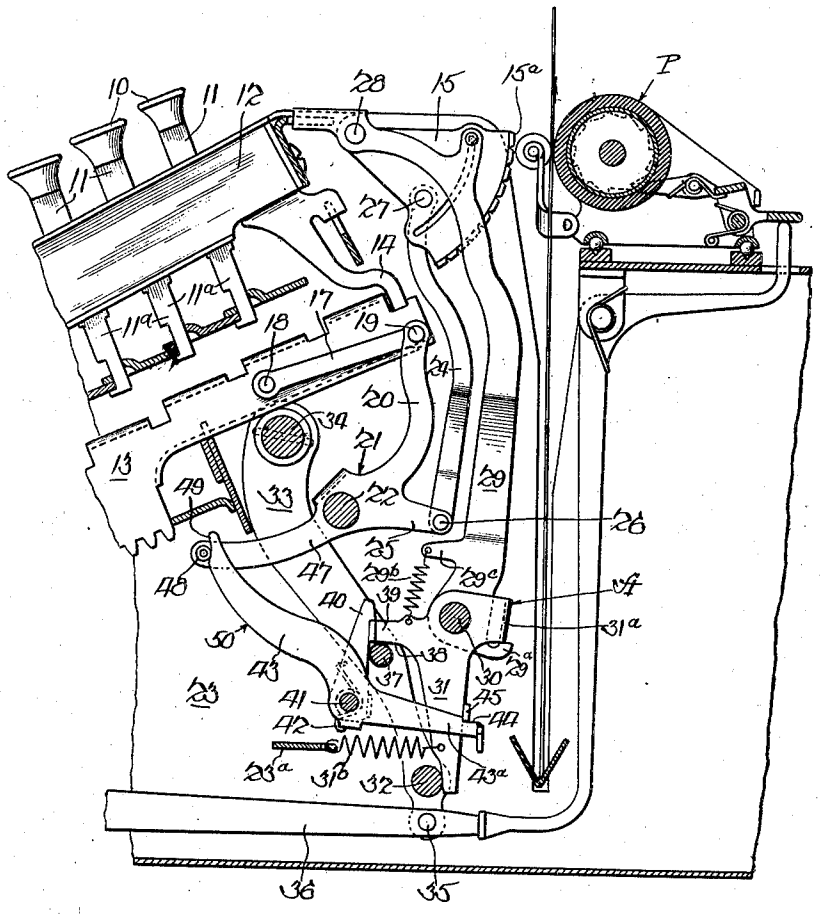
July 11, 1939. M. GARBELL 2,165,922

PRINTING MECHANISM

Filed March 23, 1936

2 Sheets-Sheet 1

Fig. 1.




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2 Sheets-Sheet 2

Fig. 3

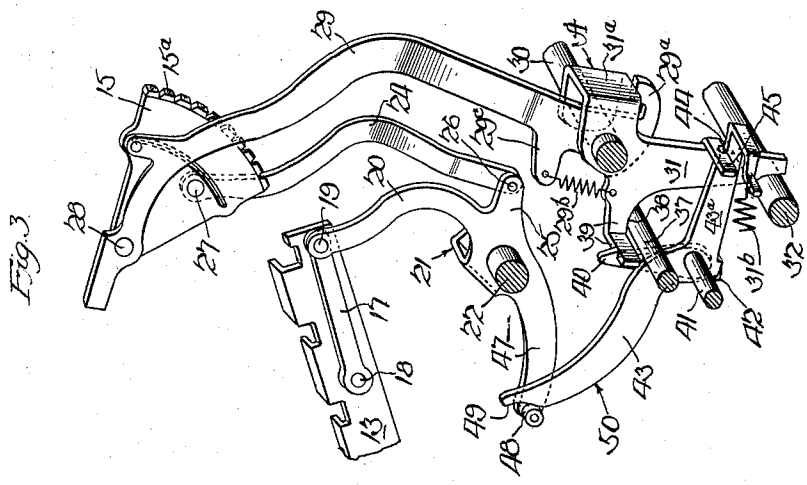
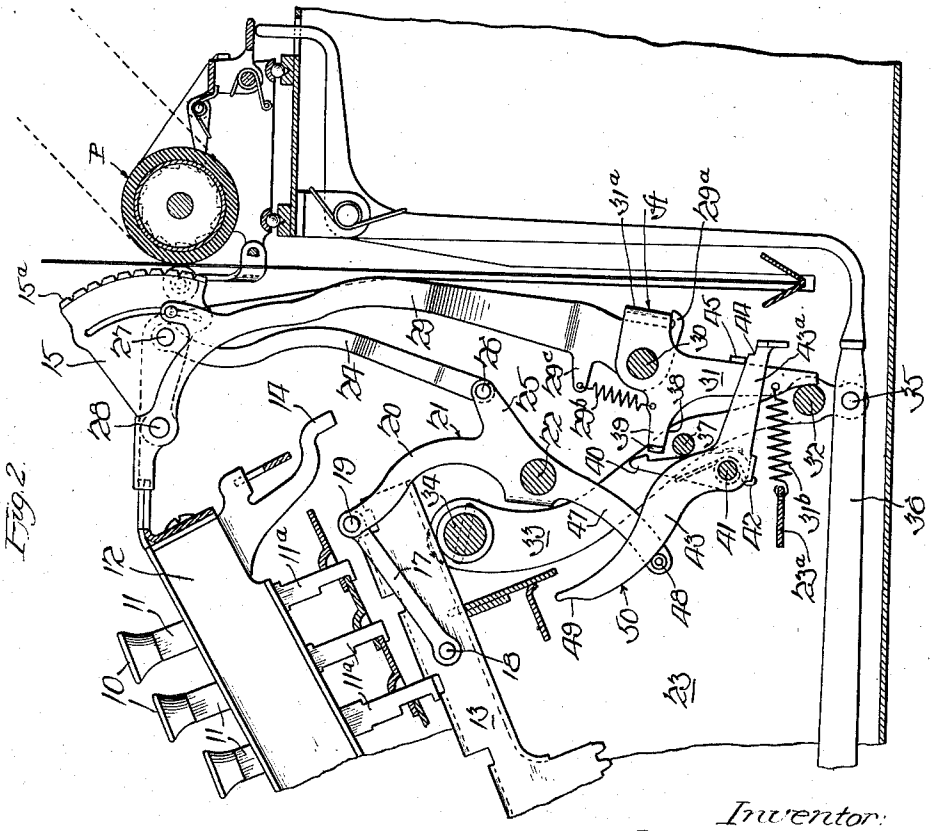


Fig. 2



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# UNITED STATES PATENT OFFICE

2,165,922

## PRINTING MECHANISM

Max Garbell, Chicago, Ill., assignor to Victor Adding Machine Company, Chicago, Ill., a corporation of Illinois

Application March 23, 1936, Serial No. 70,269

4 Claims. (Cl. 101—93)

This invention relates to improvements in a printing mechanism, and more particularly to the type of printing mechanism shown and described in my pending application Ser. No. 56,465, filed December 28, 1935.

The chief object of the present invention is the provision of a printing mechanism composed of a plurality of printing units arranged to be constantly urged and selectively released to coact with a platen for an impact thereagainst, and having means carried on each unit for instantly retracting them in spaced relation with the platen after the impact and prior to their being restored to their normal positions.

A further object is the provision of printing units arranged to be retained in spaced relation with and normally urged toward a platen, being releasable for a given distance of movement and having means on each unit permitting them to move beyond the distance of movement to which they are released, and to impact the platen.

A still further object is the provision of printing units normally urged and releasably retained for a given distance of movement toward a platen and having positive means including yieldable means on each of the units permitting them to be positively moved for a given distance and to yieldingly move beyond their given distance of movement to impact the platen and to yieldingly restore themselves prior to being positively returned to their normal positions.

Referring to the drawings:

Figure 1 is a partial detail medial sectional view of a machine embodying my improved printing mechanism.

Figure 2 is a view simlar to Figure 1, illustrating a changed position; and

Figure 3 is a detail perspective view of one of the printing units and its coacting parts.

My printing mechanism is illustrated as being attached to an adding machine, employing depressible keys 10 arranged in banks and provided with the stems 11 that extend through and are suitably guided in a keyboard 12, with the lower ends 11*a* of the key stems adapted to coact with a rack bar 13, when depressed. Below each bank of keys 10, a rack bar 13 is arranged for reciprocating movements under the control of a driving mechanism, (not shown), and are normally locked by means of lock members 14 that are operatively connected with the keyboard and controlled by any key in the bank to release the rack bar coacting therewith.

A printing unit of the printing mechanism is operatively connected to each reciprocating rack bar 13, and controls a sector 15 to selectively position one of a series of characters 15*a* thereon in printing relation with a platen P with the character corresponding to the key depressed.

As each of the printing units are arranged and operated in the same manner, it is thought that a description of one of the printing units and its operation, will suffice for a description of all.

A link 17 is pivotally connected to the rack bar 13, at 18, and has its other end pivotally connected at 19, to a leg 20 of a rockable spider member 21 that is pivotally carried on a transversely disposed shaft 22, supported in the side walls 23 of the adding machine. The spider 21 also carries a link 24, pivotally connected to a leg 25 thereof, at 26, and has its other end portion connected to the sector 15, at 27.

The sector 15 is pivotally supported at 28 on a supporting arm 29 that is pivotally carried for swinging movements on a shaft 30, supported in the side walls 23 of the machine.

A depending arm 31 is pivotally carried on the shaft 30, adjacent the arm 29, and is operatively connected with the arm 29 in a novel manner, and forms the subject matter of this application.

The tripping or releasing operation of the arm 29 to bodily carry the sector 15 toward the platen, is accomplished in the same manner as that shown and described in my pending application Ser. No. 56,465, filed December 28, 1935, and the improvement being that the unit is moved for a given distance toward the platen with the sector 15 in spaced relation therewith, and it is this movement of the unit that gives the impetus to the sector to impact the platen in a manner as will be more clearly described.

The supporting arm 29 and a depending arm 31 are arranged to form a break-joint, designated as a whole as A. The depending arm 31 serves as a control arm for the supporting arm 29 and has an integral portion 31*a* formed in the shape of a U, which serves to pivotally support the same on the shaft 30. The supporting arm 29 is carried on the shaft 30 within the U-shaped portion 31*a* of the control arm 31, and has an extending portion 29*a* that underlies and engages this portion 31*a*, and is retained thereagainst by means of a tension spring 29*b*, which has one end connected to an extending portion 29*c* of the arm 29 and has its other end connected to the control arm 31.

The extension 29*a* of the supporting arm 29 and the U-shaped portion 31*a* of the control arm 31 forms a positive driving connection for a

given distance of movement of the supporting arm, while the spring 29b which yieldingly holds them together, forms means for permitting an advance movement of the arm 29 with respect to the control arm 31.

The control arm 31 has a spring 31b fixed to the lower end thereof and to a cross-member 23a, carried in the side walls 23, which retains the arm 31 in engagement with a shaft 32 carried on and adjacent the lower ends of a pair of depending arms 33 fixed to a shaft 34 that is pivotally carried in the side walls 23 of the machine. The arms 33 have their free ends connected at 35 to a pair of links 36 (only one of the arms 33 and links 36 being shown), which are operatively connected to the actuating mechanism of the machine. The arms 33 also carry a shaft 37 which normally underlies the edge 38 of an extension 39 on the control arm 31 and serves with the shaft 32 to retain the arm 31 in an upright position.

It will be noted that the sectors 15 are retained in their retracted positions, (Fig. 1), with respect to the platen by means of the shafts 32 and 37, engaging the control arm 31 and its extension 39.

A dog 40 and a rockable member 43 are pivotally carried on a shaft 41 and are spring-urged by means of the spring 42, to securely lock the control arm 31 in normal position with the supporting arm 29 and sector 15 in retracted position.

The rockable member 43 has a portion 43a that is provided with a notch 44 on its top surface, that engages an ear 45 on the control arm 31, and is releasable therefrom upon the movement of the spider 21, which has an arm 47 that carries a roller 48 thereon which normally rests in a recess 49 on the member 43, and which roller 48 is adapted to engage a cam surface 50 upon its movement.

As thus far described, it will be seen that as the rack bars 13 are moved, they will be arrested by the stems 11a of the depressed keys, and the link 17 on these rack bars 13 will carry the spider member 21 therewith and cause the roller 48 on the leg 47 thereof, to ride out of the recess 49 and over the cam surface 50 to rock the member 43 and disengage the notch 44 thereof, from the ear 45. The rocking movement of the spider 21 simultaneously effects the positioning of the sector 15 by means of the link 24 connected thereto, and to the spider.

During the releasing movement of the rockable member 43 with the ear 45 on the control arm 31, and the positioning of one of the characters 15a of the sector 15 in printing position with respect to the platen, the arm 31 and the supporting arm 29 remain in their normal positions and are only released upon a further movement of the actuating mechanism of the machine, (not shown), which movement effects a pull on the links 36 and a swinging movement of the arms 33 therewith, to carry the shafts 32 and 37 out of engagement with the depending member 31. The movement of the shaft 37 forces the dog 40 out of engagement with the extension 39 and releases the control arm 31 to be urged by means of its spring 31a until it again contacts the shaft 32 which has been moved and which limits the movement of the control arm 31 in that direction.

As the dog 40 is released, as above described, the arm 31 will be drawn for an impact against the moved shaft 32 by means of the spring 31a, which movement will carry the supporting arm 29 therewith for a positive movement, by means of the engagement of the extension 29a thereof with the U-shaped portion 31a, and as the arm 31 is abruptly stopped by the shaft 32, the impetus given to the arm 29 and sector 15 will cause the spring 29b to yield and permit the selected character 15a of the sector, to impact the platen and to be instantly withdrawn therefrom by means of the tension of the spring 29b thereby restoring the sector 15 and arm 29 to the position to which the control arm 31 has been permitted to move.

Upon the restoring movement of the actuating mechanism of the machine, the links 36 will again be restored to their normal positions and carry the depending arms 33 and the shafts 32 and 37 therewith, which will cause the control arm 31 of the released units to rock on the shaft 30 and the arms 29 coacting therewith to be carried thereby, to bodily restore the sectors 15 to their normal at-rest positions. A further movement of the actuating mechanism restores the rack bars 13 and spiders 21, which restores the sectors 15 through the links 24 and also the roller 48 carried on the leg 47, to be restored into the recess 49 of the rockable member 43 and permit this member to be urged by its spring 42 with its notch 44 into engagement with the ear 45 of the control arm 31. The spring 42 also restores the dog 40 into locked position over the extension 39 of the control arm 31 and serves with the rockable member 43 to rigidly hold the arm 31 in normal locked position and with the arm 29 and sector 15 carried thereon, in its normal retracted position with respect to the platen.

I claim:

1. In a printing mechanism, the combination with a type carrier pivotally mounted for swinging movements, a member pivotally mounted in relation thereto, said type carrier and member being arranged for a positive movement with each other in one direction of their pivotal movements, spring means connecting the type carrier and member permitting of an advance movement of said type carrier with respect to said member and to retract the same, latch means for holding the member and type carrier in normal position, and a swingable control means normally in the path of said latch means and member for retaining said member to retain the type carrier in normal position, said control means serving to release said latch means and for limiting the movement of said member while the type carrier moves in advance thereof.

2. In a printing mechanism, the combination with a type carrier, and a member movably mounted in relation thereto and having means thereon connecting the same for a positive movement in one direction, yieldable means connecting the type carrier and member for a yielding movement of said type carrier in advance of said member, a control means, lock means for holding said member in normal position, a spring urging said member against said control means, said control means serving to release said lock means and to control the movement of said member whereby said type carrier will move in advance thereof and be retracted by said yieldable means.

3. In a printing mechanism, the combination with a type carrier pivotally mounted for swinging movements and a spring-impelled member pivotally mounted in relation thereto, said type carrier and member being connected for a posi-

tive movement in one direction of their pivotal movements, spring means connecting said type carrier and member for movement in the other direction and permitting of an advance movement of the type carrier with respect to said member, latch means for holding the member against its spring and type carrier in normal position, control means in the path of said latch means and member and coacting with said latch means to retain said member in normal position, said control means sequentially releasing the member and latch means respectively and forming means for limiting the spring-impelled movement of said member while the type carrier moves in advance thereof.

4. In a printing mechanism adapted to coact with a platen, the combination with a type carrier having a member movably mounted in relation thereto in one direction, a spring connecting the type carrier and member permitting of an advance movement of said type carrier with respect to said member and to retract the same, spring means urging the member to urge the type carrier against the platen, of a control member-actuator in the path of the member normally preventing movement of said member and type carrier toward the platen, a latch for holding said member, said control member-actuator forming means for releasing the member and latch respectively and forming means to limit movement of said member while said type carrier moves in advance thereof for an impact against the platen.

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