Nov. 4, 1952 E. OSTWALDT 2,616,363

IMPRESSION CONTROL MEANS IN ADDRESS PRINTING MACHINES

Filed Oct. 25, 1949 3 Sheets-Sheet 1

Fig. 1

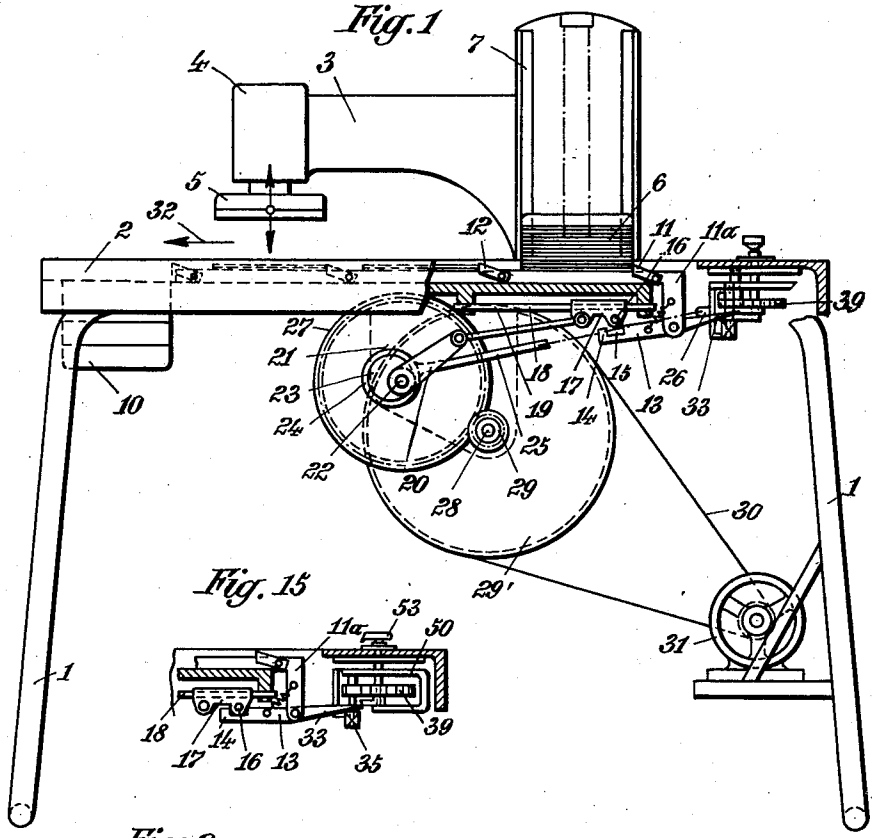
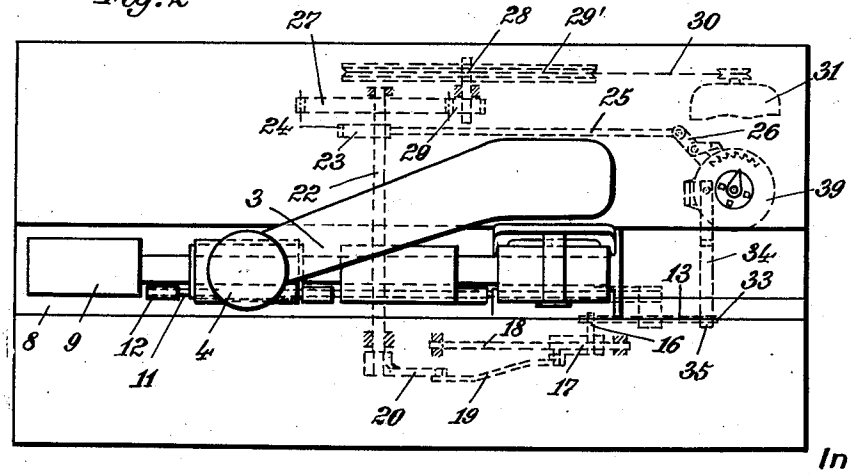


Fig. 15

Fig. 2



Inventor:
Erich OSTWALDT

by

Attorney

Nov. 4, 1952 E. OSTWALDT 2,616,363

IMPRESSION CONTROL MEANS IN ADDRESS PRINTING MACHINES

Filed Oct. 25, 1949 3 Sheets-Sheet 2

Fig. 3

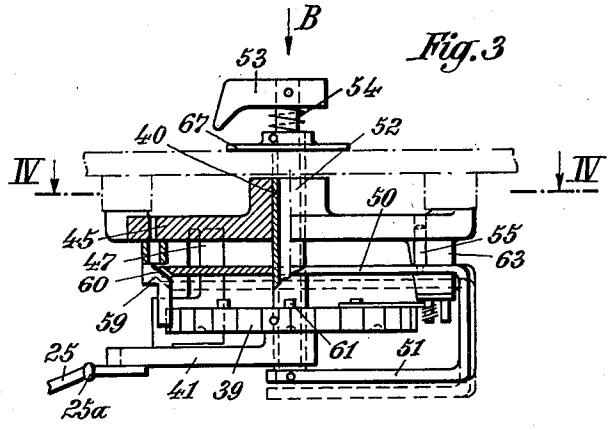


Fig. 4

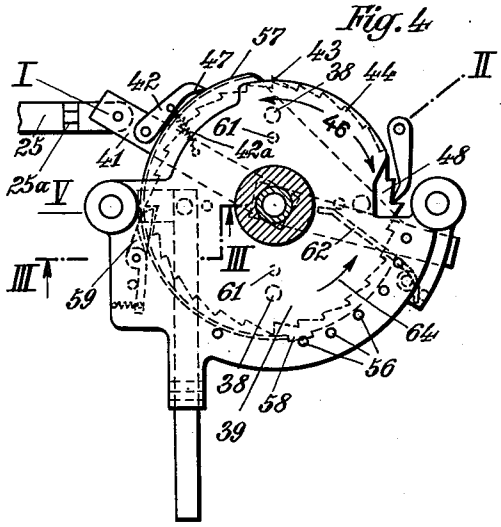


Fig. 5

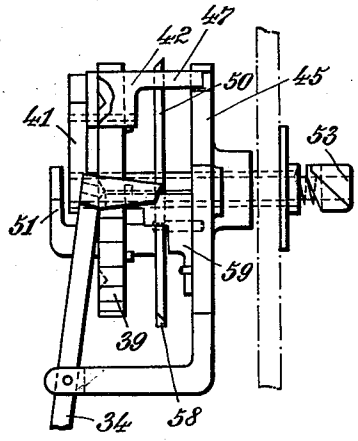


Fig. 6

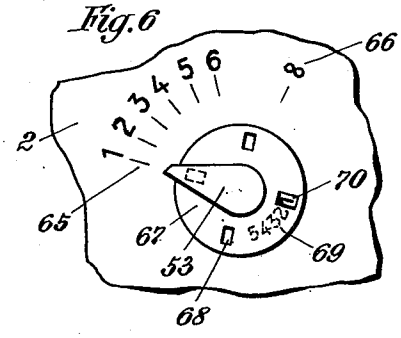
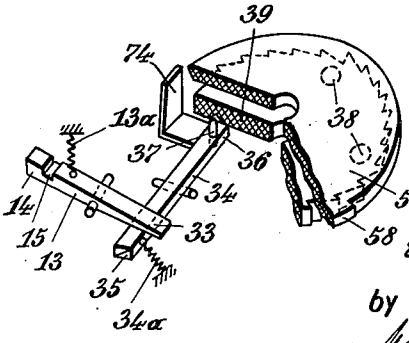


Fig. 14



Inventor:
Erich OSTWALDT

by

Attorney

Nov. 4, 1952 E. OSTWALDT 2,616,363

IMPRESSION CONTROL MEANS IN ADDRESS PRINTING MACHINES

Filed Oct. 25, 1949 3 Sheets-Sheet 3

Fig. 7

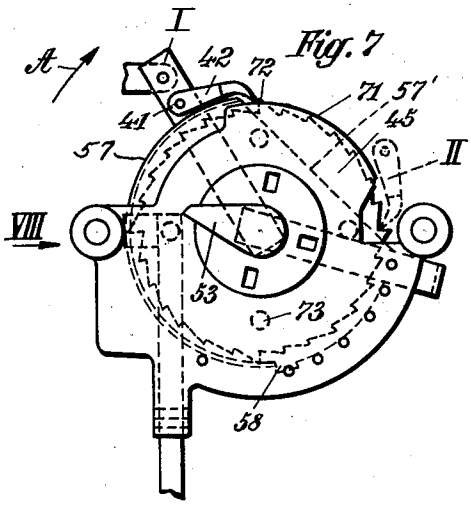


Fig. 11

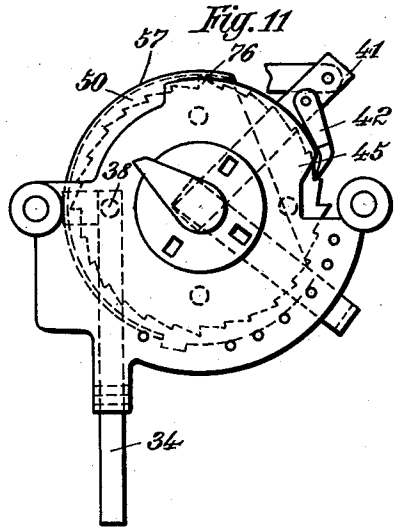


Fig. 8

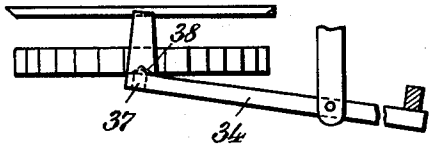


Fig. 9

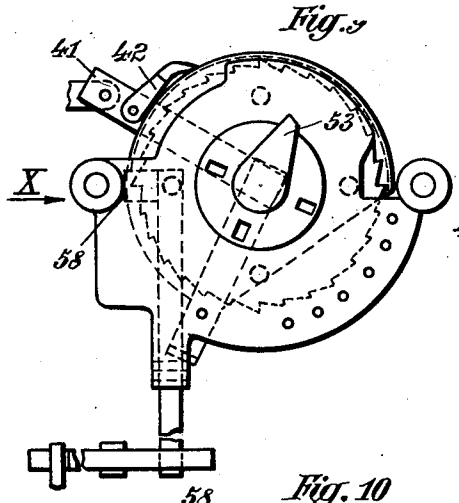


Fig. 12

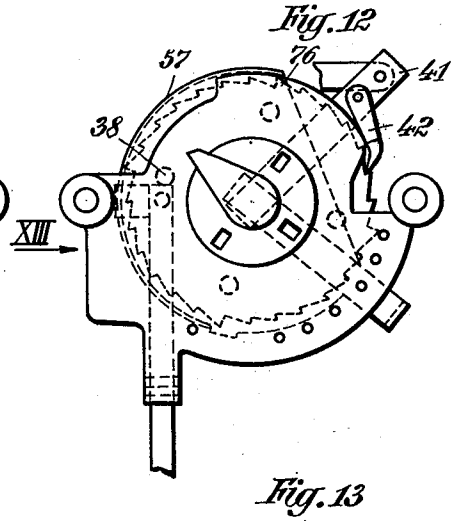


Fig. 10

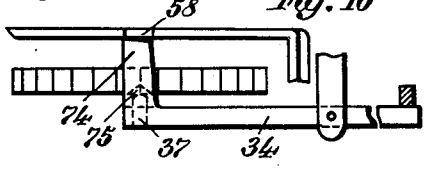
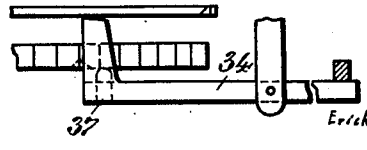


Fig. 13



Inventor
Erich OSTWALDT

by

Attorney

Patented Nov. 4, 1952

2,616,363

UNITED STATES PATENT OFFICE

2,616,363

IMPRESSION CONTROL MEANS IN ADDRESS PRINTING MACHINES

Erich Ostwaldt, Berlin-Hermsdorf, Germany, assignor to Adrema Maschinenbau G. m. b. H., Berlin, Germany

Application October 25, 1949, Serial No. 123,397
In Switzerland June 24, 1949

9 Claims. (Cl. 101—57)

1

This invention relates to printing machines, especially address printing machines, equipped with a conditioning mechanism for causing selectively one or more impressions to be made from a printing plate fed into printing position. In machines of this type the printing plates are ordinarily moved to the printing position in a step-by-step manner and an impression is made from the printing plate during an at rest interval in the step-by-step movement. It has already been suggested to provide a printing machine with a drum controlled in accordance with the working time of the printing process, said drum being provided with cams or the like so that, if desired, the printing plate brought into printing position is replaced by another one only after each second or third printing operation. This device has the disadvantage that the repetition of the printing operation cannot be interrupted. Furthermore, printing machines are known, wherein a cam drum actuated step-by-step returns into its position of rest after each series of prints. Such devices not only work noisily but also are subjected to disturbances owing to the return shock. According to another known embodiment a controlling ratchet-disc is provided with pins which may be rendered inoperative at will and may interrupt the feeding of the plates according to their position. This device has the drawback that, when changing the device to another number of impressions to be made, the previous adjustment must be rendered inoperative by a special operation.

An object of the invention is to provide an apparatus which is simple with respect to its construction as well as with respect to its operation and which permits any change of operation without additional manipulations.

The invention relates to a multiple printing machine provided with a controlling disc for the feeding or transporting device of the printing plates, said disc being toothed and being driven by means of a pawl by the drive of the machine by stages corresponding to the working time of the platen.

According to the invention the tooth formation of the controlling disc includes a big and small teeth, the big teeth initiating the feeding of the plates while the small teeth omit the feeding. The tooth formation is arranged on the outer edge of the controlling disc. According to the invention an adjustable device for covering the big teeth is provided by means of which the disc is brought into the position initiating a feeding, only after a number of intermediate steps have been made by the small teeth.

2

Other objects and structural details of the invention will be apparent from the following description when read in conjunction with the accompanying drawings forming part of this specification, wherein:

Fig. 1 is a front elevational view, partly in section, of an address printing machine according to the invention, the adjusting device for setting the number of impressions to be made from a printing plate being in the position for causing repeated impressions from a printing plate;

Fig. 2 is a top plan view of the machine according to Fig. 1;

Fig. 3 is a front elevational view of the adjusting device, in an enlarged scale, partly in section, according to line III—III of Fig. 4;

Fig. 4 is a sectional view of the device shown in Fig. 3 according to line IV—IV in Fig. 3;

Fig. 5 is a side elevational view of the device shown in Fig. 4, seen in the direction of the arrow V in Fig. 4;

Fig. 6 is a top plan view of a part of the table of the machine;

Fig. 7 is a top plan view similar to Fig. 4, the adjusting device being adjusted for making a single impression;

Fig. 8 illustrates the corresponding position of certain parts of the device shown in Fig. 7, seen in the direction of the arrow VIII in Fig. 7;

Fig. 9 is a top plan view similar to Fig. 4, the device being adjusted for making repeated impressions from a printing plate;

Fig. 10 illustrates the corresponding position of certain parts of the device shown in Fig. 9, seen in the direction of the arrow X in Fig. 9;

Fig. 11 is a top plan view similar to Fig. 4, during the first shifting the device being adjusted for making three successive impressions from a printing plate;

Fig. 12 is a top plan view similar to Fig. 11 during the second shifting of the device;

Fig. 13 illustrates the corresponding position of certain parts of the device shown in Fig. 12, seen in the direction of the arrow XIII in Fig. 12;

Fig. 14 shows some parts of the device shown in Fig. 7 in a perspective view partly in a section, and

Fig. 15 is a part of Fig. 1 showing the adjusting device in the position for making a single impression.

The address printing machine has a table or bed 2 supported by legs 1 and provided with a stationary printing arm 3, in the head 4 of which the platen 5 moves up and down. A container 7 capable of receiving a pile of printing plates 6 is arranged in front of the base of the print-

ing arm. The container is arranged above the right hand end (as viewed in Fig. 1) of a guiding track 8 embedded in the table. The guiding track extends below the platen 5 and terminates in an opening 9 through which the printing plates may fall into a receiver 10 after impressions have been made.

Below the guiding track 8 a feeding apparatus capable of feeding the printing plates is provided. This feeding apparatus consists of a slide bar 11 slidably arranged in the table for reciprocating movements in its longitudinal direction, said slide bar being provided with resilient noses or pawls 12 capable of engaging printing plates for moving same step-by-step along the track 8. The slide bar 11 has a downward extension 11*a* extending below the table and bearing a double-armed lever 13. The end 14 of this double-armed lever is provided with a recess 15 adapted to be engaged by a pivot 16 of a slide block 17 slidable along a guiding rod 18 fastened below the table. The slide block is connected with a crank 20 by means of a link 19, the crank being fastened on a shaft 22 journaled in the side walls 21 of the table. If the crank is rotated for one rotation the slide block is reciprocated once thereby driving the slide bar 11, provided, however, that the recess 15 of the double-armed lever 13 engages the pivot 16. By this movement all printing plates lying on the guiding track 8 and gripped by the noses or pawls 12 are advanced one step. This step is large enough to replace the printing plate lying below the platen 5 by the following one.

On the shaft 22 an eccentric 23 is mounted around which a sliding ring 24 of a crank rod 25 may rotate. The end of the crank rod 25 engages a crank of a multiple printing mechanism by means of which a predetermined number of impressions may be made from a printing plate being in an at rest position below the platen. This device forming the main object of the invention will be described in detail later on.

A gear 27 keyed to the shaft 22 is in mesh with a pinion 29 arranged on the main shaft 28 also supported by the side walls 21. The main shaft bears a pulley 29' driven by an electromotor 31 by means of a cone belt 30.

The platen 5 is driven by one of the shafts of the machine by means of a leverage not shown in the drawings. This drive, however, is not a feature of the invention and does not need to be described in detail. The drive of the platen is in such a relationship to the movement of feeding device of the printing plates that the slide bar 11 moves the printing plates one step during the downward movement of the platen. Care must be taken that the movement of the printing plates is finished shortly before the impression from the printing plate is made by the platen. During the upward movement of the platen the slide bar 11 returns to its initial position.

As will be readily understood from Fig. 1, the shiftable slide bar 11 performs a reciprocating movement, causing the feeding of the printing plates, only if the lever 13 is turned clockwise in such a way that the recess 15 engages the pivot 16 of the slide block 17. In that event the slide bar 11 advances in the direction of the arrow 32 and returns again if the crank 20 makes one complete revolution. When advancing each nose 12 drives the engaged printing plate in the direction of the arrow 32. When the slide bar 11 returns the noses or pawls 12 are released from the printing plates, return idly and grip the next printing plates respectively. If more than one impression are to be made from a printing plate the connection between the slide bar 11 and the slide block 17 is interrupted by bringing the lever 13 into the position shown in Fig. 1, wherein the recess 15 is out of engagement with the pivot 16 of the slide block 17. The slide block then reciprocates idly once if the crank 20 makes one revolution. As mentioned above, during each revolution of the crank 20 the platen 5 is reciprocated once, i. e. during each revolution of the crank 20 one impression is made from the printing plate.

The end 33 of the lever 13 opposite its end 14 is actuated by a double-armed lever 34 (Fig. 14) pivoted to the machine frame; the end 35 of said lever 34 is in engagement with the lower surface of the end 33 of the lever 13. The said lever 34 is provided at its end 36 with a projection 37. The levers 13 and 34 are under the action of springs 13*a* and 34*a* respectively. The projection 37 lies in the reach of holes 38 provided in a controlling disc 39 to be described later on. If the projection 37 can come into engagement with one of the holes 38 under the action of the spring 34*a* then the end 35 of the lever 34 is lowered so that it allows the lever 13 to be rotated by the spring 13*a* in clockwise direction whereby its recess 15 engages the pivot 16 of the slide block 17 (Fig. 15). If, however, the projection 37 cannot come into engagement with one of the holes 38 but abuts against the flat surface of the controlling disc 39 the lever arm 35 is raised. Thus the lever 13 is rotated in counter-clockwise direction into the position shown in Fig. 1 wherein the recess 15 is disengaged from the pivot 16 of the slide block 17 so that the slide bar 11 cannot participate in the movement of the slide block 17 and, consequently, the feeding of the plates is interrupted.

The device for adjusting the number of impressions to be made from the same printing plate containing the controlling disc 39 is illustrated in Figs. 3–5 showing three different views. The controlling disc 39 is fastened on a tubular member 40 rotatably supported by a plate 45 fixed on the lower side of table by means of screws. On the end of the tube 40 a crank 41 is loosely mounted, the outer end of which is connected by means of a ball joint 25*a* with the connecting rod 25. The crank is provided with a driving pawl 42 being under the action of a spring 42*a*. This pawl may engage teeth of a tooth formation provided on the circumference of the controlling disc 39, said tooth formation being composed of a plurality of big teeth 43 between which small teeth 44 of less depth but of the same circular pitch are arranged. According to the embodiment shown in the drawings the controlling disc has four big teeth 43 staggered for 90° relatively to each other. A hole 38 in the controlling disc 39 is coordinated to each of the big teeth.

The plate 45 is so shaped that it covers the small teeth 44 on the portion of the controlling disc designated by the double arrow 46. The driving pawl 42 is provided with a shoulder 47 engaging the rim of the plate 45. The plate 45 is provided with a recess 48 (Fig. 4) opposite the position II of the driving pawl 42 at the end of its stroke caused by the oscillating movement of the crank 41. Said recess 48 uncovers one big tooth and the last tooth of a series of small teeth, so that the driving pawl may engage a tooth when it reaches its end position II.

A further disc 50 is loosely arranged on the tube 40 concentrically with the controlling disc 39a. Said disc 50 has a U-like bent projection 51 the end of which is fastened on a rod 52 passing through the tube 40 and projecting over the table. A pointer-like handle 53 is fixed to the projecting end of the rod 52, so that the disc 50 may be readily adjusted by a rotation of the rod 52. A pressure spring 54 arranged between the table and the handle holds the rod 52 and, thus, the disc 50 fastened to the end of the rod in the position shown in Figs. 3 and 5. In this position a pin 55 (Fig. 3) fastened to the disc 50 engages one of the grooves or holes 56 (Fig. 4) provided in the plate 45. As best shown in Fig. 7, the disc 50 is in the shape of a segment of a circle, the circular edge 57 of which covers the big teeth and the small teeth arranged at the greater portion of the circumference of the controlling disc 39, while the recessed straight edge 57' of said disc 50 uncovers a portion of the tooth formation on the controlling disc 39 which is slightly larger than the row of teeth between two successive large teeth. A projection 58 is arranged on the circular circumference of the disc 50 for a purpose to be described hereinafter. When the shoulder 47 of the driving pawl 42 is in engagement with the circular portion 57 of the disc 50, as shown, for example, in Fig. 4, the pawl 42 is prevented from engagement with teeth covered by said circular portion.

A spring-loaded locking pawl 59 (Figs. 3 and 4) pivotally mounted on the plate 45 may engage teeth of the controlling disc 39. The pawl 59 is bent in such a manner and provided with an inclined surface 60 that a displacement of the disc 50 in the direction of the arrow B into the position shown by dotted lines by depressing the handle 53 causes a movement of the pawl 59 out of the path of the small teeth 44 of the tooth formation of the controlling disc 39 because the disc 50 presses away the pawl on its face 60. The pawl lies then only in the path of the big teeth 43.

The controlling disc 39 is provided with pins 61 the number of which corresponds to the number of the holes 38, the pins lying within the reach of a return spring 62 arranged on a projection of the plate 45. This return spring 62 becomes effective when upon depression of the handle 53 the disc 50 is brought into the position shown in dotted lines in Fig. 3 and, consequently, the locking pawl 59 is out of the path of the small teeth. The spring 62 tends to rotate the controlling disc 39 in the direction of the arrow 64 (Fig. 4) until the controlling disc 39 reaches its starting position upon engagement of the locking pawl 59 with one of the large teeth. The return spring 62 is so dimensioned that it jumps from one pin 61 to the next one if the controlling disc is turned through 90° in the clockwise direction.

According to the embodiment shown in the drawings the controlling disc has four big teeth staggered relatively to each other for 90° and six small teeth 44 are arranged between two successive big teeth. A device of this construction may be used for making repeated impressions or any predetermined number of impressions, between one and six, from the same printing plate.

For the purpose to adjust the device for a certain number of impressions, the positions into which the handle 53 is to be adjusted are marked on the table by graduations on the scale 65. A special position 66 corresponds to the adjustment for making repeated impressions from the same printing plate (Fig. 6).

On the portion of the tube 40 extending over the table 2 a cover plate 67 (Fig. 6) is fastened provided with four openings or windows 68 staggered relatively to each other for 90°. Through these windows 68 inscriptions 69 on the table become legible. Through the window 70 the number 1 is visible if the cover plate is adjusted into the position shown in Fig. 6.

Fig. 6 shows the handle or pointer 53 adjusted for making a single impression from each printing plate. The position of the other parts of the device shown in Figs. 7 and 8 corresponds to this position of the handle 53. The disc 50 connected with the handle 53 is in such a position, that the driving pawl 42 when moving around the axis of the device in the direction of the arrow A may engage the big tooth 72 projecting over the covering edge 71 of the plate 45. During a single revolution of the shaft 22 of the machine the driving pawl 42 executes an oscillation from the position I into the position II shown in dotted lines in Fig. 7 thereby driving the controlling disc 39 which then turns for 90°.

At the beginning of the revolution of the controlling disc the projection 37 engaged a hole 38 of the controlling disc, during the revolution the projection slides along the disc and engages at the end of the revolution the next hole indicated by the reference numeral 73 in Fig. 7. The lever 34 therefore occupies at the beginning of the shifting movement the same position as at the end of this movement (Figs. 8 and 14). In this position, shown in Fig. 15, the slide block 17 is coupled with the slide bar 11 by the pivot 16 engaging the recess 15, so that the slide block 17 moves to-and-fro together with the slide bar 11 for a stepwise feeding of the printing plates. During each following rotation of the shaft 22 the crank 41 executes a further oscillation through about 90° thereby rotating the controlling disc 39 through 90°. During each interval of rest one of the four holes 38 (Fig. 4) lies within the reach of the projection 37 so that the slide block 17 and the slide bar 11 remain in the coupled position. Therefore only a single impression is made from each printing plate.

In Figs. 9 and 10 the device is shown in such a position that repeated impressions are made from the same printing plate. The handle 53 is adjusted in this event to the marking 66 by pressing down, rotating and again releasing it (Fig. 6). Thereby the disc 50 has been brought into a position in which the rim 57 of the disc 50 covers the tooth formation of the controlling disc 39 along the entire effective length of the driving pawl 42. The projection 58 lies now in the reach of an angularly bent sheet metal 74 (Figs. 10 and 14) fixed on the end of the lever 34. It may be seen from Fig. 10 that the end of the angular sheet metal abuts against the projection 58 of the disc 50 thereby preventing the lever 34 from a motion producing the coupling although the pivot 37 lies in the reach of the hole 73. The lever 13 remains therefore in the position shown in Fig. 1, the slide bar 11 does not participate in the to-and-fro movement of the slide block 17 and no printing plate is fed. An unlimited number of impressions may be made from the printing plate being below the platen, until the handle 53 is adjusted to another position or the drive of the machine is interrupted.

The Figs. 11–13 show the device adjusted for making three impressions from the same printing

plate. In this event the handle 53 is adjusted to the numeral 3 (Fig. 6). As shown in Fig. 11, now the disc 50 is in a position wherein its circular rim portion 57 covers the big tooth 76 and the adjacent small tooth. Thus, the big tooth 76 is uncovered by the straight edge of the disc 50 and can be engaged by the driving pawl 42 only if the controlling disc 38 has executed two shifting steps by the small teeth 44 during two revolutions. As the recess 48 of the plate 45 uncovers only one of the small teeth the driving pawl 42 rotates during one oscillation the controlling disc 39 for one small tooth thereby bringing the hole 38 out of the reach of the pivot 37 of the lever 34. Fig. 11 shows the driving pawl 42 at the moment wherein it engages the space between two small teeth. Then, the driving pawl 42 shifts during its further movement the controlling disc for one tooth so that said disc is rotated for one tooth during one oscillation of the crank 41. The controlling disc then comes into the position shown in Fig. 12. As holes 38 for the projection 37 are only co-ordinated to the big teeth, the lever 34 remains after the shifting of the controlling disc 39 by the small teeth in a position wherein the slide bar 11 is disengaged from the slide block 17. During a second oscillation of the driving pawl 42 the controlling disc is again rotated for one tooth. Thereby the big tooth 76 becomes uncovered from the covering portion 57 of the disc 50 so that during the third oscillation of the crank 41 the driving pawl 42 engages the big tooth and moves the controlling disc into the position shown in Fig. 7. In that position the projection 37 may engage a hole 38 and may move the lever 34 into the position wherein the slide bar 11 is coupled with the slide block 17. Therefore three impressions have been made before the printing plates are forwarded for one step. By turning the pointer or handle 53 the disc 50 may be adjusted at will to any of the six numerals corresponding to the desired number of impressions.

As the covering plate 67 (Fig. 6) is mounted on the same tube 40 as the controlling disc 39 the covering plate moves stepwise in the same manner as the controlling disc. The numerals 69 arranged in a distance from each other corresponding to one step and being legible through one of the windows 68 indicate in consequence thereof how many prints have been made already.

What I claim is:

1. In a printing machine, the combination of: a reciprocable platen, a guiding track, a feeding mechanism for feeding successively printing plates along said guiding track into printing position below said platen, a driving shaft, driving means actuated by said driving shaft for reciprocating said platen and for actuating said feeding mechanism, disengageable coupling means interposed between said driving means and said feeding mechanism for interrupting the actuation of the latter upon disengagement of said coupling means, a rotatable controlling disc, a tooth formation on the circumference of said controlling disc, said tooth formation including a plurality of equally spaced large teeth and a row of small teeth in each space between successive large teeth, a driving pawl actuated by said driving shaft for movements along a feeding path, said driving pawl being capable of engagement with teeth of said controlling disc, a stationary member covering said small teeth with the exception of one small tooth located at the end of the feeding path of said driving pawl, a rotatable selector plate substantially in the shape of a segment of a circle, said selector plate being manually settable in selective positions for permitting one or more impressions to be made from a printing plate being in printing position, said selector plate uncovering the first large tooth in the feeding path of the driving pawl when set for permitting a single impression to be made, said selector plate covering said first large tooth and at least one adjacent small tooth in the feeding path of said driving pawl when set for permitting a predetermined number of impressions to be made, said selector plate covering all teeth in the feeding path of said driving pawl when set for permitting an unlimited number of impressions to be made, and control means actuated by said controlling disc and operatively engaged with said coupling means for disengaging the latter in response to predetermined position of said controlling disc.

2. In a printing machine as claimed in claim 1, said selector plate being in coaxial alignment with said controlling disc, and a handle connected with said selector plate for setting same by hand.

3. In a printing machine as claimed in claim 1, a tube carrying said controlling disc, a rod rotatably inserted into said tube, a supporting arm connected with one end of said rod, said supporting arm carrying said selector plate, a handle connected with the other end of said rod, and a scale, said handle being arranged in cooperative relationship to said scale.

4. In a printing machine as claimed in claim 1, said selector plate being axially displaceable, a spring operatively engaged with said selector plate, a locking pawl mounted on said stationary member for engagement with teeth of the controlling disc so as to prevent same from a return movement, an inclined surface on said selector plate, and means for axially displacing said selector plate against the action of said spring, said inclined surface engaging said locking pawl during an axial displacement of said selector plate whereby said locking pawl is brought out of the path of the small teeth but not out of the path of the large teeth.

5. In a printing machine as claimed in claim 1, said selector plate being axially displaceable, a spring operatively engaged with said selector plate, a locking pawl mounted on said stationary member for engagement with teeth of the controlling disc so as to prevent same from a return movement, an inclined surface on said selector plate, means for axially displacing said selector plate against the action of said spring, said inclined surface engaging said locking pawl during an axial displacement of said selector plate whereby said locking pawl is brought out of the path of the small teeth but not out of the path of the large teeth, a pin being associated with each large tooth of the controlling disc, and a resilient arm mounted on said stationary member, said resilient arm being arranged for engagement with one of said pins so as to return said controlling disc upon an axial displacement of said selector plate into its initial position determined by an engagement of said locking pawl with a large tooth.

6. In a printing machine as claimed in claim 1, said control means comprising a double-armed lever, said controlling disc having a number of recesses equal to the number of large teeth and arranged radially in relation to the latter, and a

projection arranged on one end of said double-armed lever capable of engagement with one of said recesses, the other arm of said double-armed lever being in operative engagement with said coupling means for disengaging same when said controlling disc is out of engagement with a recess of the controlling disc.

7. In a printing machine as claimed in claim 1, said control means comprising a double-armed lever, an extension arranged on said selector plate, and a projecting arm arranged at one end of said double-armed lever, the other arm of said double-armed lever being in operative engagement with said coupling means, said extension of the selector plate coming into abutting engagement with said projecting arm for swinging said double-armed lever so as to cause a disengagement of said coupling means by the other arm of said double-armed lever when the selector plate is set for permitting repeated impressions.

8. In a printing machine as claimed in claim 1, said control means comprising a double-armed lever, said controlling disc having a number of recesses equal to the number of large teeth and arranged radially in relation to the latter, a projection arranged on one end of said double-armed lever capable of engagement with one of said recesses, an extension arranged on said selector plate, and a projecting arm arranged at said one end of the double-armed lever, the other arm of said double-armed lever being in operative engagement with said coupling means, said other arm of the double-armed lever being swung into position for causing a disengagement of said coupling means when said controlling disc is in a position wherein said projection is out of engagement with a recess of the controlling disc, and said extension of the selector plate coming into abutting engagement with said projecting arm for swinging said double-armed lever so as to cause a disengagement of said coupling means by the other arm of said double-armed lever when the selector plate is set for permitting repeated impressions.

9. In a printing machine as claimed in claim 1, a tube carrying said controlling disc, a cover plate mounted on the upper end of said tube, said cover plate being provided with at least one window, and a scale comprising a sequence of members arranged below said plate, the members of said scale becoming visible through said window upon rotation of said controlling disc so as to indicate the numbers of intermediate steps performed by said controlling disc.

ERICH OSTWALDT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,696,759	Geiger	Dec. 25, 1928
1,717,231	Krell	June 11, 1929
1,960,948	Long	May 29, 1934
1,982,374	Colyer	Nov. 27, 1934
1,992,663	Gollwitzer	Feb. 26, 1935
2,077,965	Smith	Apr. 20, 1937