No. 641,916. Patented Jan. 23, 1900.

J. E. WRIGHT.

PRINTING TELEGRAPH INSTRUMENT.

(Application filed May 5, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 2

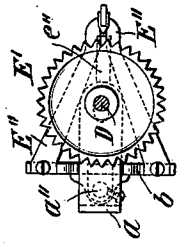


Fig. 3

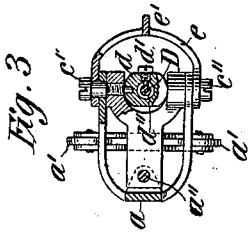


Fig. 4

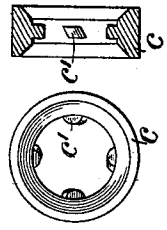
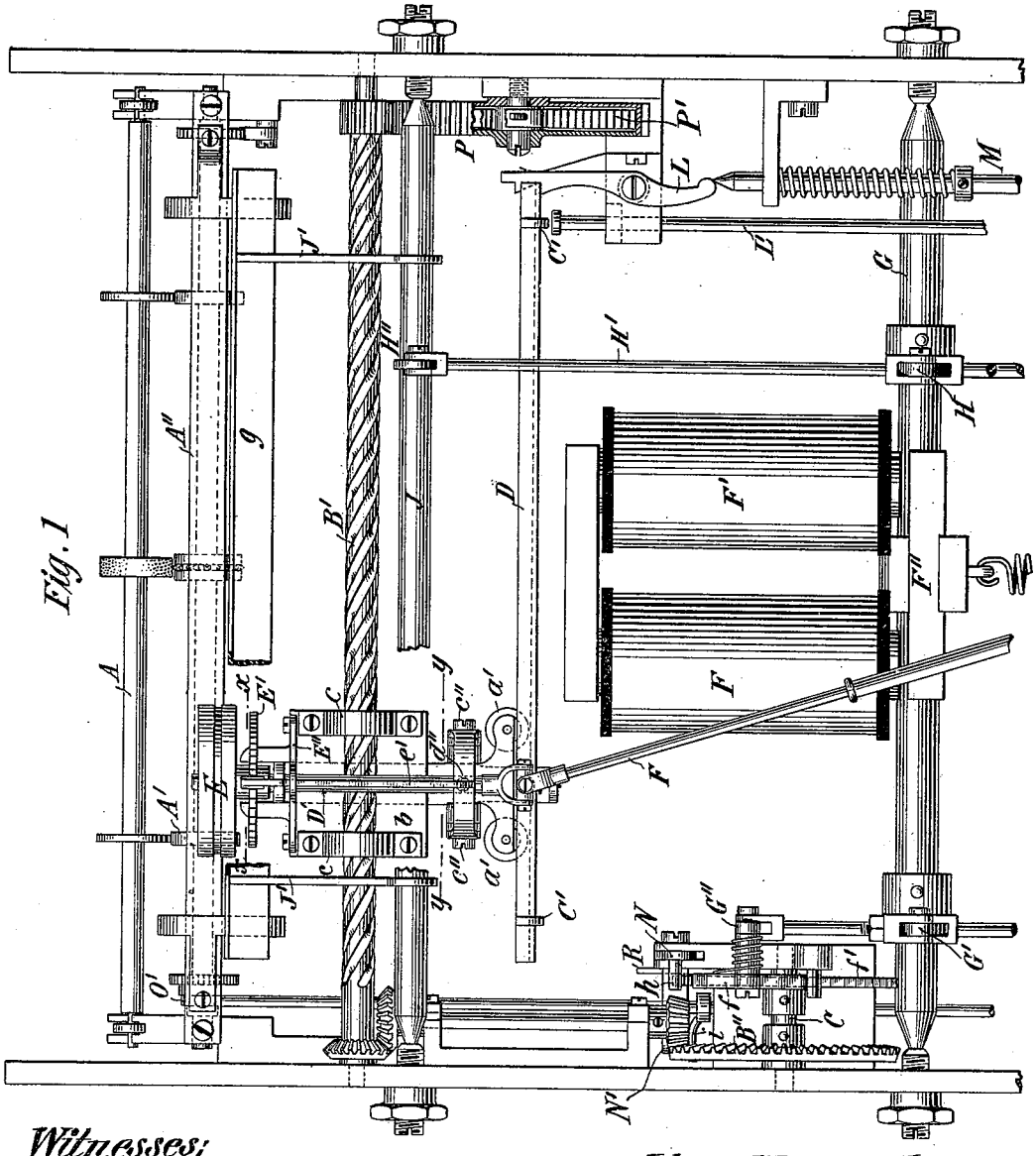


Fig. 1



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 641,916. Patented Jan. 23, 1900.

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(Application filed May 5, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 6

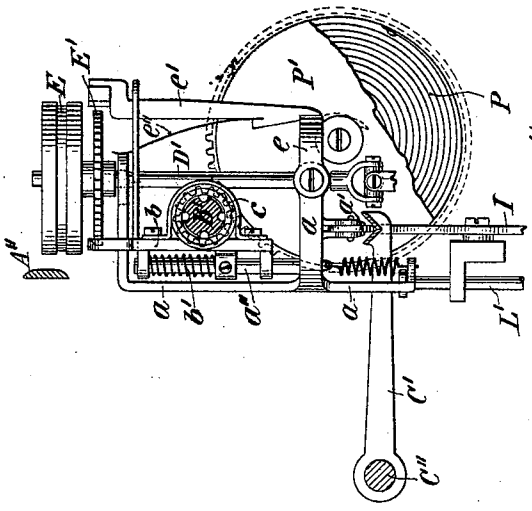


Fig. 7

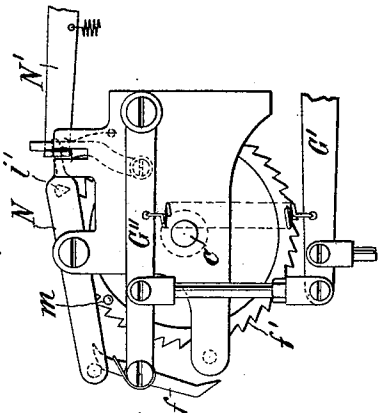
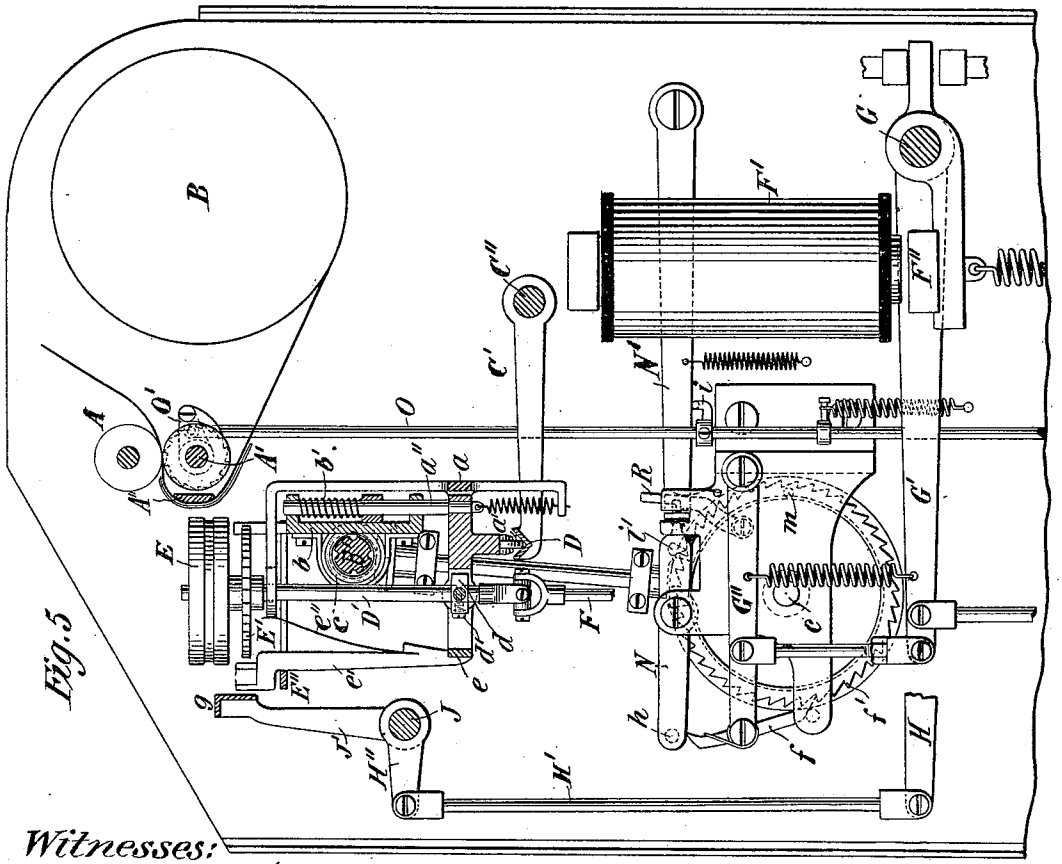


Fig. 5



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN E. WRIGHT, OF NEW YORK, N. Y.

PRINTING-TELEGRAPH INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 641,916, dated January 23, 1900.

Application filed May 5, 1899. Serial No. 715,703. (No model.)

To all whom it may concern:

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

In a patent granted to me on March 28, 1893, No. 494,185, there is shown and described a column-printing telegraph instrument upon which the invention of my present application is an improvement. In the said instrument there is an electromagnetic escapement which is operated by successive current impulses sent over the line, and thereby caused to turn the type-wheel to position to print any desired letter. There is also a rock-shaft partially rotated by a magnet which is energized by the final and prolonged impulse of any series transmitted and which carries an arm that advances through the instrumentality of a pawl-and-ratchet mechanism the type-wheel step by step transversely across the face of the printing surface or platen. Connected with this arm is a lever which only operates when the escapement is brought to a predetermined position to feed the paper the space of a line and at the same time to effect the return of the type-wheel to position to begin a line. A second arm on the rock-shaft connects with a tilting bar that forces the type-wheel over toward the printing-platen whenever the printing-magnet is energized, whether a character is to be printed or the type-wheel advanced a space while turned to present a blank in the printing position. Connected with this second arm are two levers the operation of which is dependent upon given positions of the escapement. One of these acts to raise the type-wheel so as to bring its lower row of characters into printing position and the other to release the type-wheel and permit it to drop from its raised position at a time when it is set by the escapement in a position in which a blank space is at the printing position.

A general statement of the operation of the instrument in connection with the above will be sufficient to indicate the nature of the parts shown in the patent referred to, but omitted from the drawings of the present application as not directly included in the improvements upon which this application is based.

When the operator at the transmitting-station desires to print a certain letter, he sends to line by means of a suitable transmitter the proper number of impulses to rotate the escapement and type-wheel until the desired letter is brought to the printing position. The last impulse of the series being prolonged energizes a large magnet, the armature of which through proper connections throws the type-wheel over against the paper and then advances it transversely through the space of one letter. At the end of a word the escapement and type-wheel are brought to a position in which a blank space on the wheel is brought to the printing position, so that the wheel is advanced one step, but no letter printed. If a figure or character in the lower roll of the type-wheel is to be printed, the escapement is turned to a position in which it causes the proper lever to raise the wheel and leave it locked in its elevated position. As a blank space is presented at the printing position at this time, no character is printed, so that it is is then necessary to set the wheel for the next character desired. To restore the wheel to its normal position, the escapement is turned to the position for spacing, in which it also effects the tripping and release of the type-wheel. Finally, at the end of a line the escapement is set in a given position, in which a lever connected with the ratchet-arm of the rock-shaft is caused to feed the paper, release the type-wheel, and permit it to be returned to the starting-point in its course.

With this statement of the general nature of the apparatus I now proceed to a detailed description of that portion of the same which I have constructed in a novel manner for the purpose of simplifying it and improving its action.

Figure 1 is a view in elevation and part section of the upper portion of an instrument of the kind described and which contains the improvements. Fig. 2 is a sectional view on line $x\,x$ of the type-wheel carriage. Fig. 3 is a similar view on the line $y\,y$. Fig. 4 is an enlarged detail of a portion of the type-wheel

carriage. Fig. 5 is a view in side elevation and part section of the parts shown in Fig. 1. Fig. 6 is a similar view of the type-wheel carriage and parts connected therewith, but looking in the opposite direction. Fig. 7 is an elevation of the feed mechanism.

A and A′ are the paper-feed rolls, and A″ a platen over which the paper is drawn by the same from a reel B. Below the platen is a spirally-grooved shaft B′, mounted parallel with said platen and in gear with a bevel spur-wheel B″ fixed to a ratchet-shaft C.

C′ C′ are arms extending from a rock-shaft C″ and supporting a grooved bar or trough D beneath the shaft B′, which serves as a guide or track for the support of the type-wheel carriage. The latter comprises a frame *a*, supported by rollers *a′*, which run in the trough D. A standard *a″* is set in the lower horizontal portion of the frame and passes up through lugs on a plate *b*. A spiral spring *b′* is interposed between the stud and plate, which exerts a tendency to force the frame downward with respect to plate *b*.

Secured to plate *b* are two rings *c*, each with four interior projections or teeth *c′*, which mesh with four corresponding spiral grooves in the shaft B′, so that the rotation of the latter advances the type-wheel carriage along the bar.

I have found it a matter of great difficulty to construct the grooved shaft and the engaging portion of the type-wheel carriage so that the latter will be advanced smoothly, without undue friction, and with no lost motion; but the difficulties are overcome by cutting four grooves in the shaft and placing four corresponding teeth or projections at equal distances apart in the guides.

The spindle D′ of the type-wheel E passes through an annular plate *d*, supported by pivot-screws *c″* in the bifurcated end of the lower horizontal side of the carriage, and is prevented from moving vertically through the same by a set-screw *d′*, the end of which enters a groove in the spindle, as indicated at *d″* in Fig. 1. In the upper side of the carriage-frame *a* the opening through which the spindle passes is elongated, as indicated by dotted lines in Figs. 5 and 6, to permit the spindle to oscillate about the pivot-screws *c″* as a center.

Secured to the frame *a*, so as to be capable of oscillation on the same axis as the type-wheel spindle, is a bow *e* with an upright *e′*, carrying a spring *e″*, which, bearing against the frame *a*, tends to maintain the upright out of engagement with a toothed wheel E′ on the spindle D′ below the type-wheel E. The upright *e′* passes up through an opening in a plate E″, secured to the plate *b*.

F is the extensible rod from the escapement and connected by a universal joint with the type-wheel spindle. The printing-magnet F′ has an armature F″, that is secured to a rock-shaft G and imparts a partial rotation to the latter when the magnet is energized. From this rock-shaft extend two arms G′ and H. The former is that which advances the type-wheel carriage step by step, and the latter that which operates to tilt the type-wheel to print any character that may have been brought to the printing position.

The forward movement of the type-wheel and its carriage is effected by the following means:

The arm G′ is connected with a lever G″, on the end of which is pivoted a pawl *f*, engaging with a ratchet-wheel *f′* on the shaft C. Whenever the printing-magnet F′ is energized, these devices operate to turn the ratchet-wheel the space of one tooth and through its connections with the shaft B′ advance the type-wheel and its carriage the space of one letter. The arm H is connected by a rod H′ with an arm H″ on a rock-shaft J. The partial rotation of the shaft G therefore effects a corresponding movement of the shaft J. This movement of the shaft J, which, as will be understood, is caused by the final current impulse of any series sent over the line for the purpose of setting the type-wheel, and consequently occurs after the latter has been brought to the desired position, is utilized to effect the printing. For this purpose a bar *g*, extending along the path of travel of the type-wheel, is secured to the shaft J by arms J′. When the shaft J turns, it carries the bar *g* over against the upright *e′* of the pivoted bow *e* of the carriage, and a knife-edge on the upright enters a space between two of the teeth of the wheel or disk E′. This locks the type-wheel in the exact position necessary for printing the desired character and at the same time by the continued movement of the bar *g* throws the type-wheel over against the paper on the platen A″.

The type-wheel prints normally from the upper row of characters; but when any letter or character on the lower row is to be printed the type-wheel is raised and locked in its second position. This is effected by raising the guide D until it is engaged by a pivoted catch L. The devices for accomplishing this are the same as those described in my patent above referred to and comprise the vertically-movable rod L′, which is operatively connected through a lever with the arm H. When the guide D is raised, it lifts the entire type-wheel carriage relatively to the plate *b*. To lower the type-wheel, the rod M is raised and caused to engage and trip the catch L.

The devices for restoring the type-wheel carriage to its starting-point at the beginning of a line are as follows:

A lever N is pivoted to the stationary frame, in which is supported the shaft C and ratchet-wheel *f′*, and carries a pin *h*, which lies over the end of the pawl *f*. A lever N′ is pivoted to the side plate of the instrument and being bent at right angles at its end engages with the end of lever N, the latter passing through a hole in said lever N′, as shown in Figs. 5 and 7.

O is the rod that operates a pawl O′ for feeding the paper. When this rod is raised, by setting the escapement to a given position a pin *i*, secured to it, lifts the lever N′, and thereby tilts the lever N, releases the pawl *f* from engagement with the ratchet-wheel *f*′, and raises a stop *i*′, which is on the lever N away from the said ratchet. The latter is therefore free to revolve and is rotated backward by a coiled spring P in a barrel P′, which is geared to the shaft B′ and which has been wound up by the rotation imparted to the latter for the purpose of advancing the type-wheel carriage. In the instruments heretofore made by me the ratchet and the spring-barrel were placed together at one end of the type-wheel-carriage guide, the carriage being connected with the barrel or drum by cords passing over a system of pulleys; but by using a spirally grooved or threaded shaft B′ and placing the ratchet on one side of the instrument and the drum on the other the construction is greatly simplified and access to the parts made more easy. When the lever N′ is raised, it is engaged and locked in its elevated position by a pivoted spring-catch R; but it is released by a pin *m* on the ratchet-wheel, which strikes against the catch R when the ratchet has turned backward sufficiently to bring the type-wheel carriage fully home. By this means when the mechanism for returning the type-wheel carriage has once been set in operation it cannot be stopped until the carriage has completed its full return journey.

From the above description it will now be seen that the novel features of my improvement are in the construction and arrangement of the parts of an instrument which in principle of operation and general design is similar to that of my Patent No. 494,185, above referred to.

Having now described my invention, what I claim is—

1. In a column-printing telegraph, the combination with a shaft mounted parallel to the printing-surface and containing four spiral grooves, of a type-wheel carriage having at each side a guide through which said shaft passes, each of the said guides having four pins or projections that correspond with and enter the spiral grooves, and means for imparting an intermittent movement of rotation to the shaft for advancing the type-wheel transversely, step by step, as set forth.

2. The combination with the spirally-grooved shaft and means for imparting an intermittent movement of rotation thereto, a type-wheel and a carriage carrying the same and engaging with the shaft so as to be moved transversely by its rotation, a bar or plate parallel to the line of travel of the type-wheel carriage, and means for moving said plate or bar and thereby tilting the type-wheel into contact with the printing-surface, as set forth.

3. The combination of the spirally-grooved shaft, a type-wheel carriage engaging therewith, a type-wheel and its mountings movable vertically with respect to said carriage, a guide supporting the type-wheel, means for raising and lowering the said guide, and means for tilting the type-wheel into contact with the printing-surface, as set forth.

4. In a column-printing telegraph instrument, the combination with a spirally-grooved shaft, and means for imparting an intermittent movement of rotation thereto, of a type-wheel carriage composed of two parts, one engaging with the spirally-grooved shaft and adapted to be moved transversely by its rotation, the other movable vertically with respect to the first, and a rotary type-wheel mounted thereon and capable of oscillation in a plane at right angles to the line of travel of the carriage, as set forth.

5. The combination with the type-wheel carriage, a shaft and a ratchet and pawl for advancing the said carriage, of a lever for releasing the pawl, a catch for locking said lever when tilted, and a pin or projection on the ratchet-wheel that encounters and trips said catch when the type-wheel carriage has completed its return movement, as set forth.

6. The combination with the spirally-grooved shaft, of the plate with guides through which said shaft passes and with which it engages, the frame connected with said plate and movable vertically with respect thereto, a plate pivoted to said frame, a rotary type-wheel passing through said pivoted plate, and capable of oscillation in a plane at right angles to the axis of the grooved shaft, as set forth.

7. The combination with the spirally-grooved shaft, of a type-wheel carriage engaging therewith, a rotary type-wheel capable of oscillating in a plane at right angles to the axis of the grooved shaft, an arm or upright as *e*′ pivoted to the carriage, and a toothed wheel E′ on the spindle of the type-wheel shaft with which said arm *e*′ engages when it is tilted, to force the type-wheel against the printing-surface, as set forth.

8. The combination with the shaft having four spiral grooves, of a type-wheel carriage having guides with corresponding projections that engage with said grooves, a frame connected with and movable vertically with respect to the carriage and a trough or guide D in which said frame is supported on rollers, as set forth.

JOHN E. WRIGHT.

Witnesses:
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G. W. MARTLING.