Feb. 21, 1956 L. S. WILLIAMS 2,735,362

ROLLER PRINTER

Filed Jan. 8, 1953 3 Sheets-Sheet 1

Fig. I

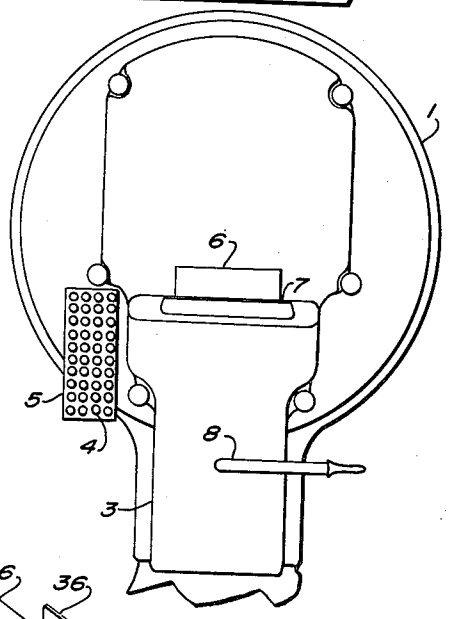
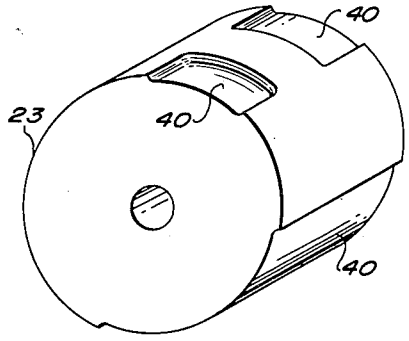


Fig. VI



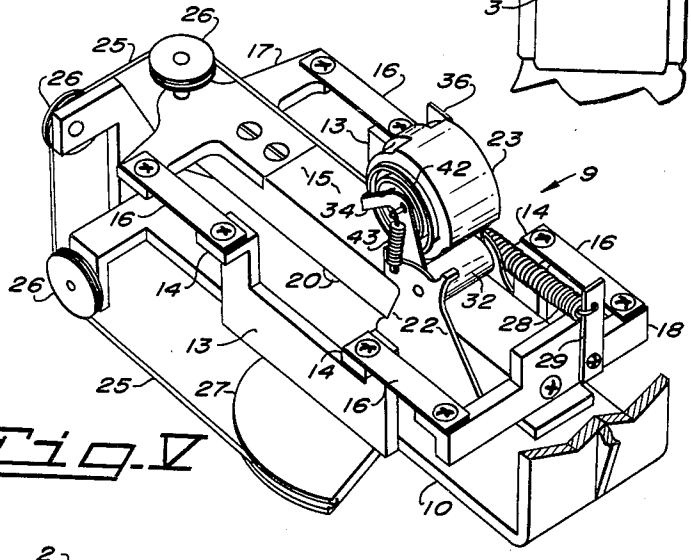


Fig. V

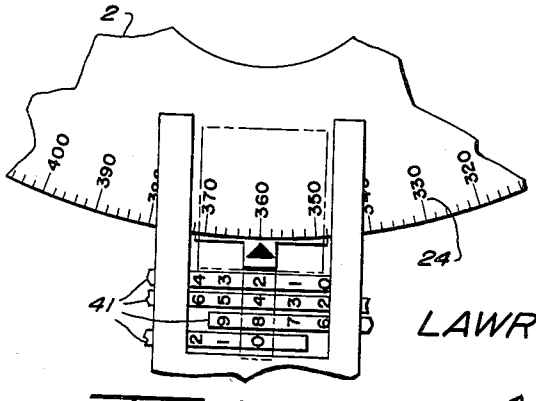


Fig. VII

INVENTOR.
LAWRENCE S. WILLIAMS
BY
Marshall, Marshall & Keasting
ATTORNEYS

Feb. 21, 1956 L. S. WILLIAMS 2,735,362

ROLLER PRINTER

Filed Jan. 8, 1953 3 Sheets-Sheet 2

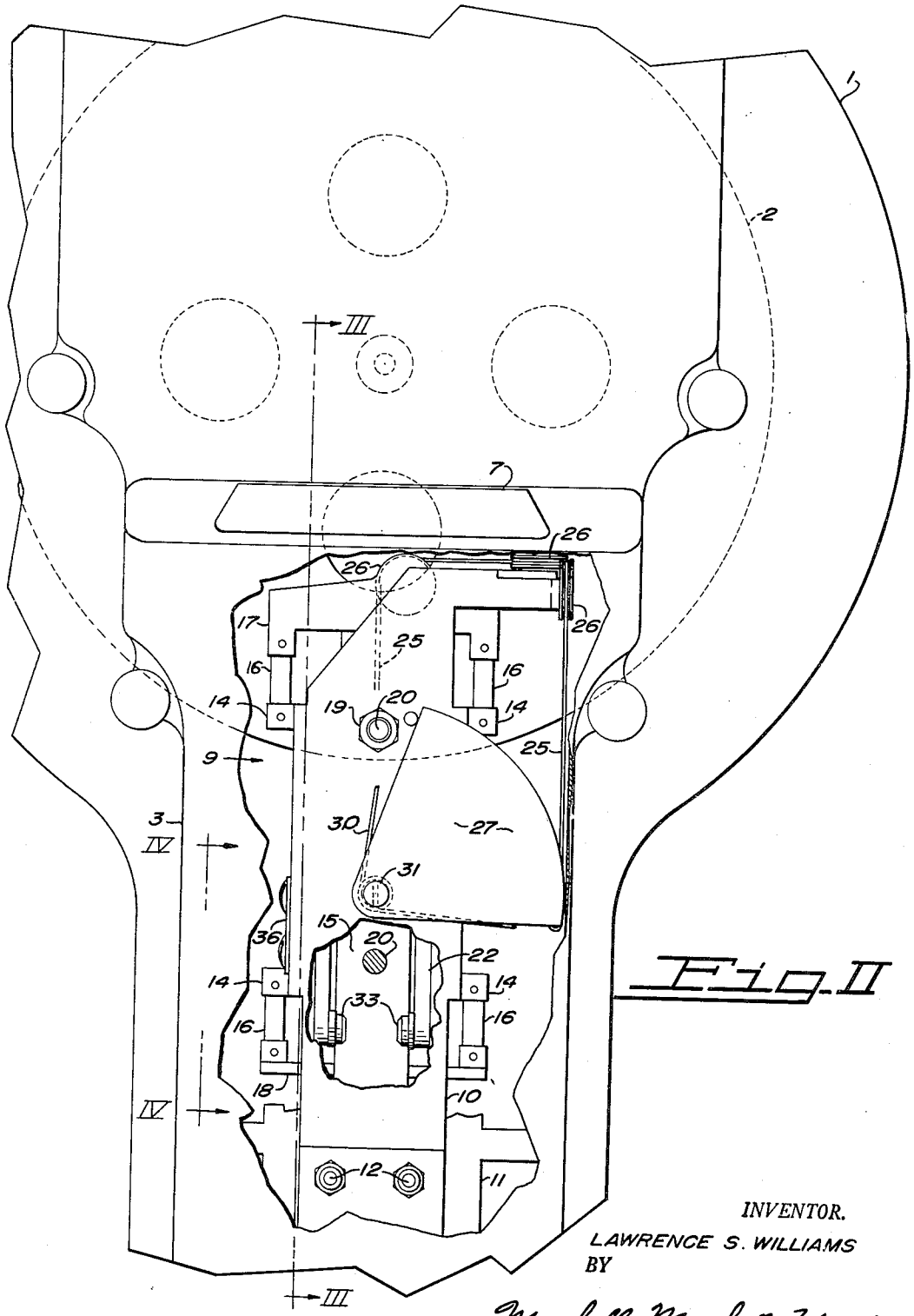


FIG. II

INVENTOR.
LAWRENCE S. WILLIAMS
BY

Marshall, Marshall & Yeaton
ATTORNEYS

Feb. 21, 1956 L. S. WILLIAMS 2,735,362

ROLLER PRINTER

Filed Jan. 8, 1953 3 Sheets-Sheet 3

Fig. IV

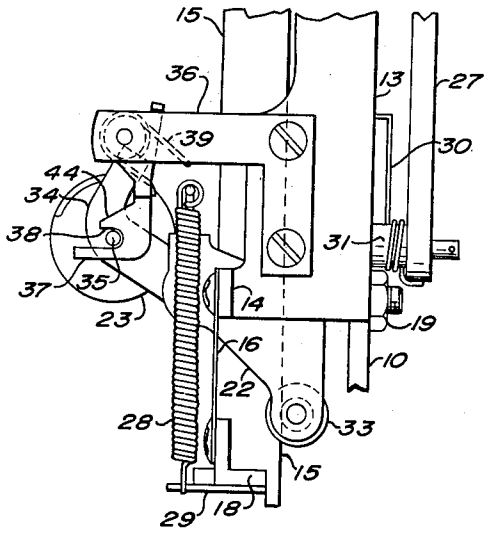
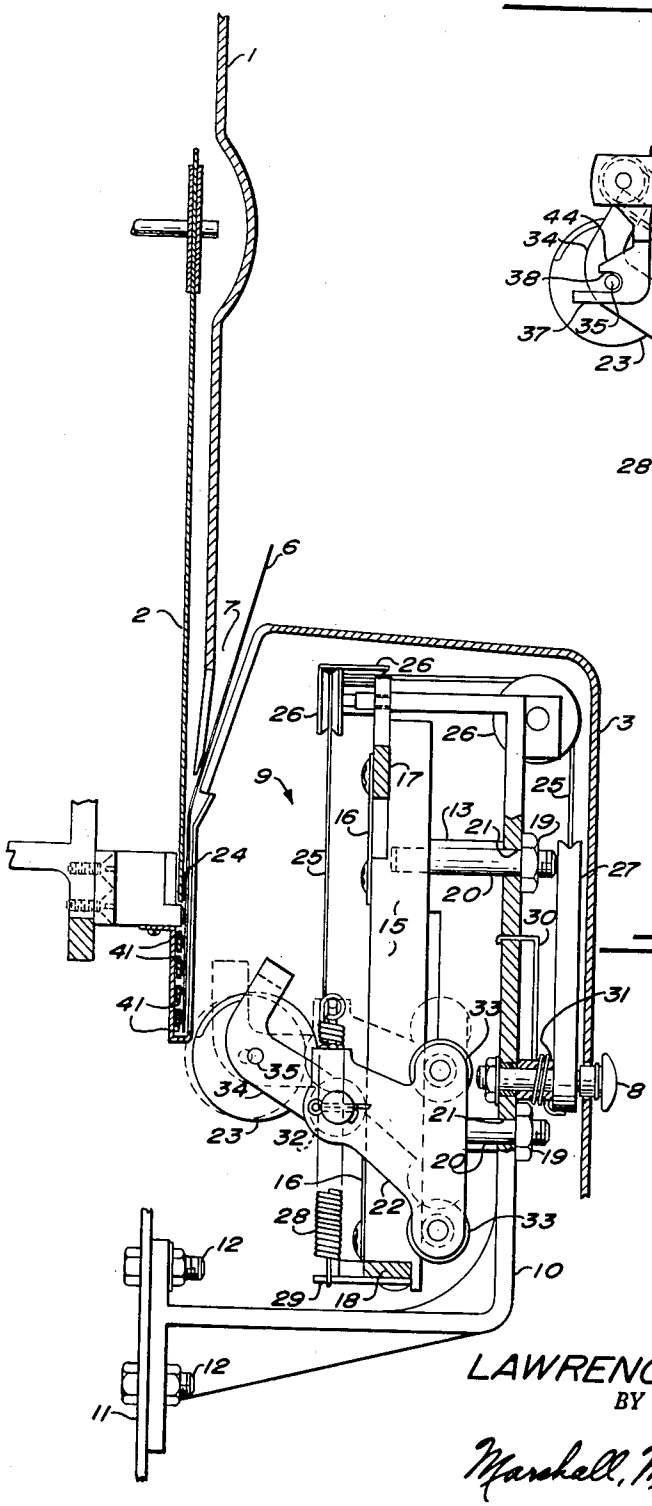


Fig. III



INVENTOR.
LAWRENCE S. WILLIAMS
BY
Marshall, Marshall & Yeasting
ATTORNEYS

United States Patent Office 2,735,362 Patented Feb. 21, 1956

2,735,362

ROLLER PRINTER

Lawrence S. Williams, Toledo, Ohio, assignor to Toledo Scale Company, Toledo, Ohio, a corporation of New Jersey

Application January 8, 1953, Serial No. 330,273

9 Claims. (Cl. 101—93)

This invention relates to printing weighing scales and in particular to an improved printing mechanism for such scales.

The principal object of this invention is to provide a printing roller which is adapted to press an element against raised printing characters on a forward printing stroke only. In a printing mechanism of the roller type, if the roller acts on the element during both the printing and return strokes, a double impression of the printing characters is often made on the element if the characters or element should shift slightly between the forward and return strokes.

Another object is to provide means for adjusting the pressure with which the roller presses the element against the type. The same adjusting means may also be used to adjust the printing mechanism for printing on elements of different thicknesses.

Still another object is to provide a roller having recessed portions on its periphery, which recessed portions permit only certain ones of the printing characters to be printed on the element.

A further object is to provide means for indexing the recessed roller in its original position at the end of a printing cycle.

A still further object is to provide means for advancing the roller into contact with the element to receive an imprint at the start of the printing stroke, means for retracting the roller from contact with the element at the end of the printing stroke, means to return the roller to its non-operated position, and means to retain the roller in its rectracted position until the start of another printing cycle.

According to the invention, a printing roller is mounted on a carriage and is reciprocable along a track in response to manually operable means. The track is arranged parallel to the face of printing characters whereby reciprocable movement of the carriage along the track will cause the roller to press a juxtaposed element against the printing characters. The roller is so arranged on the carriage that it will press the element against the characters on the printing stroke and will be retracted from printing position at the end of the printing stroke whereby no impression is taken on the return stroke.

In the drawings:

Figure I is an elevational view of the head of a printing weighing scale embodying the instant invention.

Figure II is a fragmentary enlarged view of the head shown in Figure I, illustrating the position of the printing mechanism.

Figure III is an elevational view taken substantially along line III—III of Figure II, parts being shown in section and parts being broken away.

Figure IV is a fragmentary view taken substantially along line IV—IV of Figure II.

Figure V is a view in perspective of the printing mechanism.

Figure VI is an enlarged oblique view of the recessed roller.

Figure VII is a view illustrating the extent of the area

within which impressions may be taken of printing characters by a roller recessed as shown in Figure VI.

A weighing scale embodying the instant invention comprises a head 1 in which is mounted automatic load counterbalancing mechanism (not shown). Since the weighing mechanism of the scale does not constitute a part of the invention, it is not shown and will be described only so far as is necessary to fully disclose the invention. The automatic load counterbalancing mechanism, in response to a load being weighed, rotates a flat circular chart 2 (see Figure II) to move printing characters on a marginal area of the face of the chart into a printing position. The printing position is located behind the upper portion of a housing 3 mounted forwardly of the head 1. In addition to the printing characters on the chart, other type-bearing members may be placed in printing position by pressing keys 4 on a keyboard 5 mounted on the scale head 1 alongside the housing 3. As shown in Figure I, a ticket or other element 6 is guided into a slot 7 whereby a portion of the ticket will be positioned in the printing station to receive an imprint of the printing characters thereon. It is to be understood that while the element to receive the imprint is shown as being a ticket, the instant invention may easily be adapted to print on other elements. A handle 8 is manually operable to cause printing mechanism 9 to make an imprint on the ticket 6 of the printing characters in the printing station.

Referring now to Figure II, a frame 10 is secured to framework 11 within the head by a plurality of bolts 12. The frame 10 extends forwardly toward the operator then upwardly within the housing 3. The upwardly extending portion of the frame 10 has rearwardly extending flanges 13 (shown best in Figure V) so that the upwardly extending portion of the frame 10 is substantially U-shaped in horizontal cross-section. An ear 14 is formed at each end of each flange, with all of the ears lying in a plane parallel to the upwardly extending portion of the frame 10.

A track 15 is resiliently mounted on the frame 10 by means of flexure plates 16. A pair of brackets 17 and 18 are mounted on the opposite ends of the track 15 and are adapted to have their ends receive the flexure plates 16. The other ends of the flexure plates are attached to the ears 14 (see Figure V) of the flanges 13.

Referring now to Figure III, it will be seen that the initial position of the track 15 may be adjusted relative to the frame 10 by adjusting a pair of nuts 19 on studs 20 which are fixed to the track 15 and extend through holes 21 in the frame 10. The holes 21 are of a diameter slightly greater than the diameter of the studs 20 to permit movement of the studs through the holes without restriction.

The flexure plates 16 urge the track toward the chart with sufficient force to provide good printing. The movement of the track toward the chart, before the roller moves into printing position, is limited by the nuts 19.

The track 15 lies in a plane parallel to the face of the chart 2 so that a carriage 22 mounted for reciprocable movement along the track will cause a printing roller 23 pivotally mounted on the carriage to press the ticket 6 against raised printing characters 24 on the chart 2 as the carriage reciprocates. In the instant invention the carriage 22 moves in a path which is radial with respect to the axis of the chart 2. By so providing that the printing takes place while the roller moves radially inwardly toward the axis of the chart, there is little chance that the chart will rotate on its axis while the printing roller 23 presses the ticket 6 against the chart.

The carriage 22 is reciprocated along the track 15 by a cord drive 25 which passes over a plurality of pulleys 26 and is operatively connected to the handle 8 by means of a sector 27. The carriage 22 is returned to its original position by means of a return spring 28 connecting the

carriage to an arm 29 on the bracket 18 and a spring 30 coiled around a shaft 31 on which the sector 27 is pivotally mounted.

The carriage 22 is adapted to be freely reciprocated along the track 15 by providing an anti-friction bearing 32 such as a needle-bearing to engage one side of the track, and by providing a plurality of flanged wheels 33 which engage the corners of the track on the side opposite that engaged by the bearing 32.

Adapted for pivotal movement within limitations on the axis of the bearing 32 are L-shaped toggle arms 34 which support between them on an axle 35 the printing roller 23. The limits of pivotal movement of the arms are illustrated in Figure III. When the arms are pivoted to the position shown in solid lines, the roller cannot press the ticket 6 against the printing characters 24 on the chart 2. When the arms 34 are pivoted to the position shown in dotted lines (which position is slightly past the perpendicular from the track 15), the roller 23 will press the ticket 6 against the characters 24. The ticket 6 has not been described in any great detail but may have a carbon sheet which, when pressed against the characters 24, makes an imprint on the ticket 6. An inked ribbon may also be arranged in any of several manners for printing purposes if so desired.

Referring now to Figure IV, an arm 36 is fixed to one of the flanges 13 and carries a pivotally-mounted latch 37. The latch 37 is provided with a U-shaped slot 38 which is adapted to receive an extension of the axle 35. A spring 39 urges the latch 37 toward the axle 35.

Referring now to Figure VI, the printing roller 23 has recessed portions 40 which permit only a certain area of the roller to press the ticket against the printing characters. In Figure VII, other indicia in addition to the weight indicia are shown as being printing characters provided on bars 41. The portion of the roller which presses the ticket against the bars 41 and chart 2 is defined in this figure by dotted lines. This is necessary to avoid confusion which would result in reading a printed ticket if several of the characters on each bar 41 were printed on the ticket. The bars 41 are operatively connected to the keys 4 on the keyboard 5. They may, instead of being provided with numerals, be provided with symbols to designate different articles weighed, articles being weighed for different customers, etc.

In order that the same area be printed by the roller each time, a spiral spring 42 (shown in Figure V) is provided around the axle 35 at one side of the roller. The spring 42 has one end fixed to one of the toggle arms 34 and the other end fixed to the printing roller 23. This causes the printing roller 23 to resume its original position with relation to the bars 41 and chart 2 each time a printing cycle has been completed.

Operation

The printing mechanism of the instant invention is operated as follows. An operator inserts a ticket 6 into the slot 7 to position the ticket in the printing station. This may be done either before or after the article to be weighed has been placed on the load receiver of the scale. In either case, after the weighing mechanism has come to rest, the operator pushes downwardly on the handle 8. This causes the cord drive to pull the carriage 22 upwardly on the track 15. For the first portion of the printing stroke, the axle 35 is retained in the U-shaped slot 38 of the latch 37. Retaining of the axle in the slot causes the toggle arms 34 to pivot on the anti-friction bearing 32 to advance the printing roller to the position shown in dotted lines in Figure III. When the printing roller carried on the axle 35 is pivoted to that position, it is slightly past center and is adapted to press the ticket 6 against the printing characters on the bars 41 and chart 2. As long as the carriage moves in that direction, the roller 23 will continue to press the ticket against the printing characters.

When the carriage 22 has reached the end of the printing stroke and the upward motion of the carriage has been halted, a spring 43 shown in Figure V as being connected between one of the togggle arms 34 and the carriage 28 returns the printing roller 23 to a position out of contact with the ticket.

When the handle 8 is released by the operator, the springs 28 and 30 act to return the carriage to its original non-operated position. On the return stroke the printing roller 23 is prevented from engaging the ticket to cause a double impression of the printing characters to be made upon the ticket if the chart should shift slightly. Just before the carriage returns to its original position, the axle 35 engages an inclined edge 44 on the latch 37 to depress the latch until the axle 35 enters the slot 38. The ticket may then be removed and another operation commenced.

The embodiment of the invention herein shown and described is to be regarded as illustrative only and it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

Having described the invention, I claim:

1. In a printing mechanism, in combination, at least one type bearing member adapted to be positioned in a printing station, means for supporting an element to receive an imprint in juxtaposition with the type on said type bearing member, a frame, a track mounted on said frame, said track extending in a plane substantially parallel to the face of the type during all positions of the printing roller, a carriage mounted to reciprocate along said track, means for reciprocating said carriage along said track, a pivotal member carried on said carriage, a rotatable roller carried by said pivotal member, means comprising a latch for pivoting said member to place the roller into contact with the element, said member being pivoted additionally by friction between the roller and the element when the carriage is moved along the track on its printing stroke, the additional pivoting of the member causing it to be released from the latch, means for pivoting said pivotal member at the end of the printing stroke whereby said roller moves out of contact with said element, and means for returning said carriage toward its starting position on said track with the roller remaining in its last-pivoted position.

2. The invention set forth in claim 1 in which spring means urges the pivotal member and roller to a position out of contact with the element in the direction in which the roller moves during printing.

3. The invention set forth in claim 1 in which the track is resiliently mounted on the frame to compensate for differences in the thickness of elements which are to receive imprints.

4. In a printing mechanism, in combination, a type-bearing member adapted to position raised printing type in a printing station, means for guiding an element to receive an imprint into juxtaposition with said printing type, a roller adapted to press the element against the type, said roller having recessed portions on its circumference, a frame, a track mounted on said frame, said track lying in a plane parallel to the face of said type, a carriage, means for reciprocating the carriage along a track, a pivotal member on said carriage, said member having a pivotal axis transverse to said track, means for limiting the pivotal movement of said member, said roller being rotatably mounted on said pivotal member, means for pivoting the member at the start of a printing stroke whereby said roller contacts the element to press said element against the type, means for pivoting the member at the end of the printing stroke whereby said roller moves out of contact with said element, means for returning said carriage to its original position while said member is held in its last-pivoted position, means for latching said carriage in its original position, and means for returning said roller to its original setting whereby said recessed portions on said roller occupy the same space with relation to the

carriage that they did before the start of the printing cycle.

5. The invention set forth in claim 4 in which the means for reciprocating the carriage along the track is manually operable.

6. The invention set forth in claim 4 in which means for returning the roller to its original position comprises a multiple-turn spiral spring with one end fixed to the pivotal member and the other end fixed to the roller.

7. The invention set forth in claim 4 in which the means for pivoting the pivotal member at the start of a printing stroke comprises a latch which retains the member during a first portion of the printing stroke whereby said member is moved toward the element while pivoting on its axis, said latch releasing said member when said member is pivoted.

8. The invention set forth in claim 4 in which the pivotal member is spring-urged to move the roller out of contact with said element at the end of a printing stroke.

9. In a printing mechanism adapted to make an imprint of raised type on an element to receive the imprint, in combination, means for moving the type into a printing station, means for supporting the element in juxtaposition to the type, a roller adapted to press the element against the type to make an imprint of said type on said element, the axis of said roller being parallel to the face of the type, means for reciprocating said roller in a printing stroke and in a return stroke transversely to its axis

in paths which both are parallel to the face of said type, means comprising a latch for moving said roller against said element at the start of the printing stroke, said roller being pivoted away from the latch against said element by friction between the roller and the element when the roller moves in its printing stroke, and means for holding said roller out of engagement with said element while it moves in its return stroke.

References Cited in the file of this patent

UNITED STATES PATENTS

723,567	White	Mar. 24, 1903
1,627,663	Morse	May 10, 1927
1,688,552	Nobs	Oct. 23, 1928
1,919,954	Kranz	July 25, 1933
1,941,667	Eley	Jan. 2, 1934
1,978,330	Scholtes	Oct. 23, 1934
1,981,001	Osborn	Nov. 20, 1934
2,029,906	Bennett	Feb. 4, 1936
2,068,036	Orling	Jan. 9, 1937
2,092,026	Schaefer	Sept. 7, 1937
2,181,382	Schlecht	Nov. 28, 1939
2,295,748	Moore	Sept. 15, 1942
2,417,865	Douglass	Mar. 25, 1947
2,631,529	Bernhardt	Mar. 17, 1953
2,639,662	Elliott	May 26, 1953