

No. 710,393.

Patented Sept. 30, 1902.

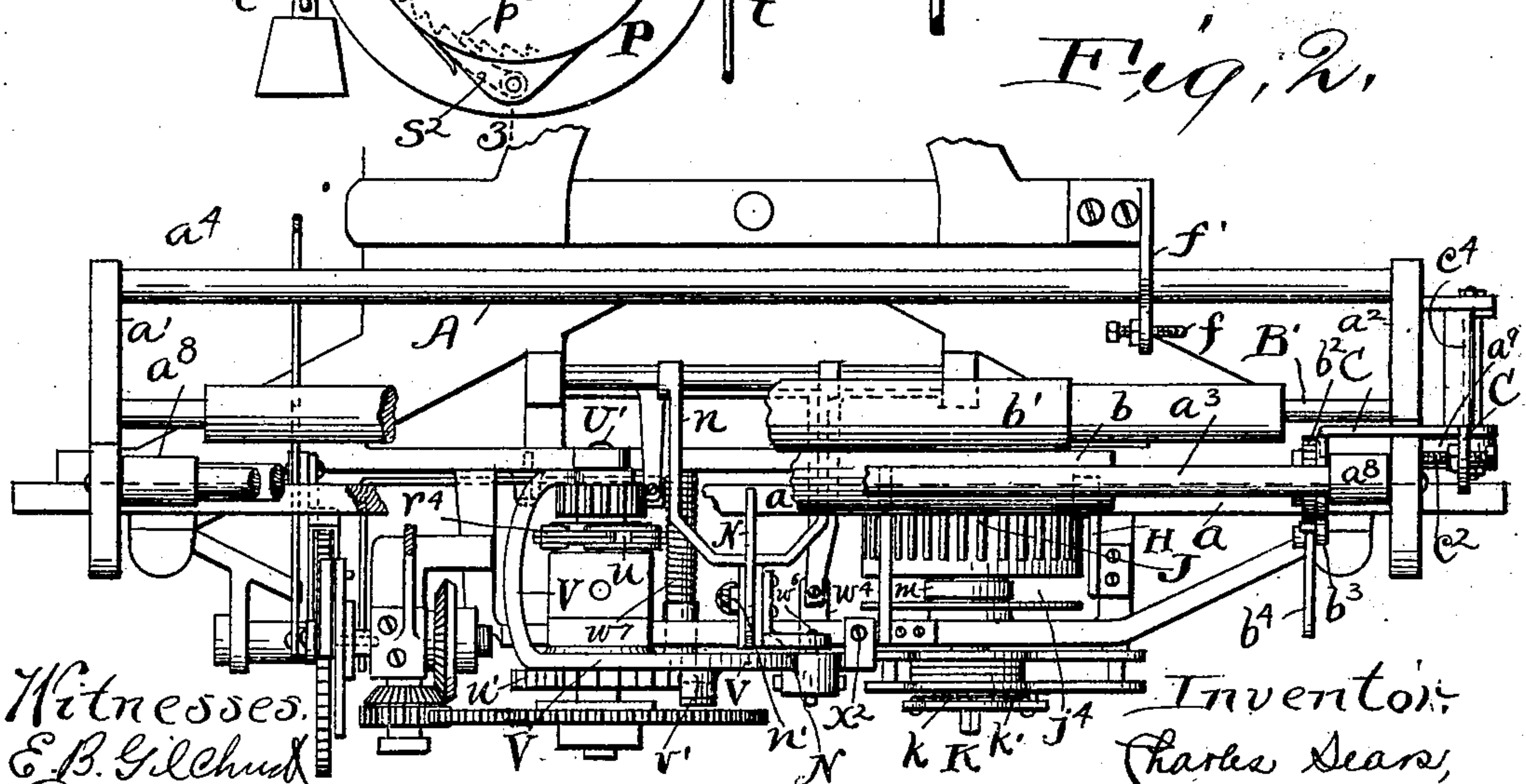
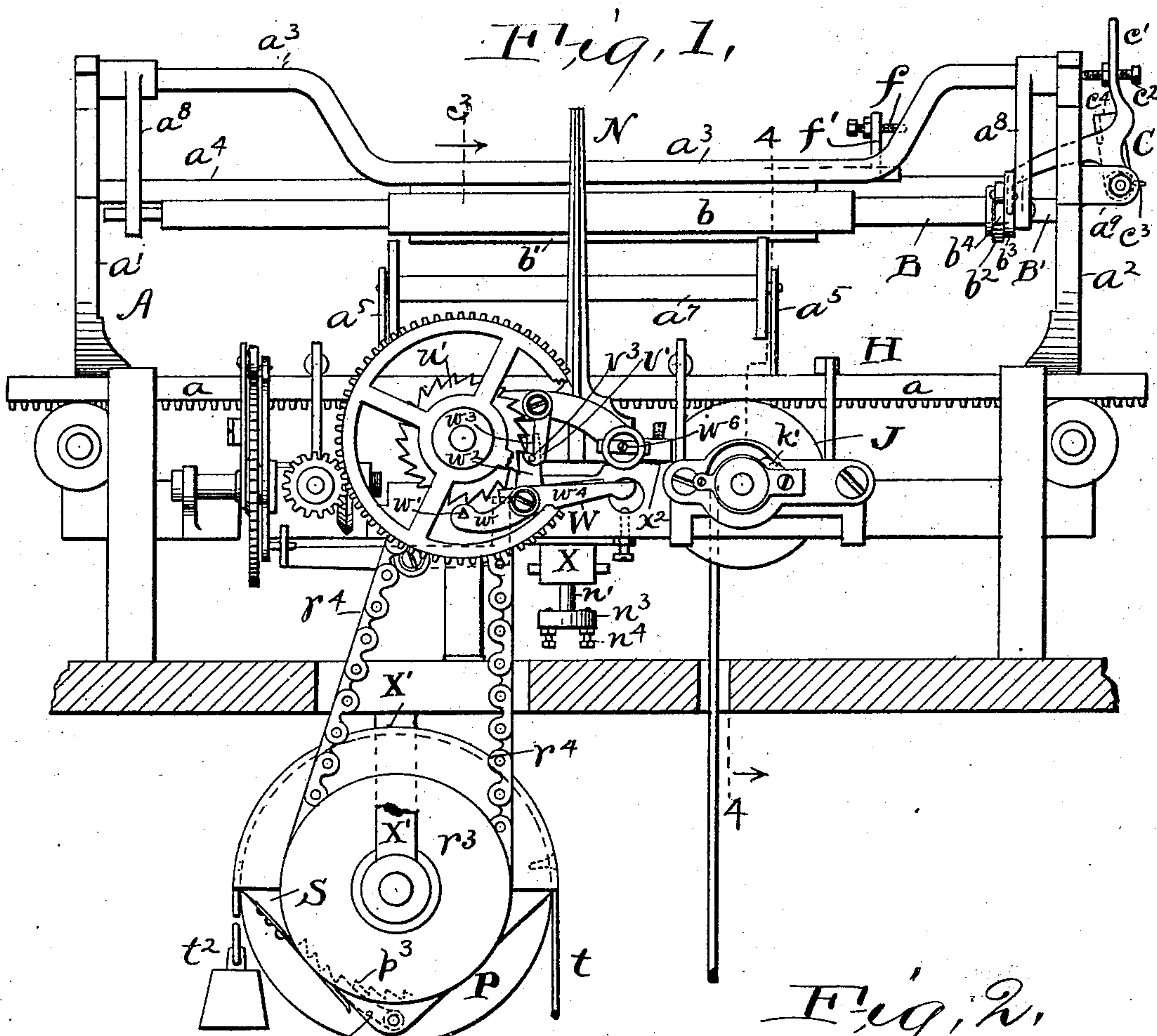
C. SEARS.

CARRIAGE MECHANISM FOR TYPE WRITERS.

(Application filed Sept. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
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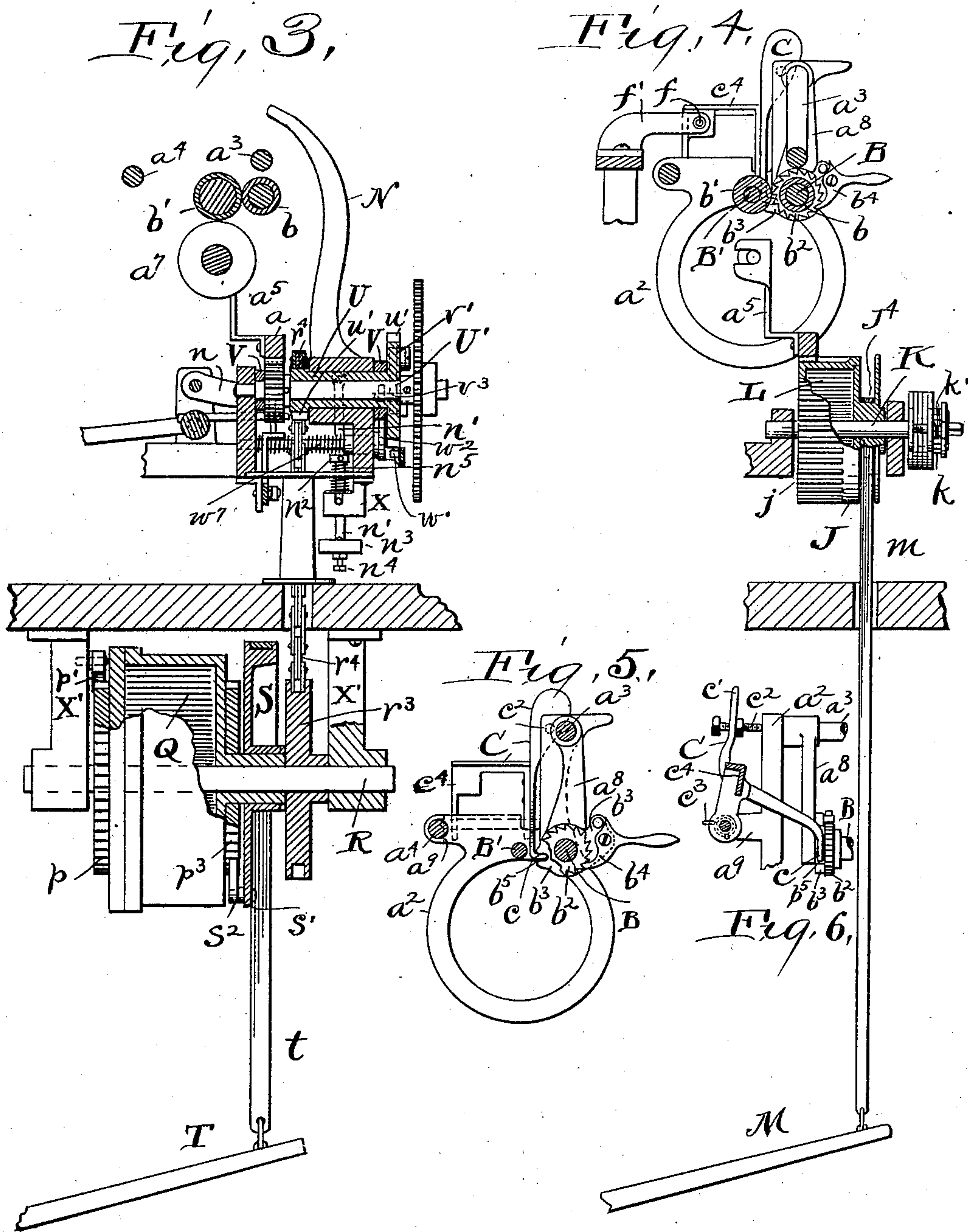
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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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CARRIAGE MECHANISM FOR TYPE-WRITERS.

SPECIFICATION forming part of Letters Patent No. 710,393, dated September 30, 1902.

Application filed September 20, 1899. Serial No. 731,051. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SEARS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Carriage Mechanism for Type-Writers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention relates to the mechanism associated with the carriage of a type-writing machine, the objects being, first, to provide novel mechanism whereby the return of the carriage to the starting-point causes the upward movement of the paper thereon into position to receive a new line of impressions; second, to provide novel mechanism whereby the operator may without using his hands return the carriage to the starting-point; third, to provide novel mechanism by which the impression-hammer is operated whenever the carriage makes one of its forward feed movements which are associated with the printing of a character.

The invention consists in the construction and combination of parts hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a rear elevation of so much of the machine as embodies the present invention. Fig. 2 is a plain view of the mechanism shown in Fig. 1. Fig. 3 is a vertical sectional view on line 3 3 of Fig. 1 looking in the direction of the arrow. Fig. 4 is a sectional view on line 4 4 of Fig. 1 looking in the direction of the arrow. Fig. 5 is a side view of the upper end of the carriage, and Fig. 6 is a front view of the mechanism shown in Fig. 5.

Referring to the parts by letters, A represents the transversely-movable carriage of a type-writing machine, which may be of any suitable construction. As shown, it consists of a narrow rack-bar a , the rack being on its under side, two ends a' a^2 , which are secured to and extend upward from said rack-bar, and two transverse rods a^3 a^4 , which extend between and are connected to said ends near their tops. Two standards a^5 a^5 rise from the base-bar and furnish bearings for a paper-reel a^7 . Above this paper-reel are two paper-feed rollers b b' , which are secured, respec-

tively, to the shafts B and B'. The paper from the reel passes up between these rollers, by which it is held when being printed upon and by which it may be moved upward in position for a new line to be printed thereon by the turning of one or the other of said rollers. The shaft B' is mounted in the ends a' a^2 , while the shaft B is mounted in two arms a^8 a^8 , which depend from and are fixed to the rod a^3 . On the shaft B a ratchet b^2 is secured. An oscillating pawl-plate b^3 is loosely mounted on this shaft adjacent to the ratchet, and it carries a pawl b^4 , which engages with the ratchet. A notch b^5 in this pawl-plate b^3 receives the finger c on the end of one arm of a lever C, which is pivoted to ears a^9 on the end a^2 of the carriage, the axis of the lever being at right angles, substantially, to the axes of the feed-rolls. This lever is provided with a vertical arm c' , through which a set-screw c^2 passes, this set-screw being adapted to engage with the end piece a^2 . A rat-trap spring c^3 exerts a constant force on the said lever, tending to turn it in that direction which will carry the said set-screw into engagement with said end piece a^2 . This lever has also an arm c^4 , which when the carriage is returned to its starting-point strikes a stop, which, as shown, is a set-screw f in a bracket f' , which is fixed to the frame of the machine and in the path of said lever-arm.

From the foregoing description it will be apparent that when the carriage is returned to its starting-point this arm c^4 by engaging with the set-screw f rocks the lever C, which in turn rocks the pawl-plate b^3 , whereby the pawl b^4 thereon through its engagement with the ratchet b^2 turns the shaft B the required distance to move the paper up into position to receive the impression for another line. When the carriage begins its step-by-step feeding movement forward, the arm c^4 moves away from the set-screw f , whereby the rat-trap spring turns said lever, with the result of moving the pawl-plate backward into position to again operate, as before described. The set-screws c^2 and f may be adjusted to determine the distance which the shaft B shall be turned. A stop H is also provided for engaging with the carriage to serve as a stop when the carriage has reached the position to begin a new line.

A spring-barrel J, having peripheral teeth, which engages with the carriage-rack a , is rotatably mounted on a rotatable shaft K, and one end of the spring L is made fast to the shaft and one to the barrel. A ratchet k and pawl k' on the shaft and frame of the machine respectively engage with each other and prevent the backward movement of the shaft, but permit its forward movement to wind the spring. The spring-barrel is therefore under the influence of the spring L to turn it in the direction to advance the carriage and does advance the carriage when the escapement is operated. Any suitable escapement may be employed. Attached to the spring-barrel J is a small drum j^4 , upon which a strap m is wound as the carriage is fed forward. The lower end of the strap is attached to a foot-lever M, wherefore it is apparent that by depressing this lever the spring-barrel is turned backward and the carriage is returned to its starting-point. This mechanism, together with that previously described for feeding the paper up, renders it unnecessary for the operator to use his hands at all for putting the mechanism into position to print the several lines.

The impression-hammer N is of common construction—that is to say, it has at its lower end the forwardly-projecting arms n , which are pivoted to the frame of the machine. It is moved to make its impression-blow by means of a coiled spring n^5 , which surrounds a rod n' , which is pivotally connected with the lower end of the hammer, said spring being compressed between a collar n^2 on said rod and a fixed bracket X, through which the rod passes. A collar n^3 on the lower end of this rod is provided with adjustable set-screws n^4 , which engage with the bracket X when the hammer has moved far enough to strike a proper impression-blow. By adjusting these screws the force of the blows may be accurately regulated. The hammer is retracted by the force of a superior spring Q and suitable intermediate mechanism, as follows: The spring is in a spring-barrel P, loosely mounted on a rotatable shaft R, which in turn is mounted in brackets $X' X'$, depending from the underside of the bed of the machine. One end of the spring is attached to the barrel and one to the shaft. A ratchet p on the spring-barrel is engaged by a pawl p' , pivoted to the adjacent bracket X' , which ratchet and pawl permit the barrel to be turned on the shaft in the direction to wind up the spring, but prevent it from being turned backward. A segment S is loosely mounted on the hub of the spring-barrel, and it has a tailpiece s' below the axis, which tailpiece supports the spring-pawl s^2 , which engages with a ratchet-wheel p^3 , secured to the spring-barrel. A strap t , which is made fast to this segment, passes around its periphery and down to a foot-lever T, to which it is attached. By depressing this foot-lever the segment is turned in one direction, the pawl

s^2 , which it carries, engages with the ratchet p^3 on the spring-barrel, which spring-barrel is therefore turned in the direction to wind up the spring. The strap t (or another strap which is likewise attached to the segment) runs over the periphery thereof in the opposite direction and has a weight t^2 attached to it. This weight acts to turn the segment in the direction which will lift the foot-lever. During its movement in this direction the pawl s^2 slips idly over the ratchet p^3 . It will be understood from the foregoing that by the operation of this foot-lever T the spring Q in the spring-barrel P may be wound up from time to time, so as to maintain the spring under a suitable tension for performing its functions, which it performs by turning the shaft whenever such movement is possible. Attached to the shaft R is a sprocket-wheel r^3 , over which a sprocket-chain r^4 runs. The sprocket-chain also runs over a sprocket-wheel u , attached to a shaft U. This shaft, for convenience, is a hollow shaft, which is mounted loosely upon another shaft U' , which latter shaft forms and carries a part of the escapement mechanism and which need not here be further referred to. On the opposite end of the hollow shaft to that to which the sprocket is attached a ratchet u' is fastened. A rocking frame or lever V is hung concentrically with and preferably upon the same hollow shaft. To it a pawl v' is pivoted, which engages with the ratchet u' , and it is obvious that the force of the spring in the spring-barrel P operates through the mechanism described to rotate the hollow shaft U, and because the pawl v' engages with said ratchet u' this rocking frame V is also turned upon its pivot until its end engages with a stop x^2 on the frame of the machine. Pivoted to the frame of the machine is a three-arm lever W, one arm, w , of which carries a detent w' , which is adapted to engage with the ratchet u' . Another arm, w^2 , has a slot w^3 , into which projects a pin v^3 , which is made fast to the pawl v' , and the other arm, w^4 , of the lever extends to a position where it may be depressed whenever a key-lever is depressed. Suitable mechanism will of course be provided for this purpose in a complete machine; but so far as the operation of the mechanism constituting the present invention is concerned, however, this arm of the lever might be depressed from time to time by hand. The rocking frame V referred to is provided with a pin w^6 , which passes into a hole in the rear end of the hammer-lever, whereby the depression of this arm of the rocking frame retracts the hammer.

The operation of the described mechanism for operating the hammer is as follows: Whenever the lever W is depressed, the detent w' is moved into engagement with the ratchet u' , thereby preventing for the time being the turning of the hollow shaft to which the ratchet is fastened. At the same time the pawl v' is moved out of engagement with the ratchet u' , which relieves the rocking

frame from the force of the spring in the spring-barrel P, whereupon the hammer-spring acts to move the hammer in the direction to make the impression-blow. When the lever W is released, a rat-trap spring w^7 , which surrounds the shaft to which said lever is fastened, returns the lever to its normal position, thus releasing the ratchet u' from the detent and moving the pawl v' into engagement with said ratchet. The spring in the spring-barrel P thereupon operating through the intermediate mechanism turns the ratchet, and it acting through the pawl v' draws the rocking frame downward as far as it will go. In its downward movement the rocking frame rotates the hammer. As before stated, the spring in the spring-barrel P may be kept at the proper tension for performing this work by more or less frequent operations of the foot-lever.

Having described my invention, I claim—

1. In a type-writing machine, in combination, a movable carriage, a rack thereon, a spring-drum having teeth meshed with said rack, a fixed frame, a rotatable shaft mounted therein and passing axially through said drum, a spring having its ends fixed to said drum and shaft, means for locking said shaft against rotation by said spring, and a treadle adapted to rotate said drum, substantially as described.

2. In a type-writing machine, in combination, a movable carriage having a rack, a spring-drum having teeth meshing in said rack, a frame, a shaft rotatably mounted through said drum and frame, a ratchet-wheel rigid with said shaft, a pawl, pivoted to said frame coöperating with said ratchet, a treadle and a strap adapted to rotate said drum, said shaft being adapted to receive a key for winding up said spring, substantially as described.

3. In a type-writing machine, the combination of a transversely-movable carriage, feed-rolls mounted thereon, a ratchet secured to said feed-rolls, and a pawl-plate loosely mounted on the same axis and having a notch in its edge, a pawl on said plate engaging with the ratchet, with a lever pivoted to the carriage having on one arm a finger which enters said notch, a set-screw in another arm and adapted to engage with one part of the carriage, a spring to move the lever in one direction to cause such engagement with the carriage, and an adjustable stop on the frame of the machine for engagement with the lever when the carriage is returned to its starting-point, substantially as specified.

4. In a type-writing machine, the combination of a transversely-movable carriage, feed-rolls mounted thereon, a ratchet secured to one of the feed-rolls, a pawl-plate pivoted to the carriage on the same axis with respect to said feed-roll, a pawl on said plate, said plate having a notch in its edge with a lever pivoted to the carriage on an axis substantially at right angles to the axis of the feed-rolls,

said lever having at one end an arm which engages with said notch, a set-screw passing through another arm of said lever and adapted to engage with a part of the carriage, a spring for rocking the lever to cause such engagement, a set-screw adjustable on the machine-frame and adapted to engage with said lever when the carriage is returned to its starting-point, and a stop with which said carriage engages to determine its starting-point, substantially as specified.

5. In a type-writing machine, the combination of an impression-hammer, and a spring for moving it forward, with a spring of greater force, connections between the said stronger spring and hammer whereby the latter is retracted, means for disconnecting said stronger spring and hammer, and means adapted to put said stronger spring under tension, substantially as described.

6. In a type-writing machine, the combination of the impression-hammer, a spring for moving it in the impression direction, a shaft having a sprocket-wheel, and mechanism operated by said shaft for drawing the hammer backward, means for releasing the connections between said hammer and the shaft whereby the hammer may be moved by its spring, with a rotatable shaft, a spring connected thereto, a sprocket-wheel secured thereon, and a sprocket-chain connecting the two sprocket-wheels, substantially as specified.

7. In a type-writing machine, the combination of a pivoted impression-hammer, and a spring for moving it in the impression direction, with a rotatable shaft, a ratchet, and a sprocket-wheel also secured thereto, a frame mounted concentrically with said shaft, connections between the frame and hammer, a pawl mounted on the frame and engaging with the ratchet, mechanism for releasing the pawl from engagement with the ratchet and for preventing the ratchet from turning, a spring-actuated shaft, a sprocket-wheel secured thereto, a sprocket-chain passing over the two sprocket-wheels referred to, and means for winding up said spring-motor, substantially as specified.

8. In a type-writing machine, the combination of the impression-hammer, a spring for moving it in the impression direction, a shaft having a sprocket-wheel, and mechanism operated by said shaft for drawing said hammer backward, means for releasing the connections between said hammer and shaft whereby the hammer may be moved by its spring, with a rotatable shaft, a sprocket-wheel secured thereon, and a sprocket-chain connecting the two sprocket-wheels, a spring-barrel loosely mounted on said shaft, two ratchet-wheels secured thereon, a pawl pivoted to the fixed support, and engaging with one ratchet-wheel, a plate mounted axially with respect to the spring-barrel, a pawl pivoted thereto engaging with the other ratchet-wheel, and a strap

secured to and passing around said segment, a lever to which one end of said strap is fastened, and a weight fastened to the other end of said strap, substantially as specified.

- 5 9. In a type-writing machine, in combination, a carriage having a rack, a pinion engaging said rack, a spring impelling said pinion to feed said carriage, a foot-lever, and means connecting it with said pinion to wind

said spring and return said carriage simultaneously, substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CHARLES SEARS.

Witnesses:

E. L. THURSTON,
ALBERT H. BATES.