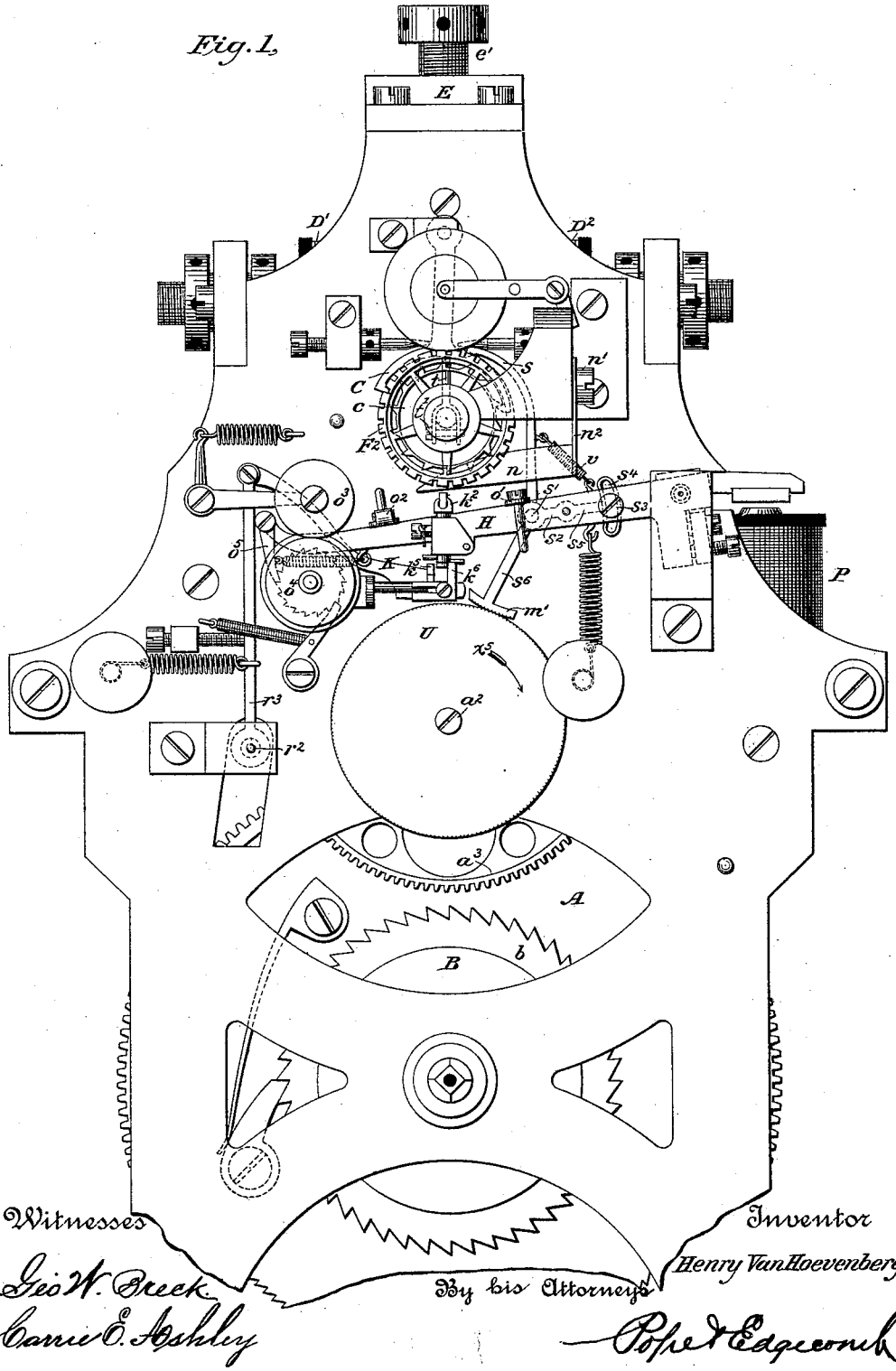
(No Model.) 4 Sheets—Sheet 1.

# H. VAN HOEVENBERGH.

## PRINTING TELEGRAPH.

No. 457,239. Patented Aug. 4, 1891.

*Fig. 1.*




Witnesses

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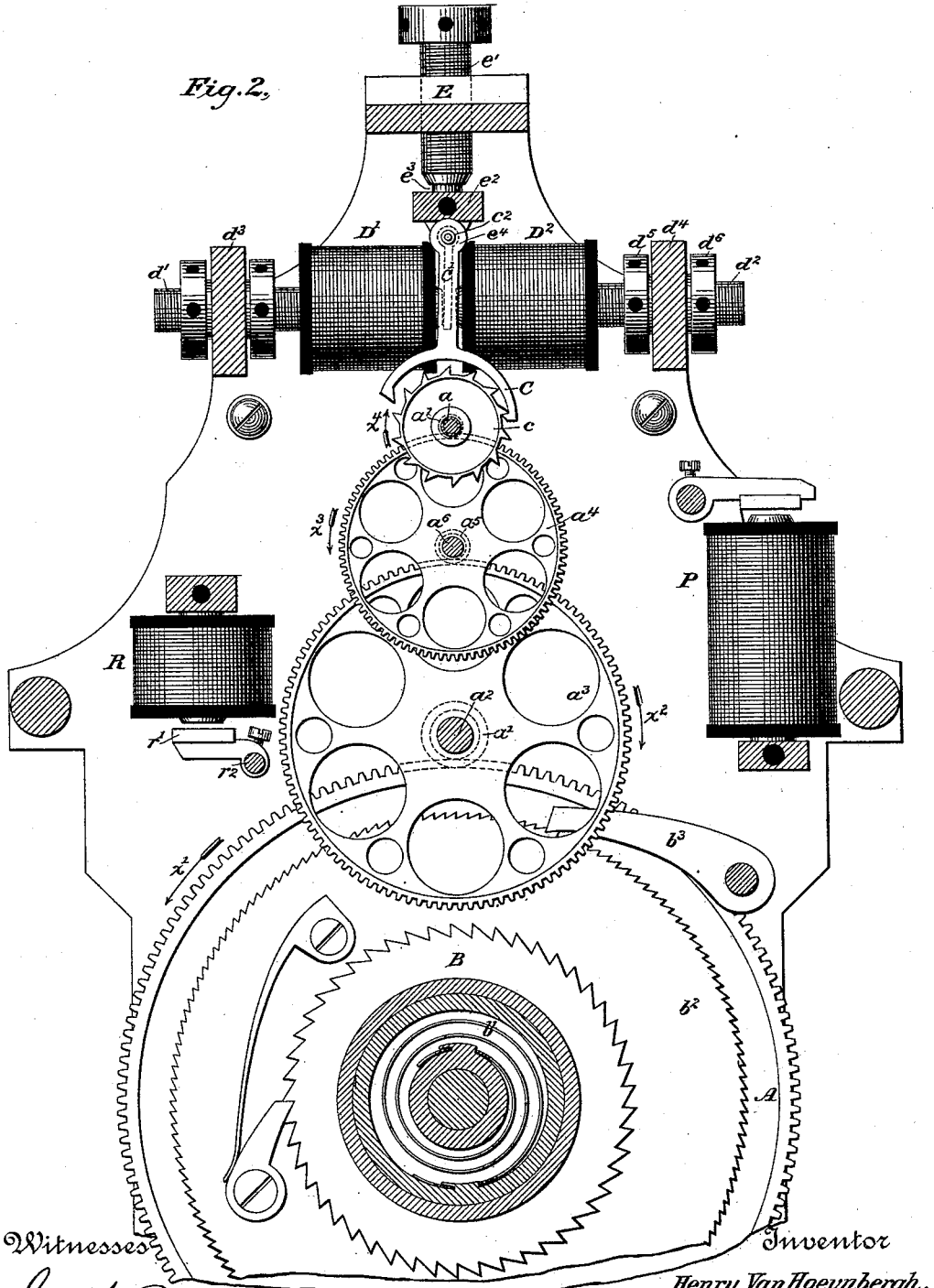
(No Model.) 4 Sheets—Sheet 2.

# H. VAN HOEVENBERGH.

## PRINTING TELEGRAPH.

No. 457,239. Patented Aug. 4, 1891.

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

# H. VAN HOEVENBERGH.

## PRINTING TELEGRAPH.

No. 457,239. Patented Aug. 4, 1891.

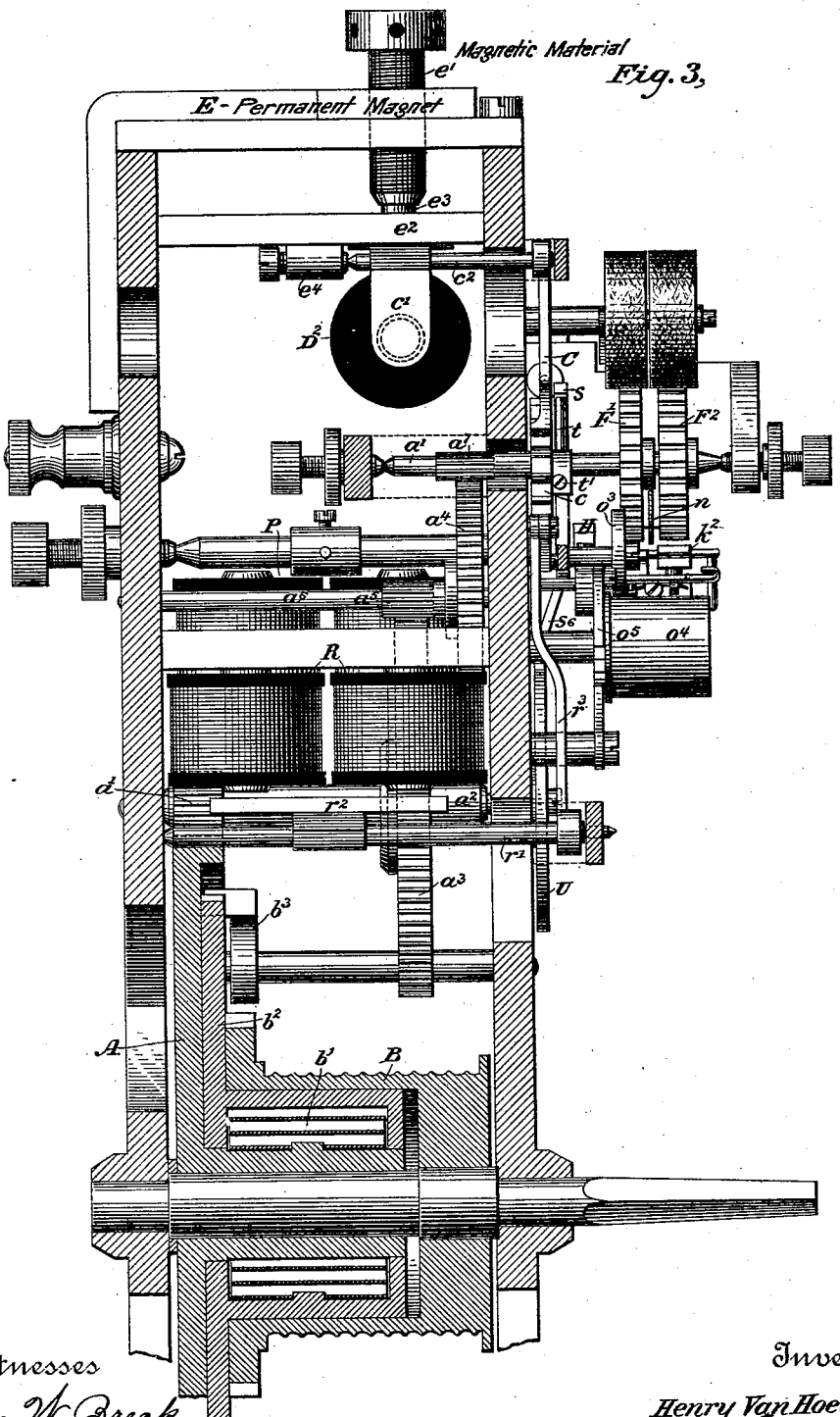


Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

# H. VAN HOEVENBERGH.

## PRINTING TELEGRAPH.

No. 457,239. Patented Aug. 4, 1891.

*Fig. 4,*

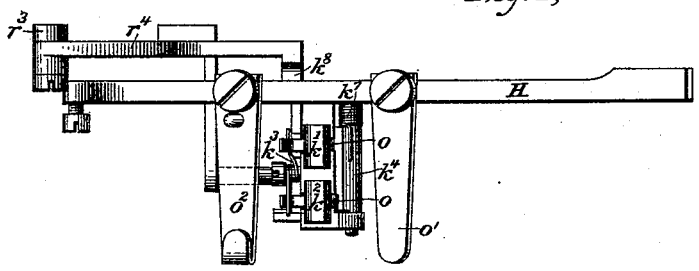



*Fig. 5,*

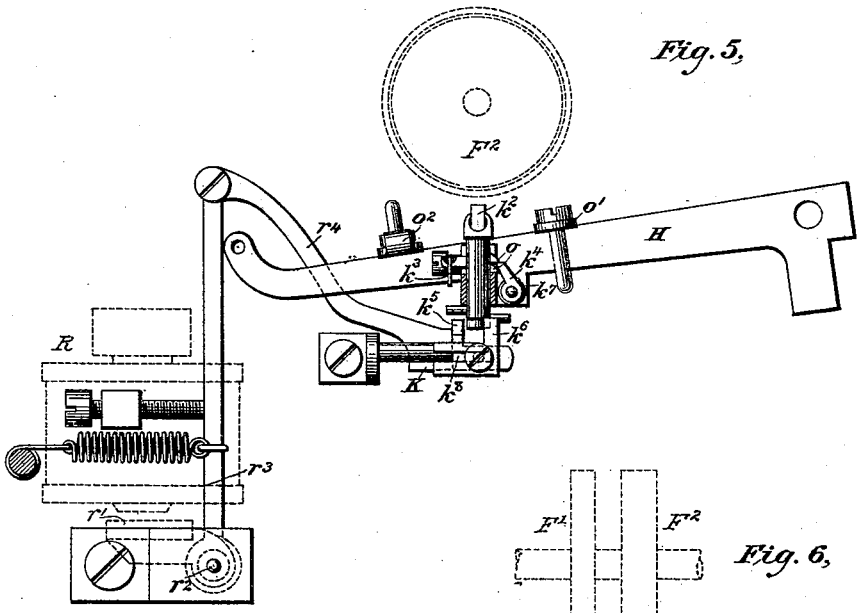
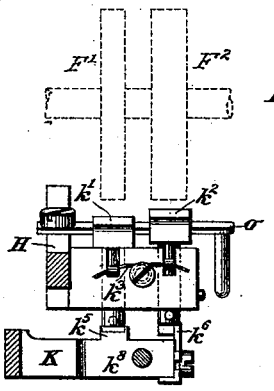



*Fig. 6,*




Witnesses

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# UNITED STATES PATENT OFFICE.

HENRY VAN HOEVENBERGH, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE BALTIMORE & OHIO TELEGRAPH COMPANY, OF BALTIMORE, MARYLAND.

## PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 457,239, dated August 4, 1891.

Application filed April 16, 1886. Serial No. 162,430. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY VAN HOEVENBERGH, a citizen of the United States, residing in Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Printing-Telegraphs, of which the following is a specification.

My invention relates to the class of apparatus employed for printing telegraphic dispatches and messages through the agency of electric currents.

The object of the invention is to provide an instrument capable of printing rapidly from either of two type-wheels, which is easily maintained in unison with the transmitter, operates with a small amount of battery-power, is not affected by considerable changes in the strength of current, and is controlled by a simple form of transmitter.

The invention consists in organizing the apparatus in substantially the following manner: Two single-coil electro-magnets are employed for controlling the movements of an escapement device, and two additional electro-magnets, respectively, serve to actuate a press-lever and to determine from which type-wheel an impression shall be taken. The escapement-magnets are each provided with heavy back plates of soft iron, but are magnetically independent of each other. The escapement-armature is of soft iron and is polarized by means of a strong permanent magnet. The press-lever carries two vertically-movable platens placed in the planes of the respective type-wheels. The controlling electro-magnet for the platen is provided with an armature-lever, which in turn controls the positions of two striking-pallets beneath the platens. When this lever is remote from its magnet, one of the striking-pallets is placed in the path of the lower extremity of the corresponding platen, which projects beneath the press-lever. Upon the downstroke of this lever the platen is forced into an upward position with reference to the lever and locked in that position. Meanwhile the act of locking this platen in its upward position serves to release the other platen, which drops into its lower position. The next upward stroke of the press-lever carries the first-named platen against its corresponding type-wheel and an impression is taken therefrom. When it is desired to print from the other type-wheel, the platen-controlling armature is held toward its electro-magnet, while the press-lever is toward the type-wheels. The second striking-pallet is thus placed in position to throw its corresponding platen upward upon the downstroke of the press-lever, thus locking it in position to print and releasing the first platen, which thereupon moves into its lower position, so that it will not strike against its type-wheel upon the next upstroke of the lever. Currents of either of two strengths are employed for actuating the escapement, while only the currents having the greater strength actuate the platen-controlling magnet. The press-magnet is preferably included in an independent line, and the strength of currents employed for operating the same may thus be independent of that employed for the other magnets. Any suitable apparatus may be employed for transmitting these currents in the proper manner.

Suitable guides for controlling the position and movements of the paper tape, upon which the impressions are to be effected, are applied to the press-lever, and an arm extends between the two type-wheels for the purpose of preventing the paper from being brought into contact with both of the type-wheels when it is carried upward by one platen-face. There is also applied to the polarizing-magnet of the escapement-armature an adjustable screw of magnetic material, by means of which the amount of polarization which the armature will receive may be readily modified. A unison-stop of the same general character as employed in the old form of Morse register is used in this instrument. An adjustable unison-stop is applied to the type-wheel shaft. This stop is designed to be intercepted at the proper periods by means of a unison-detent, brought into action by means of an arbor of the train which drives the type-wheel. When the type-wheels are revolved, the detent is caused to move gradually into the path of the stop by means of a serrated disk or wheel, mounted upon this arbor, to the periphery of which disk is applied a segment of a wheel carried upon one arm of

a lever. The remaining arm of this lever carries the detent. Each time the press-lever is actuated the segment is lifted out of engagement with the disk and the detent is allowed to return to its normal position—that is to say, remote from the path of the unison-stop. When, however, the type-wheel shaft is revolved, the detent gradually approaches the path of the stop, and eventually it arrests the same at its unison-point, provided the type-wheel shaft performs the required number of revolutions without an impression being taken. The position of the unison-detent with reference to the stop and its actuating disk or wheel is rendered adjustable in a convenient manner.

I am aware that a resilient circuit-closing spring adapted to be thrust into the path of a stop upon the type-wheel has been secured to the press-lever of a printing-instrument; but this does not act as a stop for arresting the type-wheel directly, but merely to short-circuit the actuating-magnet of the escapement-anchor.

In the accompanying drawings, which illustrate the invention, Figure 1 is a front elevation of a printing-telegraph instrument. Fig. 2 is a longitudinal section, and Fig. 3 is a vertical transverse section of the same. Figs. 4, 5, and 6 are detail views of the platen.

Referring to the drawings, A represents the driving-wheel of a train of mechanism employed for actuating the type-wheel shaft $a$. The wheel A is intended to be driven by a weight and cord applied to the drum B. The drum B is preferably coupled to the wheel A through a supplementary spring $b'$ and a disk $b^2$. The disk $b^2$ is provided with a series of teeth upon its periphery, which are engaged by a dog $b^3$, so that even though the weight and cord applied to the drum may for a time cease to exert tension upon the wheel A, the spring $b'$ will continue to actuate the train for a short period.

The wheel A is intended to be driven in the direction indicated by the arrow $x'$. This wheel, acting upon a pinion $a'$ of an arbor $a^2$, serves to revolve the wheel $a^3$ in the direction indicated by the arrow $x^2$. The wheel $a^3$ in turn impels a wheel $a^4$ in the direction of the arrow $x^3$, through the instrumentality of a pinion $a^5$ and its arbor $a^6$. The wheel $a^4$ acts upon the pinion $a^7$, carried upon the type-wheel shaft $a$, and impels it in the direction indicated by the arrow $x^4$.

A scape-wheel $c$, and an anchor C applied to the scape-wheel, permit a step-by-step movement of the type-wheel shaft. The anchor C is carried upon an arbor $c^2$, which also carries an armature $c'$. This armature extends between the poles of two confronting single-coil electro-magnets D′ and D². The cores $d'$ and $d^2$ of the electro-magnets are preferably provided with back plates $d^3$ and $d^4$ of soft iron. A permanent magnet E serves to impart to the armature $c'$ a strong polarization. The magnet E extends from above the armature toward the back of the instrument, and is bent at an angle so as to rest against the back plate, to which it is securely fastened. An adjustable screw $e'$ extends through the permanent magnet E into proximity to the support $e^2$ of the armature $c'$. Upon the upper portion of the support $e^2$ there is formed a cylindrical projection $e^3$, which is received by a corresponding aperture formed in the lower end of the screw $e'$. By adjusting the screw a greater or less distance upon this projection the amount of magnetism imparted to the support $e^2$ and thus to the armature may be modified. For the purpose of more readily inducing magnetism in the armature the latter is preferably fitted into a horizontal cylindrical bearing formed in the support $e^2$, as indicated at $e^4$. The cores of the electro-magnets D′ and D² are also rendered adjustable in a manner well understood by means of suitable screws $d^5$ and nuts $d^6$. The coils of the electro-magnets D′ and D² are wound in such manner that currents traversing the same in a given direction will develop a given polarity in the core of one electro-magnet and opposite polarity in the confronting-pole of the other magnet, while a current in the opposite direction will have the reverse effect. In this manner, by transmitting alternating currents through the coils of the electro-magnets the escapement-anchor may be caused to vibrate and the shaft $a$ permitted to advance step by step.

Upon the shaft $a$ there are carried two type-wheels F′ and F², the former being designed to carry letters of the alphabet, the latter being employed as the figure type-wheel. These type-wheels, it will be understood, are caused thus to advance step by step and present their respective type to two corresponding platens $k'$ and $k^2$, which are carried by a press-lever H. Each platen consists of a small vertical rod which is vertically movable within the press-lever. A corresponding spring $k^3$ tends to hold each platen down, but a latch $k^4$ operates to hold one or the other platen up. When the press-lever is operated, the platen, which is in its elevated position, strikes against the corresponding type-wheel. Meanwhile it is necessary that the other platen should be in its downward position, so that it will not be thrown against its type-wheel. The positions of the platens are changed upon the downstroke of the press-lever by means of two striking-pallets $k^5$ and $k^6$. The pallets are carried upon an arm $k^8$, and are so placed that only one can be in the path of its corresponding platen at a time. The arm is movable longitudinally with reference to the press-lever, and when in one position the pallet $k^5$ will be beneath the platen $k'$, and when in the other position the pallet $k^6$ is beneath the platen $k^2$. The platen-rods are provided with small notches $o$, which receive the latch $k^4$. Assuming the platen $k'$ to be up and the other down and the pallet $k^6$ to be beneath the platen $k^2$ when the lever descends, then

the platen $k^2$ will by striking against the same be pressed upward, and in passing upward it will force the latch back against the tension of its spring $k^7$. The platen $k'$ will thus be released and will fall, its pallet $k^6$ not being in its path. The next upward stroke of the lever K will cause an impression to be taken from the type-wheel $F^2$. By placing the pallet $k^5$ beneath the platen $k'$ again, this platen will be caused to assume its upward position, and the platen $k^2$ will be allowed to fall upon the downstroke of the lever.

For the purpose of controlling the position of the pallets the electro-magnet R is employed. The armature-lever $r'$ of this electro-magnet is carried upon an arbor $r^2$. The arbor $r^2$ also carries a lever or arm $r^3$, which is coupled through a link $r^4$ with an arm K, which carries the two striking-pallets $k^5$ and $k^6$. When the armature-lever is away from the poles of its electro-magnets, the arm K will be caused to assume the position shown in the drawings, with the pallet $k^5$ beneath the platen $k'$. When, however, the escapement is actuated by currents of sufficient strength to actuate the armature-lever $r'$, the pallets will be moved into their second position—that is to say, with the pallet $k^6$ beneath the platen $k^2$.

It will be understood that when it is desired to print characters from the type-wheel F' the shaft $a$ should be revolved until the desired character is opposite the platen, and then a current of the character required to actuate the lever H is transmitted through the coils of the printing-magnet P. If, however, an impression should be desired from the type-wheel $F^2$, after it has been arrested in the proper position, a current of the strength requisite to actuate the lever $r'$ is transmitted through the coils of the electro-magnet R while the lever H is raised. The downstroke of the lever will then transfer the platen and the next impression will be from the type-wheel $F^2$. It is preferred to actuate the escapement by means of currents of either of two strengths. The weaker currents do not vitalize the electro-magnet R, but currents of the greater strength do. Impressions, therefore, are taken from the type-wheel F' when the escapement is actuated by the weaker currents, and when it is actuated by currents of sufficient strength to vitalize the magnet R impressions are to be taken from the type-wheel $F^2$. It should be noticed, however, that the platens are shifted upon the downstroke of the lever after the currents are changed.

It will be observed that when one platen face or the other is presented to its type-wheel and the press-lever is actuated the paper tape might be caused by this platen-face to rub against the other type-wheel and to thus either receive an indistinct impression or to be blurred. For the purpose of preventing the tape from being brought into contact with both type-wheels, a stationary guard $n$, consisting of a flat strip of metal or other suitable material, extends between the two type-wheels, and the lower edge of this guard is slightly below the peripheries of the type-wheels, so as to intercept the paper, while not preventing it from being struck against the proper type-wheel. This guard is supported upon the frame by means of the arm $n^2$, and it is preferably rendered adjustable by means of the screw $n'$ passing through an elongated opening or slot in this arm. The paper tape is led through two suitable guides $o'$ and $o^2$, carried upon the press-lever H, and between two suitable feeding-rollers $o^3$ and $o^4$. These rollers are actuated after each impression by means of a pawl $o^5$, carried upon the lever H, in a manner well understood.

For the purpose of securing a unison of the type-wheels, an adjustable unison-stop $t$ is carried upon the type-wheel shaft $a$. This stop is preferably secured to the shaft by means of a screw $t'$, passing through the two arms of a fork at the end of the stop $t$. These two arms embrace the shaft.

The unison-detent $s$ is designed to intercept the path of the stop $t$ and to arrest the type-wheels at their unison-point when a predetermined number of revolutions of the type-wheels are completed without an impression having been taken from either. The unison-detent $s$ consists of an arm pivoted at $s'$ to an arm $s^2$. The arm $s^2$ is adjustably carried upon the lever H. By means of a screw $s^3$ entering an elongated opening $s^4$ at the end of the arm $s^5$ of the arm $s^2$ the position of the axis $s'$ of the unison arm or detent $s$ may be readily adjusted. This device is employed for the purpose of modifying the position of the segment $m'$, which is carried upon the arm $s^6$, with reference to a unison-wheel U. The wheel U is carried upon the arbor $a^2$ of the wheel $a^3$, or some other arbor of the train, and revolves therewith. The periphery of the wheel or disk U is preferably roughened or serrated slightly, and by its pressure against the segment $u'$ causes the latter to be advanced in the direction indicated by the arrow $x^5$, thus carrying the arm $s$ into such position that it will intercept the unison-stop $t$. It is preferred that the parts be so organized that two revolutions of the type-wheel shaft shall be sufficient to carry the arm $s$ from its extreme position away from the stop into position to arrest it.

For the purpose of throwing the unison-detent out of the path of the stop whenever an impression is effected, a retractile spring $v$ is applied thereto, one end being fastened to the arm $s$ and the other to the press-lever H. When, therefore, the lever H is raised and the segment $m'$ is lifted out of contact with the periphery of the disk U the arm is drawn backward out of the path of the unison-stop $t$, and when the lever H again descends the extremity $u'$ rests against the periphery of the disk U. The subsequent advancement of

the disk gradually moves the detent into the path of the stop *t*.

I claim as my invention—

1. In a printing-telegraph instrument, a type-wheel-controlling device consisting of the combination, substantially as hereinbefore set forth, of a scape-wheel, an anchor applied thereto, an armature for controlling the movements of said anchor, a permanent magnet polarizing said armature, and two single-coil electro-magnets for controlling the movements of said armature.

2. In a printing-telegraph instrument, the combination, substantially as hereinbefore set forth, with the type-wheel shaft, of a controlling device consisting of a scape-wheel, an escapement-anchor, escapement-magnets, an armature actuated thereby for controlling the movements of said anchor, a permanent magnet for polarizing said armature, and an adjustable magnetic extension of said permanent magnet, whereby the amount of polarization of said armature may be varied.

3. In a printing-telegraph instrument, a type-wheel-controlling device consisting of the combination, substantially as hereinbefore set forth, of a scape-wheel, its anchor, two single-coil electro-magnets, an armature acted upon by said magnets for actuating said anchor, a permanent magnet for inducing in said armature a given polarization, and an adjustable screw extending through the permanent magnet into proximity to said armature.

4. The combination, substantially as hereinbefore set forth, of two type-wheels, a press-lever, two independently-movable platens, a latch for holding either in a given position with reference to the lever, and means, substantially such as described, for reversing the position of the platens with reference to the lever.

5. The combination, substantially as hereinbefore set forth, of two type-wheels, a press-lever, two platens movable in said lever in a direction at right angles to their faces, tension devices tending to press each platen away from the type-wheels, a latch engaging one or the other and holding it toward its type-wheel, and a detaining device for causing either platen to remain in proximity to its type-wheel and simultaneously permitting the other to move away therefrom.

6. The combination, substantially as hereinbefore set forth, of a printing-telegraph instrument, a press-lever, two platens, a latch for holding the same in given positions with reference to said lever, two pallets respectively applied to said platens, means for placing either pallet beneath its platen, whereby the positions of the platens may be reversed with reference to the lever.

7. The combination, substantially as hereinbefore set forth, with two type-wheels and a press-lever, of two independently-movable platens, means for holding either nearer its type-wheel than the other is to its type-wheel, an electro-magnet, its armature, and means, substantially as described, controlled thereby, whereby the relative positions of the platens may be reversed through the instrumentality of said magnet and armature.

8. The combination, substantially as hereinbefore set forth, with two type-wheels and a press-lever, of two platens carried thereby, a latch engaging one or the other platen, a striking pallet applied to one of the platens, which by intercepting the path of the same upon the movement of the press-lever from the type-wheels causes the platen which was previously engaged by the latch to be released and the other to be engaged.

9. The combination, substantially as hereinbefore set forth, a type-wheel, its shaft, a unison-stop moving therewith, a press-lever, a unison-detent, an arm carrying the same, which arm is pivoted to said press-lever, and means, substantially such as described, for withdrawing said detent from the path of said stop.

10. The combination, substantially as hereinbefore set forth, of a type-wheel, a unison-stop, a press-lever, a unison-detent carried upon said press-lever, and means for adjusting the point of support of said detent.

11. The combination, substantially as hereinbefore set forth, of a type-wheel, a unison-stop, a press-lever, a pivoted unison-detent, an arm supporting said detent, which arm is pivoted to said press-lever, and means for adjusting the position of said arm and thus of said detent.

12. The combination, substantially as hereinbefore set forth, of a type-wheel, an escapement mechanism for actuating the same, a unison-stop, a press-lever, a unison-detent carried thereon, a mechanical connection between said escapement mechanism and said detent, whereby the latter is moved toward and into the path of said stop when said type-wheel is actuated.

13. The combination, substantially as hereinbefore set forth, of a type-wheel, a press-lever, a unison-stop, a unison-detent, a serrated disk, means for actuating said type-wheel and disk, a mechanical connection between said disk and said detent, which connection is established when said press-lever is at rest and is severed when said press-lever is actuated.

14. The combination, substantially as hereinbefore set forth, of a type-wheel, a unison-stop moving therewith, a press-lever, a unison-detent pivoted thereto, a disk revolving with said type-wheel, an arm pressing against said disk and connected with said detent, and means, substantially such as described, for modifying the pressure of said arm.

15. The combination, substantially as hereinbefore set forth, of a type-wheel, a unison-stop, a press-lever, a unison-detent pivoted thereto, and means, substantially such as described, for modifying the position of the support of said detent.

16. The combination, substantially as hereinbefore set forth, in a printing-telegraph instrument, with two type-wheels and actuating devices for advancing the same, of two platen-faces, a retaining device for causing one or the other to remain in position to print, and a movable arm or lever for shifting said platens upon the movement of the press-lever away from the type-wheels.

17. In a printing-telegraph instrument, a type-wheel, a unison-stop, a press-lever, and a rigid unison-detent pivoted to said lever.

18. In a printing-telegraph instrument, a type-wheel, means for actuating the same, a unison-stop, a press-lever, a rigid unison-detent carried thereon, and means for gradually advancing the latter toward the path of the stop when the type-wheel is actuated.

19. In a printing-telegraph instrument, the combination, with a type-wheel, its shaft, a scape-wheel and its anchor, and an armature for actuating said anchor, of a polarizing-magnet for said armature extending upward upon the back of said instrument and at right angles across the top of the same, an adjustable screw extending through said magnet and having a cylindrical aperture in its end, a soft-iron support for said anchor, and a soft-iron projection upon said support extending into said aperture.

In testimony whereof I have hereunto subscribed my name this 25th day of March, A. D. 1884.

HENRY VAN HOEVENBERGH.

Witnesses:
DANL. W. EDGECOMB,
CHARLES A. TERRY.