March 6, 1934. H. B. PHILLIPS 1,949,693

PRINTING FORM

Filed Aug. 18, 1930 3 Sheets-Sheet 1

Fig. 1

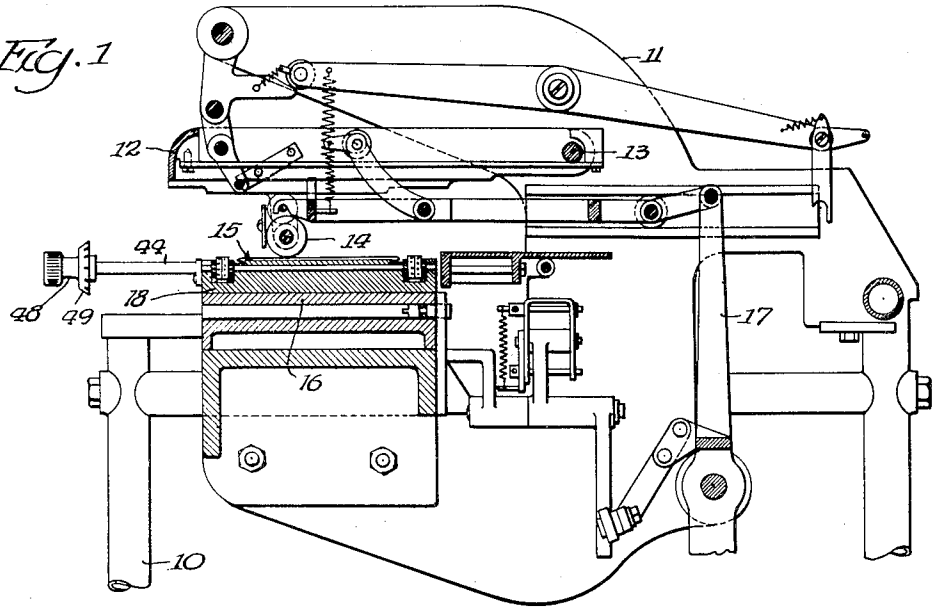
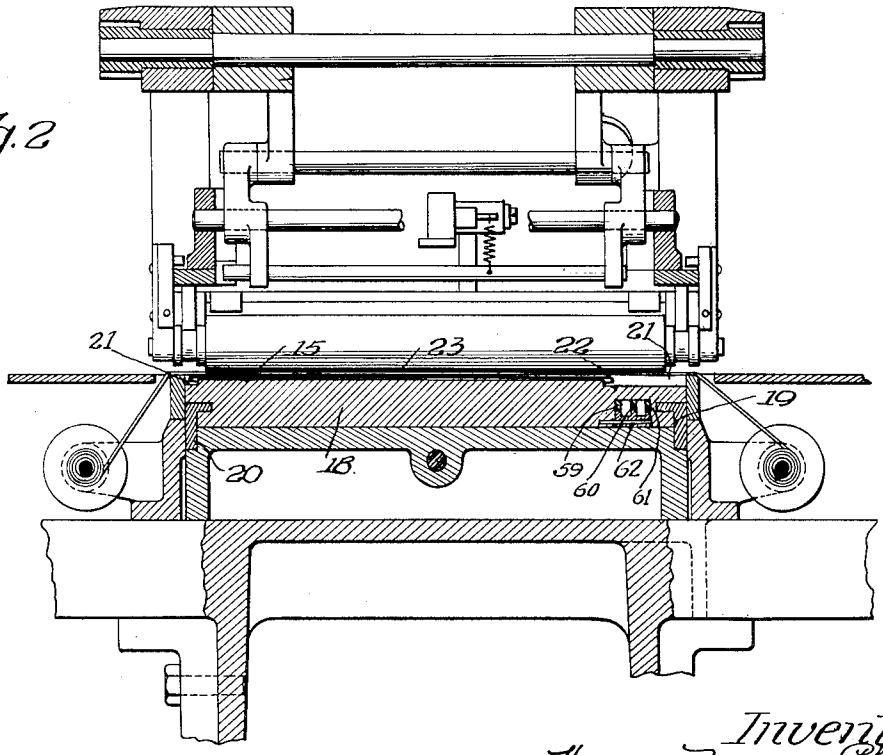


Fig. 2



Inventor.
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March 6, 1934. H. B. PHILLIPS 1,949,693

PRINTING FORM

Filed Aug. 18, 1930 3 Sheets-Sheet 2

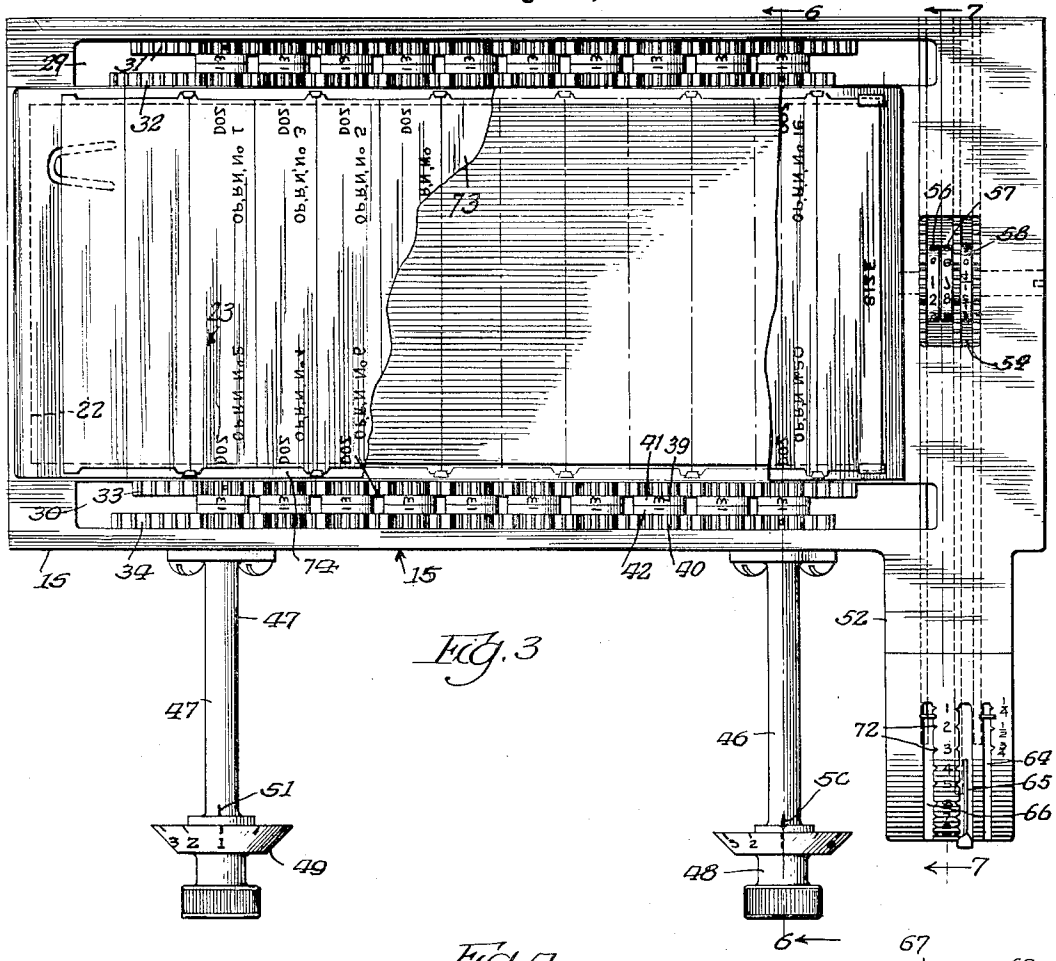


Fig. 3

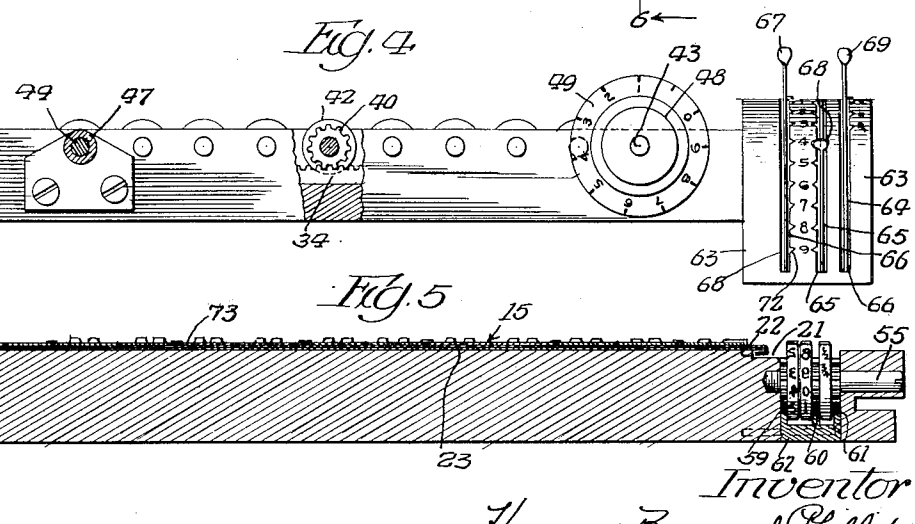


Fig. 4

Fig. 5

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March 6, 1934. H. B. PHILLIPS 1,949,693

PRINTING FORM

Filed Aug. 18, 1930 3 Sheets-Sheet 3

Fig. 6

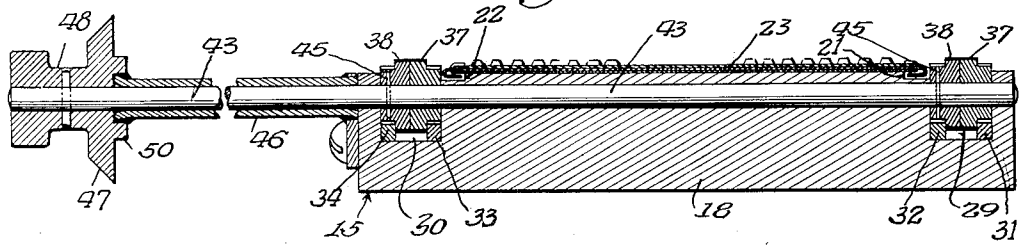
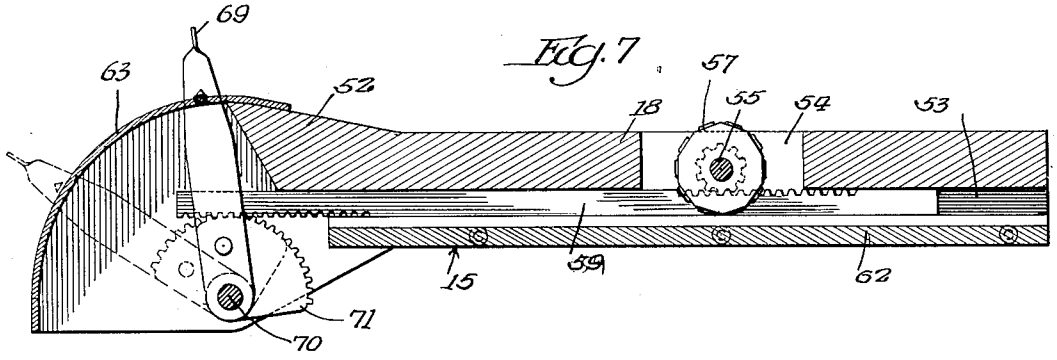


Fig. 7



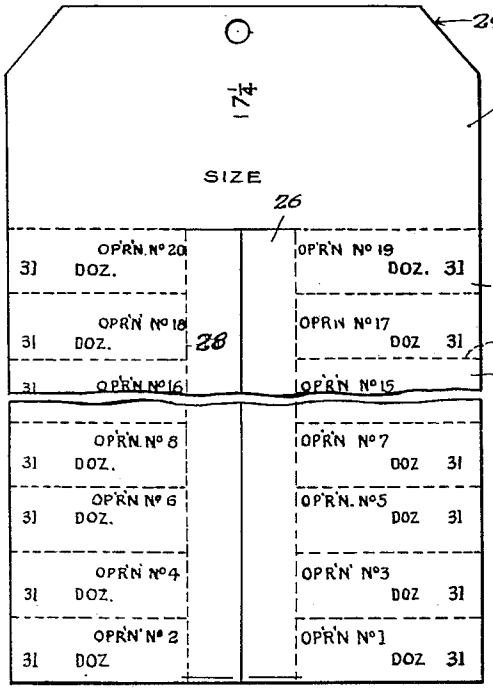
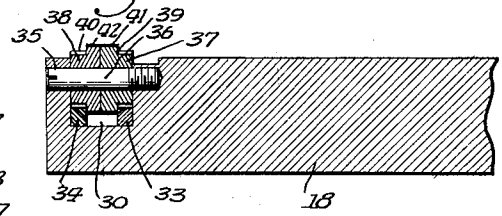


Fig. 9

Fig. 8



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Patented Mar. 6, 1934

1,949,693

UNITED STATES PATENT OFFICE

1,949,693

PRINTING FORM

Hervey Barnard Phillips, Albany, N. Y., assignor to Addressograph Company, Wilmington, Del., a corporation of Delaware

Application August 18, 1930, Serial No. 475,925

11 Claims. (Cl. 101—110)

This invention relates to printing devices and more particularly to printing devices which may be employed in the printing of forms embodying permanent and variable printed data.

While the invention is susceptible to many uses, an exemplary use of the invention is in the printing of factory production forms where, for example, certain jobs of a similar nature involve similar operations but which are manufactured in variable quantities and, for example, in different sizes. One use of such production forms is in the textile industries wherein one operation will involve cutting, another operation sewing, another operation the providing of buttonholes, and still another operation the sewing on of the buttons, and so on. Thus, for example, in the making of a shirt similar operations are performed on shirts of different sizes. Since similar operations are performed on each shirt, it is possible to make up a printing form having permanent data thereon which may be used in the printing of the factory forms needed in shirt manufacture. However, as the shirts are made in different sizes and in different quantities it is necessary that adjustable portions be provided to print this data. It is therefore one of the salient objects of my invention to provide a novel printing device embodying permanent printing devices and also embodying variable printing devices.

Other objects of my invention are to provide a printing device wherein the portions employed in the printing of permanent data are removable in order that other portions for printing other permanent data may be substituted therefor; to provide portions for printing the permanent data which may be constituted of metal plates having the printing characters embossed thereon; to provide devices for printing the variable data which may be readily adjusted; to provide devices for printing the variable data which may be expeditiously mounted in the machine and with which the permanent printing devices may be readily associated; to provide a plurality of devices for printing the variable data which may be uniformly adjusted so that all the devices will be arranged to print similar data; and to provide a printing device wherein independently adjustable devices may be provided for printing the variable data whereby variable data of different characteristics may be expeditiously printed.

A selected embodiment of the invention is illustrated in the accompanying drawings and therein

Fig. 1 is a side view partly in elevation and partly in section of a printing machine with which my improved printing device is associated;

Fig. 2 is a transverse sectional view of the machine and printing device illustrated in Fig. 1;

Fig. 3 is a top plan view of my improved printing device;

Fig. 4 is a side elevational view, in which certain parts are broken away, of the printing form illustrated in Fig. 3;

Fig. 5 is a sectional view taken substantially on the line 5—5 on Fig. 3;

Fig. 6 is a sectional view taken substantially on the line 6—6 on Fig. 3;

Fig. 7 is a sectional view taken substantially on the line 7—7 on Fig. 3;

Fig. 8 is a sectional view taken substantially on the line 8—8 on Fig. 3; and

Fig. 9 is a fragmentary elevational view of one of the articles printed by my improved printing device.

In the drawings my improved printing device is shown in connection with a printing machine of the kind disclosed in the application of Curtis George Kranz, Serial No. 434,964, filed March 10, 1930, and while I have shown the device in connection with such a machine, it is to be understood that the device is not limited to such usage as it may be used in connection with any printing machine of a kind similar to that disclosed. The printing machine disclosed embodies a frame 10. A suitable supporting structure 11 is carried by the upper end of the frame 10 and mounted thereon is a platen support, generally indicated by 12, that is pivotally mounted at 13 and which carries, through suitable devices, a roller platen 14 movable over the printing device, generally indicated by 15, arranged on the support 16 therefor that is carried by the frame 10, the platen 14 being operable by the operating lever 17 that is also mounted on the frame 10. The printing device 15 forms the subject matter of the present invention and in the present instance includes as a part thereof an anvil 18 having rabbeted grooves along the side edges thereof to receive portions of the plates 19 and 20 in order that the anvil 18 will be supported for movement to and from printing position, shown in Fig. 1. In the upper face of the anvil 18 about the edges thereof are grooves 21 defining shoulders 22 and rested on the upper surface is a printing form 23. The printing form 23 may be made in any desired manner, and it is this form that is used to print the permanent data on the articles to be printed in the machine. A typical article printed in the machine from the printing device 15 is illustrated in Fig. 9 and is indicated

by 24. This is a form which, for example, may be used in the textile industry and consists of a body having a head portion 25 and a medial portion 26 depending from the head 25, and outwardly of this medial portion 26 are the stubs 27 preferably joined together and to the medial portion 26 along the perforated lines 28 in order that the stubs 27 may be torn from the article 24. In the present instance each of the stubs 27 represents an operation, and these stubs are printed from the form 23 to carry the data, for example, "Op'r'n No. 1", "Op'r'n No. 2", and so on. In addition to the foregoing, each of the stubs 27 in the present instance have printed thereon the characters "Doz." which is manifestly an abbreviation for dozen and indicates a quantity, and it is to be understood that any other quantity designation might be used in place of dozen without purporting from the purview of the invention. On the head portion 25 the word "Size" appears, the utility of which is manifest, but it is to be understood that any other term might be used in place of "Size" as, for example, "Style" or the like. The portions for printing the variable data of my improved printing device are intended to cooperate with the characters "Doz." and "Size" on the form 24 and consists of the following mechanism: Along each of the side edges of the anvil 18 outwardly of and spaced from the shoulders 22, elongated recesses 29 and 30 are provided. Disposed in the recess 29 in juxtaposition to the side edges thereof are racks 31 and 32 and similar racks 33 and 34 are provided in the recess 30. Holes, such as 35, are drilled into the anvil 18 from the side edges thereof so as to have portions disposed on each side of the recess 30, as disclosed in Fig. 8, similar openings being provided in association with the recess 29. The portions of the openings 35 inwardly of the recesses are tapped to receive the screw threaded portions of the studs 36. Mounted on the studs 36 are the annular members 37 and 38, the combined width of which is equal to the width of the recess in which they are disposed, and preferably the members 37 and 38 are each equal to one-half the width of the recess.

The portions of the members 37 and 38 arranged on the studs 36 in the recess 30 aligned with the racks 33 and 34 are of reduced diameter and have gear teeth 39 and 40 provided thereon, and these gear teeth mesh with the racks 33 and 34 respectively. Inwardly of the gear teeth 39 and 40 the members 37 and 38 have unitary portions providing type wheels 41 and 42, the characters on these type wheels preferably being the units from 0 to 9, inclusive, arranged in a consecutive manner. As best illustrated in Fig. 3, a plurality of studs 36 and the cooperating members 37 and 38 are provided in each of the recesses 29 and 30. Each of the members 37 and 38 preferably have the gear teeth thereof meshed with the associated racks so that when the racks are moved to, in turn, move the members 37 and 38 similar type characters on the type wheels will be moved into vertical position on each of the members 37 and 38, that is, each of the members 37 engaged with a rack will synchronically move to properly position similar type characters in vertical position, as will each of the members 38. Thus, by moving any one of the racks all of the annular members engaged therewith will be similarly moved. As best illustrated in Figs. 3 and 6, the endmost of the studs 36 are supplanted by shafts 43 and 44 which extend through the anvil 18 and through the endmost of the members 37 and 38 disposed in both the recesses 29 and 30. The members 38 mounted on the shaft 43 are secured thereto by pins 45, or the like, while the members 37 are freely rotatable on the shaft 43. The members 37 on the shaft 44 are pinned or otherwise secured thereto, while the members 38 are rotatable thereon. Disposed about the shafts 43 and 44 are bearing sleeves 46 and 47, and these bearing sleeves and the shafts are preferably of a length sufficient to dispose the forward ends of the shafts adjacent the front of the machine, as illustrated in Fig. 1, when the anvil 18 is arranged in printing position. On the forward end of the bearing sleeves 46 suitable calibrated knobs 48 and 49 are provided and the calibrations thereon are adapted to register with suitable indices or the like 50 and 51 provided on the forward ends of the bearing sleeves 46 and 47, the calibrations on the knobs corresponding to the characters on the type wheel portions of the members 37 and 38. It is manifest from the foregoing description that the members 38 in each of the recesses 29 and 30 may be synchronically moved by gripping the knob 48 as both the knob 48 and the members 38 are connected to the shaft 43. Rotation of the knob 48 and therefore the shaft 43 causes the members 38 to be rotated and the gear teeth 40 of these rotated members 38 to mesh with and move the racks 32 and 34, and as the gear teeth 40 of the remaining members 38 mesh with these racks it is manifest that the other members 38 will be synchronically moved. Since the calibrations on the knob 48 are arranged to register with the index 50 in accordance with the type characters moved into upper vertical position on the members 38, it is manifest that any desired number of the type characters on the members 38 may be moved into upper vertical or printing position. Similarly by moving the knob 49 any one of the type characters on the members 37 is associated with the shaft 44 and the racks 31 and 33 in the same manner as that in which the members 38 are associated with the shaft 43 and the racks 32 and 34. The type characters on the members 37 and 38 print the characters appearing on the form 24 in association with the characters "Doz." In the present instance the device is arranged to print twenty stubs, such as 27, and this is the maximum number of stubs that may be printed when the device embodies the number of annular members 37 and 38, disclosed in the drawings. It is to be understood that any less number might be printed as may be desired, with the device arranged in the foregoing manner by merely utilizing the required number of members 37 and 38. If, however, more stubs 27 are to be printed, it will, of course, be necessary to provide additional members 37 and 38. An arrangement such as the foregoing may be provided to bring about the printing of the indicia to be associated with the word "Size" but in the present instance I have provided a somewhat different arrangement, and it is to be understood that, if desired, this different arrangement might be used to bring about the setting of the members 37 and 38. When the device is to be used for printing size, it is customary to provide three type wheels as size is indicated by ordinal numbers and fractions as, for example, 15½, 17¼, and so on. Adjacent one end of the anvil 18 on the edge thereof from which the shafts 43 and 44 extend is a boss 52 (Figs. 3 and 7). A groove 53 is cut in the lower face of the anvil 18 and extends transversely thereacross through the boss 52. Substantially midway between the positions of the recesses 29 and 30 an opening 54 is

provided which extends into the groove 53 and opens through the upper wall of the anvil 18. A stud 55, substantially similar to the studs 36, is extended from the end of the anvil 18 through the opening 55. Mounted on this stud are two members 56 and 57, substantially similar to the members 37 and 38, and arranged adjacent the member 57 is a similar member 58. The members 56, 57 and 58 each have portions thereon providing gear teeth which respectively mesh with the rack teeth provided on the upper edge of the bars 59, 60 and 61. The bars 59, 60 and 61 are retained in position by an E-shaped plate 62 closing the lower end of the groove 53.

Printing characters are arranged on the members 56 and 57 similar to the manner in which printing characters are arranged on the members 37 and 38, while on the member 58 printing characters such as ¼, ½, and so on are provided. Suitably secured to the boss 52 is a housing 63 which includes an arcuate wall having three slots 64, 65 and 66 therein. Extended through the slots 64, 65 and 66, respectively, are levers 67, 68 and 69 which are pivotally mounted on the shaft 70 carried by the depending side walls of the housing 63. Mounted on the shaft 70 adjacent each of the levers and respectively secured to each of the levers are gear segments 71, each of which gear segments mesh with rack teeth on the lower edge of the bars 59, 60 and 61. The portion of the housing 63 between the slots 64 and 65 has calibrations thereon corresponding to the type characters on the members 56 and 57 and in alignment with the calibrations and opening into each of the slots 64 and 65 are notches such as 72. Each of the levers 67 and 68 includes a projection which may be selectively engaged in any one of the notches 72, and the positioning of the levers in these notches determines the positioning of the printing characters on the members 56 and 57 in a vertical upright or printing position. Other calibrations and notches are provided for cooperation with the slots 66 so that the lever 69 may be properly positioned to position the type characters on the member 58 in upper vertical or printing position. To bring about the foregoing positioning of the type characters on the members 56, 57 and 58, the levers 67, 68 and 69 are respectively moved, which obviously moves the segment 71 connected to the moved lever, which segment meshes with the rack teeth on the lower edge of the bar which has the rack teeth on the upper edge thereof meshed with the gear teeth on the member to be positioned. It is, therefore, apparent that by properly positioning the levers the printing characters on the members 56, 57 and 58 may be arranged to print the proper characters in association with the word "Size" on the article 24. The operation numbers on the stubs 27 and the indicia, such as "Doz." and "Size", are printed from type characters which may be embossed on suitable plates, such as 73, mounted in a frame 74. These rest on the anvil 18 and include depending flanges that are disposed in the recesses 21 and abut the shoulders 22, this latter arrangement providing the printing form 23.

In use, the printing forms 23 will be made up containing the proper permanent data and the desired ones of these printing forms will be arranged on the anvil 18. By properly adjusting the knobs 48 and 49, in the present embodiment of the invention, the type characters for the proper quantities will be arranged in printing position and by adjusting the levers 67, 68 and 69 the proper printing characters for the size will be arranged in printing position. The anvil 18 will be arranged in printing position in the machine and a ribbon will be passed thereover and, if desired, a suitable mask may be arranged above the ribbon. The article to be printed will then be disposed over the mask and the platen 14 will be passed over this article and therefore the type characters on the printing plates 73 and the type characters on the members 37, 38, 56, 57 and 58 will act through the ribbon to print the indicia on the article. It is manifest that the printing form 23 may be replaced by another form whenever different articles are to be printed and it is also manifest that the variable printing data may be variably adjusted in the above described manner.

In the above description I have set forth the invention as used to print factory and industrial forms and set forth that the variable devices have been arranged to print size and quantities. This, however, is not to be taken as a limitation of the invention as it is merely an exemplary use and variable devices may be arranged to print any indicia that may be required. Further, the particular disposition of the variable printing devices may be varied in accordance with the requirements of the articles that are to be printed, the positions shown and described merely being an advantageous location.

While I have illustrated and described a selected embodiment of the 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 or additions as fall within the scope of the following claims.

I claim:

1. A printing device adapted for use in a printing machine and comprising a body having a flat face, a permanent printing form mounted on the flat face of said body and providing a flat printing surface and including a plurality of independent printing portions, variable printing members mounted in the body and respectively aligned with said independent printing portions, means interconnecting said variable printing members to permit adjustment thereof in groups, and means carried by said body for simultaneously adjusting all of the variable printing members of each group.

2. A printing device adapted for use in a printing machine and comprising a body having recesses therein along opposite edges thereof, a plurality of printing members rotatably mounted in said recesses and having type characters thereon movable into printing position on said printing device, movable means in said recesses interconnecting said printing members for simultaneous movement, and means for imparting movement to said movable members to move the type characters on said printing members into printing position.

3. A printing device adapted for use in a printing machine and comprising a body having a recess therein, a printing form mounted on said body adjacent said recess, a plurality of printing members rotatably mounted in said recess and having type characters thereon successively movable into printing relation with said printing form, a rack in said recess, gears connected to said members and meshing with said rack, and a shaft connected to one of said members whereby rotation of said shaft will move the member con-

nected thereto to move the rack and the other members through the gears connected thereto and meshing with said rack.

4. A printing device adapted for use in a printing machine and comprising a body having a recess therein and a groove extending from said recess, printing members rotatably mounted in said recess and having type characters thereon movable into a printing position, racks in said body and extending through said groove and past said recess, means on said members engaging said racks whereby said members are interconnected with said racks, levers, and means connecting said levers and said racks whereby movement of said levers will be imparted through said racks to move said printing members to position different type characters in printing position.

5. A printing device adapted for use in a printing machine and comprising a body having a recess therein and a groove extending from said recess, a permanent printing form mounted on said body, a plurality of printing members, means for rotatably supporting said printing members in said recess, type characters on said printing members, gears connected to said printing members, bars mounted in said groove and extending past said recess and having racks thereon meshed with the gears on said printing members, levers pivotally mounted in said body, racks on said bars adjacent corresponding ends thereon, and gears connected to said levers and meshing with the racks at the ends of said bars whereby movement of said levers will be transmitted to said printing members to move different type characters into printing position.

6. A printing device adapted for use in a printing machine and comprising a flat face having recesses opening thereinto adjacent the edges thereof, a printing form mounted on said flat face intermediate said recesses and providing a flat printing surface and including a plurality of independent printing portions, pins extending across said recesses in alignment with said independent printing portions, printing members mounted on said pins, type characters on said printing members, gears connected to said printing members, racks in said recesses and extending longitudinally thereof and meshed with the gears interconnected to said printing members, and means for simultaneously moving corresponding racks in each of said recesses whereby the printing members connected to said moved racks will be simultaneously moved to position type characters thereon in printing position with respect to the independent printing portions on said printing form.

7. A printing device adapted for use in a printing machine and comprising a flat face having recesses opening thereinto adjacent the edges thereof, a printing form mounted on said flat face intermediate said recesses and providing a flat printing surface and including a plurality of independent printing portions, pins extending across said recesses in alignment with said independent printing portions, printing members mounted on said pins, type characters on said printing members, gears connected to said printing members, racks in said recesses and extending longitudinally thereof and meshed with the gears interconnected to said printing members, and shafts at opposite ends of said recesses and having printing members in said recesses connected thereto through said gears connected to said shafts and meshing with corresponding racks in each of said recesses whereby rotation of said shafts will move said racks to simultaneously move all of the printing characters having gears meshed with the moved rack whereby similar type characters on said printing members will be moved into printing position relative to the independent printing portions on said printing form.

8. A printing device adapted for use in a printing machine and comprising a body having a flat face, a permanent printing form removably mounted on the flat face of said body and providing a flat printing surface and including a plurality of independent printing portions, variable printing members mounted in said body and aligned with said flat printing surface and the independent printing portions of said permanent printing form, and means for simultaneously adjusting said variable printing members.

9. A printing device adapted for use in a printing machine and comprising a body having a flat face, a permanent printing form mounted on the flat face of said body and providing a flat printing surface and including a plurality of independent printing portions, variable printing members mounted in said body and arranged in sets with a set thereof respectively aligned with each of said independent printing portions, means interconnecting corresponding printing members in each of said sets to permit adjustment thereof in groups, and means carried by said body for independently adjusting the groups of variable printing members.

10. A printing device adapted for use in a printing machine and comprising a body having a recess therein, a printing form mounted on said body adjacent said recess, a plurality of printing members rotatably mounted in said recess and having type characters thereon movable into printing relation with said printing form, a rack in said recess, means on said members engaging said rack whereby said members are interconnected by the rack, and means for imparting movement to said rack to simultaneously move said members.

11. A printing device adapted for use in a printing machine and comprising a body having a flat face, a permanent printing form mounted on the flat face of said body and providing a flat printing surface, means providing a variable printing form in alignment with said flat printing surface, means for operating said variable printing form and including a plurality of handles, and a member having a plurality of slots therein through which said handles are respectively extended, said member having notches therein opening into said slots and in which said handles may be seated to thereby retain the handles in selected positions, said slots being wider than said handles whereby said handles may be disengaged from said notches to permit movement thereof through said slots irrespective of said notches.

HERVEY BARNARD PHILLIPS.