

(No Model.)

4 Sheets—Sheet 1.

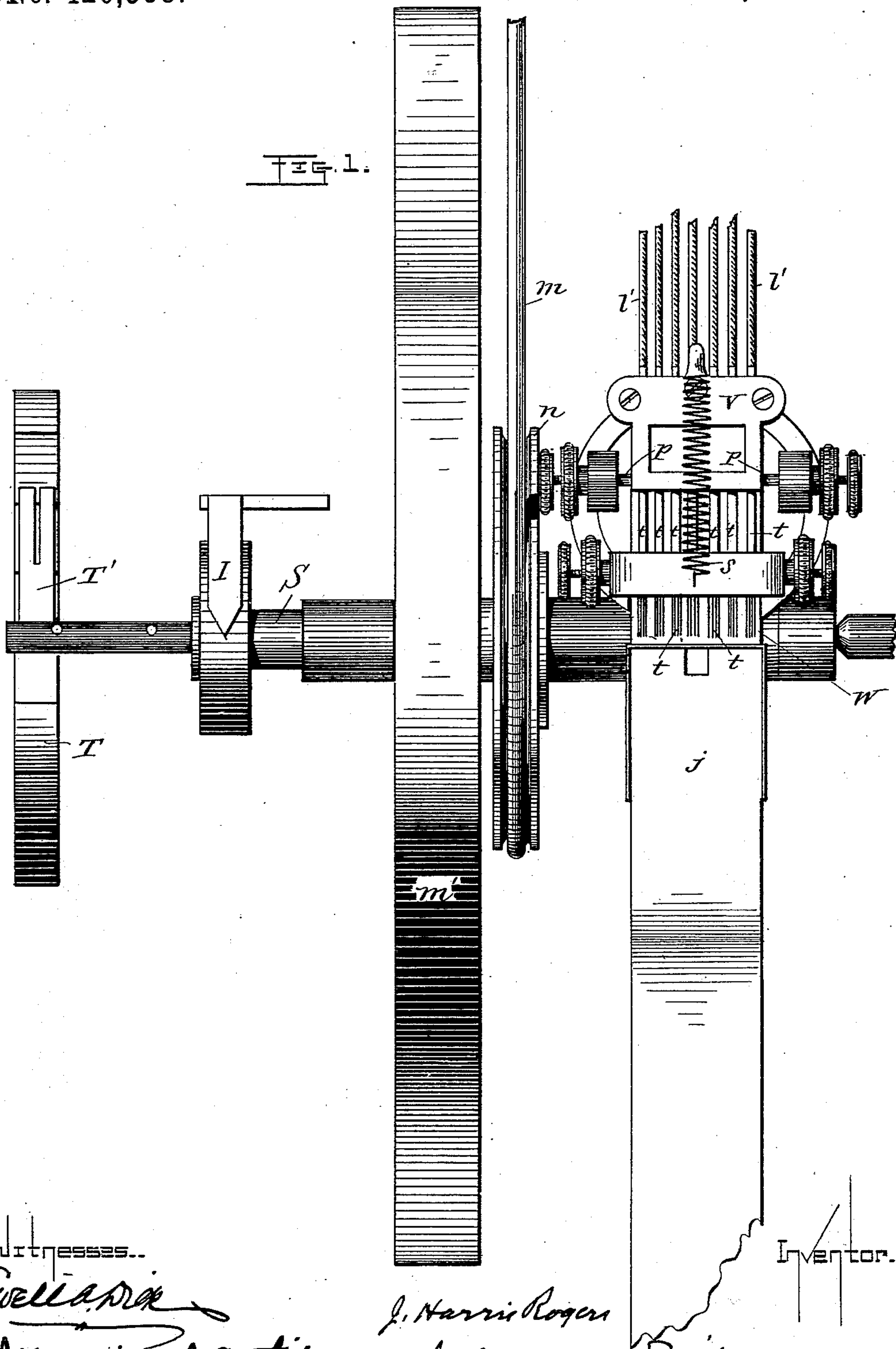
J. H. ROGERS.

PRINTING INSTRUMENT OR APPARATUS FOR TELEGRAPHIC OR  
OTHER USES.

No. 420,358.

Patented Jan. 28, 1890.

FIG. 1.



Witnesses...

*Ewell A. Drake*

*Marvin A. Curtis*

*J. Harris Rogers*

*by Marshall Bailey*  
*his attorney*

Inventor...

(No Model.)

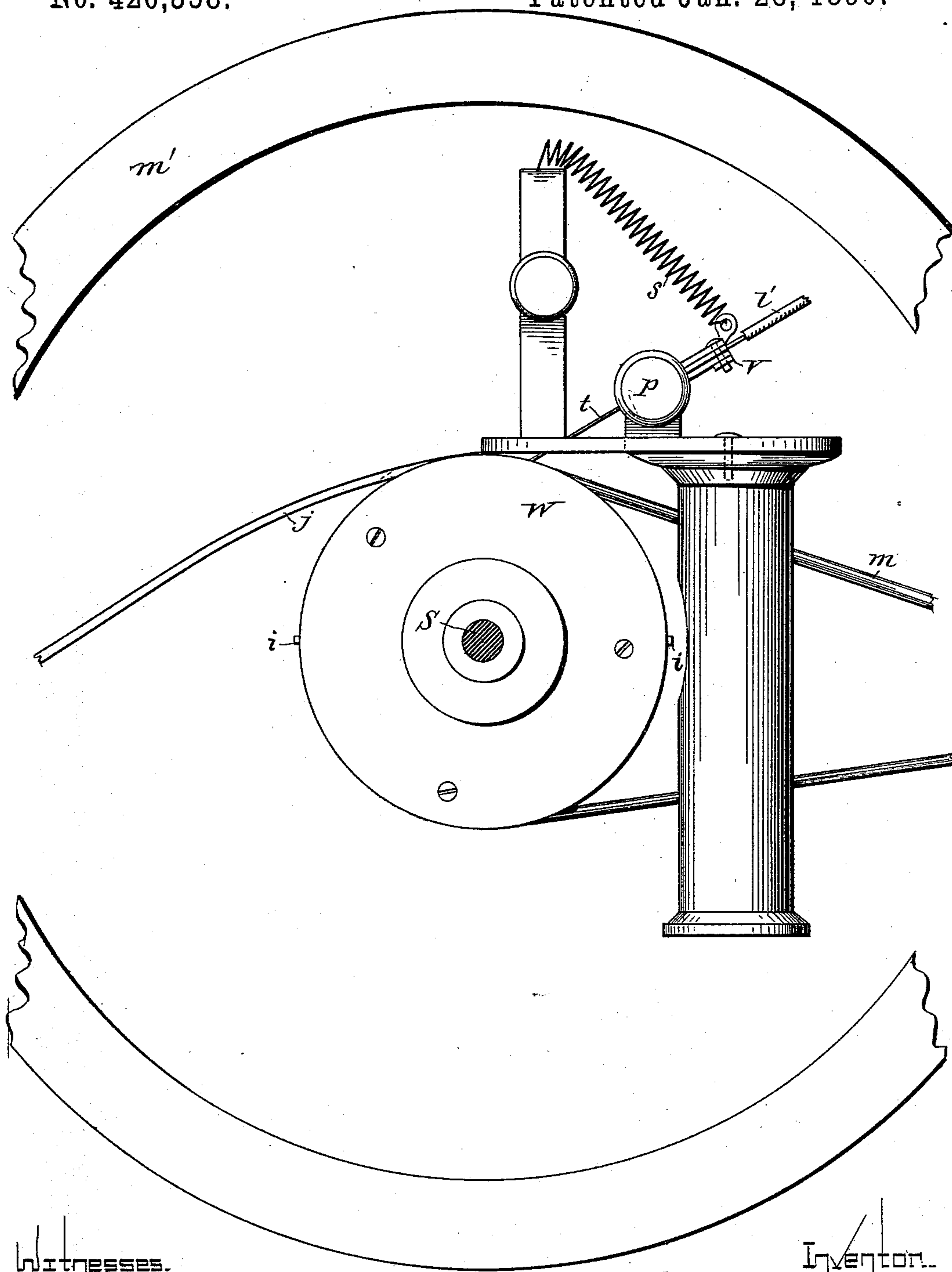
4 Sheets—Sheet 2.

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Witnesses.

*Edwell A. Pick*  
*Marvin A. Curtis*

FIG. 2.

Inventor.

*J. Harris Rogers*  
*by Maxwell Bailey*  
*his attorney*



(No Model.)

4 Sheets—Sheet 3.

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FIG. 3.

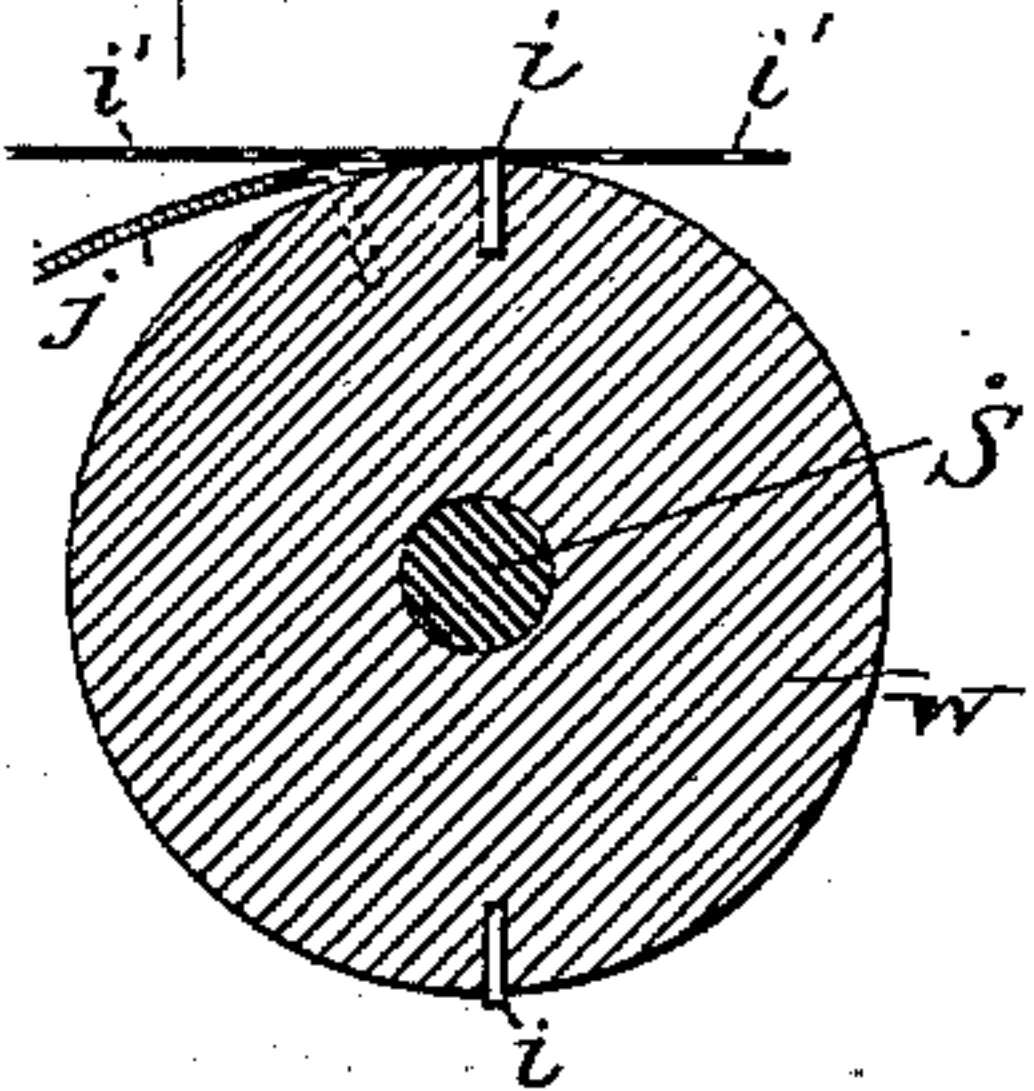
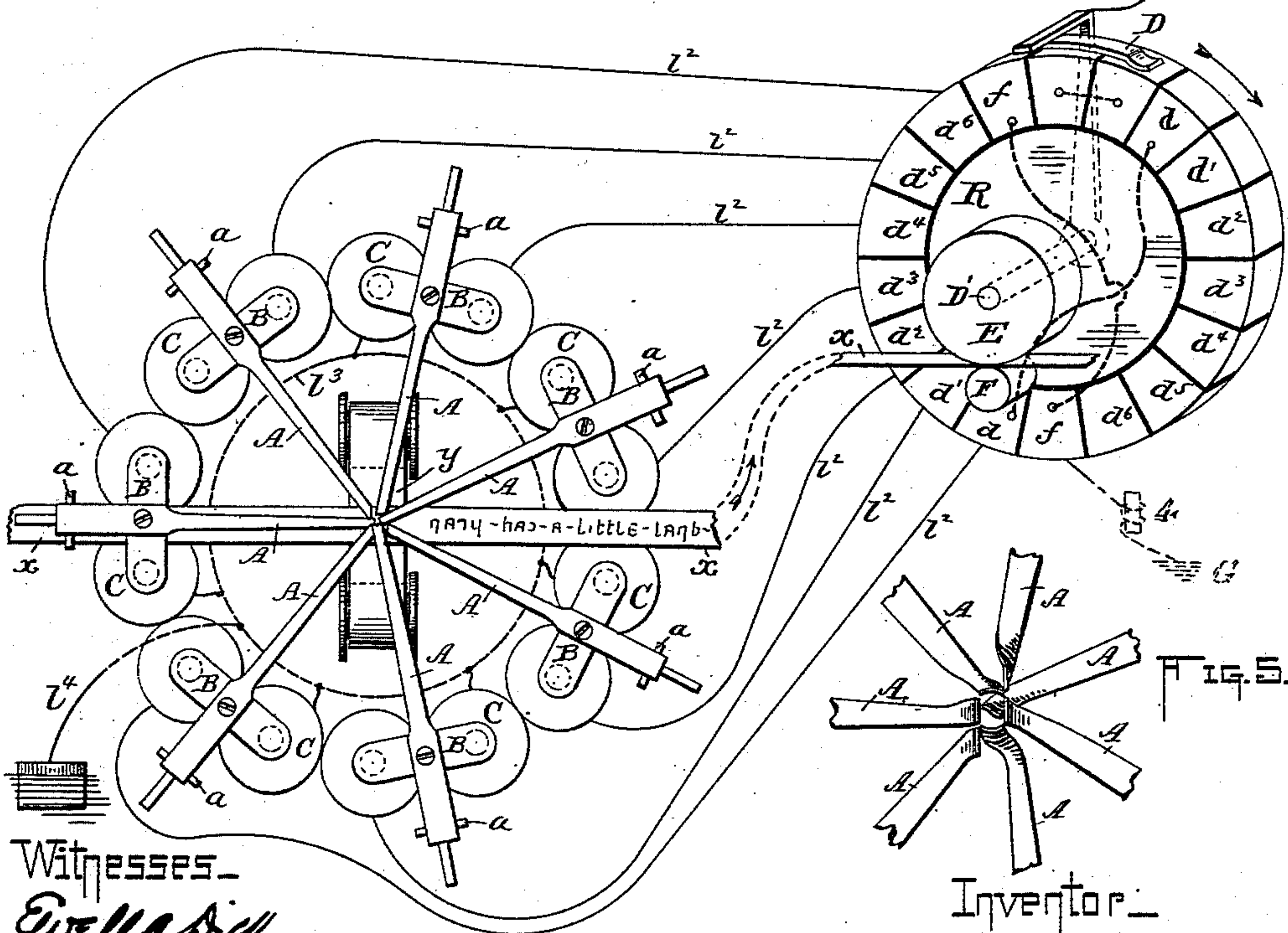
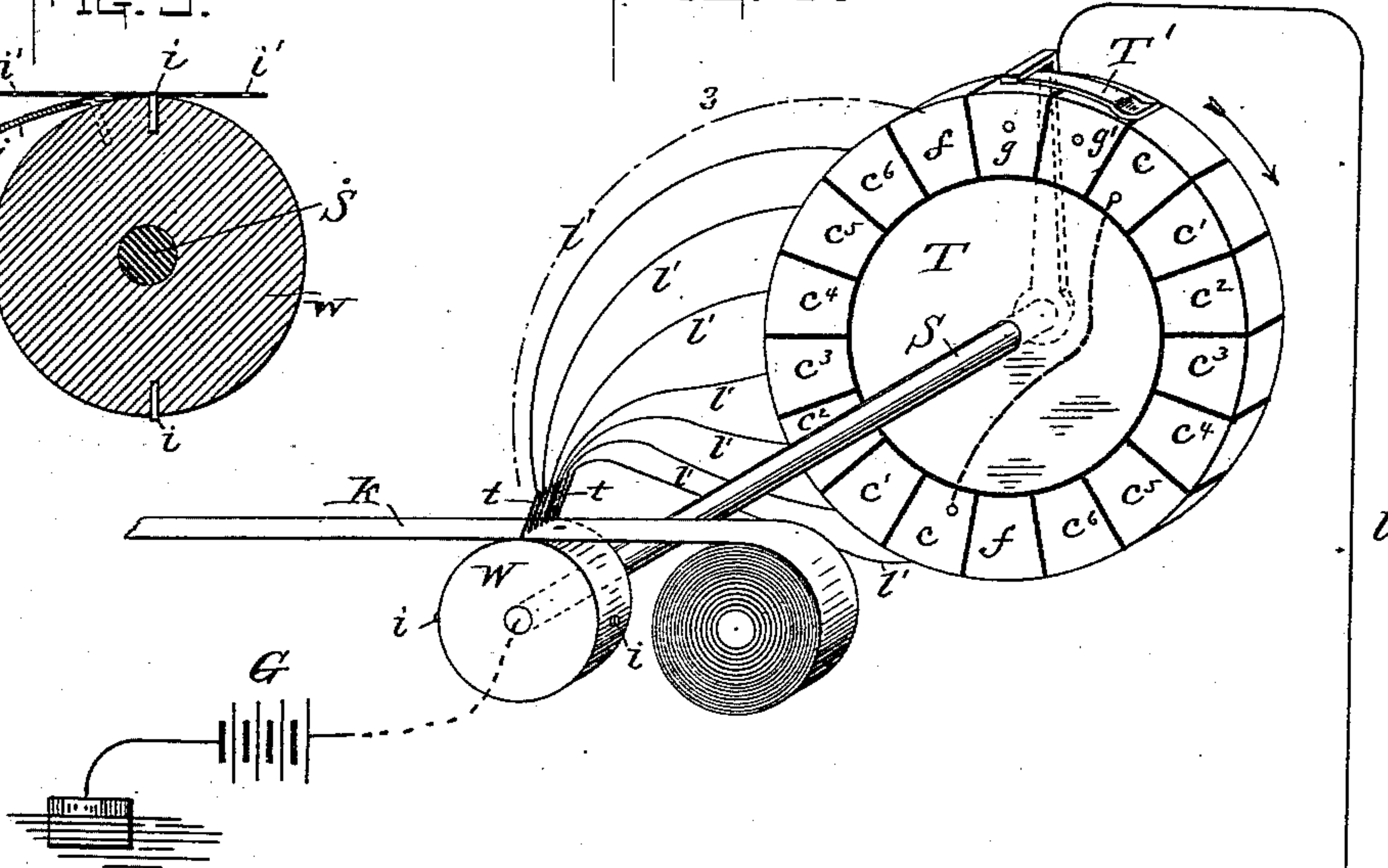


FIG. 4.



Witnesses—

*Ewell A. Dick*

*Martin A. Custer*

Inventor—

*J. Harris Rogers*  
*by Marshall Bailey*  
*his attorney*

(No Model.)

4 Sheets—Sheet 4.

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FIG. 7.

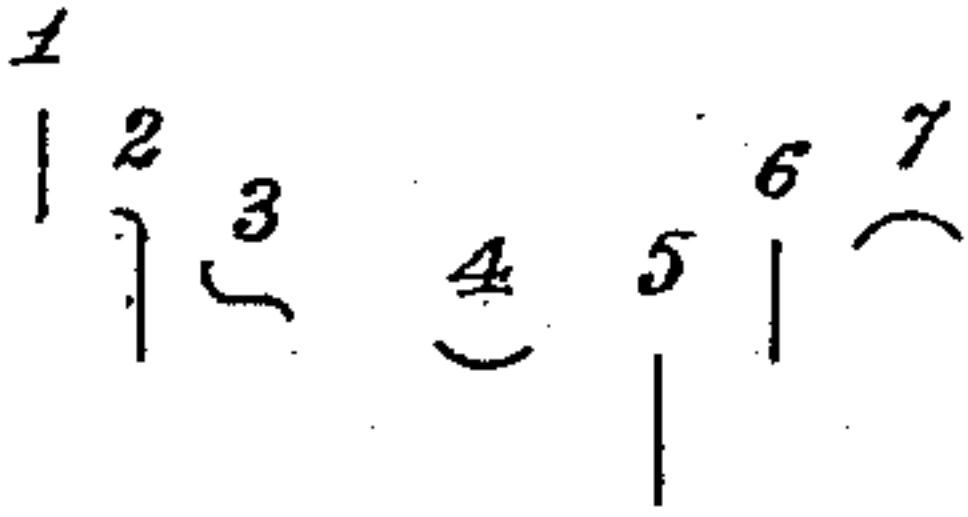


FIG. 8.



FIG. 9.

abcdefghijklmnopqrstuvwxyz

FIG. 10.

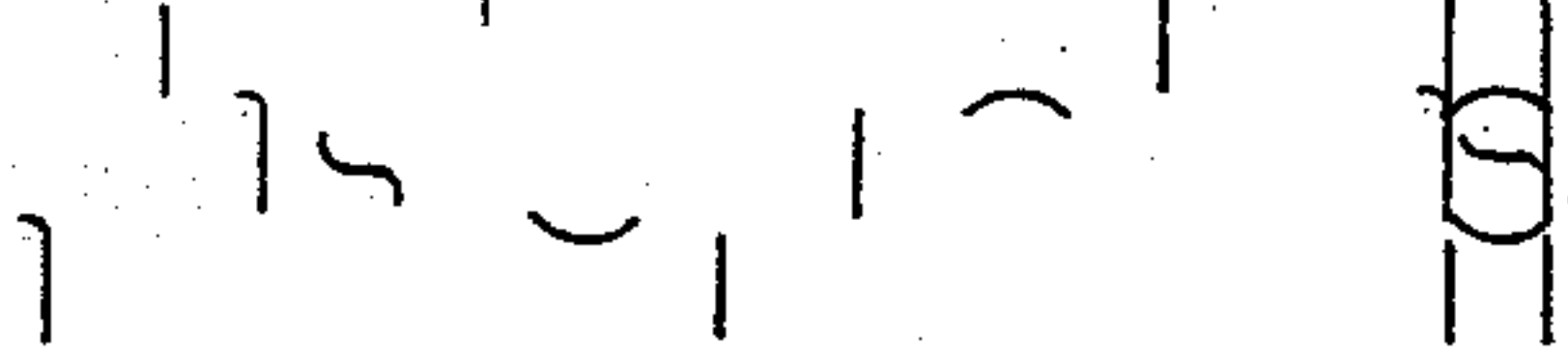


FIG. 11.

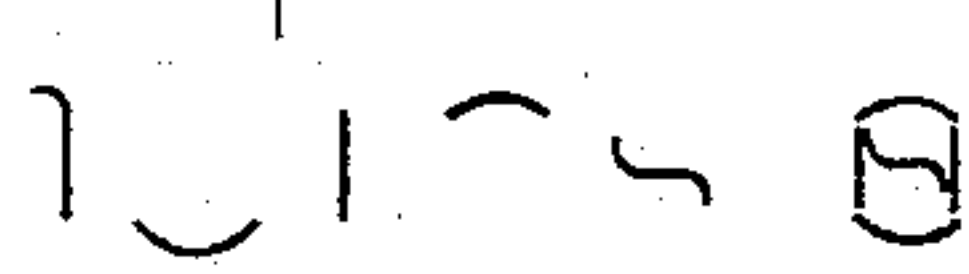
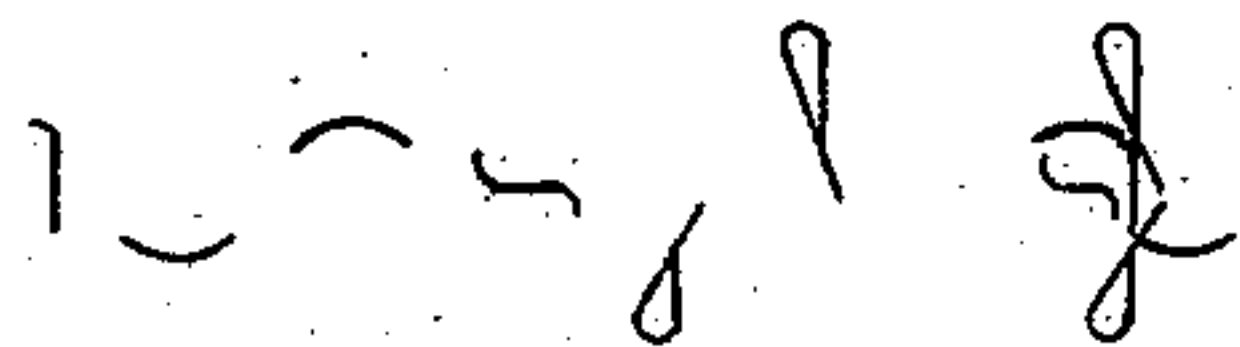


FIG. 12.



Witnesses..

*Evell A. Nick*  
*Mann A. Curtis*

Inventor..

*J. Harris Rogers*  
*by Macallan Bailey*  
*his attorney*



# UNITED STATES PATENT OFFICE.

JAMES HARRIS ROGERS, OF BLADENSBURG, MARYLAND, ASSIGNOR TO THE  
VISUAL SYNCHRONISM COMPANY, OF WEST VIRGINIA.

PRINTING INSTRUMENT OR APPARATUS FOR TELEGRAPHIC OR OTHER USES.

SPECIFICATION forming part of Letters Patent No. 420,358, dated January 28, 1890.

Application filed June 9, 1887. Serial No. 240,775. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES HARRIS ROGERS, of Bladensburg, Prince George's county, and State of Maryland, have invented certain new and useful Improvements in Printing Instruments or Apparatus for Telegraphic and other Uses, of which the following is a specification.

My invention, while susceptible of various uses, has been devised with more particular reference to its application to printing-telegraphs; and it is in that connection that I have illustrated it in the drawings accompanying this specification, which will be hereinafter more particularly referred to.

The feature which mainly characterizes my invention is that the letters or figures to be produced are formed by a system of rods or levers, the acting ends of which are brought closely together, so that the mark made by one may join or nearly join the mark made by another, and which at these ends carry each its appropriate element, by the conjoint use of two or more of which the representation or approximate representation of the desired letter or figure can be impressed or marked upon a strip of paper or other receiving material. For example, in one arrangement devised by me, in which seven elementary characters are employed, five of these characters, appropriately selected, will form "b," three will form "c," and so on, varying the number of elements and their combination as required for the production of any specific letter. The advantage gained by this in a general way is that the absolute number of characters employed is less than if one were appropriated to each letter, and in a more particular way, as applied to automatic printing-telegraphs, is that thereby the transmitting and receiving mechanism is simplified and less time is required for the transmitting and receiving operation, because fewer segments in the segment-disk of the transmitters and receivers are required, and these disks can be made smaller and driven at greater speed than would otherwise be the case.

In the application of my invention to automatic telegraphy I employ the synchronizing

method set forth in my Letters Patent No. 358,753, of March 1, 1887, in order that the receiver may act in unison and synchronously with the transmitter.

The nature of my invention and the manner in which the same is or may be carried into effect will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a plan, and Fig. 2 is a side elevation, of so much of the telegraphic transmitting apparatus as needed to explain the invention. Fig. 3 is a sectional side elevation of the preferred paper-feed device employed by me in the transmitter. Fig. 4 is a plan of the printing mechanism of the receiver, together with a diagrammatic representation of the receiving and transmitting segment-disks and their accessory devices and circuit-connections. Fig. 5 is a bottom plan of the inner or contiguous ends of the printing-levers. Fig. 6 is a representation of the monogram formed by all the elementary characters carried by said levers. Fig. 7 represents the said characters separately. Fig. 8 represents the alphabet as made by appropriately selecting and combining said characters. Figs. 9, 10, and 11 represent each the separate characters and the monogram formed thereby of modified systems of elements, Fig. 11 being designed for the production of script.

The printing mechanism for the receiver, a plan view of which, omitting the frame and other parts not needed to illustrate my invention, is shown in Fig. 4, consists of a system of levers A, vibrating upon pivots *a* and converging at their inner ends. The elementary characters employed in this particular printer are supposed to be seven, (shown in Figs. 6 and 7,) and consequently there are seven of the levers, each carrying one of the characters on its inner acting end, these ends, as shown in Fig. 5, being assembled together, so that if all are simultaneously depressed upon a strip of paper they will if inked print thereon the monogram seen in Fig. 6.

To print "a," the levers carrying the characters corresponding to 2, 3, 6, and 7 of Fig. 7 are depressed. To print "b," levers carrying characters corresponding to 1, 2, 4, 6, and 7 are depressed, and so on. The alphabet



which can in this way be printed is represented in Fig. 8. Thus by imparting an intermittent feed to the paper strip and by depressing at each rest the proper combination of levers words can be printed, there being of course for the purpose of separating one word from another an extra feed between two consecutive words, during which no printing is done. Such a printed strip is represented in Fig. 4, wherein  $x$  is the paper strip, and  $y$  is the ordinary inking-ribbon, interposed, as usual in this species of instrument, between the printing-levers and the paper.

When a printer of this kind is used in telegraphy, the printing-levers  $A$  must of course be electrically operated and controlled. To this end each lever is provided with an armature  $B$ , in conjunction with which is an electro-magnet  $C$ —one for each armature-lever—the arrangement being such that each magnet, when excited, will attract its armature, and thereby bring down its armature-lever  $A$  upon the paper to be printed on. The armature-levers are of course to be provided with retractile springs to act in opposition to the magnets; but as such springs are well known I have not deemed it necessary to illustrate them in the drawings. Each magnet is of course to be included in a separate branch circuit having in it a circuit maker and breaker, whereby the printing or armature lever can be operated by the making and breaking of the circuit. The system of electrical instrumentalities and circuits represented in the drawings for this purpose is one designed for automatic telegraphy, involving the employment of transmitting-brushes—one for each separate lever  $A$ , or elementary character represented thereby—and segment-disks or sunflower-disks—one at the sending and one at the receiving station—made up of one or more series of segments, each series consisting of insulated segments equaling in number the brushes, and each brush being electrically connected to its corresponding segment. It also involves the employment of paper previously perforated at the proper points, so that there will be contact therethrough with a conductor beneath, and the brushes which combine to make up a given letter or figure may be thrown into circuit. Devices of this character are not new with me, and have before been employed in telegraphy, and they therefore require here to be only generally referred to and illustrated.

The transmitter shown in Figs. 1, 2, and 3 and diagrammatically in Fig. 4 involves the use of a segment-disk  $T$ , (corresponding to the segment-disk  $C$  of the transmitting-apparatus shown in Fig. 4 of the drawings annexed to my Letters Patent No. 358,753,) around and in contact with the segments on which revolves the trailer-arm  $T'$ , said arm being fast to a radial arm on shaft  $S$ , which is driven by a belt and pulley  $m n$  from some suitable motor.  $m'$  is the fly-wheel of said

shaft. In a frame  $V$ , hung on trunnions or pivots  $p$ , are mounted the transmitting-brushes  $t$ , seven in number, each insulated from the other. The brush-frame is held (by a spring  $s$ ) so that its brushes will bear with yielding pressure upon the conducting-surface of a wheel  $W$ , which is fast on shaft  $S$ , and also serves as the feed-wheel for the perforated and prepared paper fillet or ribbon  $k$ , said fillet passing between the brushes and the wheel, so that the brushes make contact with the wheel only as permitted by the perforations in the paper. The segment-wheel  $T$  in this instance is made up of two series of seven segments each, the segments in each series being lettered from  $c$  to  $c^6$ , inclusive. Between each series is a segment  $f$ , during the passage of the trailer-arm over which the feed of the paper takes place, and adjoining one of the feed-segments  $f$  are two segments  $g g'$ , through the instrumentality of which the spark is produced, for the purpose of the visual synchronizing method of my aforesaid Letters Patent.

The corresponding segments  $c$ , &c., of each series are electrically connected, as indicated with respect to the two segments  $c$ , by the dotted cross-line on the transmitting-disk in Fig. 4. The cross-connections of the other corresponding segments are omitted in order to avoid obscuring the parts. Each brush  $t$  is electrically connected to its corresponding segment  $c$ , &c. The circuit-connections at the transmitting-station are as follows: Battery  $G$  has one of its poles to ground. Its other pole is connected to wheel  $W$ . Thence the circuit is through such of the brushes as may be opposite perforations in the paper ribbon through branch wires  $l'$  to corresponding segments on the segment-disk  $T$ , and thence (as the trailer-arm in its revolution passes over the periphery of the segment-disk) through each of said selected segments and the trailer-arm to line  $l$ . Inasmuch as the trailer-arm at each revolution passes over two series of segments, the feed-wheel must act twice during each revolution to avoid duplicating the same letter. One simple way of accomplishing this is to provide the wheel  $W$  upon its periphery with two diametrically-opposite pins  $i$  to take into a central row of feed-perforations  $i'$  formed in the paper. These pins, when the trailer-arm is passing over the segments  $f$ , advance the paper one step, and the pins are shed or disengaged from the paper at the proper time by a stripper  $j$ , as indicated in Fig. 3, where one of the pins is shown in dotted lines in the position it occupies when the paper is disengaged from it. A branch circuit (the representation of which is, however, omitted from the drawings in order to avoid obscuring those parts in which my present invention is comprised) leads from the battery  $G$  directly to the front one  $g$  (relatively to the direction of revolution of the trailer-arm, which is indicated by the arrow in Fig. 4) of the two segments  $g g'$ . It is



by its passage from this segment to the other one  $g'$  that the spark is produced, which, as before stated, I avail of for synchronizing purposes.

5 At the receiving-station there is a segment or sunflower disk R, (corresponding to the segment-disk E, Fig. 4, of my Letters Patent No. 358,753,) similar in construction and arrangement to the transmitting disk T, save  
10 that its two segments  $gg'$  are electrically connected with each other, and from them there is a branch wire to ground through the electro-magnet of the visual synchronizing mechanism described in my aforesaid Letters Patent No. 358,753, said electro-magnet in the  
15 drawings of the said patent being designated by the letter I.

The branch wire and electro-magnet last referred to are not represented in the drawings in order to avoid obscuring those parts of the apparatus and the circuit-connections therefor which more particularly form the subject of my present application.

In the wheel R corresponding segments  $d$   
25  $d^6$ , inclusive, of the two series are coupled together, as in wheel T, and each segment in the series is electrically connected to its appropriate electro-magnet by branch wires  $l^2$ . All of these magnets have a common connection  $l^3$ , whence by wire  $l^4$  the circuit goes to ground. Around the segment-disk R revolves  
30 a trailer-arm D, (similar to the trailer T', already described,) to which the line  $l$  is electrically connected. This trailer-arm is mounted on a power-driven shaft D', driven by some  
35 suitable motor, which in its action is controlled by my said patented synchronizing mechanism, so that the arm D shall rotate synchronously and in unison with the arm T'.  
40 On the shaft D' is a wheel E, between which and a small roller F below the fillet to be printed on is fed. This roller is intermittently and at the proper intervals raised so as to press the paper fillet  $x$  against the rotating wheel  
45 E, and thus to effect the feed. This intermittent movement of the roller can be readily obtained by any of the known and usual forms of electro-magnetic feed—as, for example, it can be mounted on or operated by the vibra-  
50 tory armature-lever of an electro-magnet 4, included in a circuit 3, leading from a brush at the transmitting-station similar to brushes  $t$  (which completes the circuit through suitable perforations in the transmitting-fillet)  
55 through the feed-segments  $ff$  of the transmitter and receiver, as indicated diagrammatically in the drawings.

The operation of the apparatus is manifest from the foregoing explanation. The transmitting-fillet, properly perforated beforehand, is fed intermittently through the transmitting-instrument, two letters being printed at each revolution. In the sentence, part of which is printed on the receiving-fillet  $x$ , the  
60 first letter, "m," is produced by perforating the paper so that the perforations shall come opposite to the brushes  $t$ , corresponding to 2, 7,

6, and 5 of the elementary characters represented in Fig. 7. The trailer-arm T', passing over one series of segments  $c c^6$ , will through  
70 them and the corresponding segments on the receiving-disk R excite the electro-magnets C, which control printing-levers A, bearing those elements, thus bringing down said levers upon the paper  $x$  and causing them by  
75 their conjoint action to print the letter desired. The next letter, "a," is produced in a similar way, the feed which spaces the letters taking place when the trailer-arm passes over either one of the segments  $f$ .  
80

It is manifest that the segment-disks can be provided with a single series of segments only or with more than two series. It is also manifest that the elements which the printing-levers represent can be varied in form as  
85 well as in number, as indicated in Figs. 9 and 11, what I regard as the characteristic of my invention being that the representation of the letter or figure (by which I intend a letter or figure used in ordinary printed or  
90 written words of a spoken language) is made up of several elementary parts or characters of that letter or figure, each carried by an instrument (of which the printing-lever is typical) independent of the others, the acting  
95 ends of which instruments or levers are brought together, so that the marks made by those of them selected may enter into and make up the representation of the letter or figure desired.  
100

Having now described my improvements and the manner in which the same are or may be carried into effect, what I claim as new and of my own invention is—

1. The combination, substantially as hereinbefore set forth, of the character rods or levers provided each with its appropriate character or element of an ordinary letter or figure, by the conjoint use of two or more of which the desired letter or figure can be  
105 printed or impressed upon a strip of paper or other receiving material, and having their ends which are provided with said characters or elements brought closely together, so that the mark made by one may join or nearly  
110 join the mark made by another, as and for the purposes hereinbefore set forth.

2. The combination of the armature-levers provided each with its appropriate character or element of an ordinary letter or figure, by  
120 the conjoint use of two or more of which the desired letter or figure can be printed or impressed upon a strip of paper or other receiving material, and arranged so that their ends which are provided with said characters shall converge or come closely together, as specified, with electro-magnets, one for each lever, transmitting mechanism, and circuit-connections, substantially as described, where-  
125 by such of the magnets as from time to time are brought into circuit shall actuate their appropriate armature-levers, substantially in the manner and for the purposes hereinbefore set forth.  
130



3. The combination, with the transmitting-brushes, segment-disk, and revolving trailer-arm therefor, of the receiving segment-disk, the trailer-arm therefor, the converging armature-levers provided each with its appropriate character or element of an ordinary letter or figure, by the conjoint use of two or more of which the desired letter or figure can be produced or printed, electro-magnets, one for each armature-lever, circuit-connections, substantially as described, and feed mechanisms for the transmitting and receiving fillets, the combination being and acting substantially as hereinbefore set forth.
4. In a printing telegraphic receiver, the combination of converging armature-levers bearing at one end each its appropriate element or character of an ordinary letter or

figure, by the conjoint use of two or more of which the desired letter or figure can be printed or impressed, and having these ends brought together, so that the mark made by one will join or nearly join that made by another, in combination with electro-magnets, one for each armature-lever, each magnet being included in an independent branch circuit, by the closing of which the armature-lever will be attracted to its magnet, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 31st day of May, A. D. 1887.

J. HARRIS ROGERS.

Witnesses:

EWELL A. DICK,  
MARVIN A. CUSTIS.