Dec. 18, 1923. 1,478,030

F. DE MINICO

TYPOGRAPHIC EMBOSSING MACHINE

Filed Dec. 30 1921 3 Sheets-Sheet 1

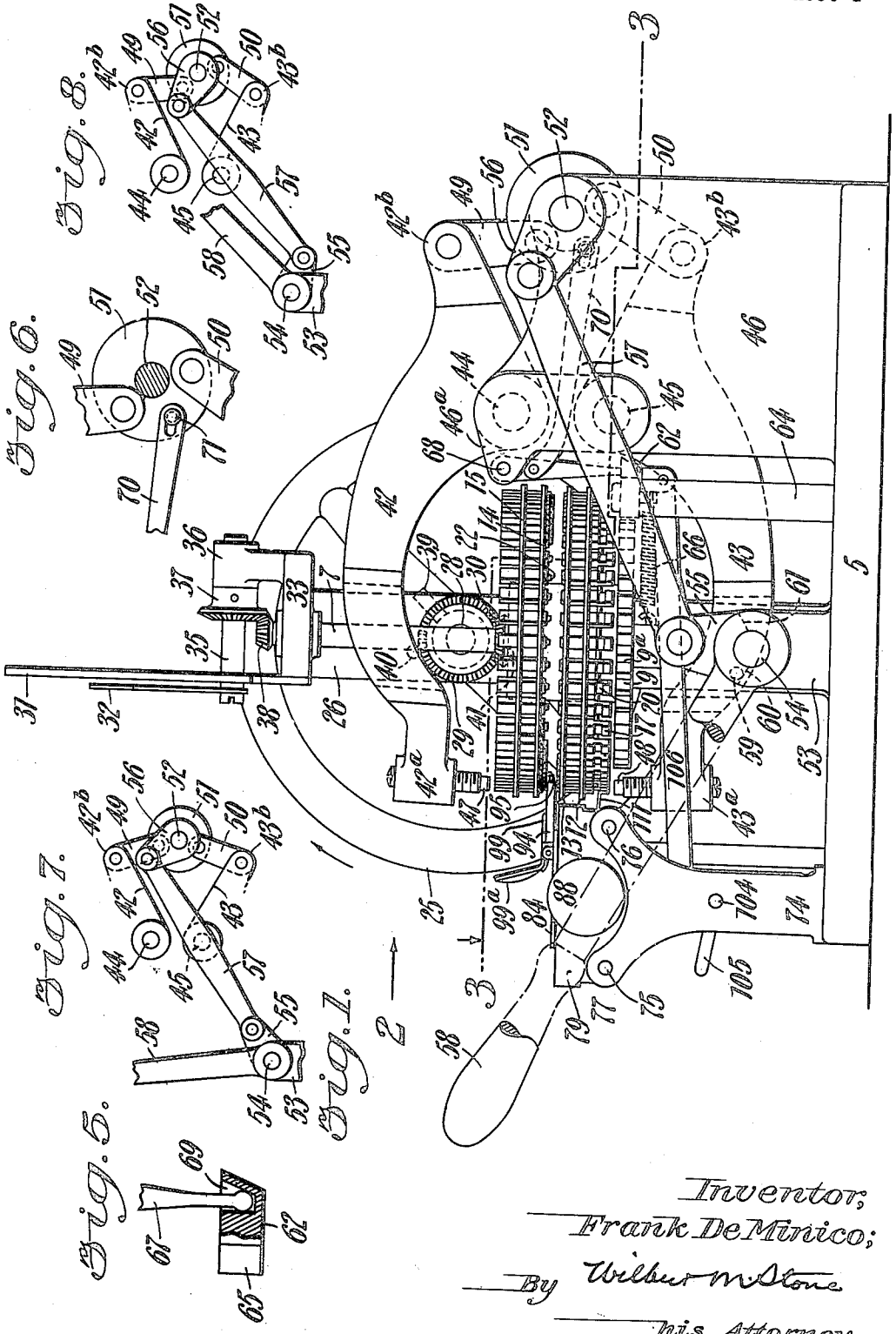


Fig. 8.

Fig. 6.

Fig. 7.

Fig. 5.

Fig. 1.

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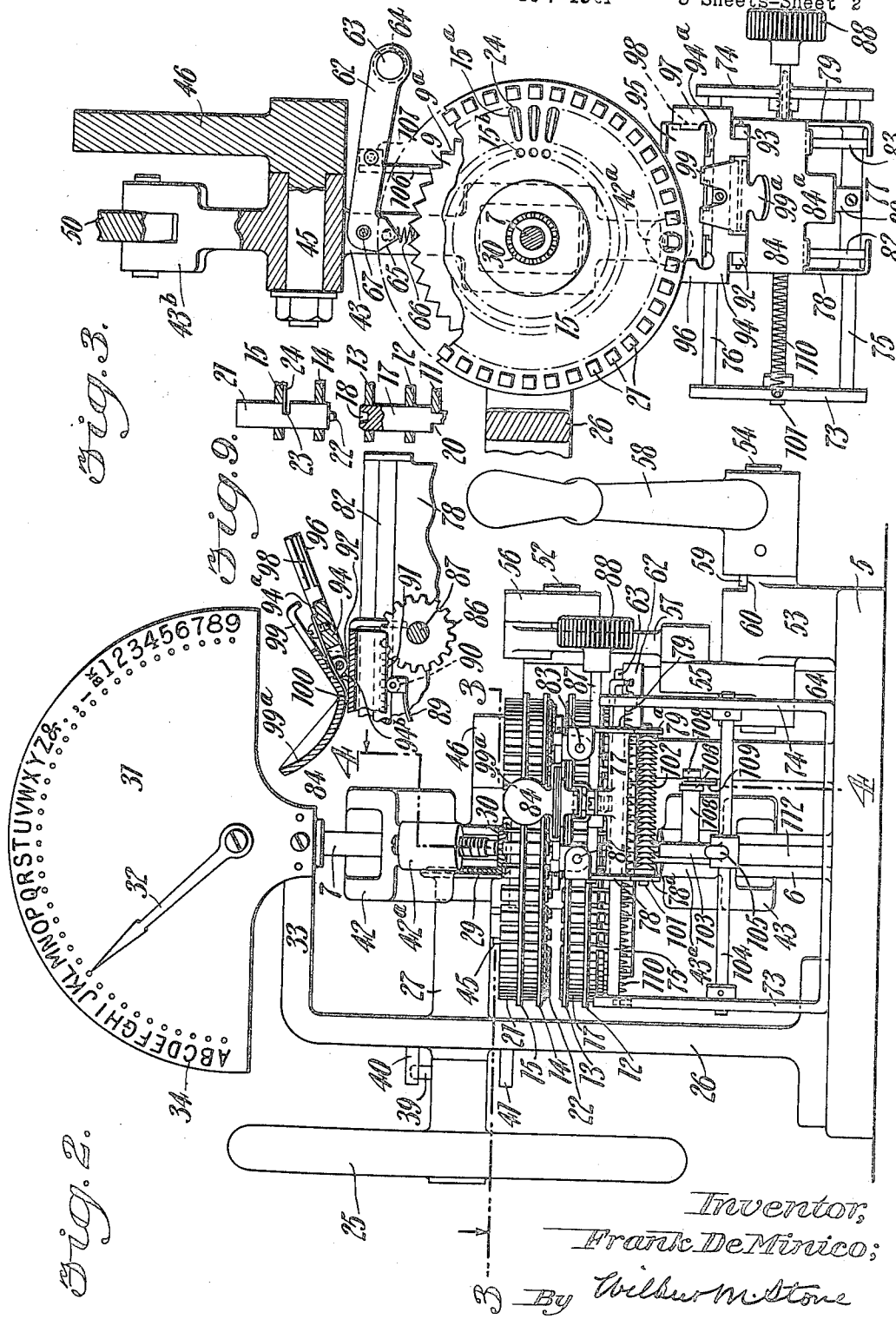


Fig. 2.

Fig. 3.

Fig. 9.

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TYPOGRAPHIC EMBOSSING MACHINE

Filed Dec. 30 1921 3 Sheets-Sheet 3

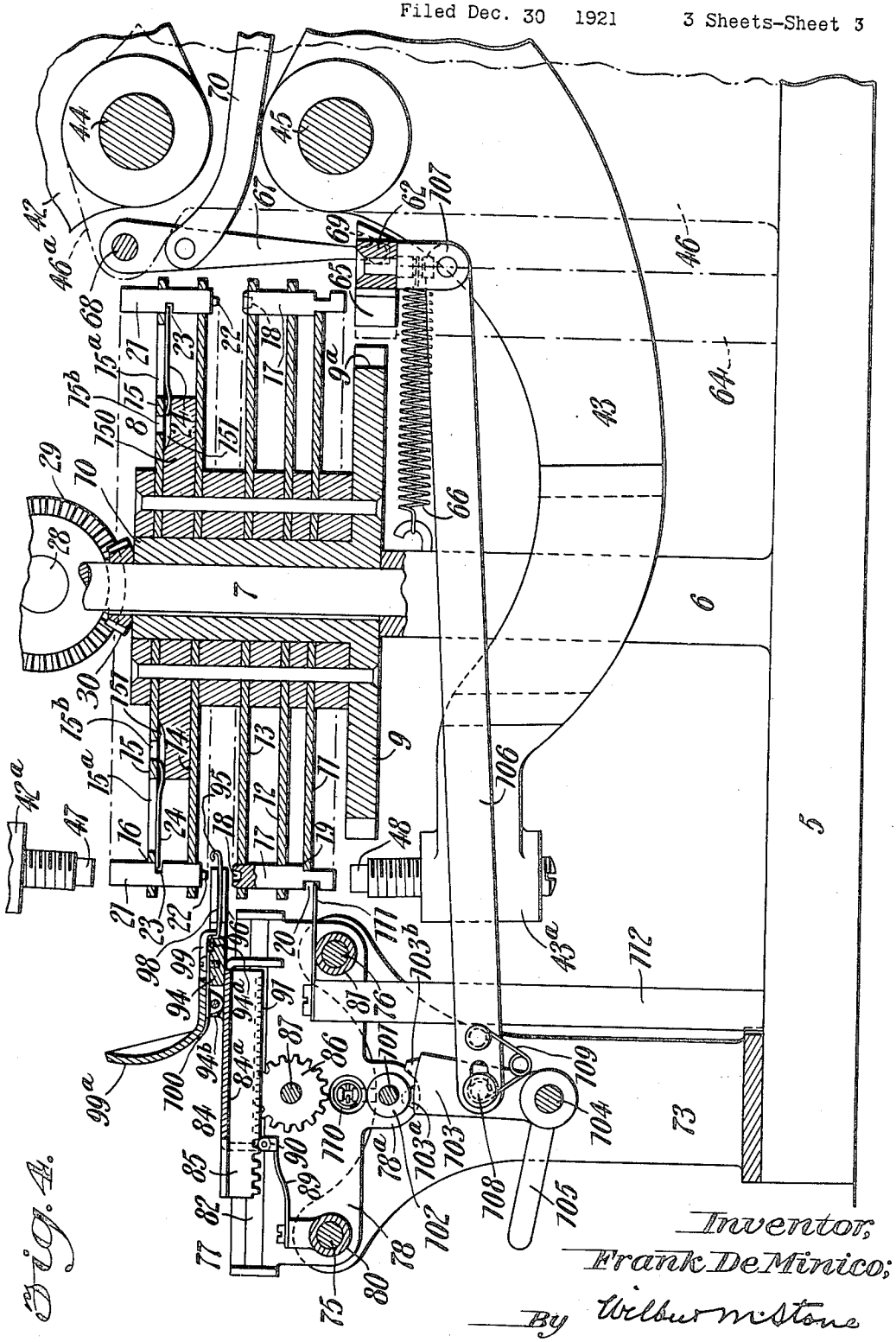


Fig. 4.

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UNITED STATES PATENT OFFICE.

FRANK DE MINICO, OF NEW YORK, N. Y., ASSIGNOR TO POLLARD-ALLING MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TYPOGRAPHIC EMBOSSING MACHINE.

Application filed December 30, 1921. Serial No. 526,016.

To all whom it may concern:

Be it known that I, FRANK DE MINICO, a citizen of the United States, and a resident of New York, borough of Bronx, in the county of Bronx and State of New York, have invented certain new and useful Improvements in Typographic Embossing Machines, of which the following is a specification.

This invention relates to typographic embossing machines and has for its object to provide a machine of the class specified simple in construction, efficient in operation, and having small liability to functional derangement. Other objects will appear later herein.

My improved machine is illustrated in its preferred embodiment for one of its several specific uses in the drawings accompanying this specification, wherein:—

Figure 1 is a side elevation of a portable, embossing machine, particularly adapted and arranged for embossing letters or other characters on thin metal plates, suitable for use as printing plates. Fig. 2 is a front elevation, looking in the direction of arrow 2 in Fig. 1. Fig. 3 is a plan view of a portion of what is shown in Figs. 1 and 2, that portion of said figures above lines 3—3 thereof, respectively, being removed. Fig. 4 is a vertical section on line 4—4 of Fig. 2. Fig. 5 is a detail elevation, partly in section, of a portion of what is shown in Figs. 1 and 4. Fig. 6 is a detail elevation of a portion of what is shown in Fig. 1. Figs. 7 and 8 are fragmentary elevations to illustrate the operation of my improved machine. Fig. 9 is a fragmentary elevation corresponding with a portion of what is shown in Fig. 4, but with the parts in different relative positions. The scale of Figs. 1, 2, 3 and 6 is equal. The scale of Figs. 4, 5 and 9 is about twice that of Fig. 1. The scale of Figs. 7 and 8 is about half that of Fig. 1.

The present improvements are directed particularly to that general class of embossing machines employing a rotatable head carrying a plurality of pairs of coacting punches and dies near its periphery, and any one of which pairs of punches and dies is brought to operative position by hand actuated means, and then by hand or power means the punch and die are brought into coacting relation with a piece of sheet metal therebetween.

While my present invention is particularly described as directed to the embossing of typographic characters on a printing plate, it will be understood that such use thereof is but one of many uses to which it is applicable, and that such use herein is for purposes of illustration and not of limitation.

My improved machine is preferably of portable character and the mechanism thereof may be mounted on base 5. On said base is post 6 in which freely turns, in a vertical bearing, pivot shaft 7 of rotatable die-head 8. For convenience of manufacture, said die-head is illustrated as built up of several elements, as follows: Positioning disc 9, having sleeve 10 upstanding therefrom, said sleeve being keyed to shaft 7. Erected upon disc 9 and preferably riveted thereto are a series of spaced-apart circular plates 11 to 15, inclusive. Plates 12 to 15 have a series of holes, as 16 in plate 15, through each thereof, said holes being equidistant from the axis of shaft 7 and each of said holes, as 16, being in vertical alignment with a similar hole in each of the other plates 14, 13 and 12. While these holes may be round they are preferably square, so as to hold the punches and dies therein against turning. Slidably mounted in such aligned holes, respectively, in plates 12 and 13 are dies, as 17, the die cavity 18 of which faces upwardly. Said dies are provided with shoulders, as 19 to die 17, on that side thereof facing inwardly toward shaft 7, and said shoulders rest upon the outer edge of lowest plate 11 of die-head 8. Opposite shoulder 19 is notch 20 in said die for engagement with leaf spring 111 when said die is in operative position. Said spring is supported on post 112 of base 5. Slidably mounted in aligned holes, respectively, in plates 14 and 15 are punches, as 21, each having a punch nose, as 22 of punch 21, for coacting with the die cavity 18 of die 17 therebelow. Said punches are provided with inwardly facing notches, as 23, each for engagement with one of a series of radially disposed leaf springs, as 24, carried between plate 15 and spacer block 150, for yieldably holding said punches in their upper idle positions, respectively.

For the ready insertion and removal of the punches, as 21, from head 8, the springs, as 24, are peculiarly mounted for movement radially of said head. Spacer block 150 has radial slots, as 151, in its upper face, one for each spring, and said slots are just wide enough to permit free endwise movement of said springs therein while maintaining them in endwise alignment, all respectively. Over each spring slot in block 150 and near the inner end of said slot is hole 15^b in plate 15, and extending from the outer edge of block 150 nearly to seat 16 of punch 21, is radial opening 15^a in plate 15, just above spring 24. These two openings in plate 15 provide access to spring 24 by means of some convenient tool for pushing that spring into and out of engagement with slot 23 of said punch. When said spring is withdrawn from said slot, punch 21 may be freely withdrawn upwardly from head 8 and after its removal, die 17 therebelow may be similarly removed upwardly through plates 14, 15.

Said die head 8 may be rotated to bring any pair of punches and dies into operative position by means of hand wheel 25, through the following described connections: Upstanding from base 5 is bracket 26 having horizontal bearing 27 in which turns freely shaft 28, to the outer end of which hand wheel 25 is fixed. To the inner end of said shaft is fixed bevel gear 29 in mesh with bevel gear 30 of half its size, fixed to shaft 7 of die-head 8. Above die-head 8 and facing the front of the machine and the operator, is dial 31 carried by arm 33 of bracket 26. Over the face of said dial, pointer 32 is mounted for oscillation. On said dial, in semi-circular arrangement, are characters, as 34, corresponding with the characters which the punches and dies of die-head 8 are adapted for embossing, respectively. Said pointer 32 is fixed to horizontal shaft 35 turning freely in bearing 36 in arm 33. Said shaft 35 has fixed thereto bevel gear 37 in engagement with bevel gear 38 of half its size, fixed to the upper end of die-head shaft 7. By this arrangement a given incremental rotation of hand wheel 25 corresponds with a character to character rotation of die-head 8 and of pointer 32. Hand wheel 25 may be provided with pin 39 projecting from the hub thereof for engagement with opposite stop pins 40, 41 for limiting the rotation of said wheel to correspond with the full rotation of die-head 8 and the half rotation of pointer 32.

For accurately positioning any selected punch and die for coacting operation, after such selection has been made by means of hand wheel 25, positioning disc 9 is provided, preferably in its periphery, with a series of V notches 9^a corresponding in number with the number of pairs of punches and dies. For engagement with said notches, one at a time, oscillating arm 62 pivoted for horizontal movement at 63 on post 64 of base 5, has at its free end wedge 65. Said wedge is constantly urged toward disc 9 by pull spring 66 and is normally held out of such engagement by lever 67 depending from pivot 68 fixed in ear 46^a of upright 46. The lower and free end of said lever 67 engages socket 69 in the rear end of wedge 65, Figs. 4 and 5. Said lever 67 is connected by link 70 with pin 71 eccentrically fixed in disc 51, Figs. 4 and 6. The joint of link 70 and pin 71 is a loose joint so as to permit free action of arm 62 when it engages a notch in disc 9.

For actuating each pair of punches and dies, as 21, 17, when they are at their operative station, upper and lower opposite levers 42, 43 pivoted on studs 44, 45, respectively, projecting horizontally from upright 46 of base 5, are provided. Said levers may have openings therethrough for straddling otherwise interfering parts as shaft 7 and post 6, respectively. Said levers terminate forwardly, to the left in Figs. 1 and 4, in heads 42^a, 43^a, in which are adjustably mounted opposed screws 47, 48, respectively, for direct engagement with any given pair of punches and dies brought into alignment therebetween. Said levers terminate rearwardly, to the right in Figs. 1 and 4, in ears 42^b, 43^b. Each of said ears is preferably bifurcated, see Fig. 3, and ear 42^b for instance, has pivoted therein one end of link 49, the other end thereof being pivoted eccentrically on disc 51. Link 50 of lever 43 similarly connects ear 43^b thereof with disc 51, and said disc has its shaft 52 rotatably mounted in upright 46. Links 49, 50 and disc 51 form opposite toggles, effective when said disc is rotated clockwise from the position of Fig. 1 to that of Fig. 7 to separate ears 42^b, 43^b and to cause screws 47, 48 to engage and force toward each other into coacting engagement, a punch, as 21, and die, as 17, respectively.

For thus oscillating toggle shaft 52 the following means are provided: Pivoted in bearing 53 of base 5 preferably in front of shaft 7, Fig. 1, is operating rock shaft 54. Fixed to said shaft is rock arm 55, and fixed to disc shaft 52 is rock arm 56. Pivotally connected to the outer ends of said arms 55, 56 are the opposite ends, respectively, of link 57. While shaft 54 may be oscillated by some known power means not shown, I preferably provide hand lever 58 for this purpose. Said lever has its hub end fixed to shaft 54 and may be provided with stop pin 59 for engagement with opposite shoulders 60, 61 of bearing 53 for limiting the stroke of said lever and arm 55.

For holding, positioning and for moving

the plate, as 95, Fig. 4, in which characters are to be embossed, the following means are provided: Between opposite frames 73, 74, upstanding from base 5, to the left of die-head 8 in Fig. 1 and in front of that die-head in Fig. 2, are carriage ways, preferably comprising two parallel spaced apart rods 75, 76 arranged horizontally. Slidably mounted on said rods is carriage 77, for convenience preferably constructed principally of sheet metal. Between carriage ends 78, 79 are supported tubular bearings 80, 81 engaging rods 75, 76, respectively. Carried by opposite pairs of ears turned inwardly from carriage ends 78, 79 are rods 82, 83 forming ways on which slides, transversely to the line of movement of the carriage, plate carrier 84. Said carrier comprises base 84^a to the under side of which is fixed rack 85 parallel with rods 82, 83 on which the carrier travels. Engaging this rack is pinion 86 fixed to shaft 87 turning in bearings in carriage ends 78, 79. Said shaft terminates at the right of said carriage, Figs. 2 and 3 in turn-button 88. Supported from tubular bearing 80 by spring member 89 is detent 90 for engagement with rack 85. Fixed to said rack, for a portion of its length, is rail 91 projecting downwardly to or below the teeth of said rack, for holding detent 90 from engaging said rack, when said carrier is in retracted position. Pivotally mounted in opposite ears 92, 93 of carrier base 84^a is plate holder 94. For the particular type of plate illustrated at 95, said holder preferably comprises opposite forwardly extending arms 96, 97, each having an inwardly facing slot as 98 for the reception of the opposite ends of said plate. The rear edge, lower edge in Fig. 3, of said plate is seated on ledge 94^a of the plate holder and said plate is held to said seat by clamp 99 pivoted concentric with plate holder 94. Said clamp is provided with finger piece 99^a. Leaf spring 100 fixed to plate holder 94 is efficient for urging clamp 99 to its work.

For moving carriage 77, step by step to the left, Figs. 2 and 3, for letter spacing the plate to be embossed, the following means are provided: Pivoted on rod 101 fixed in opposite ears 78^a, 79^a of carriage ends 78, 79, respectively, is rack 102. Said rack is preferably circular in cross section and is arranged to rotate freely on rod 101. For engagement with said rack is escapement 103 fixed to rock shaft 104 having bearings in opposite frames 73, 74. Projecting forwardly, to the left in Fig. 4, from said escapement is handle 105 for releasing said escapement from operation. Said escapement is provided on its upper free end with escapement teeth 103^a, 103^b. For permitting the hand operation of carriage 77, link 106 is slotted at its point of engagement with pin 108 of said escapement and said pin is ordinarily maintained at the left hand end of said slot, Fig. 4, by spring 109. When said carriage is moved by hand said spring is compressed. For operating said escapement, link 106, pivotally connected at one end to depending ear 107 of die-head positioning arm 62, and at its other end similarly connected at 108 to said escapement, is provided. For urging carriage 77 to the left, Figs. 2 and 3, pull spring 110 is provided.

The operation of my improved machine is as follows: Plate carrier 84 is withdrawn to the left from the position of Fig. 4 to that of Fig. 9, thereby removing its leading ends 96, 97 from the field of operation of the coacting punch and die. Said movement also shifts carrier rack 85 from engagement with the roll of detent 90, said roll being held from such engagement by rail 91. When carrier 84 is in its retracted position, Fig. 9, plate holder 94 may be swung up for the reception of a plate to be embossed, by pressing finger piece 99^a toward the left. The heel 94^b of said plate holder thereby encounters top 84^a of the plate carrier and further pressure on said finger piece causes plate clamp 99 to be lifted from said holder 94, when a plate as 95, Fig. 4, may be inserted. Then upon the release of finger piece 99^a, clamp 99 grips the inner edge of plate 95 to holder 94, and said holder swings down to its seat on carrier 84. Then, by pushing finger piece 99^a to the right to the position of Fig. 4, the first exposed tooth in plate carrier rack 85 will engage detent 90, whereby said plate 95 is located between the punches and dies respectively on die-head 8, in position to receive the first line of embossed characters thereon. To move carriage 77 to the extreme right, as in Fig. 3, to bring the left end of plate 95 in position to be embossed with the first character of the first line of characters, handle 105 is raised, thereby swinging escapement tooth 103^a out of engagement with rack 102, and said carriage is pushed by hand to the right against the pull of spring 110. Handle 105 is then released permitting escapement tooth 103^a to again engage rack 102.

Now, by means of hand wheel 25, die-head 8 is rotated until the chosen character is indicated by pointer 32 on dial 31, when lever 58 is pushed by hand to the right, from the position of Fig. 1 to that of Fig. 7 wherein rock arm 55 and link 57 are in line, rock arm 56 has been swung its maximum stroke to the right and toggles 49, 51 and 50, 51 are at their full throw, respectively. This movement of said toggles rocks on their pivots, levers 42, 43, whereby the forward ends 42^a, 43^a of those levers, respectively, approach each other to engage and force into

coacting engagement with plate 95, the chosen pair of punches and dies, as 21, 17. Punch 21 is forced downwardly against the resistance of its spring 24, and die 17 is forced upwardly against the resistance of spring 111, with which it came into engaging relation when die-head 8 was locked in selected position by wedge 65.

During the early part of the described movement of lever 58, two important sub-operations take place. First, arm 62 is released by the rotation of disc 51, whereby its wedge 65 enters the adjacent notch 9ª in positioning disc 9, under the pull of spring 66, thereby accurately indexing the selected pair of punches and dies in operative position. Coincident with this described engagement of said wedge and notch, escapement 103 is swung in anti-clockwise direction, Fig. 4, by means of link 106, thereby permitting rack 102 of carriage 77 to be moved by spring 110, one half a character increment to the left, Figs. 2 and 3. The other half of said incremental movement is had upon the return stroke in clockwise direction of escapement 103, during the final part of the stroke of lever 58.

The continued movement of hand lever 58 from the position of Fig. 7 to that of Fig. 8, unlocks the toggle action of arm 55 and link 57, and rock arm 56 is swung in anti-clockwise direction, thereby unlocking toggles 49, 51 and 50, 51 whereby levers 42, 43 are returned to their positions, respectively, of Fig. 1, thereby releasing punch 21 and die 17, which are then returned to their idle positions, respectively, said punch being returned by its individual spring 24 and said die by spring 111 fixed to post 112.

Hand lever 58 is now at the far end of its stroke, Fig. 8, and the movement of said lever from the position of Fig. 1 to that of Fig. 8 has accomplished the complete cycle of accurately locating a selected punch and die in operative position, causing said punch and die to coact to emboss their character on plate 95, releasing and returning to idle positions, respectively, said punch and die, indexing carriage 77 one character increment of movement, and unlocking wedge 65 from locating disc 9.

The several parts of the machine are now in position to repeat their operation for again embossing a character on plate 95, and which operation is accomplished by pulling lever 58 from its position of Fig. 8 back to that of Fig. 1. Thus it will be seen that a complete operative cycle of the machine is acomplished by a half cycle of movement of lever 58, that is, by moving said lever from left to right, or from right to left, Fig. 1. If in repeating the operation of the machine it is desired to emboss the same character a second time, hand wheel 25 is permitted to remain at rest, but if a different character is desired, said hand wheel is turned until pointer 32 indicates the desired character on dial 31.

When sufficient characters have been embossed in one line, carriage 77 is released by lifting lever 105, whereby escapement 103 is thrown out of engagement with rack 102, and then said carriage is pushed to the right, Figs. 2 and 3, to the desired position for starting a new line. Then plate carrier 84 is moved inwardly toward shaft 7 one or more line spaces as desired by means of turn button 88, which causes gear 86 to move rack 85 and said carrier 84, detent 90 holding said rack in the selected position.

I claim:

1. In an embossing machine having a die head rotatable about a fixed axis, and a plurality of pairs of punches and dies arranged circumferentially about said head, the combination of said dies, or punches, being normally held in inoperative positions respectively by gravity, and a spring member supported on a fixed part of the machine and projecting into operative relation with any given die when that die is in operative position, said spring member being effective for returning said die to inoperative position when moved therefrom.

2. In an embossing machine a die head rotatable about a fixed axis, and a plurality of pairs of punches and dies arranged circumferentially about said head, the combination of said punches, or dies, being normally held in inoperative positions respectively by leaf springs, one for each punch, each spring being movable in the direction of its length into and out of engagement with its respective punch.

3. In an embossing machine having a die head rotatable about a fixed axis, a plurality of pairs of punches and dies arranged circumferentially about said head, each pair of punches and dies being adapted for coactive movement, means for selecting any desired pair of punches and dies and for bringing said pair to operative position, and a pair of opposite levers adapted for engagement with a selected pair of punches and dies respectively for moving said pair into operative coaction, the combination of a toggle rockshaft, toggle connections between said shaft and each of said levers, an operating rockshaft, toggle connections between said toggle rockshaft and said operating rockshaft, and means for oscillating said operating rockshaft in either of two directions for actuating said lever toggles their full stroke and back again for causing the operative ends of said levers first to approach and then to recede from each other.

4. In a machine of the character described the combination of means for holding the plate to be embossed comprising a reciprocatable carriage, a plate carrier mounted for

reciprocation on said carriage transversely to the direction of reciprocation of said carriage, a plate holder pivotally mounted on said plate carrier, a plate clamp pivotally mounted on said plate holder, spring means for urging said plate clamp to coaction with said plate holder, a stop on said plate holder for engagement with said plate carrier, a finger piece on said clamp, said finger piece, when pressed, being efficient for swinging said plate holder and clamp in unison until said stop engages said plate carrier, and for then swinging said clamp away from said plate holder for the reception of a plate therebetween.

5. In a machine of the character described the combination of a plate carrier, a plate holder movably mounted on said plate carrier, a plate clamp pivotally mounted on said plate holder, spring means for urging said plate clamp to coaction with said plate holder, a stop on said plate holder for engagement with said plate carrier, a finger piece on said clamp, said finger piece, when pressed, being efficient for moving said plate holder and clamp in unison until said stop engages said plate carrier, and for then swinging said clamp away from said plate for the reception of a plate therebetween.

6. In a machine of the character described the combination of a reciprocatable carriage, a plate carrier mounted for reciprocation on said carriage transversely to the direction of reciprocation of said carriage, hand actuated means for reciprocating said carrier including a rack, a detent on said carriage for engagement with said rack, for holding said carrier in any one of a plurality of positions in its path of reciprocation, and means on said carrier for withholding said detent from engagement with said rack during a portion of the movement of said carrier.

7. In a machine of the character described the combination of a reciprocatable carriage, a plate carrier mounted for reciprocation on said carriage transversely to the direction of reciprocation of said carriage, a rack fixed to said plate carrier, a gear rotatably mounted in said carriage for engagement with said rack for reciprocating said carrier, hand actuated means for rotating said gear, a detent on said carriage for engagement with said rack, and means on said carrier for holding said detent from engaging a portion of said rack.

In witness whereof, I hereby affix my signature this 29th day of December, 1921.

FRANK DE MINICO.