

(No Model.)

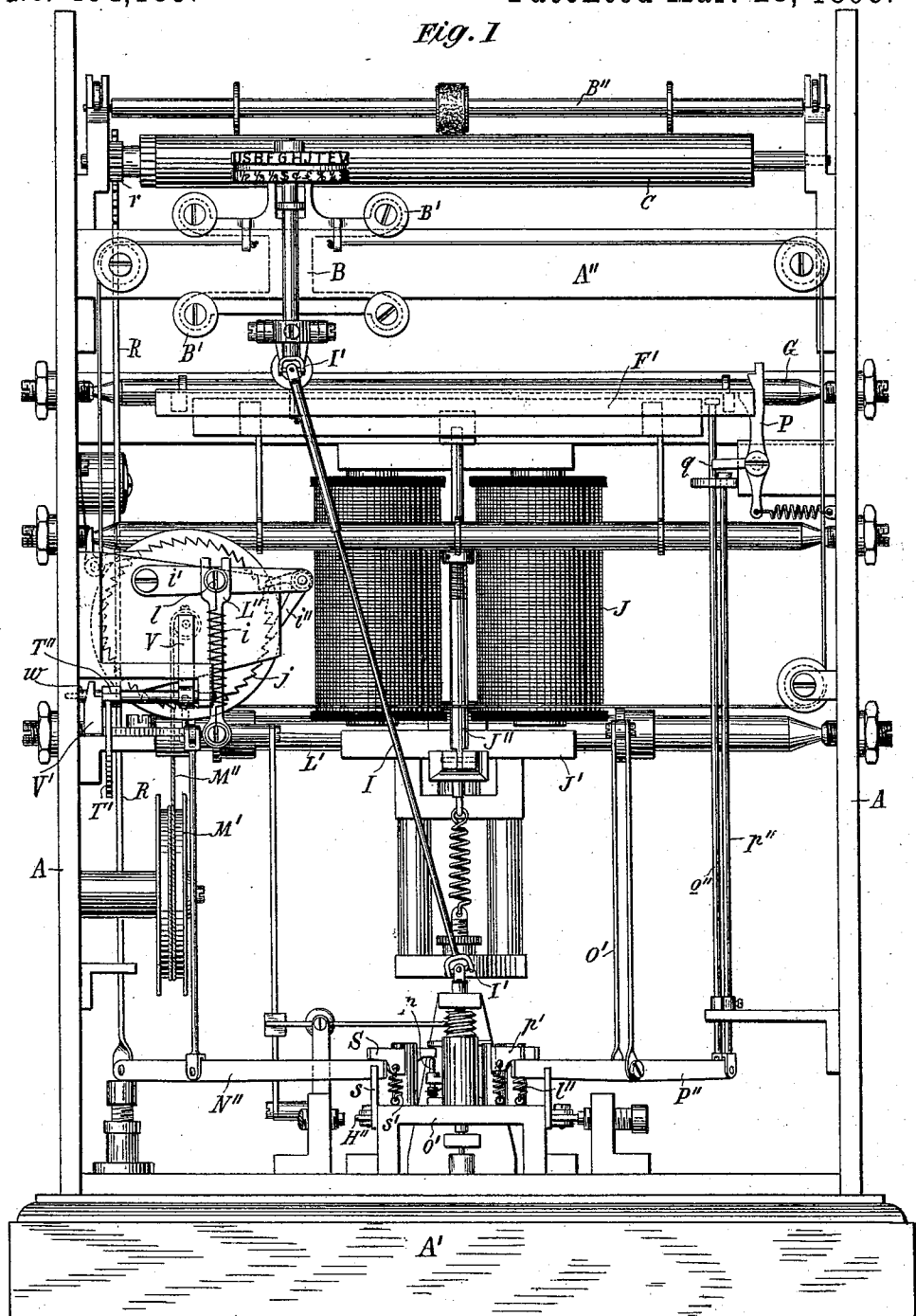
4 Sheets—Sheet 1.

J. E. WRIGHT.
PRINTING TELEGRAPH.

No. 494,185.

Patented Mar. 28, 1893.

Fig. 1



Witnesses:

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Orinist. Hopkinson

Inventor

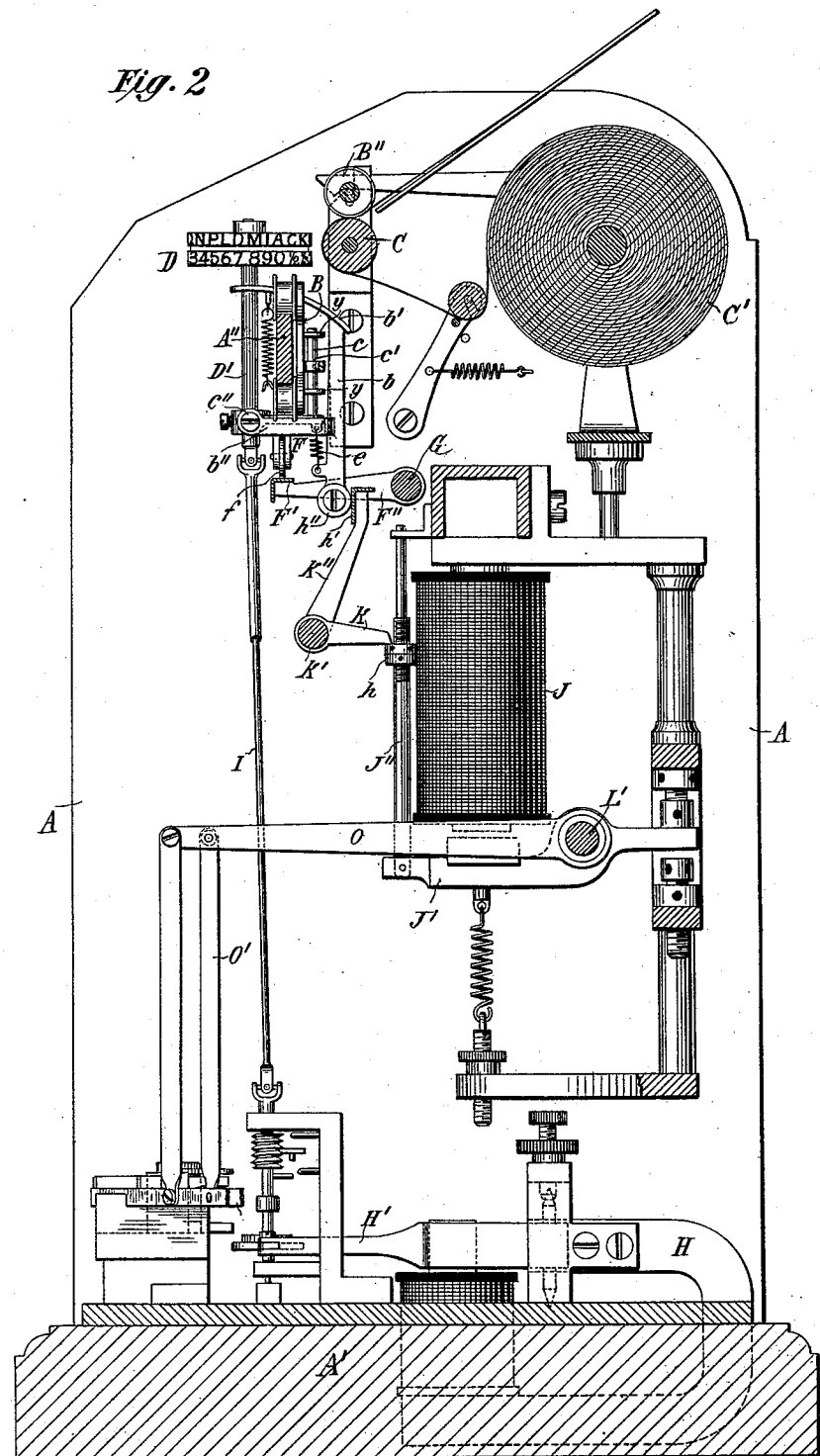
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Fig. 2



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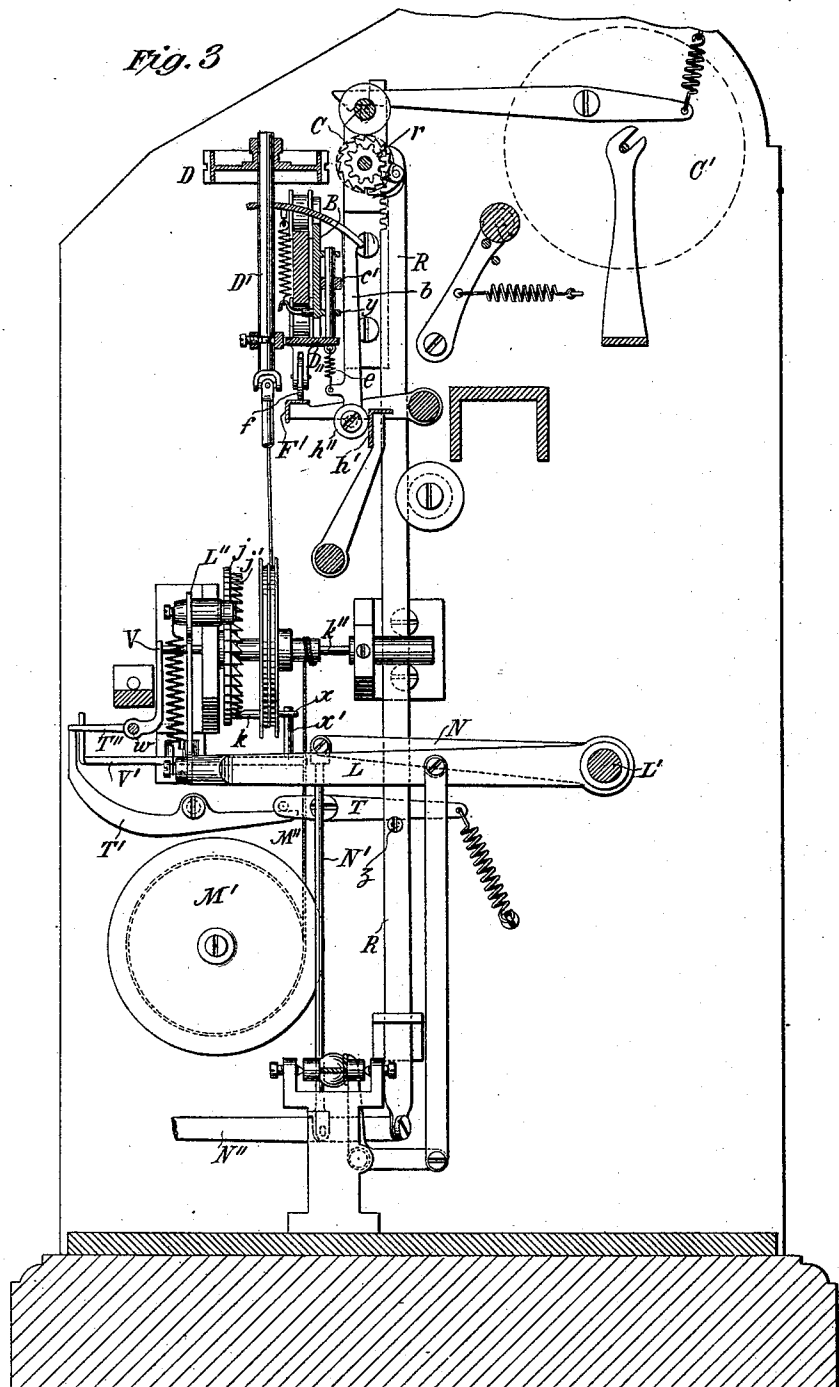
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Patented Mar. 28, 1893.



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4 Sheets—Sheet 4.

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Fig. 4

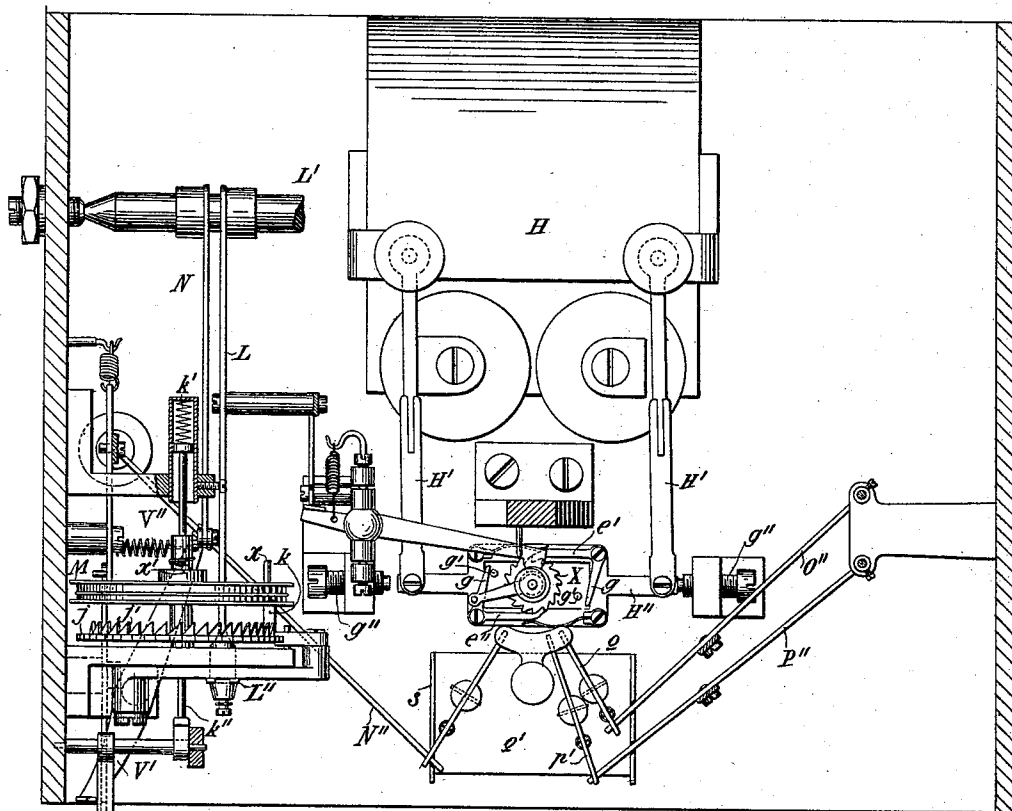


Fig. 5

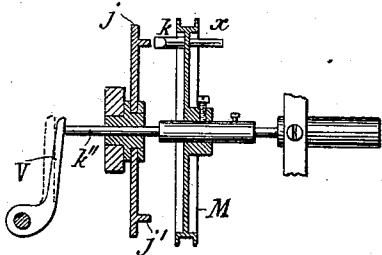


Fig. 6

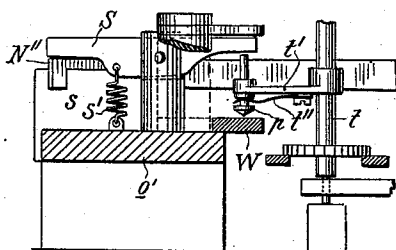


Fig. 7

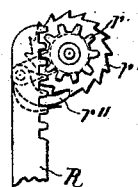
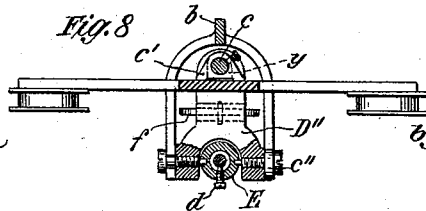


Fig. 8



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UNITED STATES PATENT OFFICE.

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PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 494,185, dated March 28, 1893.

Application filed November 16, 1892. Serial No. 452,124. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. WRIGHT, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Printing-Telegraphs, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

My invention consists in a novel column or page printing telegraphic instrument in the construction and design of which my main object has been to provide a compact, simple and effective instrument, more especially adapted for private lines, or smaller systems where the amount of work demanded of the instruments is comparatively light, or exceptional speed is not required. To this end I have devised an instrument involving but few and simple parts and which, while requiring only a current of uniform strength for its operation, performs all the functions of a complete column printer with certainty and rapidity.

As my invention resides chiefly in constructive details, I shall refer to the drawings hereto annexed for the purpose of indicating and explaining the particular features which I regard as of my invention.

Figure 1 is a front view in elevation of the instrument complete. Fig. 2 is a side elevation of the operative parts of the same with the side plate removed, and looking from the right hand side. Fig. 3 is a similar view from the opposite side. Fig. 4 is a sectional plan of the instrument. Fig. 5 is a sectional detail of a portion of the feed mechanism. Fig. 6 is a sectional detail of the escapement and other parts. Fig. 7 is a detail of a portion of the paper feed. Fig. 8 is a sectional detail of the type-wheel mechanism.

The several parts of the instrument are supported between the vertical side plates A, A, mounted on a suitable base A'.

A transverse bar or plate A'' is secured between the side plates A, A, and forms a guide or way for a carriage B, which is provided with four flanged or grooved wheels B' that travel along the opposite edge of the said plate. Back of the plate A'' are two rolls B'', C, the latter of which is the printing roll or platen against which the type-wheel impinges

to print a character, and the paper roll or spool C'. Beneath the parts named are arranged the several mechanisms that set the type-wheel, print, and feed the paper to space for letters and lines. The type-wheel D having an upper and lower row of characters is carried by a short spindle D' that is mounted in a frame composed essentially of an upright b, an overhanging arm b' and two horizontal arms b'' b''. A plate D'' provided with a stud c that passes up through ears or lugs y on the carriage B is secured to the ends of the arms b'' by means of pivot screws c''. The same screws also support pivotally a ring or circular plate E through which the type-wheel spindle D' passes, but to which it is secured against vertical movement by a set screw d set in the said plate with its point entering a circular groove in the spindle. The upper bearing for the spindle D' is afforded by the arm b', that extends through a slot or opening in the carriage. The frame comprising, as above stated, the upright b, and the arms b' and b'', is capable of being oscillated with respect to the carriage B and plate D'' by reason of its pivotal connection with the latter, and in such movement it carries with it the type-wheel spindle D' which is pivotally connected as above described with said plate D''. The frame and the type-wheel however, are connected with the carriage B in such manner as to move with it in its course forward and back on the guide bar A''.

Between the plate D'' and the standard b is a spiral spring e that tends to maintain the standard b and through it the type-wheel spindle D' in a vertical position, in which case a block c' on stud c will be in contact with the upright b.

The plate D'' is provided on its under side with a stud F carrying a roller f that runs on a bar F' supported by arms F'' extending from a rock-shaft G. In the normal position of the bar F', the type-wheel frame, which is connected to the plate D'' by pivots on one side and the spring e on the other, and hence supported by the roller f upon the bar, is in the position which presents to the printing point the characters on the upper of its two lines of characters. If the bar F' be raised, the frame and type-wheel will also be raised

and the lower row of characters will be presented to the printing point.

The type-wheel, as will be understood from the above description, has a rotary movement about its axis, whereby any desired character of a row may be brought to the printing position; secondly it has in common with its frame and carriage a transverse movement with respect to the paper whereby a succession of characters may be printed in a line; thirdly, it has together with its frame an oscillating movement with respect to its supports whereby it may be rocked or swung to impress or print any selected character upon the paper, and fourth, it has together with its frame and supports but independently of the carriage a vertical movement, by means of which either of its rows of characters may be brought into alignment with the impression or printing point. I shall now proceed to describe the means by which these several operations are carried out. In the lower part of the frame is secured a polarized electromagnet H with two poles. Before the respective poles are pivoted armatures H', joined by a bar H'', the middle portion of which is divided to form a frame between the sides of which is the escapement wheel X. Pivoted to opposite sides of the frame are spring-actuated pawls e' e'' that engage with the ratchet teeth of the escapement wheel. Each pawl is formed with a tail g in the path of which is a stop g'. The play of the armatures is limited by suitable stops g'', and as alternations of current are sent over the line the polarized armatures impart an oscillation to the bar or frame H''. The movement of the frame in one direction will cause, say, the pawl e' to turn the escapement wheel and the pawl e'' to recede from the tooth with which it rested in engagement. When the frame has moved sufficiently to advance the pawl e' and the escapement through the space of one-half of a tooth, the pawl e'' has passed into engagement with the next tooth, having receded through the same space that the other pawl advanced, and the opposite action takes place when the current is reversed. Hence for every reversal of current the frame or bar H'' in oscillating back and forth through the space of half a tooth moves the escapement through the space of a whole tooth. When a pawl has advanced through the determined space, its toe engages with the stop in its path and locks the escapement against further movement thus preventing overthrowing. Moreover, since the movement of the pawls is bodily in a straight line, there is no lost motion or inequality of movement such as rotary movement involves, and the full force of the magnetism is exerted in the most direct and effective manner. The rotation of the escapement thus secured is imparted to the type-wheel by means of an extension rod I connected by universal or gimbal joints I' to the escapement and type-wheel spindles respectively. The connecting

rod I being composed of two parts, one of which slides within the other, permits the type-wheel to move with its carriage from side to side of the instrument in printing the lines. The final impulse of current that brings the proper character on the type-wheel into position being somewhat prolonged energizes the slow acting printing magnet J sufficiently to raise its armature J'. Said armature carries a standard J'' having an adjustable stop h thereon that engages with an arm K extending from a rock-shaft K' and turns said shaft through a certain arc. This shaft supports by means of arms K'' a plate or bar h' in front of which moves the lower end of the upright b of the type-wheel frame and which is provided with a roller h'', so that when the shaft K' is turned the bar h' tilts the frame and type-wheel about the pivot screws c'' and prints the selected character. The same action takes place whether the type-wheel be in its lower or upper position. By each complete oscillation of the printing magnet armature the type-wheel carriage is advanced one step, through the following instrumentalities: L is an arm fixed to the rock shaft L' that carries the armature lever. This arm is connected by a bar L'' with a lever i' pivoted to the frame of the instrument, and carrying a pawl i'' that engages with a ratchet-wheel j', hence by each upward movement of the arm L the pawl i'' is lifted through the space of one tooth, and when the arm L drops, the lever i' is drawn down by a spring i connected at one end to arm L and at the other to the stud l that is set in the lever i' and extends through the bifurcated end of the bar L''. This turns the ratchet-wheel j through the space of one tooth.

On the same shaft with the ratchet-wheel j but fixed thereto is a drum M containing a spring or connected by a cord with a spring drum M'. The drum M is normally held by a spring k' acting upon its shaft k'' in such position that a stud k set in its side will engage with the teeth of a crown-wheel or ratchet j' on the side of the ratchet-wheel j. Normally, therefore, the drum M is prevented from rotating but is turned step-by-step by the movement of the ratchet j. A cord M'' is wound around the drum M and after passing around a series of pulleys m its ends are connected to opposite sides of the type-wheel carriage B which it moves step-by-step forward after each impression to space for characters. When the type-wheel carriage has reached the forward limit of movement or any other desired point in its travel, it may be returned to the starting point, but no injury will result to the apparatus by the continuance of impulses through the printing magnet J after the carriage has reached the limit of travel, for in such case, although the pawl i'' would be lifted by the lever L, the ratchet j and drum M would not be turned by the action of the spring i.

I employ the following means for restoring

the type-wheel carriage after it has traversed a part or the whole of its path. An arm N extends from the rock-shaft L' and rises and falls with the movement of the shaft whenever the printing magnet is energized. This arm is connected by a link N' with a lever N'' one end of which is free, while the other end is pivotally connected with a bar R passing through suitable guides up to the printing roller C. On this latter is a loose pinion r that engages with a rack on the bar R and a ratchet r' which is engaged by a pawl r'' carried by an arm that moves with the pinion so that the latter when turned in one direction carries the paper roll with it. The free end of the lever N'' works in a slot in a plate s secured to a platform o' and over its end lies the end of a lever S pivoted to a standard on the platform and having a retracting spring s'. The escapement shaft t carries an arm t' projecting horizontally, and in the end of this arm a loose pin p is supported by means of a light spring t''. In one of the positions of the escapement this pin is directly under the end of the lever S and it is brought to this position whenever it is desired to send the type-wheel back to begin a line. Although the arm N rises whenever a current impulse energizes the printing magnet, no effect is produced upon the lever N'' beyond raising its free end and rocking the lever S, but if this be prevented by the presence of the pin p under the lever, then the lever S becomes the fulcrum upon which the lever N'' is turned and the bar R is raised. This effects two operations,—the feed of the paper for a line space and the return of the type-wheel and its carriage. The first operation is performed by the rack, pinion and pawl above described; the latter by the devices shown in detail in Figs. 3 and 4. T is a lever pivoted to the frame and provided with a spring that tends to depress the end that lies in the path of a stud on the bar R. When the said bar is raised the short arm of lever T is depressed carrying with it one arm of a pivoted lever T'. The other arm of this lever engages an arm T'' on a rock-shaft w which carries a second arm V against which the end of the longitudinally movable and spring-actuated shaft k'' impinges. The upward movement of the lever T' turns the shaft w and moves the shaft k'' until the tooth k on the drum M is disengaged from the crown tooth ratchet j'. The drum is thus free to turn backward, and in so doing it restores the type-wheel carriage to its position at the start. As soon as the arm T'' is raised, a pivoted lever V' acted upon by a spring V'' (Fig. 4) and formed with a step at its end, as shown in Figs. 1 and 4, passes under the said arm and maintains it in an elevated position until a pin x on the drum M strikes against a pin x' on the lever V' and throws the lever out of engagement with the arm T''.

Printing from the upper row of letters and characters on the type-wheel requires merely

a rotary adjustment of the wheel by the escapement for the selection of the desired characters, but as I provide two rows of characters the adjustment of the type-wheel vertically is necessary in printing successively characters from different rows. The shifting of the wheel from one position to another is effected in the following manner: From the rock-shaft L' extends an arm O which is connected by a link O' with a lever O''. One end of this lever lies under the end of a lever o pivoted in a standard on platform o', while to the opposite end is hinged a bar o'' that passes upward through suitable guides and ends immediately under the bar F'. Every impulse of current that energizes the printing magnet J causes the arm O and link O' to rise, but as the lever o is prevented from oscillating only by a light spring l'' it permits the free end of lever O'' to rise. This lever, therefore, turns about its pivotal connection with the rod o''. But if the escapement be set so as to bring the pin p under the lever o then the free end of lever O'' is held down and as the link O' rises it forces up the rod o''. This lifts the bar F' and with it the type-wheel and its frame so that the lower row of characters is aligned with the printing point. When the bar F' is raised it is engaged by a spring-actuated catch or detent P which maintains it in the second position until by some special mechanism it is restored to the first. I employ for this purpose the arm O on the rock-shaft L' connecting with it lever P'', which by means of a lever p' and the pin p, similar to those above described, raises a rod p'' which coming into engagement with a pin or arm q extending from the detent or lever P, disengages the same from the bar F' and permits the latter to fall into its normal position. When any one of the levers S, o or p' becomes the fulcrum for its corresponding levers N'', O'' or P'', considerable load is imposed upon the pin p. To relieve the escapement shaft of this load I have employed in conjunction with the pin p and its supporting spring t'' a table W. Normally the pin p is held up by the spring t'' so that it sweeps over but just escapes touching the table. When encountered by one of the levers, however, it is pressed down upon the table upon which practically all the weight rests.

In practice, I employ in connection with the devices above specifically described proper means for effecting the necessary adjustments for supplying ink to the type-wheel, and for synchronizing the instruments or bringing them to unison, but as these devices form no part of my present improvements and are well understood I have given no detailed description of them.

What I claim as new is—

1. In a column printing telegraph instrument, the combination with a type-wheel and carriage for the same movable transversely for printing lines of characters, an escape-

ment and a connection between the escapement and type-wheel capable of universal movement with respect to both.

2. In a column printing telegraph instrument, the combination with a type-wheel and carriage for the same movable transversely for printing lines of characters, an extension rod and universal joints between the two members of the same and the type-wheel and escapement respectively.

3. The combination with the escapement wheel, of a printing or similar instrument, of an electro-magnet, two polarized armature levers, a divided bar or frame connecting the same and pawls carried thereby and engaging with the escapement wheel on opposite sides of the center.

4. The combination with the escapement wheel, of a printing or similar instrument, of an electro-magnet, two polarized armature levers, a divided bar or frame connecting the same, pawls carried by the bar or frame and engaging with the escapement on opposite sides of the center, said pawls being provided with extensions beyond their fulcrums and fixed stops in the paths of said extensions, whereby the pawls are caused to bind the escapement and prevent overthrowing.

5. The combination with an escapement wheel, of two pivoted and polarized armatures, a bar connecting their ends and stops for limiting the oscillation or play of the same and pawls carried by the bar and engaging with the escapement wheel on opposite sides of its center.

6. In a column printing telegraph instrument, the combination with any or all of the several devices for feeding the paper, restoring the type-wheel to begin a line, and adjust-

ing the type-wheel vertically, of levers oscillated by the printing magnet and connected at one end to the said mechanism but having the other end free, a stationary support or table under the free ends of said levers and a pin or stud carried by the escapement and adapted to be interposed by the same between any one of the levers and the table, as set forth.

7. In a column printing telegraph instrument, the combination with the type-wheel carriage of a plate connected therewith and movable vertical with respect thereto, a frame pivotally connected with the plate, and a type-wheel mounted in said frame.

8. The combination of a transversely moving type-wheel carriage, a spring-actuated drum, cords connecting the carriage and drum, a shaft having longitudinal play and carrying the drum, a ratchet-wheel turning loosely on the shaft and adapted to be rotated intermittently by the operation of the printing magnet, a spring for maintaining the ratchet and drum in engagement and means for moving the shaft longitudinally and disengaging the ratchet and drum to restore the type-wheel carriage to the starting position.

9. The combination with a transversely movable type-wheel carriage and stationary escapement, of a type-wheel carried by a spindle capable of rotary, angular and vertical movement with respect to the carriage, and an extensible connection between the said spindle and the escapement capable of universal movement with respect to both.

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