

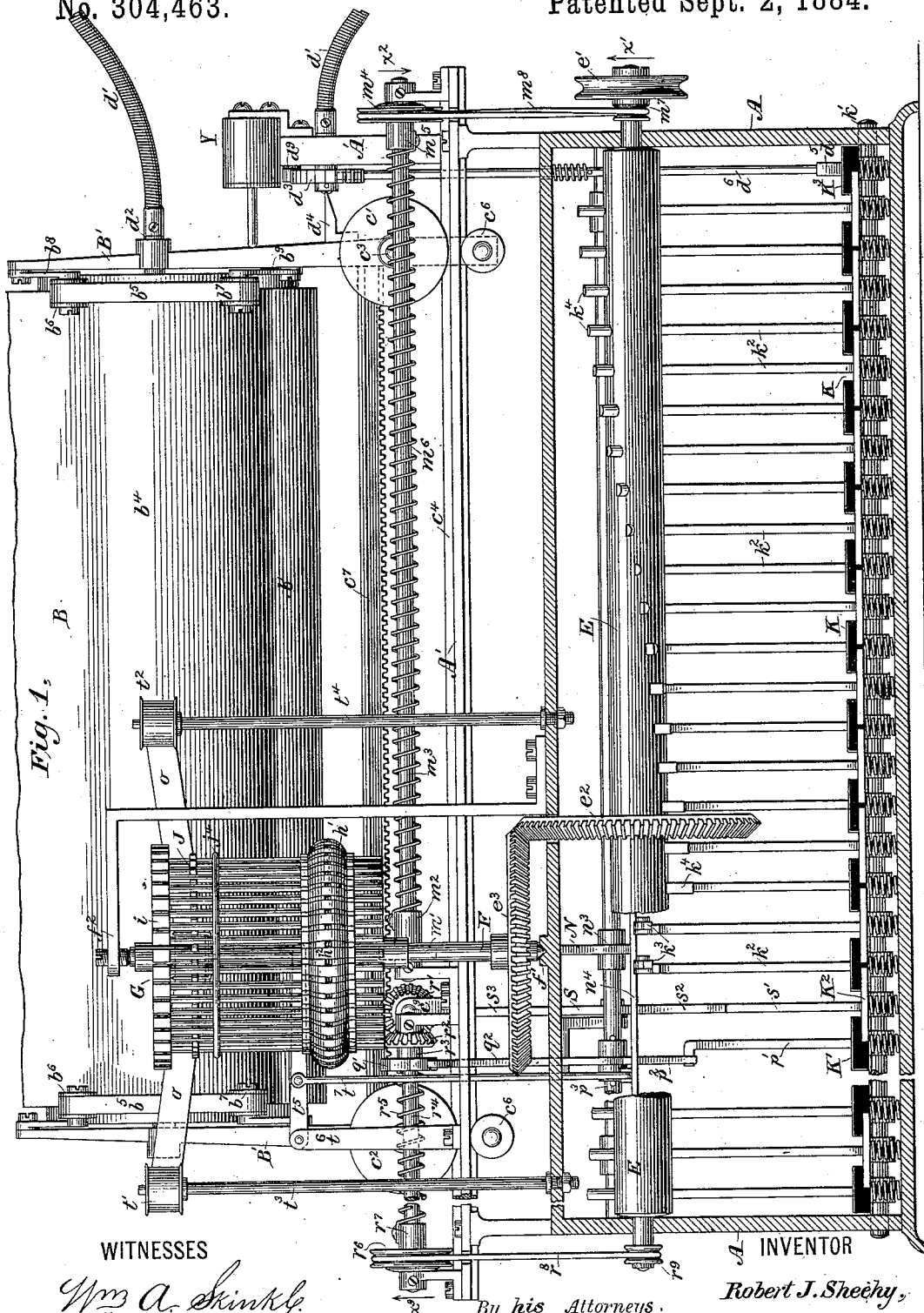
(No Model.)

2 Sheets—Sheet 1.

R. J. SHEEHY.
TYPE WRITING MACHINE.

No. 304,463.

Patented Sept. 2, 1884.



WITNESSES
Wm. A. Slink
Geo. H. Breck

By his Attorneys.

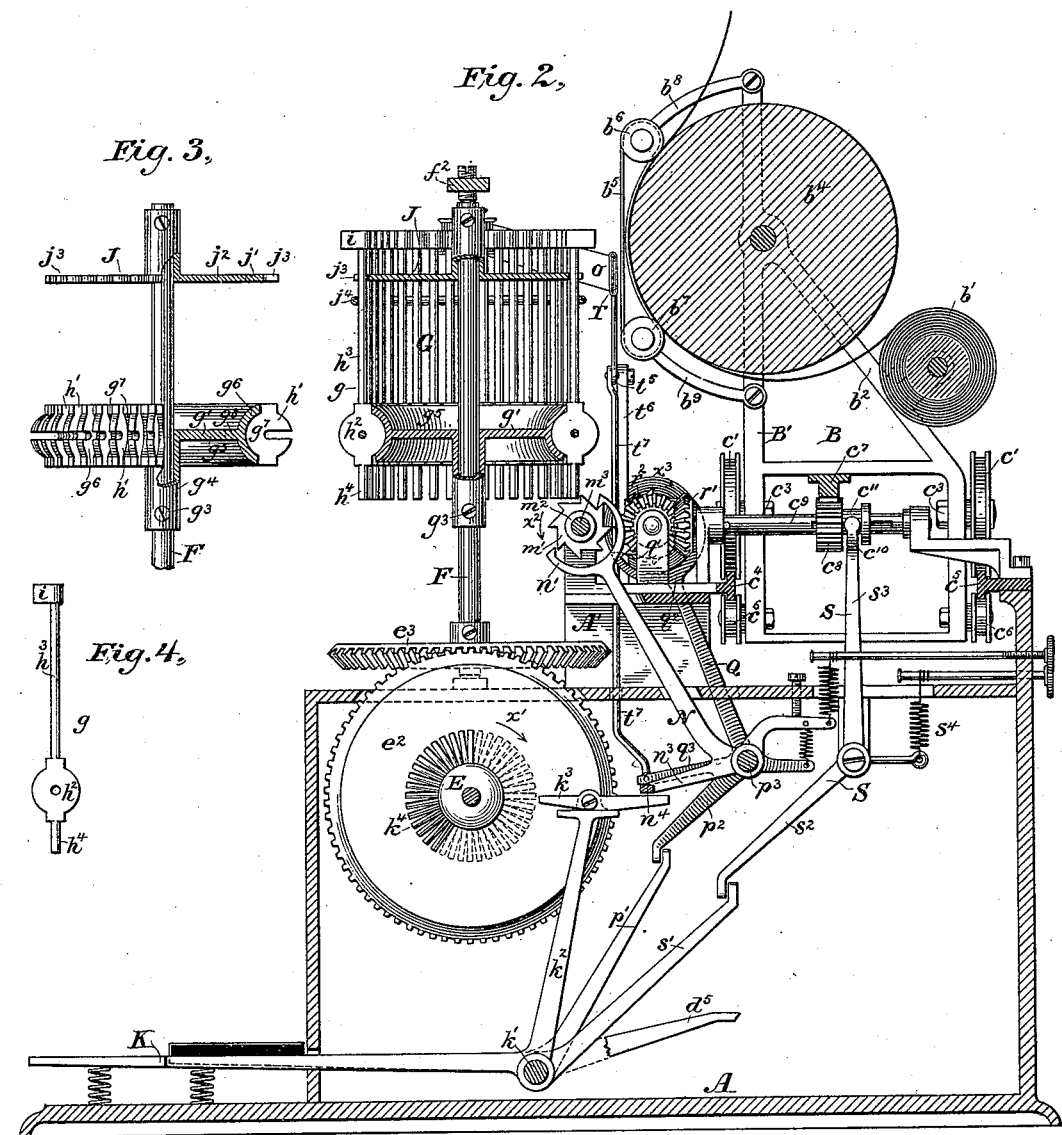
A. INVENTOR
Robert J. Sheehy

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2 Sheets—Sheet 2.

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INVENTOR

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UNITED STATES PATENT OFFICE.

ROBERT J. SHEEHY, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,463, dated September 2, 1884.

Application filed April 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. SHEEHY, a citizen of the United States, and a resident of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Type - Writers, of which the following is a specification.

My invention relates to certain improvements in the construction of a class of instruments employed for mechanically printing words and sentences character by character, and commonly designated as "page-and-line" type-writers.

The object of the invention is to provide an instrument which will render its impressions in uniform lines and with the same distinctness, which is not liable to become inoperative through constant use, which does not depend upon the force of the touch given by the operator to effect the impressions, and which presents each character to view as soon as printed.

The invention consists in a general organization of devices for conveying the paper laterally and vertically as required for receiving the impressions; for causing the individual type to be successively presented to the paper; for arresting the same in the proper position to effect the impression of any required character, and for actuating that type when it has been thus arrested. The individual type are supported at the extremities of an annular series of vertical levers, and are arranged to be revolved before the paper upon which the impressions are to be effected by means of a constant force applied through a shaft mechanically coupled therewith. A series of key-levers is provided for arresting the movement of this shaft in any one of the positions which it assumes during the time the successive type are presented to the paper, thereby rendering it possible, by actuating the proper key, to arrest any required type in position to imprint the character which it represents upon the paper. A toothed wheel tending to revolve in a given direction, but normally held in check, is automatically released by the action of the lever arresting the series of type, and acts to cause the character of the particular type to be imprinted.

The invention further comprises certain de-

vices for releasing the type when the impression has been effected, and for simultaneously advancing the carriage; also, certain subsidiary devices, all of which will be fully described in connection with the accompanying drawings, which illustrate my invention.

In the drawings, Figure 1 is a front elevation of an instrument involving the features of my invention, and Fig. 2 is a vertical cross-section of the same. Fig. 3 illustrates certain details in the construction of the type-support. Fig. 4 is a detail drawing of a type-lever.

Referring to the drawings, A represents the base upon which the various parts of the instrument rest, and A' a skeleton frame, forming a support for the different portions of the same.

At the rear portion of the machine is placed the paper-carriage B. This portion of the instrument comprises a paper-carrying roll, b' , supported at its respective extremities upon two arms, $b^2 b^3$, of the carriage-frame B' , from which a continuous sheet of paper is supplied to an impression-roller b^4 . The paper is pressed against the surface of the impression-roller by means of two elastic bands, $b^5 b^6$, respectively placed near the opposite extremities of the roller and passing over two pulleys, $b^7 b^8$ and $b^9 b^{10}$, supported upon pivoted arms $b^8 b^9$ and $b^9 b^{10}$. The frame B' , which supports the rollers b' and b^4 , is provided with two pairs of grooved rollers, c' and c^2 , which are supported upon axes c^3 at the lower portion of the frame. These wheels run upon two track-rails, c^4 and c^5 , extending parallel with the direction of motion of the carriage B, and they are of such length as to permit a sufficient excursion on the part of the carriage to allow the impression-roller b^4 to be carried backward and forward before the type. The track-rails c^4 and c^5 are provided with downwardly-projecting flanges, upon which run four small wheels, c^6 , also pivoted to the frame B' and serving to prevent the carriage from being raised from the rails. The carriage B carries a rack-bar, c^7 , into which meshes a pinion, c^8 , for controlling the movement of the carriage. The pinion c^8 is feathered to an arbor or shaft, c^9 , extending at right angles to the direction of motion of the carriage, and capable of being moved out

of engagement with the rack-bar by means of a lever, S, and fork c^0 , fitting into an annular groove formed in a collar, c^{11} , of the pinion.

For the purpose of revolving the roller b^4 , a flexible shaft, d' , is provided. One end of this shaft is attached to the extremity of the axis d^2 , upon which the drum or roller b^4 revolves, while the other extremity of the same is fastened to the arbor of a ratchet-wheel, d^3 , supported on the frame A'. A suitable device, hereinafter described, is employed for imparting to this wheel an advance movement, as required. This movement is communicated to the drum b^4 through the flexible shaft d' , and the paper is thus advanced through the space represented by one line for each movement. The shaft d' is constructed to exert upon the carriage B a force tending to move the same in the right-hand direction, and thus to return it to the position for commencing a line.

Extending through the length of the instrument is a shaft, E, supported at its respective extremities in the frame A. The shaft E extends beyond the frame A at one extremity, and is provided with a pulley-wheel, drum, or other suitable device, e' , by means of which the shaft is rotated in the direction indicated by the arrow x .

Upon the shaft E is carried a beveled gear-wheel, e^2 , which meshes with a corresponding wheel, e^3 , carried upon a shaft, F, extending at right angles to the shaft E. The shaft F has a bearing at f^1 in the frame A, and a second bearing in an arm, f^2 , extending above the same. Upon this shaft is carried an annular support or fulcrum-disk, g' , to which support are pivoted the individual levers of a cylindrical series, G. The support or fulcrum-disk g' is adjustably secured to the shaft by means of a set-screw, g^3 , extending through a collar, g^4 . From the upper portion of this collar four arms, g^5 , radiate and support a web, g^6 , carrying an annular enlargement, g^6 . Within the face of this ring g^6 is formed an annular groove, g^7 . The face of the ring g^6 is further provided with a series of vertical disk-shaped slots or openings, h' , for receiving the fulcrums of the levers of the series G. The levers g each consists of a flat disk-shaped portion, h^2 , which fits within the corresponding opening h' . From the upper side of the disk h^2 extends an arm, h^3 , carrying at its upper extremity a type, i . From the opposite side of the disk h^2 projects a short arm, h^4 , extending below the support or fulcrum-disk g' .

Secured to the shaft F, near the upper extremities of the levers g , is a skeleton guide or rest, J, against which the levers are pressed when not in use. This rest consists of a ring, j' , supported upon radial arms j^2 , and provided with wedge-shaped teeth j^3 , projecting outward a short distance beyond the levers. One of these teeth extends between each two adjacent levers, and serves to prevent the same from vibrating laterally when the type-cylinder is rapidly revolved by the movement com-

municated to the shaft F through the wheels e^2 and e^3 . The levers are normally held in their perpendicular position and between their respective teeth j^3 by means of an elastic band, j^4 , embracing the cylindrical series G.

Having thus described the method of rotating the series of type before the paper, the method of arresting the cylinder in the required position and imprinting any required character will now be described.

A series of key-levers, K, is arranged at the front of the instrument, one key being provided for arresting the type-cylinder in the required position for effecting the impression of each type in the series. The levers K are all pivoted to a common support, k^1 , extending longitudinally through the instrument, and each lever is provided with an upwardly-projecting arm, k^2 , upon which is carried a rock-lever, k^3 . The short arm of each lever k^3 normally projects into proximity to the path of a corresponding pin, k^4 , carried upon the shaft or drum E. When any key-lever K is actuated by depressing the outer end of the same, the short arm of the lever k^3 is projected into the path of the corresponding pin k^4 , and this pin acts first to depress that end of the lever, and then to arrest the movement of the shaft E. It will be evident thus that by depressing any key-lever K the type-cylinder will be caused to stand in a particular position dependent upon the angular position of the pin k^4 , the path of which is thus blocked. The keys and pins are therefore arranged in such relative positions that any particular key which may be actuated will arrest the type-cylinder in the position required for imprinting a type bearing the character corresponding to that key. When the type-cylinder has in this manner been arrested in the required position, the type presented to the paper is impressed thereon by means of a toothed wheel, m' , acting upon the short arm h^4 of the corresponding type-lever g . The toothed wheel m' is secured to a sleeve, m^2 , surrounding one extremity of a fixed shaft, m^3 . A pulley or friction-wheel, m^4 , is carried upon a corresponding sleeve, m^5 , at the opposite extremity of the shaft m^3 , and the two are united by a coil-spring, m^6 , surrounding the shaft. The friction-pulley m^4 is so connected with a corresponding pulley, m^7 , upon the shaft E by means of a belt, m^8 , that the normal revolution of the shaft will tend to revolve the pulley m^4 in the direction indicated by the arrow x . This motion is communicated through the coil-spring m^6 to the toothed wheel m' . The wheel m' , however, is normally retained by an anchor-escapement, n' , carried upon the long arm of a lever, N. The revolution of the shaft E therefore normally tends to store up in the convolutions of the spring m^6 a certain amount of energy dependent upon the leverage and friction between the wheels m^4 and m^7 and the belt m^8 . After the spring is thus wound to the required tension, the belt m^8 will simply slip upon one or the other of the wheels without

further winding the spring. When it is desired to actuate one of the levers g , it is necessary only to release the wheel m' from the anchor n' and allow it to advance, under the action of the spring m^s , one tooth. The long arm of the lever g will thereby be thrown forward and the type i struck against an ink-ribbon, o , intervening between the same and the paper, and the type will thus be imprinted upon the paper. The short arm n^s of the lever N is attached to a light rod, n^t , which extends above the long arms of the entire series of rock-levers k^s , but normally not in actual contact therewith. So long as the rod n^t is in its normal position, one tooth of the anchor n' engages the wheel m' . When, however, any key K is depressed and the corresponding pin k^t strikes against the lever k^s , that lever will be turned upon the arm k^2 , and the long arm elevated through the rotary force of the shaft E . This movement of the lever causes the rod n^t to be elevated, and thus the escapement n' to be actuated, releasing the wheel m' and allowing it to be revolved through the space occupied by one tooth, and the lever g actuated in the manner indicated. When the lever g is in its forward position, the tooth of the wheel m' by which it is actuated passes beneath the short arm, and the lever then resumes its normal position.

For the purpose of advancing the carriage at the completion of each impression, the rack-bar c' and pinion c^s , before referred to, are employed. At one extremity of the arbor c^s , upon which the pinion is feathered, is carried a beveled gear-wheel, r' , which meshes with a corresponding wheel, r^s , placed at right angles therewith. The wheel r^s is carried upon a sleeve, r^2 , which also carries an escapement-wheel, q' , similar to the wheel m' , but having its teeth set in the opposite direction. The sleeve r^2 surrounds a fixed shaft, r^t , and is connected by means of a coil-spring, r^s , with a pulley, r^6 , carried upon a sleeve, r^7 , the entire organization being similar to that described with reference to the shaft m^s , spring m^6 , and pulley m^t . The pulley r^6 is connected by a belt or cord, r^s , with a pulley, r^9 , upon the shaft E , and the motion of the latter tends to turn the wheel r' in the direction indicated by the arrow x^s , in a manner precisely similar to that described with reference to the wheel m' . The escapement device q' is normally held in check by an anchor, q^2 . When, however, this anchor is actuated, the wheel q' is permitted to advance one tooth for each complete forward and backward movement. The escapement q^2 constitutes the long arm of a lever, Q , the short arm q^s of which extends above the rod n^t . Each time the rod n^t is elevated the escapement q^2 will be actuated through this lever, and as it returns to its normal position the wheel q' will be advanced one tooth. This movement will be communicated to the pinion c^s , and thus to the carriage B . The relative parts are so adjusted that each time the escapement q^2 is actuated the

carriage will be advanced through the space occupied by a single letter or character and the space designed to intervene between two characters. For the purpose of rendering it possible to advance the carriage in this manner without first printing a character, a key-lever, K' , is provided, which is supplied with an arm, p' , extending into proximity to an arm, p^2 , affixed to the arbor p^s of the lever Q . When the lever K' is depressed, the arm p' engages the arm p^2 and actuates the lever Q in the manner already described with reference to the keys K . For the purpose of permitting the carriage to be returned to its starting-point when it is desired to commence a new line, a key-lever, K^2 , is provided with means by which the pinion c^s is moved out of engagement with the rack-bar c' . The lever K^2 is provided with an arm, s' , extending into proximity to one arm, s^2 , of a lever, S . The remaining arm, s^s , of this lever is constructed with a fork, c^u , which embraces the groove formed in the collar c^u of the pinion c^s . The pinion c^s is normally held in its forward position, engaging the rack-bar c' , by means of a spring, s^t , acting upon the lever S . When, however, the key-lever K^2 is depressed, the pinion c^s will be moved upon the arbor c^s , through the agency of the lever S , out of engagement with the rack-bar c' , and the carriage B will then be free to move to the right-hand limit of its excursion through the retractile force exerted by the flexible shaft d' .

A pneumatic cushion, Y , of any suitable construction, is placed at the right-hand limit of the excursion of the carriage B for receiving the blow of the carriage when it is returned under the influence of the spring-shaft d' . When the carriage is thus returned to its starting-point, it is desirable that the drum b^t be automatically revolved for the purpose of carrying the paper upward, preparatory to printing a new line. This end is accomplished by placing upon the extremity of the carriage B , proximate to the ratchet-wheel d^s , before referred to, a beveled tooth, d^t , which, when the carriage is in its right-hand position, enters between two teeth of said wheel d^s , and causes it to be advanced one tooth. The shaft d' communicates this motion to the drum b^t in the manner already described.

In addition to the device just described, a key-lever, K^3 , is provided for revolving the drum b^t at any point in the excursion of the carriage B . The lever K^3 is preferably placed at the extreme right of the series K , and is constructed with an arm, d^s , above the extremity of which is supported a vertical rod, d^u . The upper extremity of the rod d^u engages the teeth of the ratchet-wheel d^s , and when an upward movement is communicated to the same by depressing the key K^3 the rod acts to advance the ratchet-wheel one tooth, and thus to actuate the drum b^t . A pawl, d^p , is employed for retaining the wheel d^s in its advanced position.

The ink-ribbon o , through the agency of which the impressions are rendered distin-

guishable, is carried upon two rollers, t' and t'' , carried upon two supports, t^3 and t^4 . The ribbon o passes through a suitable guide, T , carried at the extremity of an arm, t^5 , which is pivoted to a suitable support, t^6 , extending from the frame A' . A rod, t' , the lower extremity of which is attached to the bar or rod n^4 , extends upward to and is pivoted with the arm t^5 . Each time, therefore, that any key-lever K is actuated the rod t' will be thrown upward, and the arm t^5 and guide T elevated. The parts are so adjusted that while the ribbon o is thus normally held down a sufficient distance that it may not hide the characters which have been printed, it will nevertheless be raised each time a new character is to be imprinted, and will for the moment intervene between the type and the paper.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a revolving shaft, a series of type independently supported upon a corresponding series of fulcrumed levers, a movable paper-carriage, a series of key-levers, each acting, when depressed, to arrest the motion of said shaft and series of type in a predetermined position, and a system of levers acting through the agency of the force exerted by said shaft to permit the particular type corresponding with the key depressed to be impelled toward said paper-carriage.

2. The combination, substantially as hereinbefore set forth, of a revolving shaft, a series of fulcrumed levers revolving in unison therewith, a series of type respectively carried upon said levers, a series of key-levers respectively corresponding with said type, a series of pins carried upon said shaft and respectively corresponding with said key-levers, and a system of levers whereby the movement of said series of type may be arrested by the depression of any one of said key-levers, and the type corresponding therewith actuated.

3. The combination, substantially as hereinbefore set forth, of a key-lever, a revolving shaft, a pin carried upon said shaft, a second lever pivoted to said key-lever and arranged to be thrown into the path of said pin by the depression of said key-lever, an escapement device actuated by said second lever, and a type corresponding with said key-lever actuated through the agency of said escapement device.

4. The combination, substantially as hereinbefore set forth, of a key-lever, a revolving shaft, a pin or projection upon said shaft, a second lever pivoted to said key-lever and arranged to be thrown into the path of said pin or projection by the depression of said key-lever, and a third lever actuated by said second lever.

5. The combination, substantially as hereinbefore set forth, of a revolving shaft, a pin or projection upon said shaft, a pivoted lever, means, substantially such as described, for projecting one arm of said lever into the path of said pin or projection, a type-lever, a toothed

wheel for actuating said type-lever, means, substantially such as described, for imparting to said wheel a tendency to revolve in a given direction, an escapement acting to check said tendency, and an arm extending from said escapement into the path of said pivoted lever, whereby said escapement may be operated to release said wheel and permit said type-lever to be actuated when said pivoted lever is projected into the path of said pin.

6. The combination, substantially as hereinbefore set forth, of a movable paper-carriage, a rack-bar secured to said carriage, a pinion engaging said rack-bar, a continuously-revolving shaft, means, substantially such as described, for communicating from said shaft to said pinion a tendency to revolve in a given direction, an escapement device for controlling said tendency, and a series of levers, through the instrumentality of any one of which said escapement device may be operated to allow said pinion to be advanced.

7. The combination, substantially as hereinbefore set forth, of a paper-carriage, a device tending to impel said carriage in one direction, a rack-bar affixed to said carriage, a pinion engaging said rack-bar, means, substantially such as described, tending to communicate to said carriage through said pinion a motion in the opposite direction, an escapement for controlling the action of said pinion, means, substantially such as described, for operating said escapement, and a system of levers whereby said pinion may be disengaged from said rack-bar.

8. The combination, substantially as hereinbefore set forth, of a revolving shaft, a series of type-levers revolving synchronously therewith, a toothed wheel for actuating said levers, an escapement for controlling the movements of said toothed wheel, a pulley, a yielding frictional connection between said pulley and shaft, and a coil-spring uniting said pulley with said toothed wheel.

9. The combination, substantially as hereinbefore set forth, of the revolving series of fulcrumed levers, the series of type respectively supported upon said levers, the longitudinally-movable carriage, the supporting-track for said carriage, and the wheels moving along said track.

10. The combination, substantially as hereinbefore set forth, of a revolving shaft, a pulley, a yielding frictional connection between said shaft and pulley, a toothed wheel, a coil-spring uniting said pulley with said toothed wheel, an escapement for controlling the movements of said toothed wheel, a series of levers, and means, substantially such as described, for actuating said escapement through the agency of any one of said levers and said revolving shaft.

11. The combination, substantially as hereinbefore set forth, of an annular series of fulcrumed levers, a series of type respectively supported thereon, means, substantially such as described, for revolving the same, and

means, substantially such as described, for actuating any one of said type independently of the remaining type.

12. A type-cylinder consisting of the series of type-levers g , having arms h^2 and h^4 , the annular support g' , to which said type-levers are pivoted, the independent guide J , and a central shaft or axis, to which said annular support and guide are secured.

13. The combination, substantially as herebefore set forth, of the annular series of type-levers, the annular support for said levers, and the guide or rest J , comprising the ring j' and the radiating wedge-shaped teeth j^3 .

14. The combination, substantially as herebefore set forth, of the type-lever support, the annular series of type-levers, the vertical shaft for carrying the same, the guide or rest having the wedge-shaped teeth, between which said levers are normally held, and means, substantially such as described, for securing said support and guide upon said shaft.

15. The combination, substantially as herebefore set forth, of a paper-carriage, means, substantially such as described, for impelling said carriage step by step in a given direction, a flexible shaft tending to impel said carriage in the opposite direction, a toothed wheel se-

cured to one extremity of said flexible shaft, and means, substantially such as described, for imparting an advance movement to said wheel.

16. The combination, substantially as herebefore set forth, of a revolving shaft, an annular plate affixed to said shaft, a cylindrical enlargement or lug formed upon said plate, an annular groove formed in the face of said lug, a series of vertical slots intersecting said groove, and a series of levers respectively having their bearings in said vertical slots.

17. The combination, substantially as herebefore set forth, of a series of type, means, substantially such as described, for actuating any one of said type, an ink-ribbon normally held away from said type, two stationary ribbon-rolls, a guide for said ribbon, and means, substantially such as described, for causing said guide to move said ribbon into the path of the type which is to be imprinted.

In testimony whereof I have hereunto subscribed my name this 4th day of April A. D. 1883.

ROBERT J. SHEEHY.

Witnesses:

CHARLES A. TERRY,
CARRIE E. DAVIDSON.