

(No Model.)

3 Sheets—Sheet 1.

M. D. PORTER.
PRINTING TELEGRAPH RECEIVER.

No. 491,133.

Patented Feb. 7, 1893.

Fig. 1.

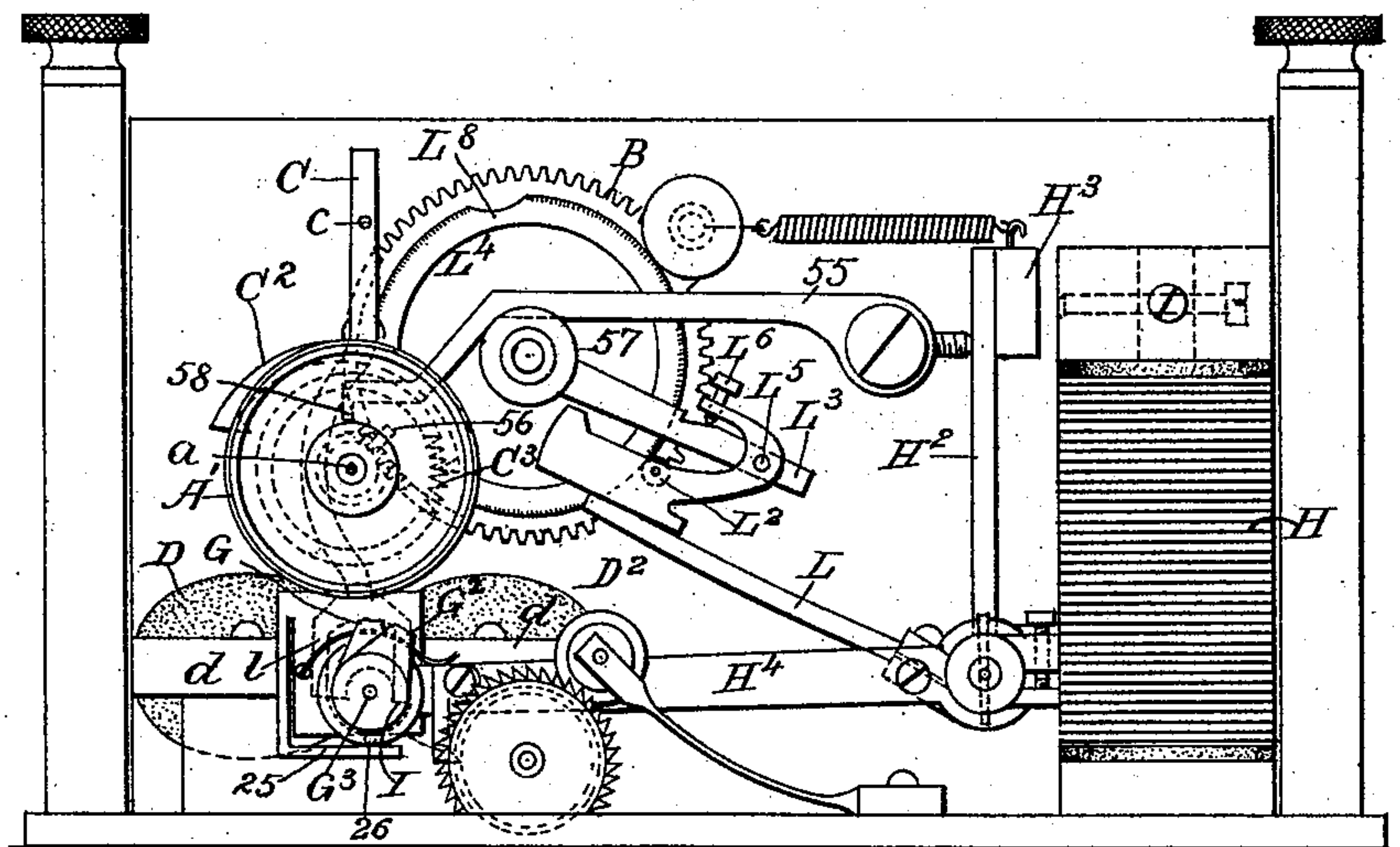
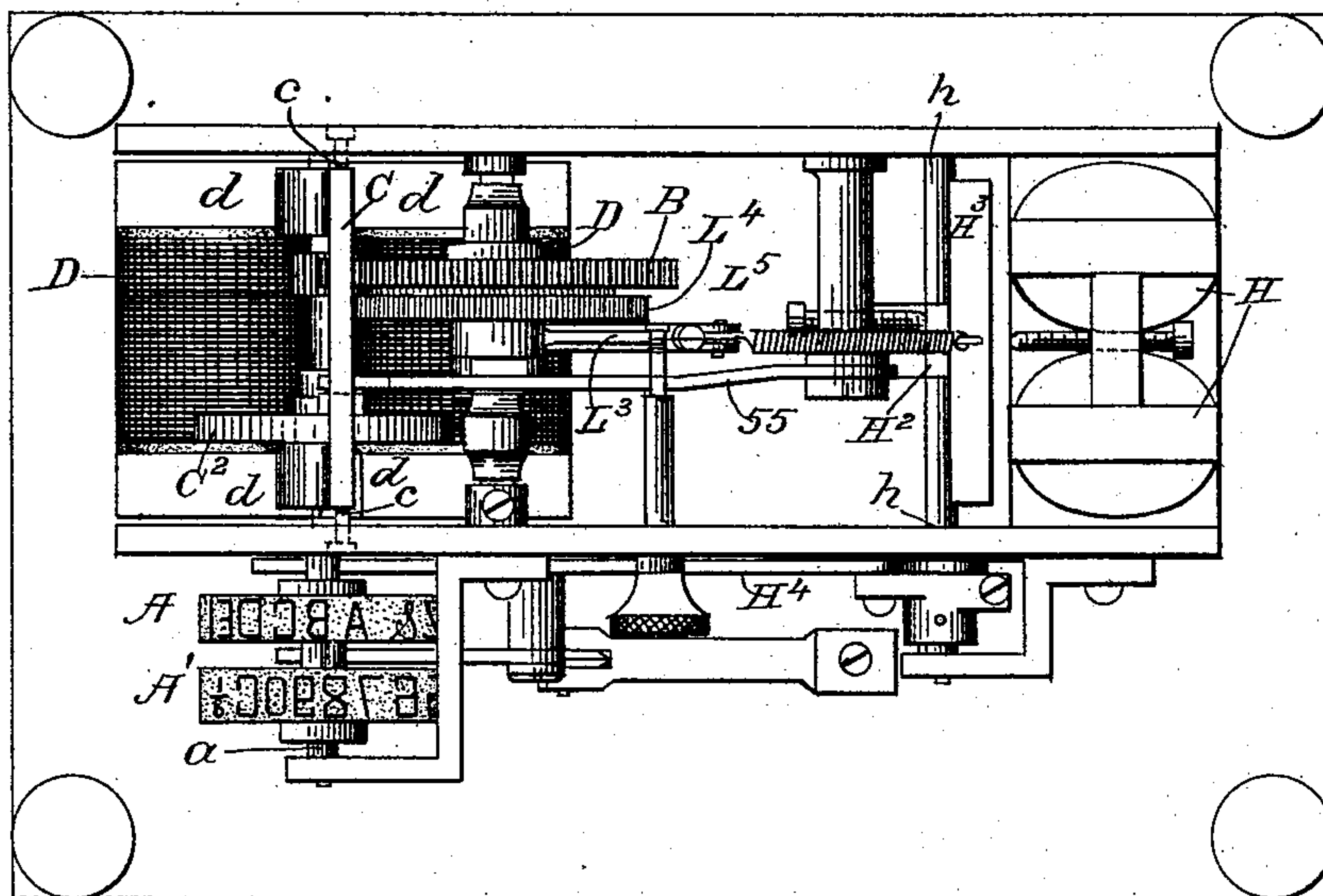


Fig. 2.



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INVENTOR:
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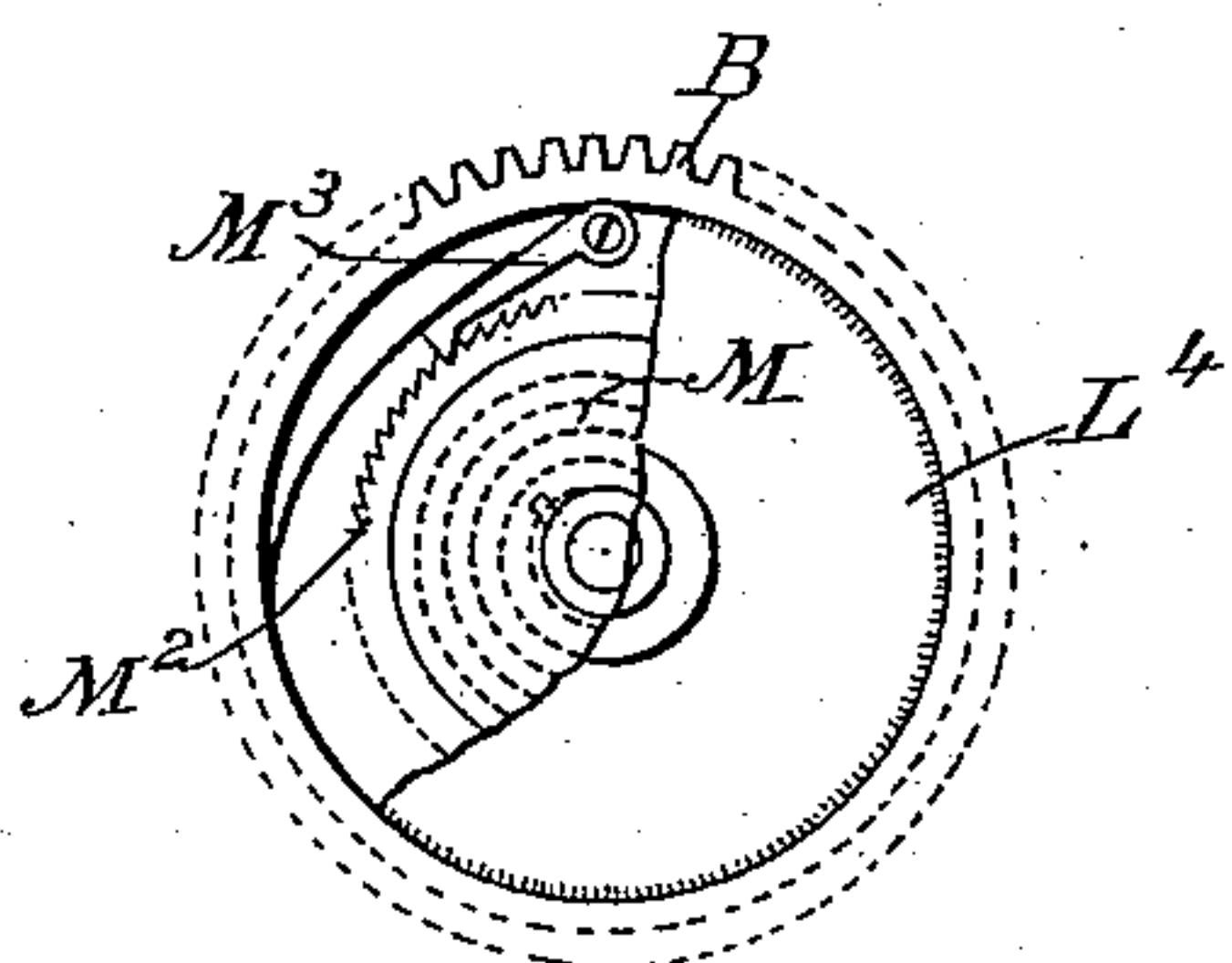
By J. C. Townsend
Attorney

3 Sheets—Sheet 2.

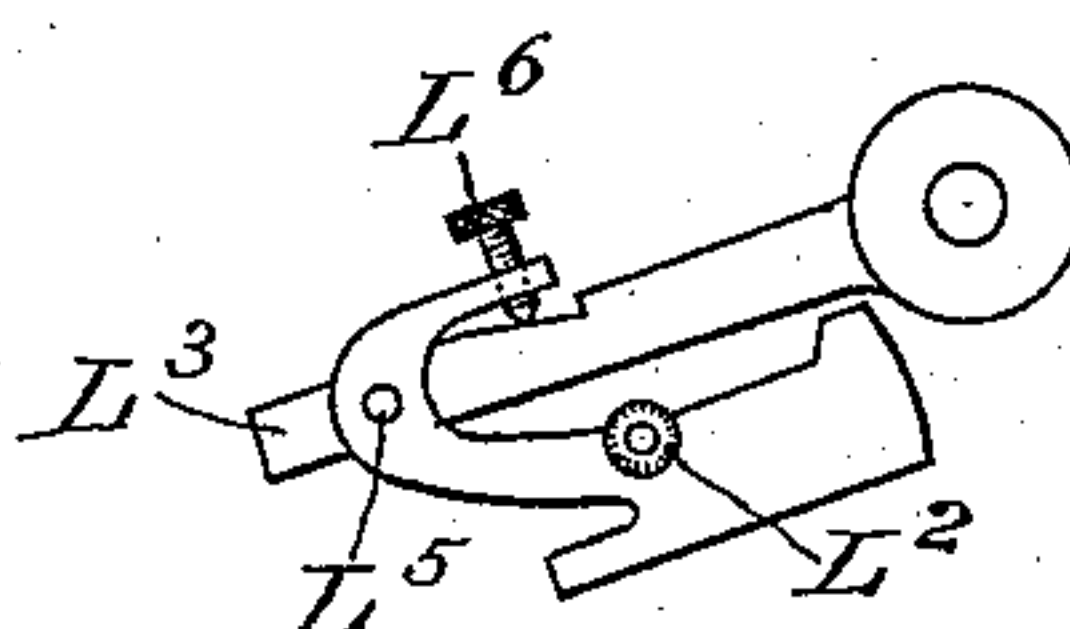
No. 491,133.

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Fig. 3.



Fic. 4.



Figs. 5.

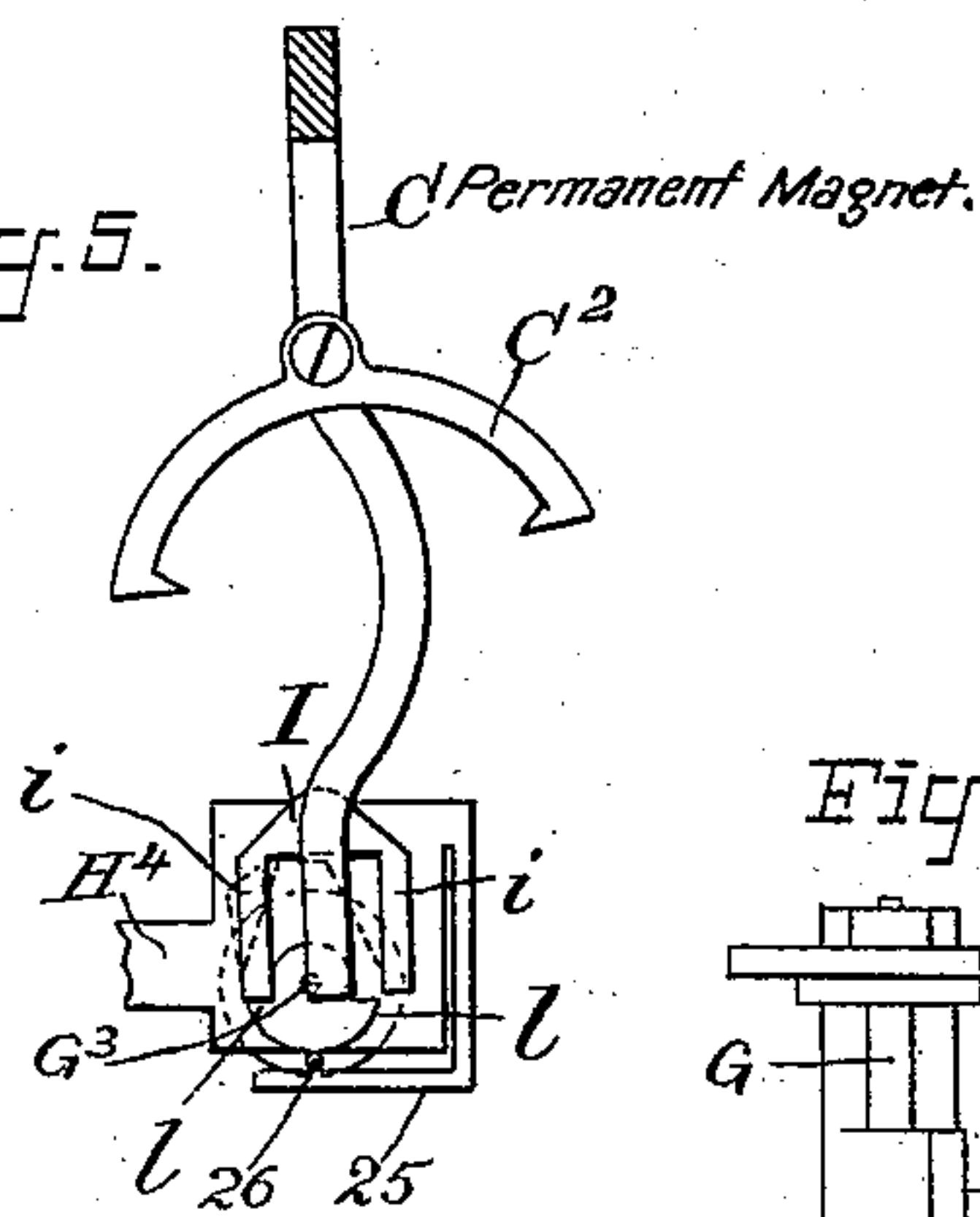


Fig. 6.

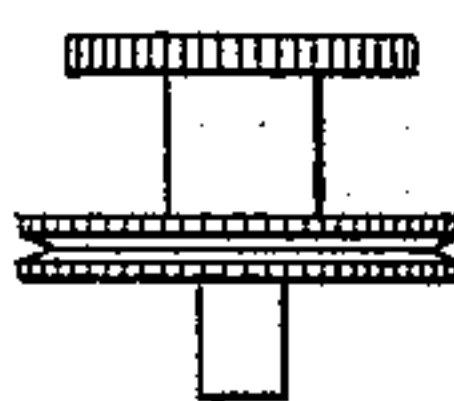
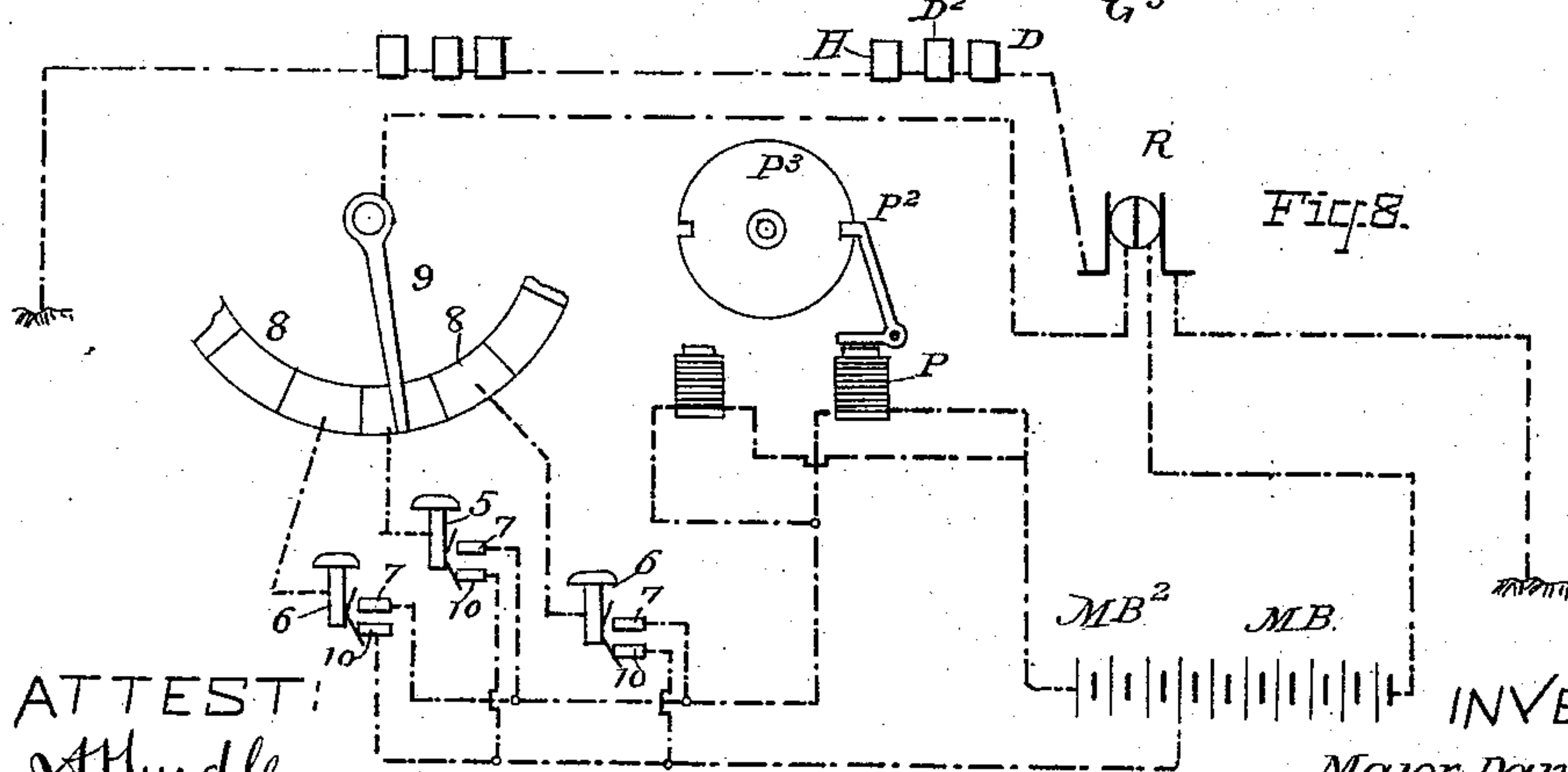
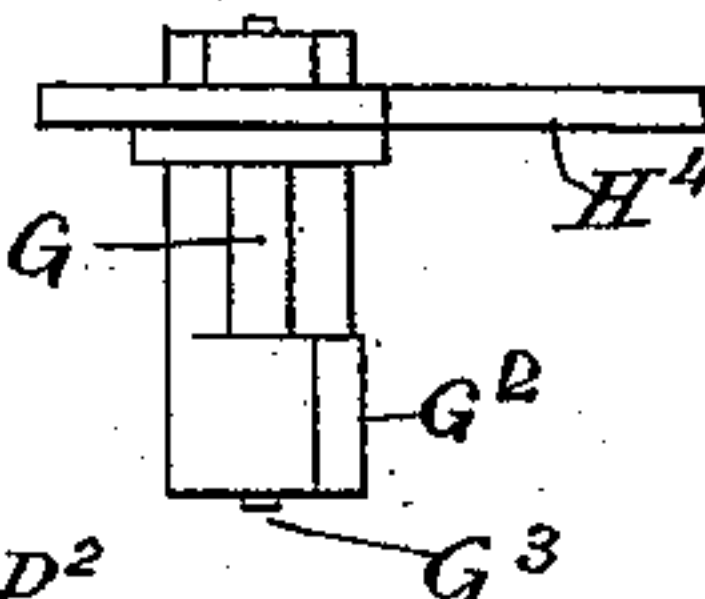


Fig-7.



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3 Sheets—Sheet 3.

M. D. PORTER.
PRINTING TELEGRAPH RECEIVER.

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Fig. 9.

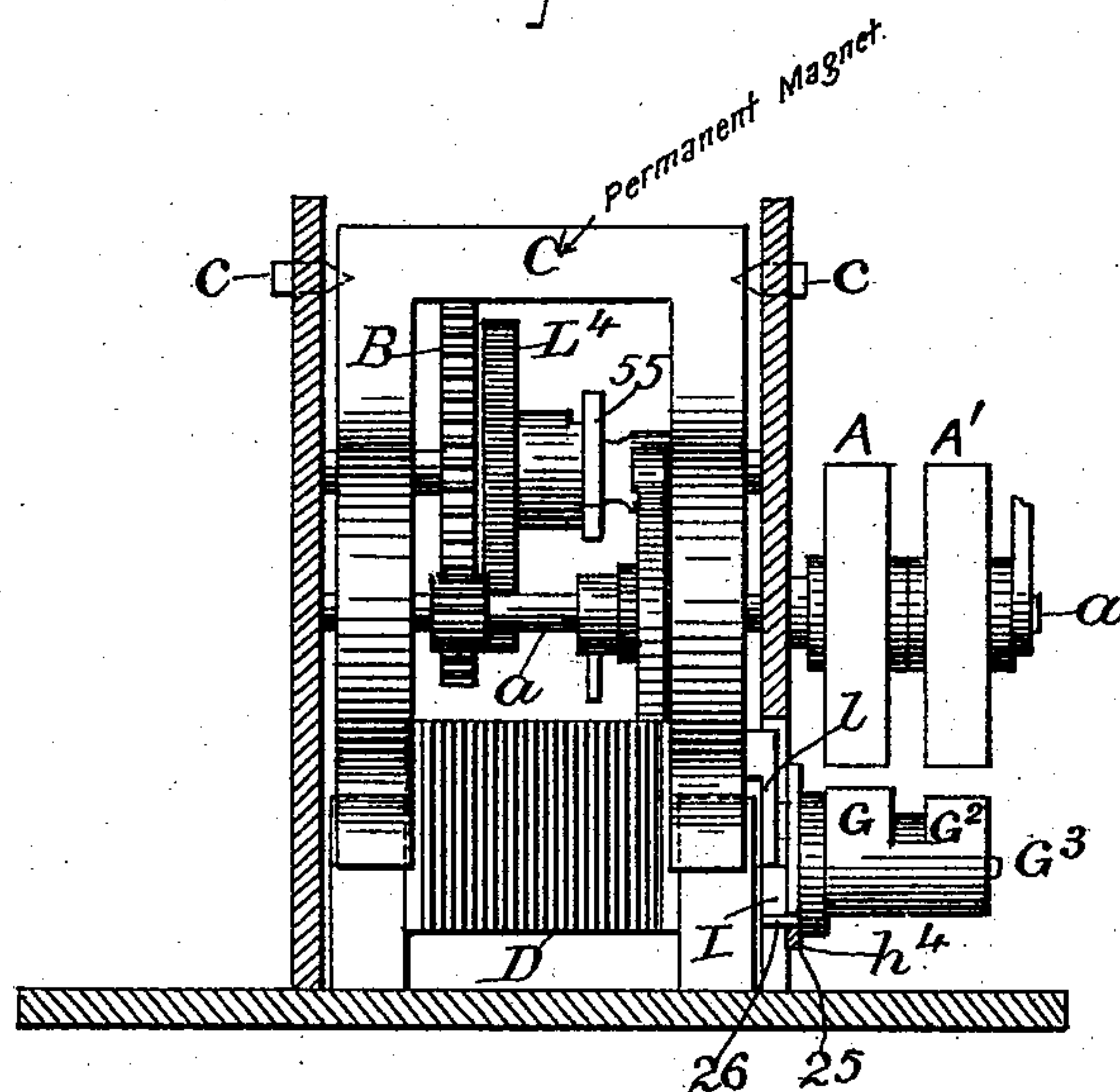


Fig. 11.

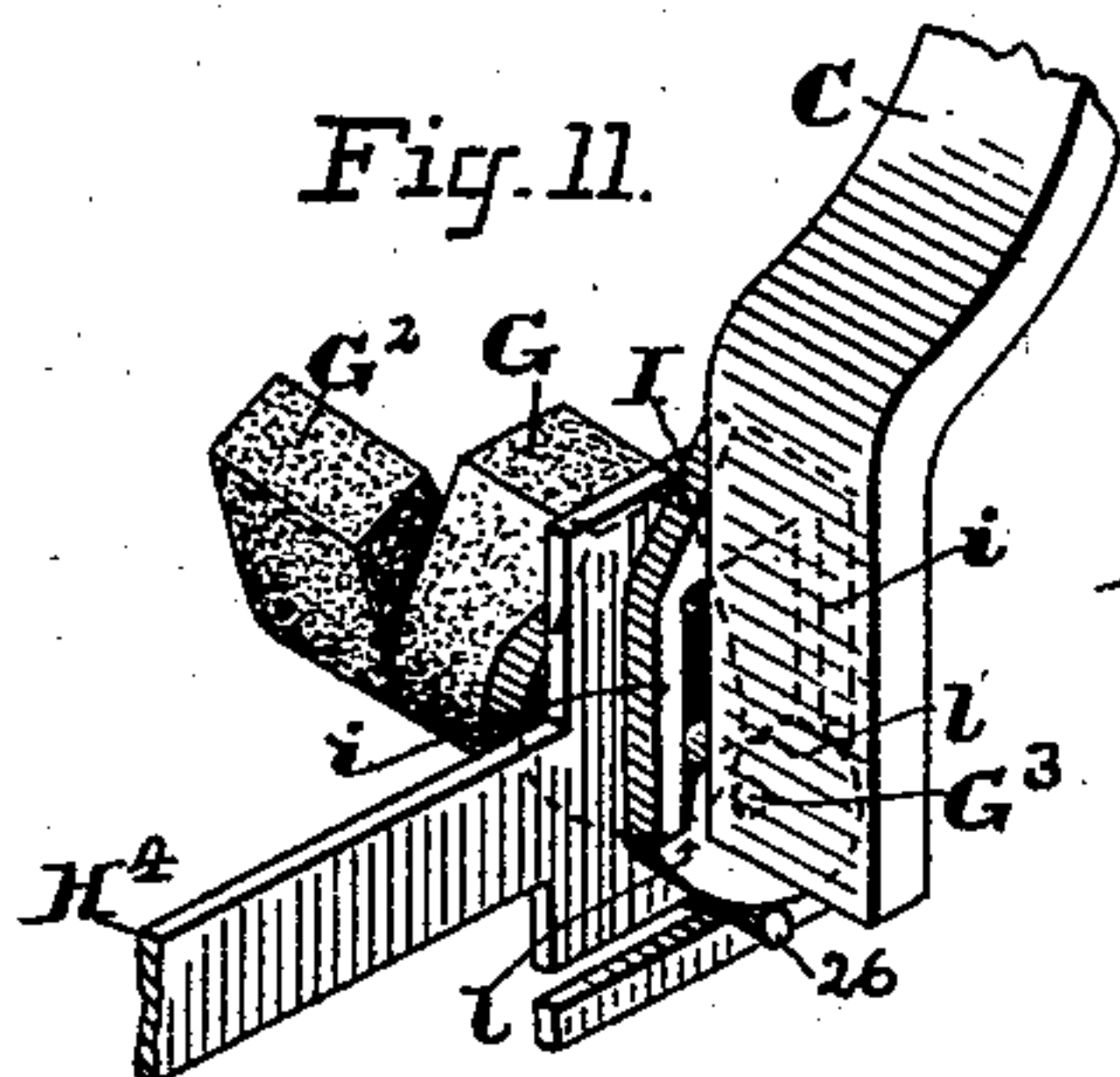
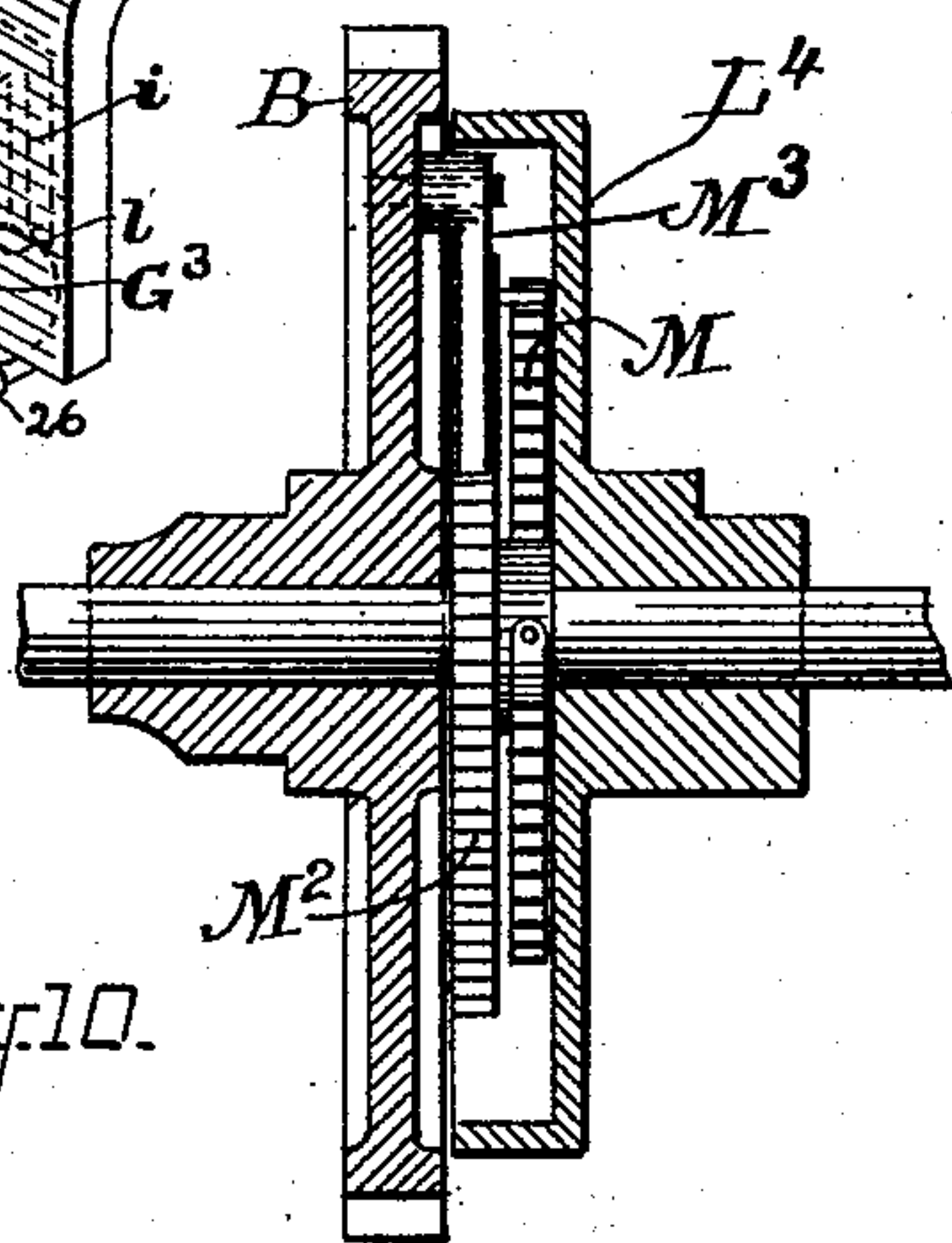


Fig. 10.



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UNITED STATES PATENT OFFICE.

MAJOR DANE PORTER, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE
NATIONAL TICKER COMPANY, OF WEST VIRGINIA.

PRINTING-TELEGRAPH RECEIVER.

SPECIFICATION forming part of Letters Patent No. 491,133, dated February 7, 1893.

Application filed December 10, 1891. Serial No. 414,573. (No model.)

To all whom it may concern:

Be it known that I, MAJOR DANE PORTER, a citizen of the Dominion of Canada, and a resident of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Printing-Telegraph Receiver, of which the following is a specification.

My invention relates to the construction of printing telegraph receiving instruments and is designed to furnish a simple, effective and cheap organization of apparatus whereby an impression may be effected from either one of two type wheels bearing respectively letter and figure type as in stock printers or tickers.

Another object of my invention is to provide an instrument by which reports may be printed with rapidity over a single line circuit.

To these ends my invention consists in the novel organizations and combinations of apparatus hereinafter described and then specified in the claims.

A further object of my invention is to dispense with the necessity of winding up a spring or weight by hand in those stock printers wherein the type wheel is subjected to the constant action of a power tending to rotate it.

In the accompanying drawings:—Figure 1, is a side elevation of the devices with the supporting side plate removed and all parts connected therewith remaining intact in the figure. Fig. 2, is a plan view. Fig. 3, is a detached view of the spring winding mechanism. Fig. 4, is a detail view of the winding lever. Fig. 5, is a detail view of the bifurcated armature. Fig. 6, is a detail view of the friction wheels. Fig. 7, represents a plan view of the pads connected with the press lever. Fig. 8, is a diagram. Fig. 9, is an end elevation of the machine, parts being broken away to show the polarized armature and device controlled by the position thereof. Fig. 10, shows in enlarged detail view the connections of the winding spring, the shaft supporting the wheels being seen in side view. Fig. 11, is a perspective view of the shifting device for the press pad detached from the remaining parts.

A, A', indicate the two type wheels which may be formed separately or integral with one another, as desired, but are properly mounted so as to rotate together by attach-

ment to or by revolving upon a shaft or spindle *a*. The types of the two wheels A, A', are arranged in parallel circumferential lines with the individual types of one wheel opposite the spaces between the types upon the other and as usual in the art I prefer to assign to one of said wheels the letters of the alphabet and to the other numbers and other characters. The wheels are driven by a wheel B, which gears with the wheel upon the shaft *a*, or is otherwise connected to the type wheel and is itself impelled or actuated by a spring or weight as will be presently described.

C, is a vibratory escapement lever carrying the usual escapement C², that engages with an escapement wheel C³, connected to the type wheels and allows a movement thereof step by step as well understood in the art. When the escapement lever stands at one extreme of its vibration, a type of the wheel A, will be in position for printing while, when it stands in the other position, a type of the other wheel will be in position for printing.

The escapement lever C, is vibrated by means of reversed or alternating currents transmitted over the line from the transmitting instruments and made to circulate in the coils of the electro-magnets D, D². The polarized receiving magnet which produces the vibrations in the lever C, is made up of said magnets D, D², and a piece of steel permanently magnetized and consisting of a U shaped piece shown in edge view in Fig. 5, and in side elevation in Fig. 9, which permanently magnetized piece of steel itself preferably constitutes the vibratory lever C. The lever is pivoted at the points *c*, and its two terminals are respectively north and south and are acted upon by the poles *d*, of the electro-magnets D, D², in the well known manner, a current of one polarity in the coils of said magnets causing repulsion to take place between the lever and the magnet D², for instance, and attraction between said lever and the magnet D, while a current of the opposite polarity causes the reverse action.

H, is the press electro-magnet which operates upon the printing devices and is a neutral magnet so that its armature will not vibrate by the action of the reversed currents on the circuit. The coils of the magnet H, are in the

same line circuit, preferably, with the coils of the magnets D, D², and the armature lever of said magnet H, is provided with a suitable retractor which is adjusted so that the armature will be drawn up only upon a sufficient pause in the transmission of the alternating currents to allow the magnet to acquire a full charge, or, if desired, the adjustment may be made such that the armature can only be drawn up by increasing the strength of the current of the last polarity sent over the line. H², is the armature lever of this magnet which is pivoted at h, and is connected with an armature H³, which operates through said lever upon the press devices.

The press pad may be made in two parts G, G², which are mounted together upon a sleeve turning upon a pivot G³, extending from the press lever H⁴. One part G, of the press pad is that which operates with wheel A, while the other G², operates with the wheel A'. The pads can be turned together so that one only will operate when the press lever is thrown out by the press magnet. Their position is controlled by means of a position controlling stop I, which is carried upon the vibratory lever C, and has preferably two arms or projections i which are engaged by arms l, which are secured to the sleeve or oscillatory part carrying the press pads G, G². When the escapement lever is in one position the controlling stop I, will be thrown over so that one of said arms l, will engage therewith when the press lever is thrown up and thereby swing the press pads around so that one of them as, for instance, G, will operate. When the escapement lever C, is in the opposite position, the other arm l, will engage with a projection on the controlling stop I, and reverse the position of the press pad or printing device so that the other pad G², will be swung around into position to print from the wheel A', as the press lever is thrown up carrying the press devices with it. The parts are so arranged that when the lever C, is in position to bring a type of the wheel A, into position for printing then when the press lever H⁴, is thrown up, the shifting mechanism will operate to bring the pad G so as to print from the wheel A, the parts being so arranged, however, that the shifting will take place before the pad reaches the position for printing. Conversely when the lever C, is in the opposite position and a type of the wheel A', is in position for printing, the shifting mechanism will operate to throw the pad G², into position.

25, is a spring which bears against a pin 26, secured to and oscillating with the shiftable press whereby the latter will be held in shifted position until forcibly moved to the other position.

The driving wheel B, is driven by a spring or weight which is kept wound or strained by the operation of the magnet H, which is in the main line circuit with the escapement controlling magnet. I have in the present case

illustrated the wheel B, as driven by means of a spring which is kept wound up or strained by the action of the magnet H. For this purpose the armature lever which operates upon the press or printing devices is provided with an arm or extension L, that operates upon a winding pawl L², of any suitable construction which is hung from an arm L³, pivoted to rotate freely on the shaft which carries the wheel D.

L⁴, is the winding drum or wheel engaged by the pawl L².

The actuating spring indicated at M, has one end fixed to the shaft upon which the wheel B, rotates while its other end is fastened to the side of the winding drum or wheel L⁴. On the inside of the drum or wheel L⁴, is a ratchet wheel M², which is engaged by a pawl M³, carried by the wheel B. As the spring uncoils the wheel M², carries the pawl M³, and the wheel B, around, and thus supplies the power which tends to rotate the type wheels. The wheels B, and L⁴, are both mounted to rotate freely on the shaft or spindle to which one end of the spring is secured. As the wheel B, is held from rotation when the escapement wheel is at rest the pawl M³, carried thereby and engaging with the wheel upon the winding drum will prevent the unwinding of the spring until the escapement lever moves to permit a tooth of the escapement wheel to pass. Pawl M³, therefore, serves as a retaining pawl and being placed upon the inside of the winding drum between the same and the wheel B, is protected from injury. The winding pawl is mounted upon a lever pivoted at L⁵, upon the lever L³. The upper arm of the lever carries an adjustable stop L⁶. The lower arm which carries the pawl L², is engaged on its underside by the arm L, projecting from the press device. The weight of the lower arm holds the pawl L², out of engagement with the wheel L⁴, a distance dependent upon the adjustment of the stop L⁶, so that the wheel may rotate backward as the spring unwinds and thereby rotate the type wheel. The springs should be normally set in the mechanism to have the necessary tension to apply the proper driving power to the type wheel and it is kept wound up by the operation of the magnet H. To prevent overwinding I cut away the winding drum at the point indicated at L⁸, whereby, when the drum has been given one whole turn, said space will come opposite the driving pawl and the latter when it moves up will fail to turn the wheel.

For a unison stop device I employ a stop lever 55, pivoted on a suitable support to swing in a vertical plane so as to move its free end 58, into and out of position where it will be engaged by an arm or pin 56, projecting from the type wheel. The lever 55, is kept normally raised so that the wheel may revolve freely by resting upon the hub 57, or upon any other suitable surface which rotates with the winding wheel or drum through

which the end of the actuating spring is connected. This hub is cut away as indicated in dotted lines Fig. 1, at one part of its periphery at a point such that when the spring has run down to a greater or less extent through continued rotation of the type wheel without actuation of the winding pawl, the lever 55, will be allowed to drop down so as to bring the toe at its end 58, into position to be engaged by the stop pin 56. To bring the device to unison it is, therefore, only necessary to operate the type wheel without actuating the printing device, producing a half dozen more or less revolutions of such type wheels, or a number of such revolutions sufficient to move the cut away portion of the hub under the lever 55. During normal operation the spring is kept wound up and the winding drum is kept turned around to such position that the cut-away portion of the hub will not revolve to position where it will allow the lever 55, to drop.

The mechanism described is mounted in a suitable frame as indicated and as well understood in the art.

The transmitter which supplies the alternate positive and negative impulses for rotating the type wheels and which prolongs the current last sent, whether the same be positive or negative, or increases the strength thereof and stops the transmission of the alternating impulses when the key corresponding to the character to be impressed is operated may be of any usual or proper character. The diagram Fig. 8 illustrates a combination of apparatus which may be used for the purpose. In the diagram M, B, M, B² are two sections of main battery the section M, B, of which is employed in producing the rotation of the type wheel while the section M, B², is added to the first—for the purpose of sending the increased strength of current to operate the press magnet.

The keys of the transmitter are indicated by the numerals 5, 6, three only of such keys being shown and each being adapted when depressed to throw in the section of battery M, B², and at the same time complete the circuit of a stop magnet indicated at P, which operates upon a stop lever P², and thereby blocks a stop wheel P³, that is upon a shaft of the transmitting mechanism or is properly connected therewith so as to bring the same to rest on the depression of any key. The magnet P, is preferably in the common connection from the section of battery M, B², which leads to all the keys. Each key has a stop 7, connected to said section of battery. The keys 6, connect to the segments 8, of a sun-flower device the rotating circuit closing arm of which is indicated at 9. The arm 9, suitably connects with a current reversing commutator indicated at R, the rotating segments of said current devices being connected respectively to the arm 9, and to one terminal of the battery while the springs thereof connect respectively to line and to ground. This current reversing

appliance rotates as is well understood in the art in unison with the arm 9, and reverses the current for each movement of the arm 9, from one segment 8, to an adjoining segment. The keys 6, 6, which may be considered as corresponding to the wheel A, of the transmitter connect to alternate segments 8, or to those upon which the arms 9, rest when the pole changer will produce upon the line a polarity of current requisite for throwing the arm C, so as to move a type of the wheel A, into position for printing. The keys 5, on the other hand connect to the remaining segments 8, which alternate with those to which keys 6, connect, or in other words to those segments upon which the arm 9, rests when the commutator sends over the line a current of the opposite polarity or that which is required to bring a type of the wheel A', into position for printing. The commutator R, and the sun-flower device are mechanically connected so as to rotate in unison as well understood in the art.

The commutator or pole changer R, may have any number of segments upon its revolving pole as well understood and the relative number of revolutions of the arm 9, and said pole changer device, would obviously depend upon the number of reversals which will be produced by each whole revolution of the pole changer or commutator.

The keys of the transmitter are each provided with stops 10, by which circuit is normally closed between the section M, B, of the battery and the segments of the sunflower.

The operation of the apparatus would be as follows:—The sunflower apparatus being driven at any desired speed and the circuit of the magnet P, being broken so that the stop devices will not interfere with the free rotation of the mechanism, the section M, B, of the battery will by means of the pole changer R, be caused to send alternating currents over the line, the connection of such battery with the line not being interrupted by the sunflower because all of the keys are constantly connected to the battery and there is no interruption of the circuit as the arm 9, passes from one segment to an adjoining segment. By this means, rapid alternations of current being produced on the line, the lever C, will rapidly vibrate and will permit the type-wheels to rotate under the action of the driving wheel B, step by step. On depression of any transmitting key the section of battery M, B², will be placed in connection with the segment 8, to which said key is connected and when the arm 9, reaches such segment an increased current of the given polarity, depending upon the position which the commutator R, occupies at such instant, will flow over the line circuit and through the magnet P, the effect of which will be that the mechanism of the transmitter will be brought to rest on that section of the sunflower connected to the key depressed and the alternations of current will cease. The type wheels will therefore be

brought to rest in the position corresponding to the position which the lever C, occupies with that polarity of current which is transmitted in increased amount. At the same time the magnet H, will acquire sufficient power to operate upon the press lever and the latter will be thrown up with the effect of bringing the proper press pad into position to print from the wheel whose type is in position opposite the press magnet. At the same time the pawl or winding device will be operated to wind the actuating spring. When the transmitting key depressed is released it will return to normal position by the usual retracting spring, the effect of which is to cut out the section of battery M, B², and the stop magnet P, thus allowing the driving mechanism of the transmitter to continue the rotation of the sun-flower device and of the commutator or pole changer and the rotation of the type-wheel in the receiver to be resumed. At the same time the armature of the press magnet H, will recede ready for the next operation and the winding pawl will take a new position ready to wind the spring again at the next impression.

I am aware that it has been before proposed to employ in printing telegraphs a printing mechanism the position of which should be automatically controlled according to the wheel from which it is desired to take the impression. I do not, therefore, claim the same broadly, but I do claim the controlling of the position of the shiftable printing mechanism by a device carried by the escapement lever which oscillates and sets such devices into one position or the other according to the wheel to be printed from in which position it will be engaged by the shiftable printing devices which are actuated by the press lever.

In order to wind up the spring of the receiver when it has run down through revolution of the type wheel unattended by operation of the printing pad, it is only necessary to depress some key of the transmitter and hold the same down until the transmitting mechanism comes to rest after which the mechanism may, by any suitably hand-operated mechanical lock, be locked in position with the circuit completed through such key. Said key may then be operated any desired number of times without any movement of the transmitting mechanism, pole changer and type wheel devices, and each depression of the key will produce a movement of the press lever or other lever operated by the neutral magnet in the main line and thus actuate the winding pawl. After a sufficient number of operations of such key to fully rewind any springs that may have run down, the mechanism may be unlocked and the apparatus will then operate in the ordinary manner for printing.

In order to bring the receiver or receivers into unison with one another and with the transmitter, it is only necessary to permit a

continued reversal of the current to take place sufficient to permit the winding spring to run down and allow the unison stop lever to drop into the path of the stop pin on the shaft of the type wheel in all of the receivers. As these stop pins are placed at the same position on the shafts for all the receivers they will all be stopped at the same point.

The transmitter is brought into unison with the receivers by keeping the instrument running until sufficient time to have all of them come to unison and then bringing the transmitter around to, for instance, A, or to whatever letter the tickers are synchronized for.

What I claim as my invention is:—

1. The combination in a printing telegraph, of a vibrating escapement lever, two type wheels revolving together and controlled thereby, a press lever, a magnet in the line circuit with the type wheel magnet for actuating the same, a shiftable printing mechanism carried by said press lever, and a position controlling stop therefor carried by the escapement lever.

2. In a printing telegraph receiving instrument, the combination substantially as described, of two type wheels mounted to revolve together and having the characters on one arranged opposite the spaces on the other, a polarized receiving magnet having a vibratory lever actuating the escapement for said wheels, a neutral magnet in the same main line, a shiftable printing mechanism carried by the armature lever of said neutral magnet, and a position controlling device engaged thereby and oscillating with the escapement lever.

3. The combination substantially as described, in a printing telegraph, of a vibrating escapement lever, two type wheels revolving together and having the characters on one arranged opposite the spaces on the other, a press lever, a shiftable printing device carried thereby for printing from one wheel at a time, and a shifting stop or abutment therefor vibrating with the escapement lever.

4. The combination substantially as described, of two type wheels, a vibratory escapement therefor carrying the position controlling stop for the press device, a press lever having two pads mounted upon a swinging support, and an arm or arms connected to said swinging pads and adapted to engage with the stop carried by the escapement lever.

5. The combination substantially as described, with a printing telegraph receiver having two type wheels, of a polarized magnet controlling the escapement therefor, a press magnet in the line circuit with said polarized magnet, a shiftable printing mechanism actuated thereby, and a position controlling device therefor carried by the escapement lever of the type wheel.

6. The combination substantially as described, with the press lever, of the two press pads G, G², pivoted so as to oscillate in a plane

parallel to the type wheels, a stop or stops carried by the escapement levers of said type wheels, and an arm connected to said pads and adapted to engage with the stops when the press lever is actuated to print.

7. The combination, substantially as described, of the shiftable oscillating stop I, a vibratory armature lever operating the same and upon which the stop is mounted, a press lever, a pair of shiftable pads G, G², mounted on the press lever and adapted to rock together, and the arms l, connected with said pads and adapted to engage with the stop I, as and for the purpose described.

8. The combination in a printing telegraph, of a polarized escapement magnet, a press magnet in circuit therewith and adapted to respond only to an increased current, a shiftable printing mechanism actuated thereby, and a position controlling device carried by the escapement lever of the polarized electromagnet.

9. The combination in a printing telegraph, of a type wheel, an actuating spring therefor, a ratchet and pawl at one end of said spring, a winding device normally disconnected from the spring, and a press magnet having its armature lever connected to said winding device.

10. The combination in a printing telegraph, of the type wheel, an actuating spring therefor having one end fixed, a winding drum or wheel, an actuating pawl therefor normally disengaged from said drum or wheel, and a press magnet having a press armature lever connected to said actuating pawl, as and for the purpose described.

11. The combination in a printing telegraph, of a type wheel, a driving wheel therefor, an actuating spring one end of which is fixed, a winding drum to which the other end is attached, a ratchet and pawl connection between said winding drum and the driving wheel, and a winding device normally disengaged from the drum and actuated by an electro-magnet in the main line circuit.

12. In a printing telegraph receiver, the combination substantially as described, of the winding drum and its actuating magnet, an actuating pawl, and a pivoted supporting arm therefor hung upon a lever and provided with an adjustable stop for limiting the movement of said support upon the lever.

13. The combination substantially as described in a printing telegraph, of a winding pawl, a swinging support therefor engaged by the actuating device, and a pivoted arm carrying said support, as and for the purpose described.

14. The combination substantially as described, with the winding drum, of the lever L³, the arm L⁵, pivoted thereon and having an adjustable stop L⁷, a pawl carried by the

arm L⁵, and an actuating arm engaging with the arm L⁵.

15. The combination in a printing telegraph, of a type wheel or wheels, a polarized escapement magnet, an actuating spring or weight, a ratchet and pawl connecting the same with said type wheel, a neutral press magnet in the main line, and a rewinding mechanism normally disconnected from the spring and operated by said press magnet.

16. The combination in a printing telegraph, of two type wheels mounted to rotate together, a polarized escapement magnet, an actuating spring or weight for said type wheel, a press magnet, a rewinding device actuated thereby, and a shiftable press mechanism the position of which is controlled by the position of the escapement lever for the type wheel, as and for the purpose described.

17. The combination, substantially as described, of a pair of type wheels mounted to rotate together, a polarized escapement magnet, a neutral press magnet, a shiftable printing mechanism actuated thereby for printing from one or the other of said wheels at pleasure, an actuating spring or weight for supplying the power constantly tending to rotate the type wheels, and a rewinding mechanism therefor actuated by said neutral press magnet, but normally disconnected from the spring, and a ratchet and pawl at one end of the spring for holding while the said mechanism is disconnected.

18. In a printing telegraph receiver, the combination substantially as described, of a unison stop lever, a driving spring or weight, and a cam or hub connected with said spring and serving to normally hold the unison lever out of position for engagement by the unison stop.

19. The combination substantially as described, in a printing telegraph receiver, of the winding drum or wheel, the unison lever resting on the hub thereof which is cut away at one point, and a stop pin or projection from the type wheel shaft.

20. In a printing telegraph receiver, the combination, substantially as described, of the driving spring or weight, the winding wheel, a ratchet and pawl connection between the same and the type wheel driving wheel, and a unison stop device the movable lever or stop member of which is normally held out of stop or unison position by a cam or hub rotating with the winding wheel.

Signed at New York, in the county of New York and State of New York, this 28th day of September, A. D. 1891.

MAJOR DANE PORTER.

Witnesses:

WM. H. CAPEL,
T. F. CONREY.