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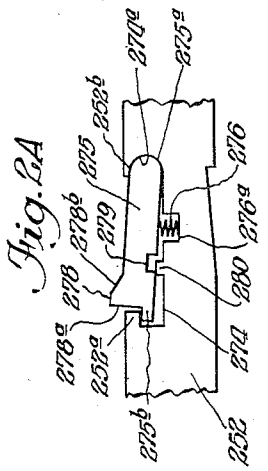
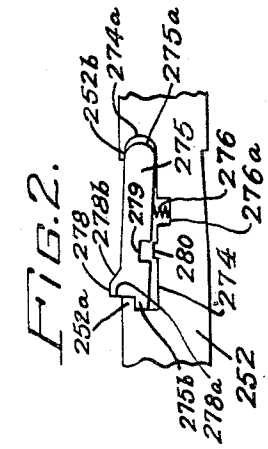
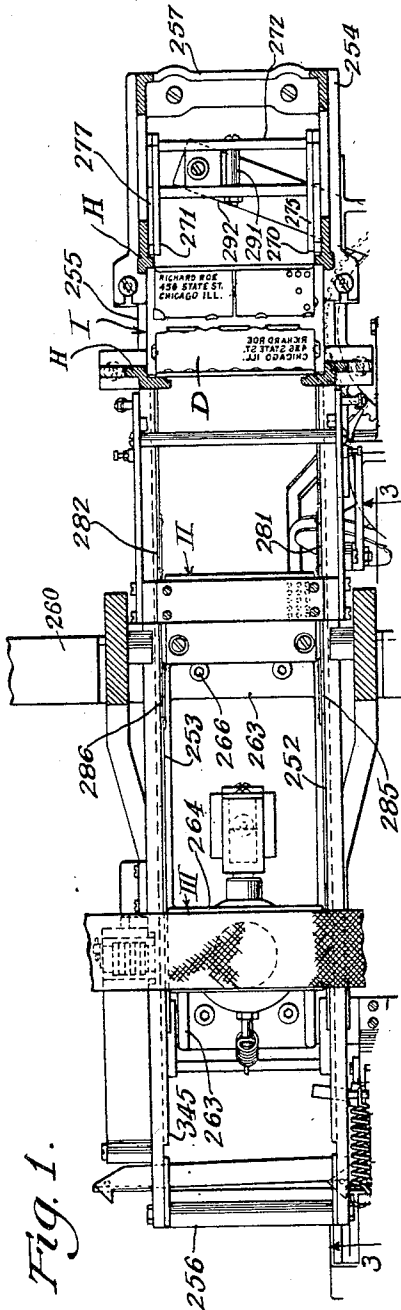
W. T. GOLLWITZER

2,451,213

RECIPROCATABLE FEED MEANS FOR PRINTING MACHINES

Original Filed July 28, 1938

2 Sheets-Sheet 1



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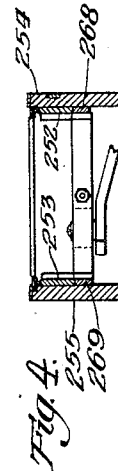
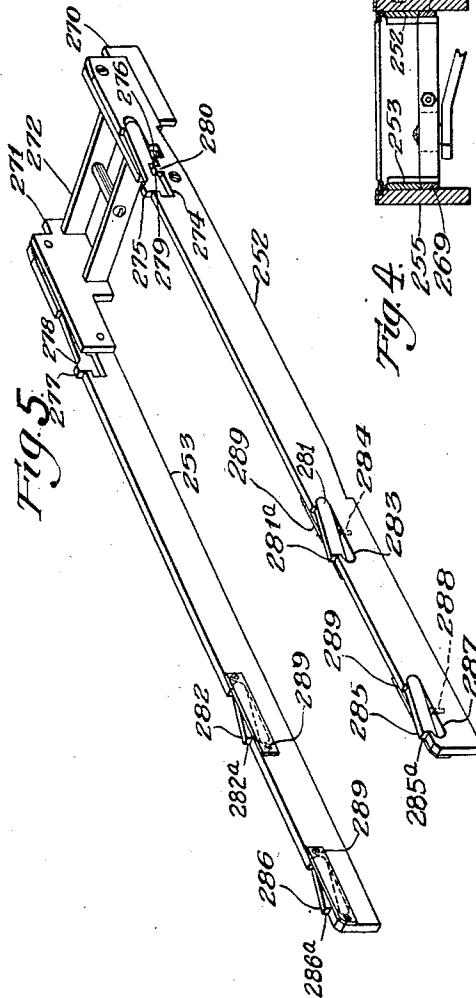
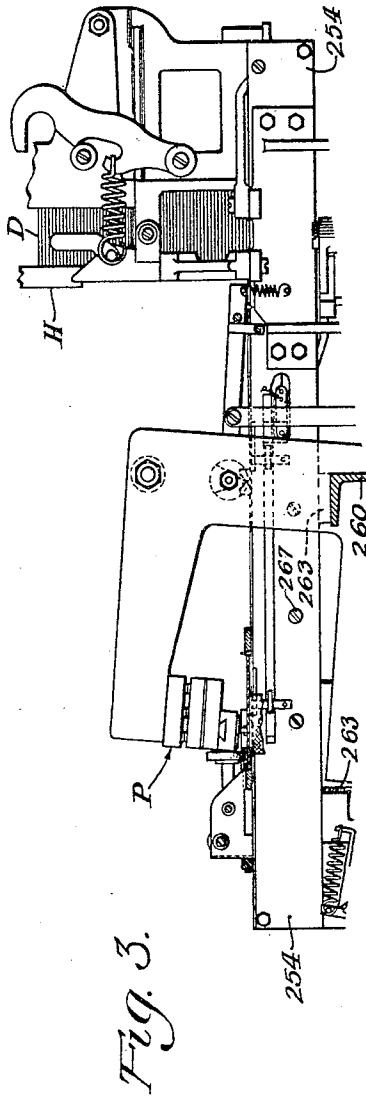
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UNITED STATES PATENT OFFICE

2,451,213

RECIPROCABLE FEED MEANS FOR
PRINTING MACHINES

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Original application October 16, 1941, Serial No.
415,317, which is a division of application Serial
No. 221,841, July 28, 1938. Divided and this
application September 15, 1944, Serial No.
554,258

3 Claims. (Cl. 271-44)

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This application is a division of my copending application, Serial No. 415,317, filed October 16, 1941, and now issued as Patent No. 2,375,842, patented May 17, 1945, which in turn is a division of my application, Serial No. 221,841, filed July 28, 1938, on which Patent No. 2,296,277 issued September 22, 1942.

This invention pertains to printing and the like machines through which printing, printing and control or like devices are sequentially fed to have printing, control or other operations performed therefrom, thereon or under control thereof, and more specifically this invention pertains to advancing such devices through a series of positions in a machine whereat operations may be performed therefrom, thereon or under control thereof.

Printing, printing and control and like devices are customarily stored in drawers, trays or the like when not in use, and when it is desired to utilize such devices in the machine they are transferred from the drawers or the like to a magazine or other receiving means in the machine. Suitable feeding means operates to withdraw these devices successively from the magazine and to advance them along a guideway in a step-by-step manner. In machines of the character to which the present invention pertains each device is brought to rest in each of a plurality of positions along the guideway, in at least some of which positions operations such as sensing, setting up of variantly settable means and direct-contact printing are effected upon, under control of or from the devices disposed in such positions. Each device passes successively through these positions or stations after being withdrawn from the magazine, and after the various operations with respect thereto have been performed, the device is discharged to a collector to be returned to the drawer or other storage receptacle therefor.

An important object of the present invention is to simplify the provision of printing device advancing pawls in machines of the aforesaid character and a further object is to arrange a series of members such as pawls on a reciprocatory element so that the pawls may engage corresponding edges of printing or like devices and move such devices through unequal distances along a guideway during a forward stroke of the reciprocatory element, said pawls being ineffective to move said devices during a return or idle stroke of the reciprocatory element.

There are instances where accurate positioning of printing, printing and control and like de-

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vices in stationary positions during their movement through the machine is essential, as where detecting operations are to be performed thereon or where impressions made therefrom are to be accurately positioned on the sheets or the like. In view of this it is another important object of this invention to provide a novel arrangement for accurately positioning printing and control or like devices in the various stationary positions thereof occupied thereby in the course of movement thereof through printing and like machines.

Reference has been made hereinabove to printing, printing and control or like devices and while hereinafter reference will be made specifically to printing and control devices of the character, for example, disclosed in Patent No. 2,132,412, patented October 11, 1938, it is to be understood that such devices are representative of devices of the character for use with which the present invention is particularly adapted and thus, while for the purposes of this description reference will be made specifically to printing and control devices, it is to be understood that such specific reference is to be taken in the generic sense for, as will be apparent from the foregoing description, my invention is susceptible of use with a wide variety of devices other than the printing and control devices illustrated and described herein.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment and the principle thereof and what I now consider to be the best mode in which I have contemplated applying that principle. Other modifications of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a top fragmentary plan view, in which certain parts are broken away, of a guideway through which printing and control devices may be fed into and from operative positions in the machine;

Fig. 2 is a detail view drawn to an enlarged scale, of a feed pawl and the support therefor employed in my novel apparatus.

Fig. 2A is a view similar to Fig. 2 and showing the parts in a different relation.

Fig. 3 is a vertical sectional view taken substantially along the line 3-3 of Fig. 1;

Fig. 4 is a transverse sectional view taken substantially along the line 4—4 of Fig. 1; and

Fig. 5 is a perspective view of the reciprocating carrier bars.

The machine in which the novel apparatus of the present invention may be utilized is described in detail in my above referred to co-pending application, Serial No. 415,317 filed October 16, 1941, which in turn is a division of my application, Serial No. 221,841, filed July 28, 1938, now Patent No. 2,296,277, to which reference may be made for a detailed description of various operative mechanisms included in the machine other than those to which the present invention particularly pertains. In this respect, however, it is to be understood that the aforesaid machine is merely exemplary of machines of the character in which the present invention may be utilized.

The present invention, as shown in the accompanying drawings, primarily pertains to an arrangement for advancing printing and control devices, from which impressions may be made by a platen P, through a machine in which such a platen is included, each of such devices in the present instance also including a control portion under control of which a multiplying mechanism or the like machine may be operated. A printing and control device of this character is shown in Fig. 1 and is, as explained hereinabove, typical of devices that may be handled by the present invention.

The printing and control device D as illustrated in the accompanying drawings includes a carrier or, as it is called in the art, a frame 1 having, in this instance, a metallic plate 2 removably retained thereon by fixed retaining devices 3, a bead 3' at the lower edge of the frame, and yieldable or depressible retaining tongues 4. When one or the other of the tongues 4 is depressed the plate 2 may be slid endwise from the retaining devices 3 and the bead 3'. Type characters T are, in this instance, embossed in the metallic plate 2 so as to appear in relief on one face thereof and in intaglio on the opposite face, impressions being made from the relief faces of the type characters T when the printing and control device D is fed into printing relation with the platen P, Fig. 3, in the machine. Each such printing and control device also bears an identification card 5 on which an impression is made from the type characters T so that the data which may be printed from the type characters T may be read easily, thus facilitating handling of the device D. This card 5 is removably retained on the frame 1 above the plate 2 thereon by suitable retaining devices 7 and a bead 8 at the top of the frame. A control card 6 is retained on the frame 1, at one side of the card 5, by the retaining devices 9, the bead 8, and retaining devices 7' interposed between the cards 5 and 6. The card 6 and the underlying portion of the frame 1 are adapted to have perforations formed therein in accordance with a selected code so as to afford control means or representations of data on the device. The perforations in the control card 6 and the underlying portion of the frame 1 may be conveniently produced in a machine such as that disclosed in my co-pending application Serial No. 210,897, filed May 31, 1938, now Patent No. 2,265,229, patented December 9, 1941.

As has been explained hereinabove, printing, printing and control and like devices, of which the just described printing and control device D is exemplary, are customarily stored in drawers, trays or the like when not in use, and when these

devices are passed through printing or like machines, for example, one of the character shown herein, they are introduced into a suitable receiver in the machine and in the present instance these printing and control devices are introduced into an upstanding magazine H, Fig. 3, that is provided at the rear side of the machine and at the rear end of the printing and control device guideway, through which guideway the printing and control devices advance to printing position below the platen P.

After the printing and control devices have passed through printing position below the platen P they are reintroduced into the drawer in a known manner.

In the present machine the lowermost printing and control device in the magazine H is removed therefrom and is fed through positions or stations in the printing and control device guideway, in one of which stations the control areas on the printing and control devices are sensed to effect set-up of a multiplying mechanism or the like and in another of which stations impressions are made directly from the type characters provided on the printing and control devices. Included in the means which withdraw the printing and control devices from the magazine and move these devices through the aforesaid stations in the machine are means which positively retain the printing devices in position in the stations into which they are moved to have operations performed thereon or therefrom.

The magazine H is supported at the rear side of the machine and projects upwardly above the top of a table carried by the frame of the machine. The printing and control devices D are introduced into this magazine so that the lowermost of the printing and control devices D may be withdrawn therefrom by the reciprocable carrier bars 252 and 253, Figs. 4 and 5. These carrier bars are disposed between the side plates 254 and 255, Fig. 4, which are spaced apart by spacer bars 256 and 257, openings being provided in the side plates 254 and 255 and bolts being passed through these openings and threaded into tapped openings in the ends of the spacer bars to interconnect the side plates.

The side plates 254 and 255 are rigidly supported in the frame of the machine and to this end a rear girder 260, Figs. 1 and 3, is provided as well as a front girder 261. The girders 260 and 261 afford a firm support for the casting 263 on which the anvil 264, Fig. 1, is provided, the printing and control devices resting on this anvil at the time impressions are made directly therefrom by the platen P. As shown in Fig. 1 the casting 263 is bolted to the girder 261, as indicated at 265, and this casting is also bolted to the girder 260, as indicated at 266. The side plates 254 and 255 are firmly secured to opposite sides of the casting 263 and the magazine H is mounted on and carried by the side plates 254 and 255 at the rear ends thereof.

The carrier bars 252 and 253 are supported for reciprocal movement over the inner faces of the side plates 254 and 255 by strips 268 and 269, Figs. 1 and 4, the carrier bars merely resting on the upper edges of these strips, as best shown in Fig. 4. A plate 270, Fig. 5, is fast to the inner side of the carrier bar 252 at the rear end thereof and a similar plate 271 is fast to the inner face of the carrier bar 253 at the rear end thereof. Bars 272 are secured to, as by being welded thereto, and extended between the plates 270 and 271 and serve to maintain the rear ends of the

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carrier bars 252 and 253 in permanent spaced relation, this spaced relation being such that the carrier bars are held in a tight sliding fit against the inner faces of the side plates 254 and 255.

The anvil 264 is recessed at its sides and below the top surface thereof, as at 273 and the forward ends of the carrier bars 252 and 253 rest in such recesses to be supported for reciprocal movement over the inner faces of the side plates 254 and 255 and at the same time be maintained in properly spaced relation.

In the present arrangement the lowermost of the printing and control devices is withdrawn from station or position I in the guideway, Fig. 1 which is at the bottom of the magazine H and first comes to rest in what will be referred to hereinafter as the sensing position or station, this position or station being indicated at II, Fig. 1. In the course of movement of the printing and control devices through the guideway they also come to rest in printing position above the anvil 264, which position or station is indicated at III in Fig. 1. After passing from station III over anvil 264, the printing and control devices D pass into a discharge chute 346 fragmentally illustrated in Fig. 3. It will be apparent from the foregoing that in the present apparatus the printing and control devices come to rest in two different positions or stations after movement thereof from the magazine H and prior to their discharge into the chute 346.

As has been explained when printing and control devices are to be advanced to the machine they are first introduced into the magazine H to be stacked one upon the other so that the lowermost printing and control devices in such a stack is disposed at position I. The printing and control device which is thus disposed in position I is then advanced to position II by pawls 275 and 277 which are respectively mounted in the carrier bars 252 and 253. The manner in which these pawls 275 and 277 are arranged and the manner in which they are mounted in the carrier bars is best illustrated in Figs. 2 and 2A where the pawl 275 and the portion of the carrier bar 252 in which this pawl was mounted are illustrated.

Thus referring to Fig. 2 a recess 274 is formed in the carrier bar 252 and this recess opens into the upper edge of the carrier bar 252. The rear end of the recess 274 is rounded as at 274a to be complementary to the rounded rear end 275a of the pawl 275. This can be seen best by referring to Fig. 2. The recess 274 is of greater length longitudinally of the carrier bar 252 than the pawl 275 so as to permit longitudinal movement of the pawl in the recess.

A notch 276a opens into the lower edge of the recess 274 about midway between the ends thereof and the spring 276 is disposed in this recess to be effective on the lower edge of the pawl 275 to thereby urge the same upwardly. In order to limit upward movement of the pawl 275 an overhanging lip 252a is provided at the forward end of the recess 274 and at the upper edge thereof and a toe portion 275b is provided at the forward end of the pawl 275, the relation of the lip 252a to the toe portion 275b being such that this toe portion remains under this lip at all times during the longitudinal movement of the pawl 275. Another overhanging lip 252b is provided at the top of the recess 274 and overlies the rear end of the pawl 275 at all times. The pawl 275 pivots on its rounded rearward end 275a under and against the influence of the spring 276.

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A lug 278 is provided on the top edge of the pawl 275 and projects past the free end of the lip 252a and projects above the top of the carrier bar 252, the forward edge 278a of this lug 278 affording the printing and control device engaging surface of the pawl 275, it being the engagement of the surface 278a and a corresponding surface on the pawl 277 which engage the rear edge of a printing and control device in position I to advance the same to position II in the course of advancing movement of the carrier bars 252 and 253 which is brought about in the manner explained hereinabove.

It is necessary that the lug 278 be depressed downwardly so as to enable the pawl 275 to be moved beneath a printing and control device in position I in the course of rearward movement of the carrier bar 252 and to this end an inclined cam surface 278b is formed on the rear edge of the lug or tooth 278. When the cam surface 278b engages the forward edge of a printing and control device disposed at position I, this surface is effective to cam the pawl 275 downwardly against the action of the spring 276 and this occurs shortly after the initiation of rearward movement of the carrier bar 252 in a reciprocation thereof. The upper edge of the lug or tooth 278 remains in engagement with the bottom of a printing and control device at position I once the pawl 275 has been cammed downwardly as aforesaid and until the carrier bar 252 has moved rearwardly sufficiently to dispose the edge 278a of the tooth 278 in a position behind the printing and control device at position I and once the tooth 278 has passed beyond the rear edge of this device the pawl 275 moves upwardly under the influence of the spring 276 to thereby dispose the surface 278a in position to engage the rear edge of a printing and control device in position I when the carrier bar 252 moves in a succeeding cycle of operation thereof.

When a plurality of printing and control devices are stored in the magazine H, these exert appreciable downward force on the lowermost printing and control device in such a stack thereof and in the course of an advancing movement of the carrier bar 252 and the pawl 275, this force tends to urge the tooth 278 downwardly. Therefore an arrangement is provided which is effective to prevent displacement of a surface 278a from engagement with the rear edge of a printing and control device being advanced thereby during the course of movement of the tooth 278 beneath the stack of printing and control devices in the magazine H.

By referring to Fig. 2, it will be seen that a lug 280 extends upwardly from the lower wall of the recess 274 about midway between the forward end of this recess and the notch 276a. Moreover a complementary notch 279 is formed in the lower edge of the pawl 275 and in the course of longitudinal movement of the pawl 275 the notch 279 is moved into and out of registration with the lug 280. The parts occupy the positions thereof shown in Fig. 2 during rearward movement of the carrier bar 252 and the pawl 275 and at this time the notch 279 is aligned with the lug 280 so that when the tooth 278 is forced downwardly the lug 280 will be embraced in the notch 279 and the lug is so embraced during the time the tooth 278 is riding on the printing and control device at position I in the course of rearward movement of the carrier bar 252. However, as an incident to the

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engagement of the surface 278a with the rear edge of a printing and control device at position I in the course of an advancing movement of the carrier bar 252, the pawl 275 is forced rearwardly in the recess 274 and the distance moved is then sufficient to move the notch 279 out of registration with the lug 280 so that therefore the lower edge of the pawl 275 forwardly of the notch 279 will be aligned with and will seat on the upper edge of the lug 280 as shown in Fig. 2A, and this engagement is effective to insure against downward displacement of the pawl 275 in the course of advancing movement of the carrier bar 252 so as to thereby insure that the surface 278a remains in engagement with the rear edge of the device that is to be advanced by the pawl 275. However, when the carrier bar 252 moves rearwardly and the surface 278b engages the forward edge of a printing and control device at position I, the pawl 275 is moved forwardly in the recess 274 into position shown in Fig. 2 to thereby align the recess 279 with the lug 280 to permit downward movement of the pawl 275.

It will be understood that the pawl 277 is arranged in a recess in a carrier bar 253 in the manner described hereinabove with reference to the pawl 275 and the recess 274. Furthermore, it will be understood that the pawls 275 and 277 are arranged in transverse alignment one with the other to insure proper advancing of a printing and control device along the guideway therefore from position I to position II.

In order that the carrier bars 252 and 253 will not only advance the printing and control devices from position I to position II in the course of the uniform reciprocatory movement imparted thereto, but will also advance the printing and control devices from position II to position III, two pawls 281 and 282 are respectively mounted in recesses as 283 in the carrier bars 252 and 253. These pawls are acted on by springs as 284 to have the device engaging faces 281a and 282a or near the forwardly disposed ends thereof projected above the top edges of the carrier bars. The pawls 281 and 282 are spaced forwardly of the pawls 275 and 277 in the carrier bars 252 and 253, respectively, in an appreciable amount which is equal to the spacing between position II and position III, which is to say, the pawls 281 and 282 are located in such position with respect to the pawls 275 and 277 that when the carrier bars come to rest in their forwardmost position, in which the pawls 275 and 277 are effective to dispose a printing device, that was in position I at the beginning of the forward stroke in the reciprocatory movement of the carrier bars, in position II, then the pawls 281 and 282 are in such position that the printing and control device which was in position II will be disposed in position III.

Two other pawls 285 and 286 are respectively mounted in recesses as 287 in the carrier bars 252 and 253 and are acted on by springs as 288 to have the device engaging faces 285a and 286a near the forward ends thereof urged upwardly above the upper edges of the carrier bars 252 and 253, respectively. The pawls 285 and 286 are spaced respectively forwardly of the pawls 281 and 282 in but a relatively small amount which is equal to the distance from the rear edge of a printing and control device disposed at position III to the point at which the printing and control devices pass from the guide through which they are advanced by the carrier bars 252 and

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253 to pass into the printing and control device discharge chute 346. When the carrier bars are moved rearwardly, the springs 288 yield to enable the pawls 285 and 286 to pass beneath the printing and control device which is at that time disposed in position III.

It will be understood that the pawls 281 and 282 and the pawls 285 and 286 are mounted in recesses in the respective carrier bars in which these pawls are to be mounted that correspond to the recess 274, Fig. 2, except that the pawls 281, 282, 285 and 286 are not arranged in the recesses therefor for longitudinal movement in these recesses. Thus insofar as these four pawls are concerned the rounded rear ends thereof which correspond to the rounded rear end 275a, Fig. 2, on the pawl 275 at all times rest in a rounded end as the end 274a of the recess 274, Fig. 2. Furthermore, each recess is equipped with lips like the overhanging lip 252a and the overhanging lip 252b, which serve the same functions as the lips 252a and 252b, it being understood that each pawl 281, 282, 285 and 286 includes a toe portion corresponding to the toe portion 275b and also that each of these pawls are urged upwardly by a spring like the spring 276. Since, however, the pawls 281, 282, 285 and 286 will not move beneath a stack of printing and control devices as the other pawls 275 and 277, it is not necessary that an arrangement such as the lug 280 and the notch 279 be provided since there will be no force acting on these pawls tending to displace the same when they are effective to advance a printing and control device engaged thereby.

The various pawls mounted in the carrier bars 252 and 253 have been described as being mounted in recesses in the carrier bars and pawls are in part retained in these recesses by plates as 289, Fig. 11 that are mounted on the inner faces of the carrier bars in alignment with the recesses in which the pawls are mounted. The plates as 289 serve to prevent inward movement of the pawls from the recesses and movement of the pawls outwardly from the recesses is prevented since the carrier bars 252 and 253 are mounted for sliding movement over and against the inner faces of the side plates 254 and 255 and the pawls engage the inner faces of these side plates.

As explained, during the course of the rearward movement of the carrier bars the pawls 281 and 282 are forced downwardly to ride under a printing and control device disposed at position II. When, however, in the course of the rearward movement of these pawls they are clear of and disposed behind the printing device in position II these pawls spring up behind the rear edge of such printing and control device under the effect of the springs as 284. In this regard, the extent of the rearward stroke in the reciprocatory movement of the carrier bars 252 and 253 is arranged to be sufficient to insure that not only will the printing and control devices be advanced from position II to position III in the advancing movement of the carrier bars but also to insure that the pawls 281 and 282 will be free to spring up behind a printing and control device disposed at position II. Thus, the amount of reciprocatory movement imparted to the carrier bars 252 and 253 in the present instance is equal to the distance from position II to position III plus such additional movement as will be required to insure that the pawls 281 and 282 will be free to operate to spring up to properly engage the rear edge of a printing and control device in position II, such

slight additional movement being what is termed in the art, an operative clearance.

From the foregoing description it will be apparent that the present invention materially simplifies the provision of printing device advancing pawls in printing machines of the aforesaid character, and it will further be apparent that the pawl arrangement herein discussed is simple and rugged in character.

It is also to be noted that while I have referred to the devices D herein as being printing and control devices, such devices could well be what are commonly known in the art as printing devices and these devices could bear either stencil printing means or embossed type characters or the devices could be of other form and constitute, for example, only control means rather than printing means or both printing and control means, insofar as the essential features of the present invention are concerned.

Thus, while I have illustrated and described a selected embodiment of my invention, it is to be understood that this is capable of variation and modification and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a printing machine, means affording a printing device guideway along which such printing devices may be advanced, a pair of carrier bars connected together in laterally spaced relation and supported and guided in said guideway for reciprocating movement, said carrier bars each having a plurality of elongated recesses formed in their upper edges and affording overhanging lugs at each end of each recess, a plurality of pawls, one of which is allocated to and disposed in each of the recesses, one end of each pawl and the corresponding end of the respective recess in which such pawl is mounted being formed to afford complemental arcuate surfaces affording a pivotal mounting for the pawl, spring means in each recess operable to pivot the related pawl upwardly, a lug formed on the other end of each pawl and disposed beneath the overhanging lug at the adjacent end of the related recess to limit upward pivotal movement of such pawl, and means including retaining plates on the inner side surfaces of said carrier bars operable to hold said pawls laterally in position in said recesses.

2. In a printing machine, means including at least one side rail and affording a printing device guideway along which printing devices may be advanced, advancing means including at least one carrier bar supported and guided on said side rail for reciprocating movement with the one side surface of said carrier bar slidably engaging a side surface of said side rail, said carrier bar having a plurality of elongated recesses formed in its upper edge and affording overhanging lugs at each end of each recess, a plurality of pawls, one of which is allocated to and disposed in each of the recesses, one end of each pawl and the corresponding end of the respective recess in which

such pawl is mounted being formed to afford complemental arcuate surfaces affording a pivotal mounting for the pawl, spring means in each recess operable to pivot the related pawl upwardly, a lug formed on the other end of each pawl and disposed beneath the overhanging lug at the adjacent end of the related recess to limit upward pivotal movement of such pawl, and means on the other side surface of said carrier bar operable to hold said pawls laterally in position in said recesses.

3. In a printing machine, a pair of laterally spaced side rails having means thereon affording slideways for embracing opposite edge portions of printing devices and along which such printing devices may be advanced, a pair of carrier bars connected together in laterally spaced relation and supported and guided on said side rails for reciprocating movement with the upper edges of said bars disposed adjacent to and just below the lower edges of the respective slideways and with the outer side surfaces of said carrier bars slidably engaging the inner side surfaces of said side rails, said carrier bars each having a plurality of elongated recesses formed in their upper edges and affording overhanging lugs at each end of each recess, a plurality of pawls, one of which is allocated to and disposed in each of the recesses, one end of each pawl and the corresponding end of the respective recess in which such pawl is mounted being formed to afford complemental arcuate surfaces affording a pivotal mounting for the pawl, spring means in each recess operable to pivot the related pawl upwardly into an upwardly projecting effective relation with respect to the carrier bar on which such pawl is mounted, a lug formed on the other end of each pawl and disposed beneath the overhanging lug at the adjacent end of the related recess to limit upward pivotal movement of such pawl, and means on the inner side surfaces of said carrier bars operable to hold said pawls laterally in position in said recesses.

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