28, extending from a  
95 block 29, so that the shank 27 can be rocked upon the pin 28 as an axis, the set-screw 30 holding the shank 27 in its desired position. The block 29 is through the resilient strip 31 con-  
100 nected to the block 32, which is pivoted, as by the pivot-pin 2<sup>a</sup>, to the before-mentioned block 2. This strip 31 is thin horizontally, but is of considerable height, so that although  
105 when the key 8 is reciprocated vertically the strip so connects the blocks 32 and 29 that they rock as parts of the same lever, the key can be oscillated horizontally by reason of  
110 the resiliency or flexibility of the said strip. In other words, the connection between the key proper 8 and its pivot-block 32 is flexible horizontally, but is stiff vertically. Project-  
115 ing from what may be termed the "under" surface of the key 8 is the usual terminal 33, which coöperates with the terminal 9, while extending from the top of the key 8 is a second  
120 terminal 34. Terminals 35 and 36, mounted upon the base 1 and upon opposite sides of the key 8, are connected, respectively, with the terminal 9 (as through the wire *i*) and the terminal  
125 5, (as through the wire *k*.) When the key 8 is in its normal position, with the terminal 33 extending downwardly and adapted to coöperate with the terminal 9, said key is operable vertically in the usual well-understood manner. When, however, the key 8 is given a quarter of  
a revolution upon its longitudinal axis to bring it into the position shown in Fig. 3, the terminal 33 is adapted to coöperate with the terminal 36, and the terminal 34 is adapted to coöperate with the terminal 35 when the key

is swung horizontally upon its flexible connection 31, dashes being produced when the terminal 33 contacts with the terminal 36 and dots being produced when the terminal 34 contacts with the terminal 35. Thus the key 8 can be operated either vertically or horizontally, so that the operator can vary the movement of his hand, and thus avoid the excessive strain which results from constantly moving the key in one line, and said key 8 can, when desired, also be employed for sending the dashes as well as the dots.

Referring now more particularly to Figs. 5 and 6, when the key 8 is swung laterally into contact with the terminal 36 current passes from the battery and through the wires *a* and *c* to the terminal 5, thence through the wire *k* to the terminal 36, thence through the key 8 to the block 2, and thence through the wires *d* and *b* back to battery. When the key 8 is swung laterally into contact with the terminal 35, current from the battery passes through the wires *a* and *c* to the magnet 10, thence through the wire *f* and the pin 20 to the pivot-block 14, thence through the auxiliary lever 15 and its spring 17 to the pin 16, thence through the wires *g* and *h* to the terminal 9, thence through the wire *i* to the terminal 35, thence through the key 8 to the block 2, and thence through the wires *d* and *b* back to battery. It will be readily apparent that when the key 8 is in contact with the terminal 36 the action of the transmitter is similar to the action which occurs when the key 3 is in contact with the terminal 5, while when the key 8 is in contact with the terminal 35 the action is the same as when said key 8 is in contact with the terminal 9.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a telegraphic transmitter, the combination of a magnet, a key, and its cooperating terminal, of a contact member included in the circuit including said magnet, said key and said cooperating terminal, a second contact member normally in contact with said first-mentioned contact member, an armature for said magnet, a member adapted to engage said cooperating contact member, and means whereby upon attraction of said armature said cooperating contact member is positively engaged by said member and is thereby positively carried out of engagement with said first-mentioned contact member; substantially as described.

2. In a telegraphic transmitter, the combination with a magnet, a key, and its cooperat-

ing terminal, of a lever carrying a contact member, an element carried by said lever but movable with relation thereto, a cooperating contact member carried by said element, said contact members being included in the circuit which also includes said magnet, said key and its said cooperating terminal, an armature connected to said lever and cooperating with said magnet, and an obstruction in the path of movement of said member carried by said lever and adapted when said lever is rocked to engage said member and move the same with relation to said lever to effect separation of said contact members; substantially as described.

3. In a telegraphic transmitter, the combination with a magnet, a key, and its cooperating terminal, of a lever carrying a contact member, an auxiliary lever mounted upon said first-mentioned lever and carrying a contact member cooperating with said first-mentioned contact member, said contact members being included in the circuit which also includes said magnet, said key and its said cooperating terminal, an armature connected to said first-mentioned lever and cooperating with said magnet, and an obstruction in the path of movement of said auxiliary lever when the latter is moved by said first-mentioned lever, whereby upon movement of said first-mentioned lever said obstruction engages said auxiliary lever and rocks the same to effect separation between said contact members; substantially as described.

4. In a telegraphic transmitter, the combination with a magnet, a key, and its cooperating terminal, of a lever carrying a contact member, an auxiliary lever mounted upon said first-mentioned lever and provided with a spring contact member cooperating with said first-mentioned contact member, a finger upon said auxiliary lever and adapted to engage said spring to act upon the latter in effecting disengagement of said spring from its cooperating contact member, said contact members being included in the circuit which includes said magnet, said key and its said cooperating terminal, an armature cooperating with said magnet and connected to said first-mentioned lever, and an obstruction adapted upon movement of said first-mentioned lever to engage said auxiliary lever and move the latter to cause separation between said contact members; substantially as described.

5. In a telegraphic transmitter, a key-support, a key proper, a block pivotally connected to said support to permit reciprocal operation of said key in one line, and a connector between said key proper and said block, said connector being flexible in a line transverse that in which the key reciprocates when said block is rocked but stiff in the said line in which the said block rocks upon its pivot; substantially as described.

6. In a telegraphic transmitter, a key-sup-  
port, a block pivotally connected thereto, a  
second block, flexible connection between said  
blocks, a key proper having swivel connec-  
5 tion with said second block, and terminals co-  
operating with said key; substantially as de-  
scribed.

In testimony whereof I hereunto affix my  
signature, in the presence of two witnesses,  
this 13th day of February, 1904.

WILLIAM E. MILLER, SR.

Witnesses:

GALES P. MOORE,

GEORGE BAKEWELL.