

(No Model.)

2 Sheets—Sheet 1.

H. VAN HOEVENBERGH.

PAGE PRINTING TELEGRAPH.

No. 316,680.

Patented Apr. 28, 1885.

Fig. 1.

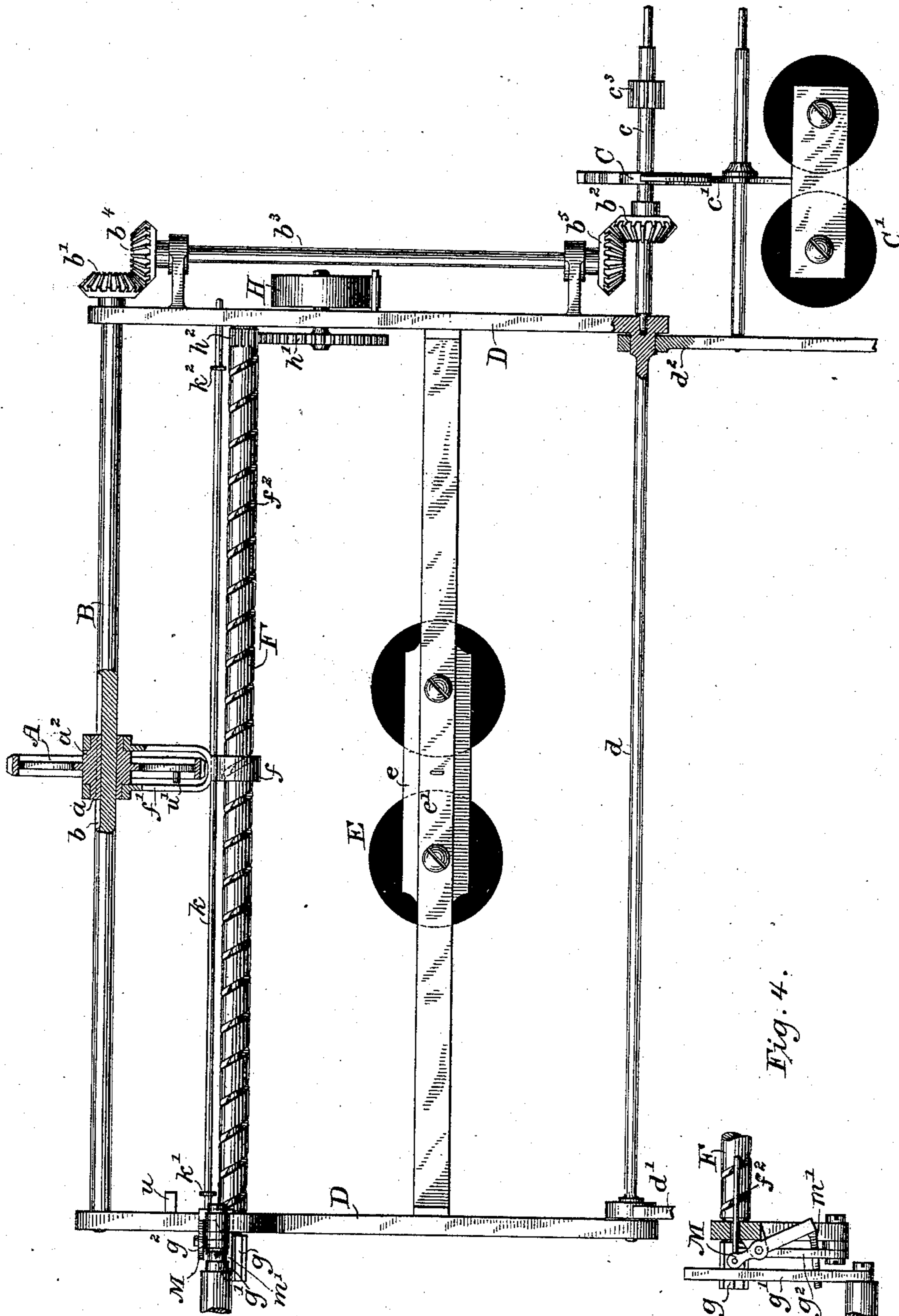


Fig. 4.

Witnesses

Wm. A. Skinkle

Carrie C. Ashley

Inventor

Henry Van Hoebenbergh

By his Attorneys

Robert Edgcomb

(No Model.)

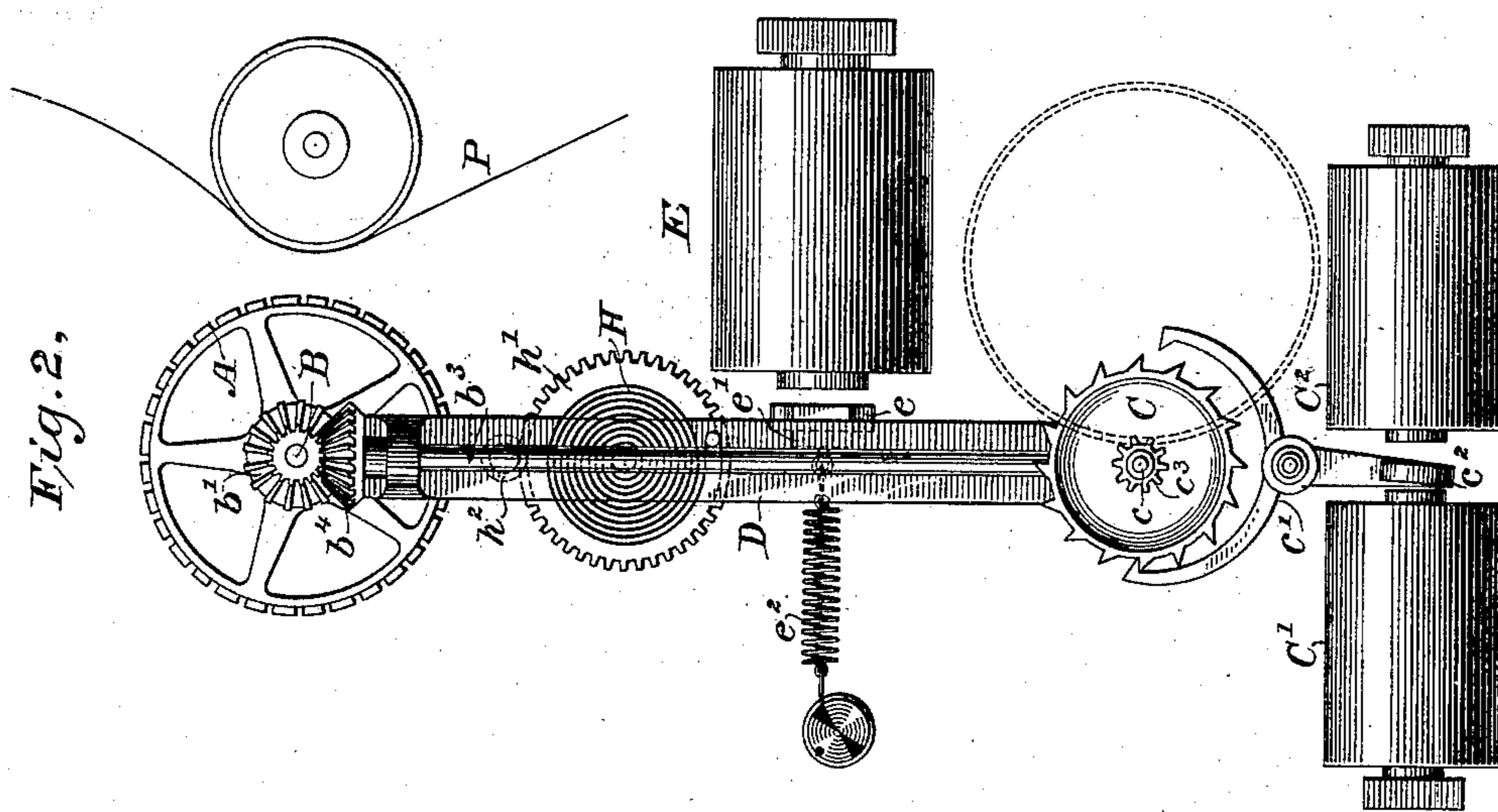
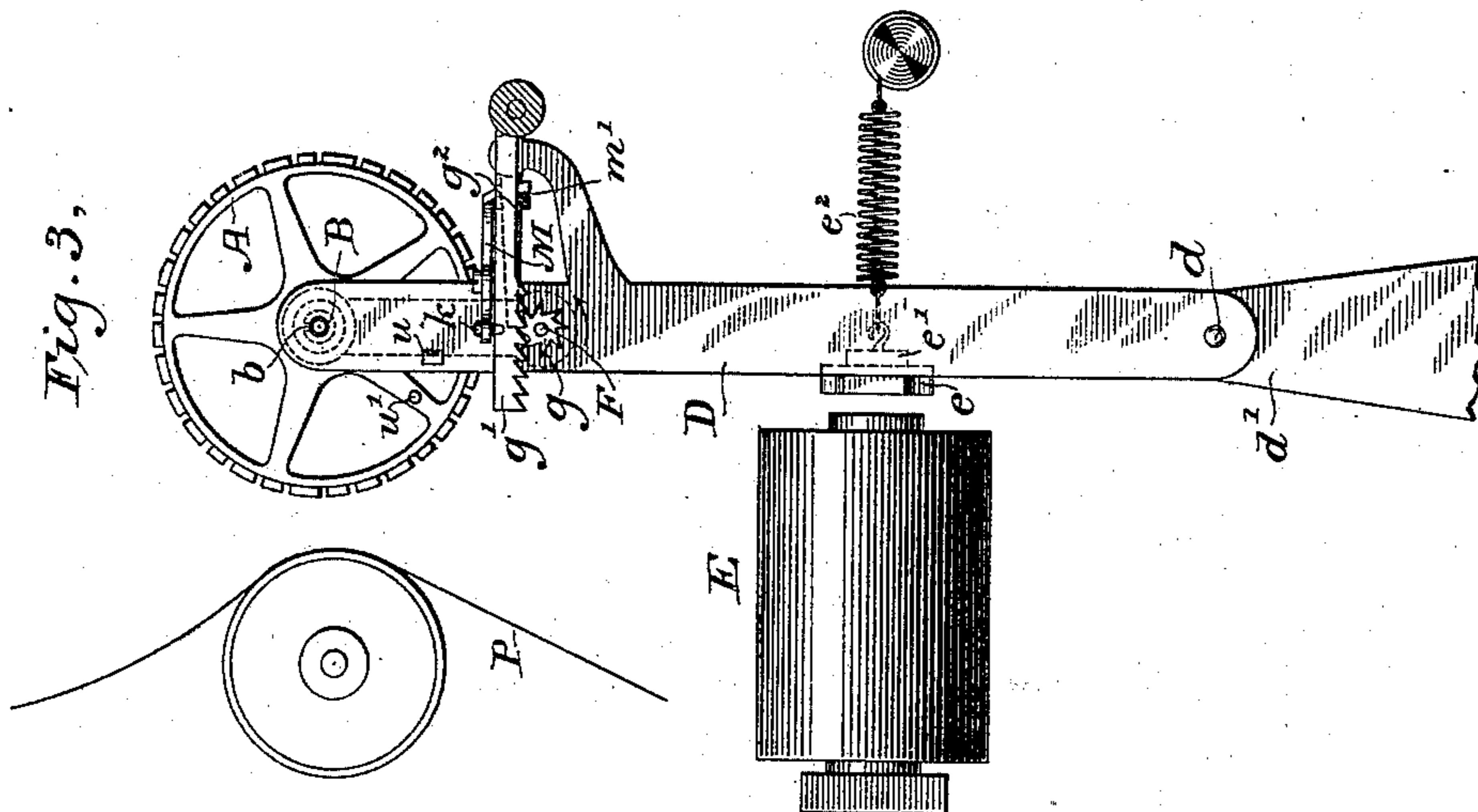
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Wm A. Skinkley  
Carrie E. Ashley

Inventor

Henry Van Hovenbergh

By his Attorneys

Pope & Edgecomb

# UNITED STATES PATENT OFFICE.

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

## PAGE-PRINTING TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 316,680, dated April 28, 1885.

Application filed August 7, 1884. (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 Type-Wheel-Actuating Devices for Printing-Telegraph Instruments, of which the following is a specification.

10 My invention relates to the class of telegraphic instruments known as "page" and "line" printers.

The object of the invention is to provide convenient means for advancing a movable type-wheel laterally across the face of the sheet of paper upon which the impressions are to be made, for revolving the same in such manner that any desired type may be presented to the paper in each of the successive lateral positions which the type-wheel is caused to occupy, and for impelling the type-wheel toward the paper from any position which it may be caused to occupy, in such manner that an impression will be effected of the particular type confronting the paper.

15 In carrying out my invention I support a type-wheel of any convenient form upon an axis extending laterally across the front of the page upon which the impressions are to be effected, and cause the same to be revolved by means of any suitable form of escapement device. The type carried upon the type-wheel are thus caused to be successively presented to the paper. For the purpose of moving the type-wheel laterally, and thus bringing it into the proper position to print the succeeding characters in a line of matter, a spirally-grooved rod or worm-shaft is employed. A nut fitting upon this rod is supported from the bearings of the type-wheel. When this spirally-grooved rod is rotated, the type-wheel is advanced from one extremity to the other of its shaft or supporting-rod. A ratchet-wheel and pawl are employed in connection with the spirally-grooved rod for giving it a slight revolution each time an impression is effected, thereby causing it to advance the type-wheel laterally a distance equal to the width of the type and the space which it is designed shall separate two adjacent type. For the purpose of effecting impressions, the shaft upon which

the type-wheel is carried and the spirally-grooved shaft are both supported in a movable frame, the movements of which are controlled by an electro-magnet. This electro-magnet, when vitalized, serves to move the entire frame, and thus to impel the type-wheel against the paper and effect an impression. The position of the impressions will depend upon the lateral positions occupied by the type-wheel, while the particular character printed will depend upon the distance through which the type-wheel has been revolved. During the movement of the type-wheel from the commencement to the end of the line the revolution of the worm-shaft is caused to wind a spring, and when the type-wheel has reached the limit of its excursion, a complete line of characters having been printed, the driving-pawl and a retaining click or dog, which are applied to the worm-shaft, are automatically disengaged therefrom. The spring then serves to turn the rod in the direction opposite to that in which it has been revolved during the advance movement of the type-wheel, and it will thus be automatically returned to its starting-point. The pawl and click are then caused to again engage the ratchet-wheel.

This application relates, especially, to the type-wheel-controlling devices, and to the devices for producing impressions, and I do not herein claim the method of operating the same. Such method, however, is claimed in another application of even date herewith, No. 137,888.

In the accompanying drawings, Figure 1 is a front elevation of such parts of the printing-instrument as are necessary to illustrate the invention; and Fig. 2 is an end view of the same, showing the escapement and driving mechanism. Fig. 3 is an end view of the instrument, showing the organization of the device employed for moving the type-wheel laterally; and Fig. 4 illustrates certain details of construction.

Referring to these figures, A represents a type-wheel which is carried upon a longitudinally-grooved shaft, B. The type-wheel is longitudinally movable upon the shaft, and is constructed with a feather, *a*, entering the groove *b*, formed in the shaft. By means of this feather and groove the type-wheel, while capable of moving laterally in front of a sheet

of paper, P, is also constructed to revolve with the shaft when the latter is actuated.

For the purpose of rotating the type-wheel, and thus causing the successive type to be presented to the paper, a beveled gear-wheel,  $b'$ , is carried at one extremity of the shaft B. This gear-wheel is coupled with a second gear-wheel,  $b^2$ , by means of a connecting-rod,  $b^3$ , having at its respective extremities two gear-wheels,  $b^4$  and  $b^5$ . The wheels  $b^4$  and  $b^5$  respectively engage the wheels  $b'$  and  $b^2$ . The wheel  $b^2$  is carried upon an escapement-shaft,  $c$ , which in turn carries the scape-wheel C. The step-by-step movement of the wheel C is occasioned by means of an anchor-escapement,  $c'$ . The anchor  $c'$  is operated by an armature,  $c^2$ , which in turn is actuated in one direction and the opposite by means of two electro-magnets,  $C'$  and  $C^2$ , in a manner well understood. Any suitable means are applied to the shaft  $c$  through the gear-wheel  $c^3$  for the purpose of driving the same when it is released by the movements of the escapement-anchor.

The parts are so adjusted that by each vibration of the escapement-anchor, or for each two vibrations of the same, as may be desired, a succeeding type upon the type-wheel A will be presented to the sheet of paper. An ink-ribbon is supported in any suitable manner in front of the type-wheel A—as, for instance, by means of two rollers—so that when the type-wheel is caused to strike the paper an impression will be made of the character confronting the same.

For the purpose of causing the type-wheel to be carried against the paper, and to thus effect an impression when it is so desired, the shaft B is supported in a movable frame, D. This frame is pivoted by means of a bar or axis,  $d$ , which is supported in brackets or arms  $d'$  and  $d^2$  at its respective extremities. The axis  $d$  is preferably placed in the same axial line with the arbor  $c$  of the scape-wheel, so that the frame D may be turned thereon without causing the type-wheel A to be turned by the movement of the upper end of the shaft  $b^3$ . The entire frame D is thus movable toward and away from the sheet of paper P upon which the impressions are to be effected. This sheet of paper is carried in any suitable manner over an impression-roller toward which the type-wheel is intended to be forced.

For the purpose of thus actuating the frame D and the type-wheel A an armature,  $e$ , is carried upon a bar,  $e'$ , supported in the frame D, and this armature is applied to an electro-magnet, E. A suitable retractile spring,  $e^2$ , is employed for normally holding the armature  $e$  away from its electro-magnet, and thus the frame D and type-wheel A away from the paper. When, however, the electro-magnet E is vitalized, the frame is drawn forward by reason of the attraction exerted upon the armature  $e$ , and an impression will thus be effected of the character presented by the type-wheel. When an impression has thus been effected, it is necessary that the type-wheel should be

moved laterally with reference to the paper, so as to be in position to print a succeeding character in the line. For this purpose a threaded nut,  $f$ , is supported in a bracket,  $f'$ , which loosely surrounds the hub  $a^2$  of the type-wheel, and this nut surrounds and is engaged by a threaded rod or worm-shaft, F. The rod F is supported at its respective extremities in the frame D, and the thread  $f^2$ , formed in the rod F, extends spirally from one end to the other of the same. When the rod is revolved, the type-wheel is caused to move in one direction or the other, according to the direction of the revolution of the shaft or rod. For the purpose of revolving the shaft as it may be necessary for thus advancing the type-wheel laterally, a ratchet-wheel,  $g$ , is applied to one end of the same, and this ratchet-wheel is designed to be engaged by means of a pawl,  $g'$ , which is supported upon an independent stationary portion of the frame of the instrument. During the forward movement of the frame D the ratchet-pawl  $g'$  passes freely over the teeth of the ratchet-wheel without actuating the same. When, however, the frame D returns to its normal position after an impression has been effected, the teeth of the pawl engage the wheel and rotate the rod F in the direction indicated by the arrow. In this manner the type-wheel A is caused to be moved the distance represented by a space from the left hand toward the right. It then stands in position to print a succeeding character. For the purpose of causing the shaft F to be retained in its advanced position, a retaining click or dog,  $g^2$ , is applied thereto, and this click, by falling into the successive teeth as the ratchet-wheel is revolved, holds it in its successive advanced positions. After the type-wheel has been caused in this manner to move from the left to the right hand limit of its excursion, it is necessary that it should be in some manner returned to its starting-point. For this purpose a spring, H, is applied to the shaft or rod F, with which it is connected by a gear-wheel,  $h'$ , and a pinion,  $h^2$ , carried upon the remaining extremity of the shaft F. This spring will be wound by the revolution of the shaft F when the type-wheel A is being moved from the left to the right hand limit of its excursion. When, therefore, it is desired to return the type-wheel to its starting-point, it is necessary only that the ratchet-wheel  $g$  be released from the pawl  $g'$  and dog  $g^2$ . To effect this a bar or small rod,  $k$ , is supported in the frame D in such a manner that it is capable of a slight longitudinal movement. Near the respective extremities of this bar or rod there are formed annular lugs or rings  $k'$  and  $k^2$ . These lugs are designed to be engaged by the bracket  $f'$  of the type-wheel A, or by the nut  $f$ , when the type-wheel is near the corresponding limit of its excursion. When the type-wheel is moved from the left hand toward the right hand, and the last character of a line has been printed, the lug  $k^2$  will be engaged, and during the succeeding lateral movement

of the type-wheel the rod  $k$  will be moved laterally toward the right hand. When, on the other hand, the type-wheel is moving in the opposite direction toward the left hand, the rod  $k$  will in like manner be moved toward the left hand by reason of the engagement of the bracket with the lug  $k'$ . In this manner the longitudinal movement of the rod  $k$  may be obtained. The movements of the rod  $k$  thus obtained are employed for causing the pawl and dog  $g'$  and  $g^2$  to release and engage the ratchet-wheel  $G$ . For this purpose the left-hand end of the rod is pivoted to one arm of a lever,  $M$ . The remaining arm of this lever carries a beveled arm,  $m'$ , which passes below the faces of the ratchet-pawl  $g'$  and the dog  $g^2$ . When the rod  $k$  is moved toward the right hand, the beveled arm  $m'$  is forced against the faces of the pawl and the dog, and serves thus to throw the same out of engagement with the ratchet-wheel. The shaft  $F$  immediately revolves under the influence of the spring  $H$ , and causes the type-wheel to return to its starting-point at the left-hand limit of its excursion. The rod  $k$  is then moved toward the left hand, and the lever  $M$  is thus again actuated, causing the arm  $m'$  to be moved out of engagement with the pawl and dog, which thereupon again engage the ratchet-wheel  $g$ , and the operation is repeated.

For the purpose of causing the paper sheet to be lifted upward after a line of impressions has been effected, any suitable well-known means may be employed.

Any suitable form of unison device may be applied to the type-wheel  $A$  and the shaft  $B$  for insuring that the type-wheel is in unison with the transmitter. I prefer, however, for this purpose to employ a pin,  $u$ , which projects from the frame  $D$  into the path of an arm,  $u'$ , carried upon the type-wheel, when the type-wheel is at the extreme left-hand limit of its excursion. By actuating the escapement when the type-wheel has been returned to its starting-point the type-wheel will be automatically arrested at its unison-point by means of the arm and pin. By thus giving it a lateral movement it will be in position to print.

In practice I prefer to employ for the purpose of actuating the escapement device alternating currents of a given strength, and for vitalizing the printing-magnet either currents of greater strength or of greater duration, as may be found convenient.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a type-wheel, a type-wheel shaft upon which it is carried, a threaded rod or worm-shaft, means, substantially such as described, for revolving said worm-shaft, and a nut connecting said type-wheel with said worm-shaft, whereby the movements of the latter actuate the type-wheel.

2. The combination, substantially as hereinbefore set forth, of a type-wheel, a type-wheel shaft along which the type-wheel is movable, means, substantially such as de-

scribed, for revolving said shaft and type-wheel, a spirally-threaded rod, and a nut coupling said rod with said type-wheel, and means, substantially such as described, for revolving said threaded shaft.

3. The combination, substantially as hereinbefore set forth, of a type-wheel, a shaft upon which it is longitudinally movable, means, substantially such as described, for revolving said shaft and type-wheel, a spirally-threaded shaft, a mechanical connection between said type-wheel and said threaded shaft, whereby the revolution of the latter in one direction or the other causes said type-wheel to move upon its shaft in one direction or the other, means, substantially such as described, for turning said threaded shaft in one direction step by step, and a spring which is wound when said shaft is turned.

4. The combination, substantially as hereinbefore set forth, of a type-wheel, a shaft upon which it is longitudinally movable, means, substantially such as described, for revolving said shaft and type-wheel, a spirally-threaded shaft, a mechanical connection between said type-wheel and said threaded shaft whereby the revolution of the latter in one direction or the other causes said type-wheel to move upon its shaft in one direction or the other, a ratchet-wheel applied to said threaded shaft, a pawl, and means, substantially such as described, for causing said pawl and ratchet-wheel to turn said threaded shaft in one direction, a spring which is wound by the revolution of said shaft, a click which normally retains said shaft against the tension exerted by said spring, and means, substantially such as described, for releasing said shaft from said pawl and click when it has performed a predetermined number of revolutions.

5. The combination, substantially as hereinbefore set forth, of a type-wheel, a stationary shaft upon which it is laterally movable, means, substantially such as described, for revolving said type-wheel, and for moving it laterally along said shaft, and automatically-operated devices, substantially such as described, for causing said type-wheel to return to its starting-point when it has been moved laterally through a given distance.

6. The combination, substantially as hereinbefore set forth, of a type-wheel, a shaft upon which it is longitudinally movable, means, substantially such as described, for revolving said type-wheel, and for moving it laterally upon its shaft, a spring, and means, substantially such as described, for winding the same when said type-wheel is moved laterally, a releasing device for said type-wheel, which is automatically operated at a given point in the excursion of the type-wheel, whereby said spring is permitted to return the same to its starting-point, and a unison device consisting of a detent carried upon the type-wheel and a stop which intercepts the path of said detent at a particular point in the excursion of said type-wheel.

7. The combination, substantially as herein-  
before set forth, of a type-wheel, a shaft for  
the same, a groove and a feather coupling said  
type-wheel and shaft, an escapement-magnet,  
5 its armature and armature-lever, a mechanical  
connection, substantially such as described,  
between said lever and said type-wheel shaft,  
whereby a step-by-step movement is given to  
said type-wheel when said lever is actuated,  
10 and means, substantially such as described, for  
impelling said type-wheel laterally upon its  
shaft.

8. The combination, substantially as herein-  
before set forth, with a type-wheel and a shaft  
15 upon which it is longitudinally movable, of  
means, substantially such as described, for oc-  
casioning a longitudinal movement of the type-  
wheel in one direction, means tending to im-  
pel the type-wheel in the opposite direction, a  
20 pawl or click normally restraining this tend-  
ency, a longitudinally-movable rod, a releas-  
ing device for said pawl or click coupled with  
said rod, and means, substantially such as de-  
scribed, whereby said type-wheel serves to  
25 actuate said rod in one direction when near  
one limit of its excursion, and in the opposite  
direction when near the other limit of its ex-  
cursion, thereby causing the releasing device  
to be actuated.

30 9. The combination, substantially as herein-  
before set forth, of the type-wheel A, the shaft  
B, upon which it is longitudinally movable,  
the escapement-magnet, its armature and ar-  
mature-lever, the scape-wheel C, its shaft c,  
35 and the mechanical connection between said  
scape-wheel shaft and said type-wheel shaft,

consisting of the gear-wheels  $b'$  and  $b^2$ , the  
shaft  $b^3$ , and the gear-wheels  $b^4$  and  $b^5$ .

10. The combination, substantially as here-  
inbefore set forth, of a type-wheel, an axis for 40  
the same upon which it is longitudinally mov-  
able, a movable frame in which said axis is  
supported, an armature carried upon said  
frame, an electro-magnet to which said arma-  
ture is applied, and means, substantially such 45  
as described, for vitalizing said electro-mag-  
net and actuating said frame.

11. The combination, substantially as here-  
inbefore set forth, of a type-wheel, a shaft up-  
on which it is longitudinally movable, a piv- 50  
oted support for said shaft, and an electro-mag-  
net and its armature applied to said support,  
whereby said support is actuated and said  
type-wheel caused to effect an impression when  
said electro-magnet is vitalized. 55

12. The combination, substantially as here-  
inbefore set forth, with a type-wheel, and  
means, substantially such as described, for  
causing the same to be moved laterally and to  
be revolved in front of a sheet of paper, of a 60  
pivoted frame in which said type-wheel is sup-  
ported, and means, substantially such as de-  
scribed, for moving said frame toward and  
away from the paper.

In testimony whereof I have hereunto sub- 65  
scribed my name this 26th day of June, A. D.  
1884.

HENRY VAN HOEVENBERGH. [L. S.]

Witnesses:

DANL. W. EDGECOMB,  
CHARLES A. TERRY.