Aug. 9, 1932. M. J. HOFFMAN 1,871,060

PRINTING DEVICE

Filed Jan. 22, 1931 3 Sheets-Sheet 1

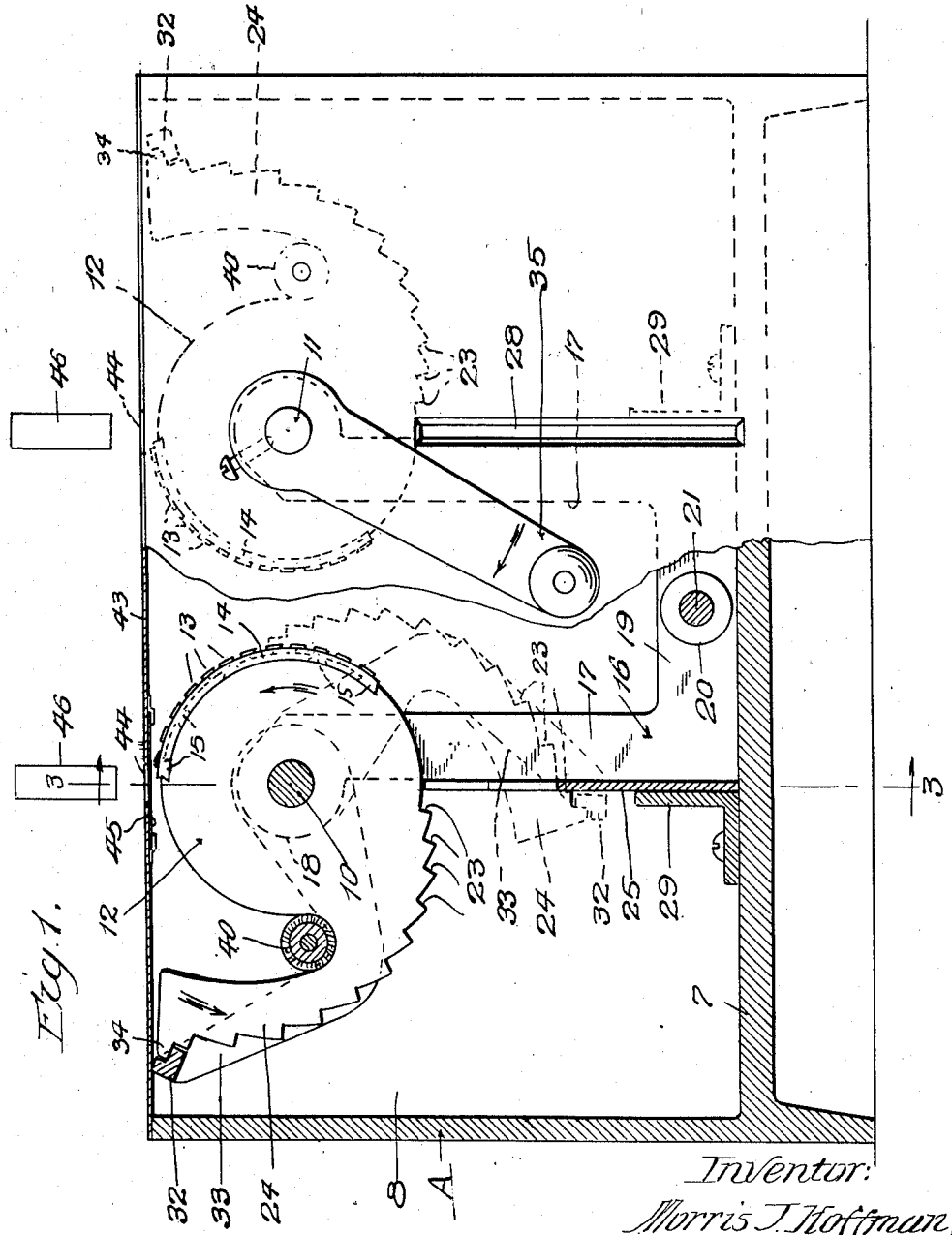


Fig. 1.

Inventor:
Morris J. Hoffman,
By Charles O. Sherway
His Atty.

Aug. 9, 1932. M. J. HOFFMAN 1,871,060

PRINTING DEVICE

Filed Jan. 22, 1931 3 Sheets-Sheet 2

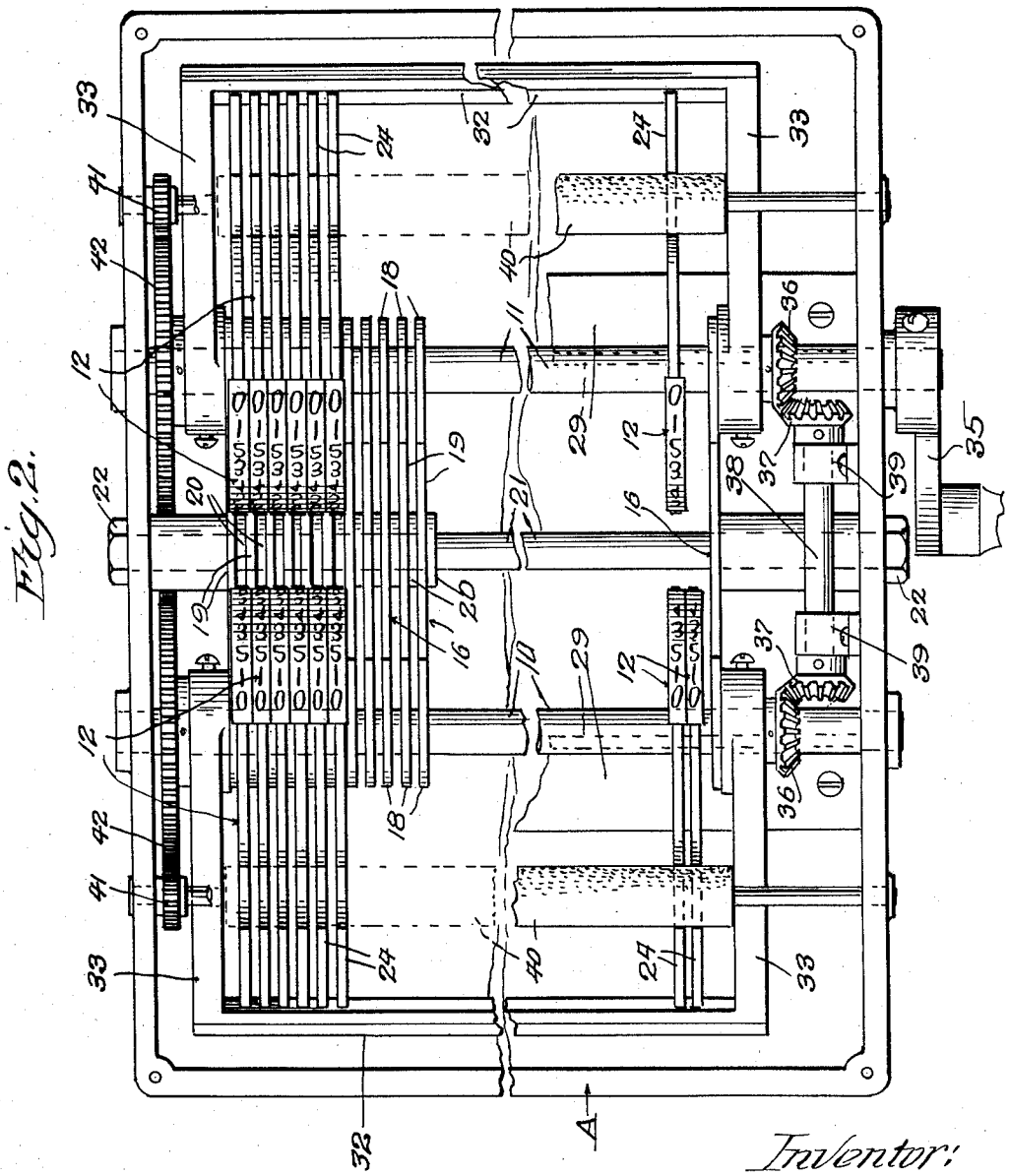


Fig. 2.

Inventor:
Morris J. Hoffman,
By Charles O. Skowron
His Atty.

Aug. 9, 1932. M. J. HOFFMAN 1,871,060

PRINTING DEVICE

Filed Jan. 22, 1931 3 Sheets-Sheet 3

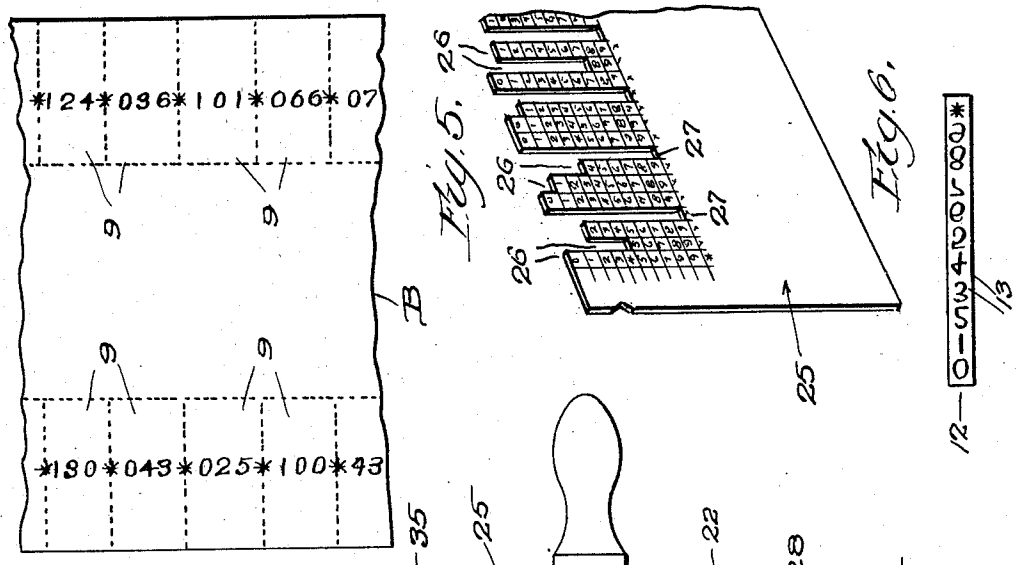


Fig. 5.

Fig. 6.

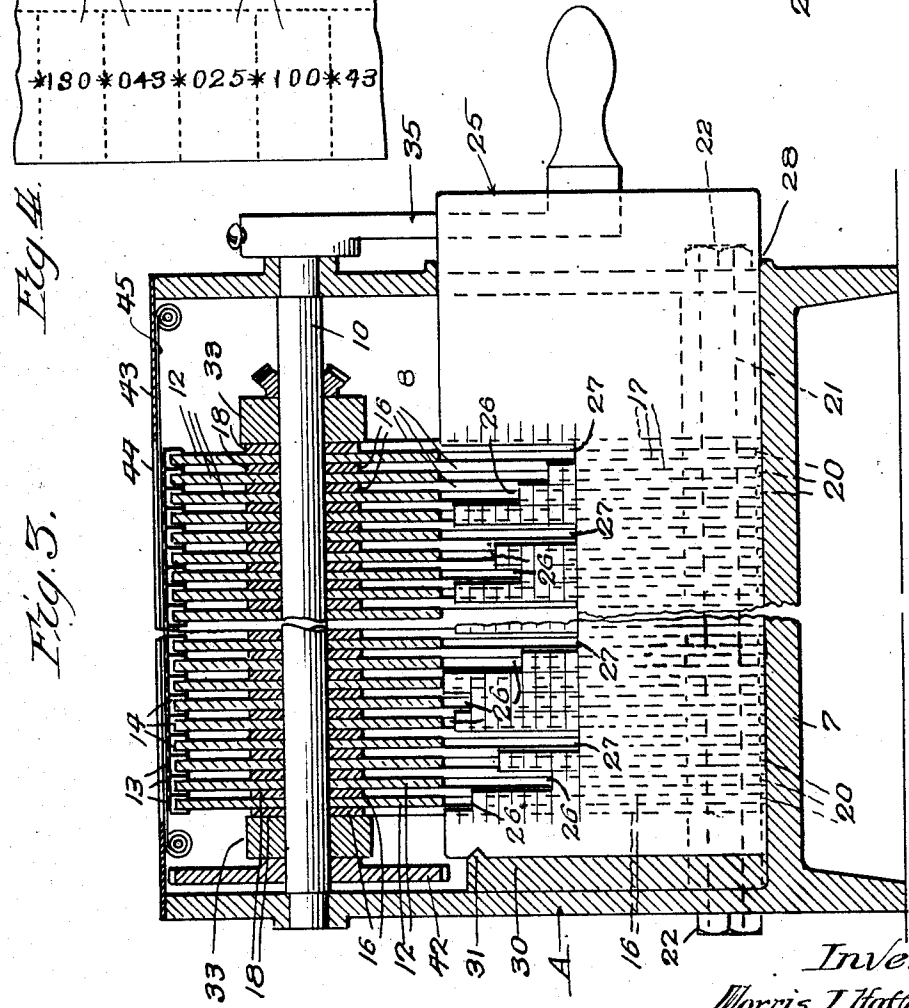


Fig. 4.

Fig. 3.

Inventor:
Morris J. Hoffman.
by Charles G. Shurcy
his Atty

Patented Aug. 9, 1932 1,871,060

UNITED STATES PATENT OFFICE

MORRIS J. HOFFMAN, OF CHICAGO, ILLINOIS

PRINTING DEVICE

Application filed January 22, 1931. Serial No. 510,394.

This invention relates to printing devices, and its principal object is the provision of simple and novel means for quickly setting up selected type characters into printing position, so that one or more numbers or words may be printed therefrom. Another object is to provide in a printing device an index plate, whereby the members bearing the type characters may be automatically stopped at their proper position to present the selected type characters in printing position.

Another object is to provide a series of disk-like printing members placed side by side and having type characters disposed on their peripheries and having also means cooperating with an index plate for locating the selected type characters in printing position.

Other objects and advantages will appear in the course of the specification, and with all of the objects and advantages in view, this invention consists in the several novel features hereinafter fully set forth and claimed.

The invention is clearly illustrated in the drawings accompanying this specification in which—

Figure 1 is a view, partly in front elevation and partly in vertical longitudinal section, of a printing device embodying a simple form of the present invention;

Fig. 2 is a plan partly broken away with the top plate of the device removed;

Fig. 3 is a vertical cross section taken on the line 3—3 of Fig. 1;

Fig. 4 is a fragmental face view of a coupon ticket illustrating data printed thereon by the printing device;

Fig. 5 is a fragmental perspective view of one of the index plates used in the device; and

Fig. 6 is a diagrammatic view illustrating a suggested series of type characters that may be employed on the printing members.

Referring to said drawings, which illustrate one embodiment of the present invention, the reference character A designates a case, preferably of rectangular form, having a bottom 7 above which is a compartment 8 for receiving the operating mechanism of the device.

In its present form, the invention has been applied to a device for printing data upon a coupon ticket B (see Fig. 4) such as is used for keeping a record of a workman's time upon articles of manufacture, tickets of this kind having a plurality of coupons 9 disposed along the side edges of the ticket and adapted to be torn therefrom. The coupons represent the price to be paid for the work done upon the article of manufacture, and the prices to be paid the several workmen are printed by the present invention upon the two rows of coupons.

Journaled in the case A are two rock shafts 10 and 11 which extend parallel with each other and are spaced apart a distance equal to the distance between the lines upon the two rows of coupons where the printing is to be done. Upon each rock shaft is rotatably mounted a series of relatively thin disk-like printing members 12, each disk portion having disposed upon a portion of its periphery type characters 13, such as the digits 0 to 9, and a star or blank space or type characters for printing the letters of the alphabet may be provided. As a preference, the type characters are provided upon a marginal flange 14 which may be cast upon the disk portions. When a cast metal flange is employed for the type characters, the flange and disk are preferably provided with interlocking tongue and slot connections 15.

The disk-like parts of the printing members 12 being narrower than the flanges which contain the type characters are held in spaced relation by spacers 16 which may be in the form of upright members 17 having enlarged circular apertured portions 18 at their upper ends which encircle the shafts 10 and 11. The upright members 17 may extend down to the bottom 7 of the case and may be connected by horizontal portions 19 at their lower ends which are spaced apart by washers 20 through which extends a rod 21 which is mounted in the walls of the case and is secured thereby as, for instance, by nuts 22 upon the outer end of the rod. The washers 20 space apart the spacers 16, thereby permitting the printing members 12 to rotate freely between the spacers.

Each printing member 12 is formed with stepped shoulders 23 disposed along a curved line which is eccentric with respect to the axis of rotation of the printing member, said shoulders being shown as formed upon a tail 24 that extends from the disk-like part of the printing members. Co-operating with the stepped shoulders of the printing members 12 of each series is an index plate 25 which may be in the form of a flat plate having notches 26 and 27 extending in from one edge and arranged to align with the disk-like portions of each series of printing members. In the front wall of the case below the two series of printing members are slots 28 through which the index plates 25 may be inserted into the interior of the case below the printing members.

The upright edges of each series of spacers 16 coincide with one edge of an associated slot, and coinciding with the other edge of the slot is the face of a guide member 29, here shown in the form of an angle iron bar secured to the bottom 7, the upright flange of which co-operates with the adjacent edges of the spacers 16 to form a guideway for receiving and guiding the index plate to its operating position in the device. Said spacers and angle iron bar act to form lateral supports for the index plates, whereby the same are held in upright position under the printing members 12.

A back stop or other abutment member 30 may be provided at the rear wall of the device for determining the position of the index plates under the printing members 12 so as to bring the notches of said index plates into alignment with the associated printing members. The upper end portions of the notches of the index plates provide shoulders or stops against which the shoulders 23 on the printing members are adapted to strike whenever the printing members are permitted to turn upon the shafts 10 and 11. To insure the proper placing of the index plate in the guideway, the back stop 30 may be provided with a tapered lug 31 adapted to enter a notch formed in the end edge of the index plate.

The type characters of each printing member 12 are spaced equi-distantly along the circumference of the disk-like portion thereof and the shoulders 23 are spaced apart so as to correspond with the spacing of the type characters; that is to say, the angular distance between the shoulders 23 is the same as the angular distance between the type characters. The stepped arrangement of the shoulders provides positioning means co-operating with the notched index plate to locate any selected type character in printing position when the shoulder corresponding to said type character strikes the index plate.

The depth of the notches in the index plate determine the positions at which the printing members stop. For instance, in the form of index plate shown, the upper edge portion of the plate forms the stop against which the innermost shoulder 23 of any printing member will stop, and in the present case it stops the printing member at the place where the character "0" stands in printing position. A notch whose depth equals the width of the innermost shoulder 23 permits that shoulder to pass the index plate, but the upper edge portion of the notch arrests the second shoulder 23 in the series, thereby stopping the printing member at the place where the type character "1" stands in printing position.

It will be observed, therefore, that the depth of the cut away or notched portion of the index plate for any selected type character is sufficient to permit all of the shoulders 23 to pass through the notch which precede the shoulder corresponding to the selected type character. The index plates may be ruled, as indicated in Figs. 3 and 5, to show the depths for the various notches and may contain characters corresponding to the characters on the printing members so as to aid the workmen in cutting out the notches of the index plates.

Each of the printing members may contain a blank space or a star, asterisk, or the like, which may be used for the purpose of spacing the numbers printed, and for the purpose of illustrating the invention, each fourth notch 27 in the index plate is made of a depth to stop the associated printing members at the place where the star or asterisk stands in printing position. The fragment of the coupon ticket illustrated in Fig. 4 shows two rows of numbers printed upon the coupons with the star or asterisk intermediate and spacing the numbers on the respective coupons. The index plate may be cut out or notched to print any set or combination of characters desired with as many digits in the numbers printed as are necessary. In establishments where the prices remain fixed for the various operations and there are several schedules of prices, the required number of properly cut out index plates may be kept on hand, and when the fixed prices become altered, new plates may readily be cut out with suitable punching mechanism which, however, forms no part of the present invention.

The printing members 12 normally occupy an inoperative position and may move from such inoperative position to any selected printing position principally by gravity, or solely by gravity, the tails 24 serving to rotate the printing members upon their axes. A clearing device is provided for bringing each series of printing members back into inoperative position, and, as shown, the clearing device for each series comprises a bar 32 carried upon the ends of arms 33 which are rigidly mounted upon the rock shafts 10 and

11. The bars 32 form supports for the tails of the printing members, and, as shown, said tails may be provided with lugs 34 which rest upon the bars 32. A crank arm 35 is rigidly mounted upon one of the shafts 10 or 11 and provides means whereby the shaft may be rotated.

In printing devices where two series of printing members are employed, gearing is provided between the two shafts 10 and 11 for causing simultaneous rotation thereof, and one form of gearing may comprise beveled gears 36 on the shafts 10 and 11 and pinions 37 meshing with said beveled gears and mounted upon a shaft 38 journaled in bearing brackets 39 carried by a wall of the case. The gearing not only causes simultaneous rotation of the two shafts, but also causes them to rotate in reverse directions which enables the two series of printing members to be placed relatively close together.

In order to positively rotate the printing members 12, friction rollers 40 may be provided which extend parallel with the axes of the disk-like portions of the printing members and frictionally engage the peripheries thereof. The friction rollers may be in the form of rubber rollers, or cylindrical brushes, or the rollers may be covered with felt or other pliable material, so that the stopping of any of the printing members will not interfere with the continued rotation of the friction rollers. The friction rollers are journaled in the walls of the case and are geared to the shafts 10 and 11 as, for instance, by pinions 41 mounted on the shafts of the rollers and gear wheels 42 mounted on the shafts 10 and 11. The ratio of the gears is such that the surface speed of the friction rollers shall be substantially the same or slightly greater than that of the disk-like portions of the printing members.

The upper side of the case is covered by a plate 43 fastened to the case and having elongated slots 44 arranged in vertical alignment with the shafts 10 and 11, and through which the type characters on the printing members are exposed when brought into printing position. Any suitable means may be provided for making the impressions on the card which is to be printed, and conveniently ink ribbons 45 may be provided between the plate 43 and the printing members, and rollers or pressure pads 46 may be provided above the plate for pressing the card down upon the ink ribbons so as to receive the impressions from the type characters.

In the operation of the device, the proper index plates for setting up the selected type characters to print the required data on the card are inserted into the guideways of the device, and the crank arm 35 is then turned in the direction of the arrow in Fig. 1, thereby swinging down both clearing devices and permitting the printing members to rotate upon their axes until stopped by the shoulders thereof that strike against the upper edge portions of the notched out parts of the index plates which brings the corresponding selected type characters into printing position underneath the slots in the cover. When the friction rollers are employed, the latter are rotated through the instrumentalities of the shafts and the gearing between the rollers and shafts, and by reason of the friction applied to the edges of the disk-like parts of the printing members, the latter are positively rotated until arrested by the index plates. The card to be printed is then laid upon the cover and the impression making device is brought down upon the card, thereby causing an impression to be made thereupon by the type characters which have been brought into printing position.

To restore the printing members to inoperative position, the crank arm is turned in the reverse direction, whereby the clearing devices are swung upward. By reason of the engagement of the cross bars 32 with the tails 24 of the printing members, the latter are turned back to their normal position.

It will be understood that one series of the printing members may be employed in a printing device for printing a single row of characters, in which case the other series of printing members and the mechanism for operating them is omitted. It is also to be understood that any combination or group of characters may be set up with the index plate by forming the appropriate notches therein.

When used for printing coupon tickets, the device is usually combined with other printing mechanism for printing other data on the coupon ticket. One type of such printing mechanism is shown and described in my application for patent on coupon ticket printing machines, filed October 31, 1930, Serial No. 492,506. It is to be understood, however, that the printing mechanism associated with the present device may take various forms, and that the present device may be used alone or in association with other printing mechanism.

More or less variation of the exact details of construction is possible without departing from the spirit of this invention. I desire, therefore, not to limit myself to the exact form of the construction shown and described, but intend, in the following claims, to point out all of the invention disclosed herein.

I claim as new, and desire to secure by Letters Patent:

1. In a printing device, a series of printing members having spaced type characters thereon and stop shoulders thereon conforming to the spacing of the type characters in combination with an insertable and removable

index plate having shoulders thereon co-operating with the stop shoulders of said printing members to locate selected type characters thereof in printing position.

2. In a printing device, a series of printing members having spaced type characters thereon and stop shoulders thereon conforming to the spacing of the type characters in combination with a plurality of insertable and removable index plates, each having definitely located shoulders thereon co-operating with the stop shoulders of said printing members to locate selected type characters in printing position.

3. In a printing device, a series of rotatably mounted printing members having type characters circumferentially disposed thereon and provided with stepped shoulders corresponding in location with the location of the type characters on the printing members, in combination with an index plate having shoulders thereon co-operating with the shoulders on the printing members to locate the selected type characters in printing position.

4. In a printing device, a series of rotatably mounted printing members having type characters circumferentially disposed thereon, each printing member being provided with stepped shoulders eccentrically disposed with respect to the axis of rotation of the printing member, in combination with an index plate having shoulders thereon co-operating with the shoulder on the printing member to locate the selected type characters thereof in printing position.

5. In a printing device, a series of rotatably mounted printing members having type characters circumferentially disposed thereon, each printing member having a tail formed with stepped shoulders eccentrically arranged with respect to the axis of rotation of the printing member, said printing members acting to move the type characters to printing position by gravity, in combination with an index plate having means thereon co-operating with said stepped shoulders to locate selected type characters in printing position.

6. In a printing device, a series of rotatably mounted printing members, each having a disk-like part on which type characters are circumferentially disposed, and a series of stepped eccentrically disposed shoulders in combination with a friction roller engaging said disk-like parts, means for rotating said roller, and an index plate co-operating with said shoulders of the printing members to locate selected type characters in printing position.

7. In a printing device, a series of rotatably mounted printing members, each having a disk-like part on which type characters are circumferentially disposed, a series of stepped eccentrically disposed shoulders in combination with a friction roller engaging said disk-like parts, a crank arm, gearing for rotating said friction roller from said crank arm, and an index plate having shoulders co-operating with the shoulders on the printing members to locate selected type characters in printing position.

8. In a printing device, a series of rotatably mounted printing members comprising disk-like portions on which are circumferentially disposed type characters, and tails extending from the disk-like portions and formed with stepped shoulders corresponding in location with the location of the type characters on the disk-like portions, said printing members capable of occupying printing positions and an inoperative position, in combination with an index plate having means co-operating with the shulders on the tails of the printing members to locate selected type characters in printing position, and a clearing device engaging the tails of said printing members and operating to restore the printing members to their inoperative position.

9. In a printing device, a series of rotatably mounted printing members comprising disk-like portions on which are circumferentially disposed type characters, and tails extending from said disk-like portions and formed with stepped shoulders corresponding in location with the location of the type characters on the disk-like portions, said printing members capable of occupying printing positions and an inoperative position, in combination with an index plate having means thereon co-operating with the shoulders on the printing members to locate selected type characters in printing position, a rotable clearing device mounted to rotate on the axis of the printing members and adapted to restore the printing members to inoperative position, and a crank arm for manipulating said clearing device.

10. In a printing device, a series of rotatable printing members having disk-like portions provided with type characters on their peripheries and having also tails provided with stepped shoulders corresponding in location with the location of the type characters on the disk-like portions, a shaft on which said printing members are rotatably mounted, a clearing device fixedly secured to said shaft and having a bar supportingly engaging the tails of the printing members, and a crank arm connected to said shaft.

11. In a printing device, the combination of two spaced series of rotatable printing members having type characters circumferentially disposed thereon and provided with stepped shoulders corresponding in location with the location of the type characters on the printing members, rock shafts upon which said two series of printing members are rotatably mounted, gearing between said shafts for causing simultaneous rotation

thereof, clearing devices, one for each series of printing members, and mounted on an associated shaft, and index plates, one for each series of printing members, and having shoulders thereon co-operating with the shoulders on the printing members to locate the selected type characters in printing position.

12. In a printing device, the combination of two series of rotatable printing members having type characters circumferentially disposed thereon and provided with stepped shoulders corresponding in location with the location of the type characters on the printing members, two rock shafts on which said two series of printing members are rotatably mounted, gearing between said shafts for causing simultaneous rotation thereof, means for rotating one of said shafts, clearing devices, one for each series of printing members and mounted on an associated shaft, and having means supportingly engaging the stepped portions of the printing members, and index plates one for each series of printing members and having means co-operating with the shoulders on the printing members to locate the selected type characters in printing position.

13. In a printing device, a series of rotatable printing members having type characters circumferentially disposed thereon and provided with stepped shoulders corresponding in location with the location of the type characters on the printing members, a rock shaft on which said printing members are rotatably mounted, spacers interposed between said printing members and having upright portions forming one side of a guideway, a guide member forming the other side of the guideway, and an index plate slidably guided in said guideway and having shoulders thereon co-operating with the shoulders on the printing members to locate the selected type characters in printing position.

14. In a printing device, the combination of a series of rotatable printing members having type characters circumferentially disposed thereon and provided with stepped shoulders corresponding in location with the location of the type characters on the printing members, a shaft on which said printing members are rotatably mounted, upright spacing members interposed between said printing members and having portions surrounding said shaft, a guide member co-operating with said upright spacers to form a guideway, and an index plate slidably guided in said guideway and having shoulders thereon co-operating with the shoulders on the printing members to locate the selected type characters in printing position.

15. In a printing device, the combination of two series of rotatably mounted printing members having type characters circumferentially disposed thereon and provided with stepped shoulders corresponding in location with the location of the type characters on the printing members, shafts on which said two series of printing members are rotatably mounted, spacers interposed between said printing members and each having upright portions connected at their lower ends by a cross member, and index plates having shoulders thereon co-operating with the shoulders on the printing members to locate the selected type characters in printing position.

MORRIS J. HOFFMAN.