May 9, 1950 G. A. SIMMS 2,506,746

APPARATUS FOR MAKING INTERRUPTED TYPE FACES

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Fig. 1.

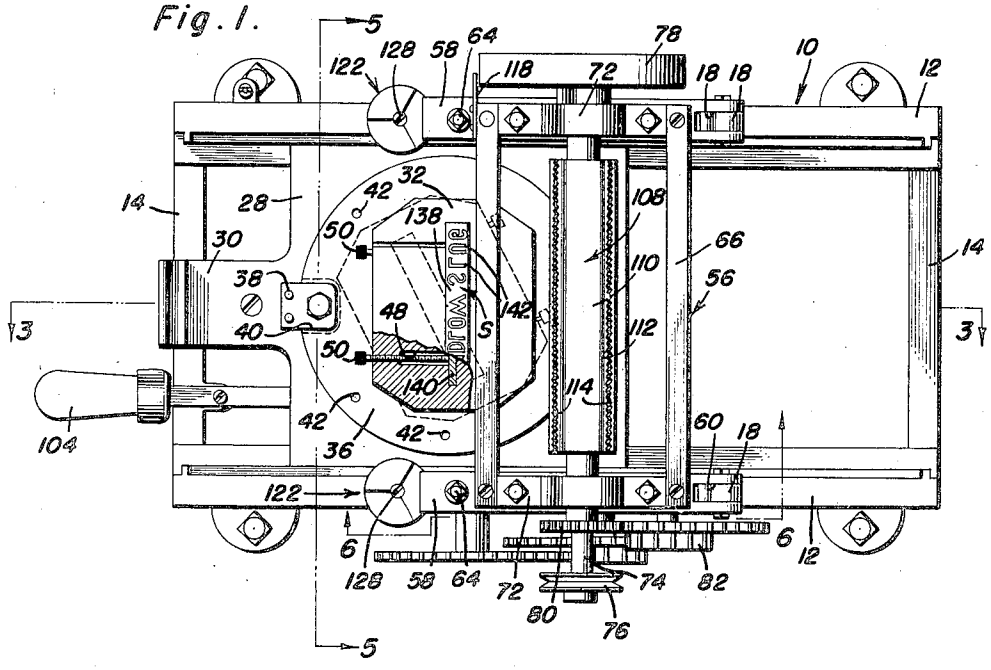



Fig. 2.

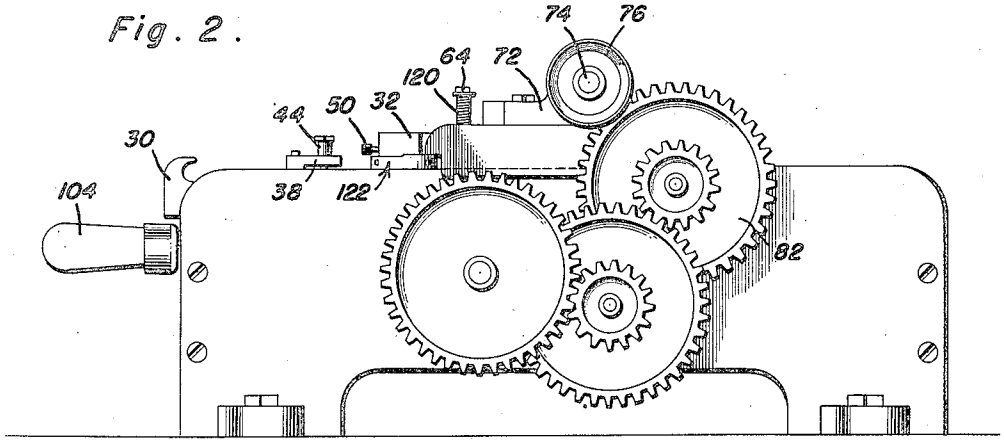



Fig. 6.

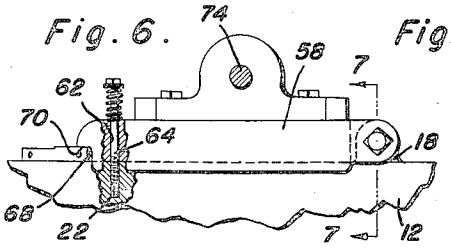
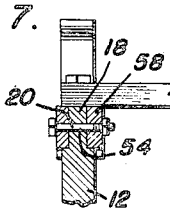



Fig. 7.




George A. Simms
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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APPARATUS FOR MAKING INTERRUPTED TYPE FACES

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Fig. 3.

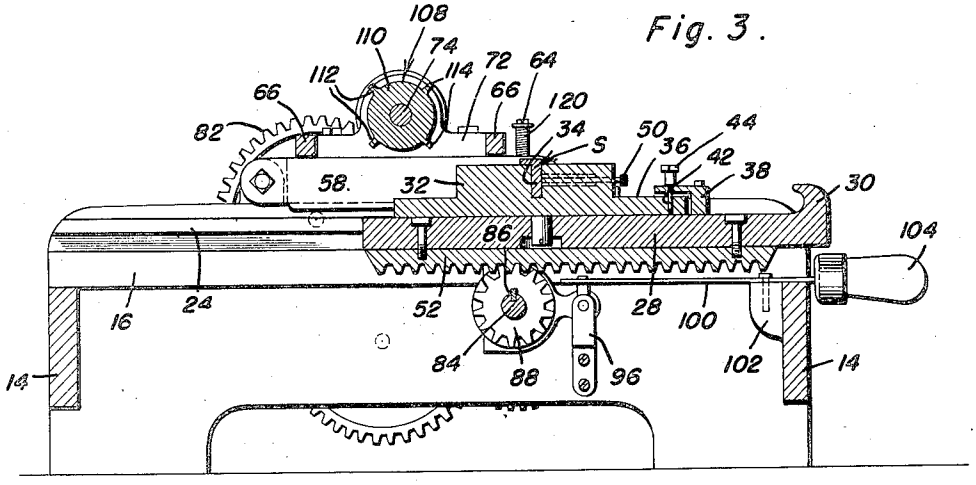
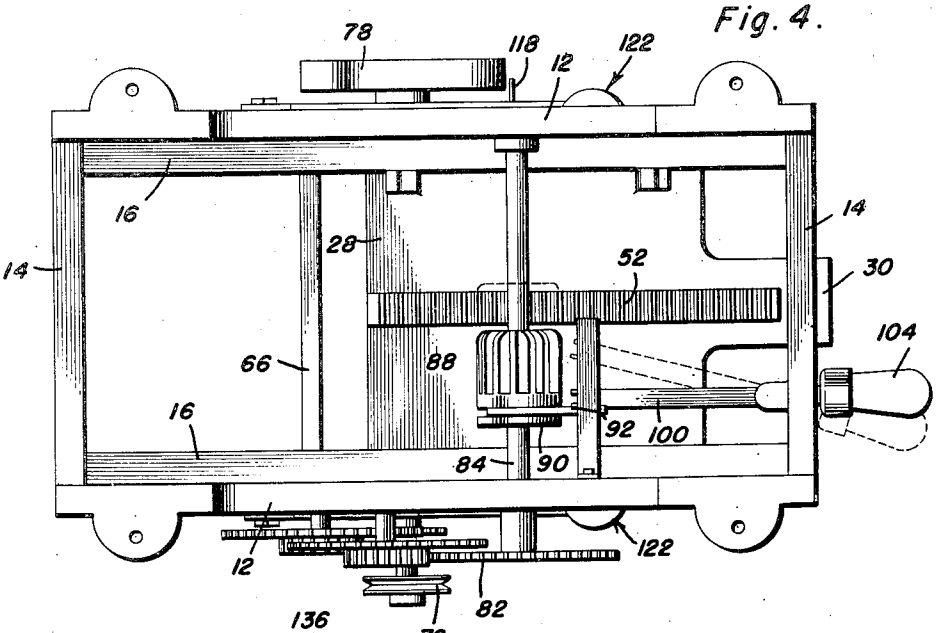



Fig. 4.



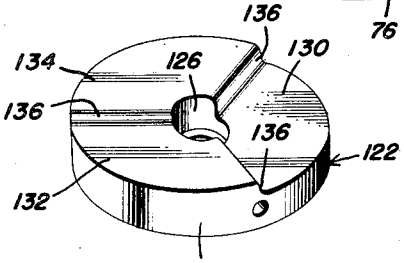




Fig. 8.

George A. Simms
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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APPARATUS FOR MAKING INTERRUPTED TYPE FACES

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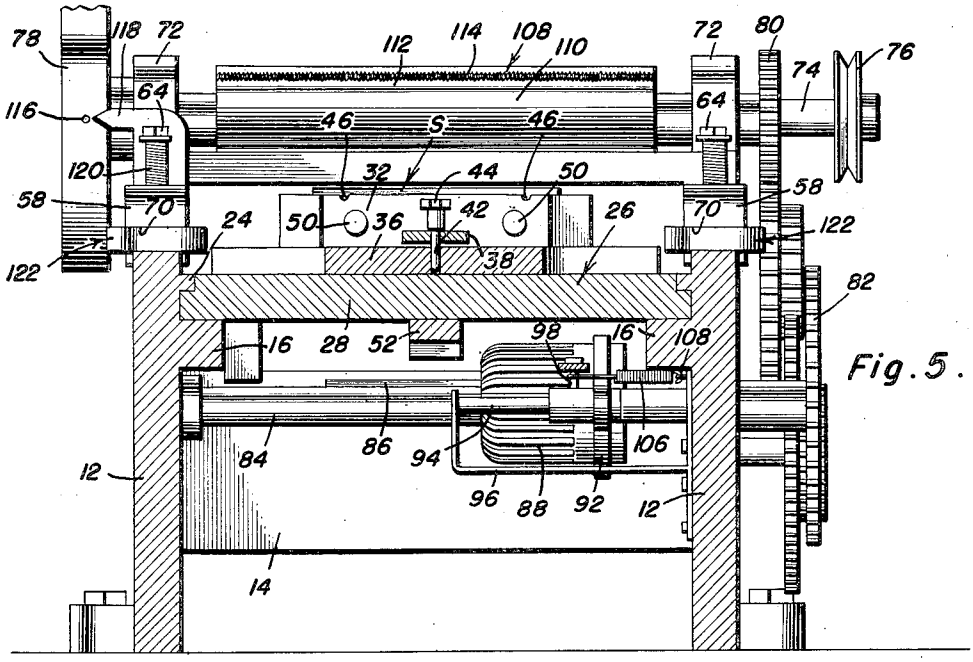



Fig. 5.

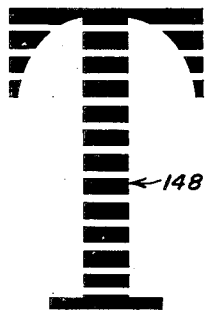



Fig. 10.

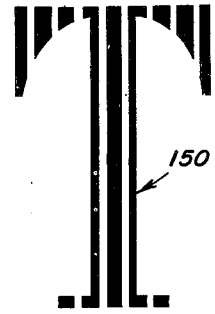



Fig. 11.

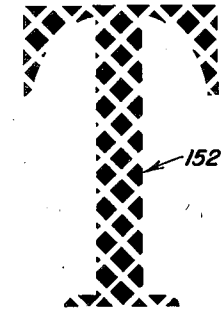



Fig. 12.

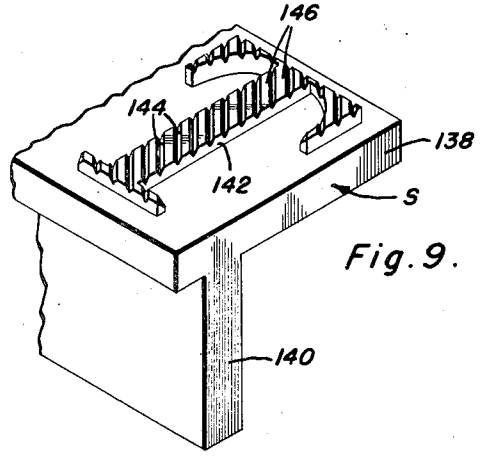



Fig. 9.

George A. Simms
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jackson
Attorneys

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# UNITED STATES PATENT OFFICE

2,506,746

## APPARATUS FOR MAKING INTERRUPTED TYPE FACES

George A. Simms, Washington, D. C.

Application November 29, 1948, Serial No. 62,486

15 Claims. (Cl. 90—16)

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This invention relates to the art of printing and has for its primary object to alter the character of a conventional type face to produce impressions which while following the contour of the character or characters represented by the type face, so reduces the area of contact of the type face with the work as to present an appearance totally different from that produced by the original type face.

Another object is to groove with great accuracy the type face carried on a conventional type slug so that the ink carrying and work contacting surface of the type face is represented by groups of separate faces in each character borne by the slug.

A still further object is to interrupt a conventional type face with spaced parallel grooves which extend therethrough to form uniformly spaced ink bearing work contacting surfaces.

Still another object of the invention is to enable the user to increase or decrease the widths of the grooves, thereby regulating the area of the type face which contacts the work.

The above and other objects may be attained by employing this invention which embodies among its features a slug, a type face on said slug and said type face having spaced parallel grooves extending therethrough to form uniformly spaced ink bearing work contacting surfaces.

Other features include moving a slug bearing a type face in a rectilinear path which lies parallel to the type face, and while so moving said slug cutting spaced parallel grooves through the type face.

Still other features include a supporting table mounted to move in a rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the rectilinear path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table and means to rotate the milling cutter.

Other features include means driven by the milling cutter rotating means to retard the speed at which the table moves in its rectilinear path beneath the milling cutter during the milling of a slug carried by the table.

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Still other features include a carriage mounted to move in a rectilinear path, a table mounted on the carriage to rotate about an axis which lies perpendicular to the rectilinear path, a milling cutter mounted to rotate about a transverse axis in spaced relation to the rectilinear path through which the carriage moves, and intermediate the ends thereof, means passing through the table and entering the carriage to hold the table in a variety of positions about the perpendicular axis, and means on the table to support a type slug with the face thereof in the path of movement of the milling cutter.

In the drawings:

Figure 1 is a top plan view of a machine for producing an interrupted type face in accordance with this invention,

Figure 2 is a side view of the machine illustrated in Figure 1,

Figure 3 is a longitudinal sectional view taken substantially along the line 3—3 of Figure 1,

Figure 4 is a bottom plan view of the machine illustrated in Figure 1,

Figure 5 is a transverse sectional view taken substantially along the line 5—5 of Figure 1,

Figure 6 is a fragmentary sectional view taken substantially along the line 6—6 of Figure 1,

Figure 7 is a vertical sectional view taken substantially along the line 7—7 of Figure 6,

Figure 8 is a perspective view of one of the cutter height regulating disks,

Figure 9 is an enlarged fragmentary perspective of a conventional type slug showing the type face thereon having diagonal grooves cut therein in accordance with this invention,

Figure 10 is a view of one style of product produced by this invention,

Figure 11 is a view similar to Figure 10 of another style of product, and

Figure 12 is a view similar to Figures 10 and 11 showing a still further style of product which may be produced on my machine.

Referring to the drawings in detail, this improved type face interrupting machine designated generally 10 comprises a frame composed of spaced parallel side bars 12 which are joined at opposite ends by end bars 14 which hold said side bars in spaced parallel relation as will be readily understood upon reference to the drawings. Carried on the inner face of each side bar is an elongated longitudinal rib 16 forming the guide way for a carriage to be more fully hereinafter described. Extending upwardly from the upper edge of each side bar 12 intermediate the ends thereof is an ear 18, and these ears 18 are

provided with aligning openings 20, the purpose of which will be more fully hereinafter explained. Formed in each side bar 12 and entering the top thereof in spaced relation to each ear 18 is an internally screw threaded opening 22, the purpose of which will hereinafter appear. Carried by each side bar 12 near its upper edge and in spaced relation to the guide 16 thereon is an inwardly extending parallel rib 24 which cooperates with an adjacent guide 16 in forming a guideway in which the carriage designated generally 26 is mounted to slide in a rectilinear path.

The carriage 26 above referred to comprises a platform 28 from one end of which projects a handle 30, and mounted on the top face of the carriage for rotation about an axis which lies perpendicular thereto is a table 32 which is provided in its upper face with an elongated slot 34 for the reception of a type slug designated generally S. The table 32 is provided with an outstanding annular peripheral flange 36, and fixed to the carriage, and partially overlying the flange 36 is an inverted L-shaped bracket 38, the horizontal leg of which lies parallel with the carriage 28 and overhangs the edge of the flange 36 as will be readily understood upon reference to Figure 3. Formed in the flange 36 is a notch 40 of a size sufficient to accommodate the flange of the bracket 38 so that when necessary the table may be removed from the carriage by moving the notch 40 into registry with the bracket 38. Formed in the flange 36 and extending therethrough in parallel relation to the axis about which the table 32 rotates, is a row of spaced openings 42 which are adapted to selectively receive a locking pin 44 which is thrust through an opening in the horizontal leg of the bracket 38 as will be readily understood upon reference to the drawings. It will thus be seen that the table may be held at a variety of angular positions with relation to the carriage 28 and the rectilinear path through which the carriage moves. Formed in the upper side of the table 32 and extending from one edge thereof and opening into the slot 34 is a pair of spaced parallel grooves 46 which facilitate the introduction of an instrument below the top of the slug S to permit the latter to be pried upwardly out of the slot 34 when the slug is to be removed from the table. Entering the table 32 through one side edge thereof is a pair of spaced parallel internally screw threaded bores 48 in which are received the screw threaded shanks of set screws 50, the inner ends of which impinge against the vertical flange of the slug S to lock the slug in the groove 34.

Fixed to the underside of the carriage 28 substantially midway between opposite sides thereof, and extending longitudinally substantially throughout the entire length of the carriage is a rack bar 52 the purpose of which will be more fully hereinafter described.

Pivotally mounted on pivot pins 54 which extend through the openings 20 in the ears 18 is a frame designated generally 56 which comprises a pair of spaced parallel side members 58 the ends of which are bifurcated as at 60 to receive the ears 18, and the side members 58 are provided adjacent the ends opposite the bifurcated ends 60 with vertically extending openings 62, which align with the internally screw threaded openings 22 in the side bars 12 for the reception of threaded pins 64. The side members 58 are held in spaced parallel relation by cross bars 66, and formed in the ends of the side members 58 adjacent the openings 62 are notches 68 (Fig. 6)



forming shoulders 70, the purpose of which will more fully hereinafter appear. Fixed to the upper sides of the side members 58 are journal bearings 72, and rotatably supported in said journal bearings is a transversely extending shaft 74 carrying adjacent one end a drive pulley 76 and at its opposite end a flywheel 78. Fixed to the shaft 74 adjacent the drive pulley 76 is a drive pinion 80 which has meshing engagement with a speed reducing gear train 82. This speed reducing gear train has driving connection with a drive shaft 84 which is located below the carriage 28 and extends transversely below the rectilinear path through which the carriage moves. Splined as at 86 for longitudinal sliding movement on the shaft 84 is a spur pinion 88 carrying adjacent one end a grooved collar 90 in the groove of which is received a fork 92. This fork is mounted to slide on a rod 94 which is supported in a suitable bracket 96 carried by the frame 10 below the carriage 26, and carried by the fork is an upstanding pin 98 which is engaged by the bifurcated end of a hand lever 100 which is pivotally mounted on a suitable bracket 102 adjacent one end of the frame 10 and is equipped with a hand grip 104 by means of which the lever may be manipulated from one end of the device. A retractile coil spring 106 is coupled at one end to the pin 98 and at its opposite end to an eye 108 carried by the bracket 96 to hold the gear 88 in retracted position and out of meshing engagement with the rack 52. From the structure just described it will be understood that when the hand grip 104 is moved against the effort of the spring 106, the gear 88 will be moved into meshing engagement with the rack 52, but as soon as the hand grip 104 is released, the spring 106 will function to withdraw the gear 88 from meshing engagement with the rack 52.

Mounted on the shaft 74 between the bearings 72 is a cutter designated generally 108 which comprises a circular cylindrical body 110 provided with spaced outwardly extending radial arms 112 the outer edges of which carry substantially V-shaped cutting or milling teeth 114. The radial arms 112 are so spaced about the periphery of the cylindrical body 110 that a slug S carried by the table 32 may be moved along a rectilinear path beneath the cutting tool 108 without engaging the teeth 114, and in order to indicate to the operator when the cutting tool 108 is in this position, the periphery of the flywheel 78 is equipped with an index mark 116 which cooperates with an index pointer 118 carried by one of the bearings 72 as will be readily understood upon reference to Figure 5.

Surrounding each threaded pin 64 and bearing at one end on the head of said pin, and at the opposite end on a side member 58 is a compression coil spring 120 which yieldingly urges the side members downwardly about the pivot pins 54, and the shoulder 70 of each side member 58 into contact with a stop member designated generally 122, each of which comprises a disk 124 having an axial bore 126 for the reception of a pivot screw 128 (Fig. 1) which enters a side bar 12 adjacent the opening 22 therein. Formed on the upper surface of each disk 124 are peripherally spaced lands 130, 132 and 134 which are joined by upwardly inclined cam surfaces 136. These lands 130, 132 and 134 cooperate with the shoulders 70 in holding the ends of the side members 58 remote from the pivot pins 54 at various heights, thereby to increase or decrease the depth of cup made in a slug S mounted in the slot 34 in the table 32.

It will be understood of course that both of the stop members 122 must be adjusted so that the cutter 108 will be held in substantially parallel relation with the table 32.

In use, a type slug S of the type cast on what is known as the "Ludlow" machine is provided with a top flange 138 and a depending flange 140 which as illustrated is received in the slot 34 of the table 32 in such a manner that the top flange 138 rests on top of the table with its top surface located at a definite position with relation to the cutter 108. The type face 142 is carried on the top surface of the flange 138 as an integral part thereof, and by adjusting the position of the table 32 on the carriage 28, it is obvious that the angular position of the slug S relative to the cutter may be governed. Having positioned the slug S on the table 32, the depth of cut is next regulated by rotating the stops 122 about their respective screws 128, so that the side members 58 are held to the desired height. With the drive pulley 76 coupled to a suitable source of power and being driven thereby, the operator need only to move the hand grip 104 into the position substantially as shown in the dotted lines in Figure 4 so as to cause the teeth of the pinion 86 to mesh with the teeth of the rack 52. Owing to the fact that the pinion 86 is driven through the medium of the speed reduction gear train 82 in unison with the cutter 108, it will be evident that the carriage 28 and the table 32 will be fed at a predetermined rate beneath the cutter 108 so that the type face 142 passing beneath the cutter will have spaced grooves 144 cut therein. Obviously by raising or lowering the frame 56 on the stops 122, the depth of cut made by the teeth 114 can be regulated and hence the width of the lands 146 on the type face 142 may be regulated. As a consequence the shading of the product of the type face may be governed to suit the requirements of the user.

In Figures 10, 11 and 12 examples are given of the different styles of letters that may be produced by this device, it being understood that in Figure 10 the table 32 is turned so that the slug S passes beneath the cutter 108 in an endwise position so that the printed letter designated generally 148 will be composed of a plurality of horizontal bars. With the slug S turned into the position illustrated in Figure 1, the printed letter designated generally 150 and represented in Figure 11 will be composed of spaced parallel vertical bars. A further representation of a modified printed letter 152 is illustrated in Figure 12 in which parallel diagonal cuts are made in the type face 142, so that the letter is composed of groups of squares and triangles. Obviously by regulating the depth of cut made in the type face, the amount of metal left in the lands 146 may be governed and hence the printed letters resulting therefrom may be made in various shades.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that minor changes in the details of construction and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

Having described the invention, what is claimed as new is:

1. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the rectilinear path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table and means to rotate the milling cutter.

2. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the rectilinear path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate the milling cutter, and means driven by the milling cutter rotating means to retard the speed at which the table moves in its rectilinear path beneath the milling cutter during the milling of a slug carried by the table.

3. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the rectilinear path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate the milling cutter, and manually controlled means driven by the milling cutter rotating means to retard the speed at which the table moves in its rectilinear path beneath the milling cutter during the milling of a slug carried by the table.

4. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path and to rotate about an axis which lies perpendicular to the rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate the milling cutter and means selectively to hold the table in various positions about the perpendicular axis to regulate the angle at which a slug carried by the table passes beneath the milling cutter.

5. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path and to rotate about an axis which lies perpendicular to the rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the

rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means selectively to hold the table in various positions about the perpendicular axis to regulate the angle at which a slug carried by the table passes beneath the milling cutter, and means driven by the milling cutter rotating means to retard the speed at which the table moves in its rectilinear path beneath the milling cutter during the milling of a slug carried by the table.

6. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path and to rotate about an axis which lies perpendicular to the rectilinear path a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path adjustable means adjacent opposite sides of the path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate the milling cutter, means selectively to hold the table in various positions about the perpendicular axis to regulate the angle at which a slug carried by the table passes beneath the milling cutter, and manually controlled means driven by the milling cutter rotating means to retard the speed at which the table moves in its rectilinear path beneath the milling cutter during the milling of a slug carried by the table.

7. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path and to rotate about an axis which lies perpendicular to the rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate the milling cutter, means selectively to hold the table in various positions about the perpendicular axis to regulate the angle at which a slug carried by the table passes beneath the milling cutter, a rack bar carried by the side of the table remote from the milling cutter, a drive pinion mounted on the side of the table remote from the milling cutter to slide into and out of meshing engagement with the rack bar, means establishing driving connection between the milling cutter driving means and the drive pinion and manually actuated means to move the drive pinion into meshing engagement with the rack bar.

8. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path and to rotate about an axis which lies perpendicular to the rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate the milling cutter, means selectively to hold the table in various positions about the perpendicular axis to regulate the angle at which a slug carried by the table passes beneath the milling cutter, a rack bar carried by the side of the table remote from the milling cutter, a drive pinion mounted on the side of the table remote from the milling cutter to slide into and out of meshing engagement with the rack bar, means establishing driving connection between the milling cutter driving means and the drive pinion, yielding means to hold the drive pinion out of meshing engagement with the rack bar and manually actuated means to move the drive pinion into meshing engagement with the rack bar against the effort of the last mentioned yielding means.



9. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the rectilinear path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate the milling cutter, said table having a slot entering the top thereof for receiving a type slug and locating it on the table and set screws threadedly entering the table and extending into the slot for impingement on the type slug.

10. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path and to rotate about an axis which lies perpendicular to the rectilinear path, a milling cutter having V-shaped type metal cutting teeth mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, means yieldingly to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of the path to arrest movement of the milling cutter under the influence of the yielding means and thereby regulate the depth of cut made by the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate the milling cutter, means selectively to hold the table in various positions about the perpendicular axis to regulate the angle at which a slug carried by the table passes beneath the milling cutter, said table having a slot entering the top thereof for receiving a type slug and locating it on the table and set screws threadedly entering the table and extending into the slot for impingement on the type slug.

11. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path, a milling cutter having circumferentially spaced cutting blades extending outwardly therefrom, V-shaped type metal cutting teeth on the outer edges of said cutting blades, said milling cutter being mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, yielding means adjacent opposite sides of said path to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of said path to arrest the advance of the milling cutter toward said path under the influence of the yielding means and thereby regulate the depth of cut made by the teeth of the milling cutter in type faces on a slug carried by the slug supporting table, and means to rotate said milling cutter.

12. In a machine for producing an interrupted type face, a slug supporting table mounted to move in a rectilinear path, a milling cutter having circumferentially spaced cutting blades extending outwardly therefrom, V-shaped type metal cutting teeth on the outer edges of said cutting blades, said milling cutter being mounted adjacent the rectilinear path to rotate about an axis which lies transversely of and spaced from said path intermediate the ends thereof, yielding means adjacent opposite sides of said path to advance the milling cutter toward the rectilinear path, adjustable means adjacent opposite sides of said path to arrest the advance of the milling cutter toward said path under the influence of the yielding means and thereby regulate the depth of cut made by the teeth of the milling cutter in type faces on a slug carried by the slug supporting table, means to rotate said milling cutter, and means driven by the milling cutter rotating means to retard the speed at which the table moves in its rectilinear path beneath the milling cutter during the milling of a slug carried by the table.

13. In a machine for producing an interrupted type face, a carriage mounted to move in a rectilinear path, a slug supporting table mounted on the carriage to rotate about an axis which lies perpendicular to the rectilinear path, a type face milling cutter mounted adjacent the rectilinear path to rotate about an axis which lies transversely of the rectilinear path in spaced relation thereto, substantially V-shaped type metal cutting teeth on the milling cutter for cutting grooves in the type faces of a slug carried by the table, means to rotate the cutter, means yieldingly to advance the milling cutter toward the rectilinear path and the teeth thereof into the path of movement of a type slug carried by the table as the latter advances with the carriage along the rectilinear path, and means driven by the cutter rotating means to retard the speed of movement of the table as it passes beneath the milling cutter.

14. In a machine for producing an interrupted type face, a carriage mounted to move in a rectilinear path, a slug supporting table mounted on



the carriage to rotate about an axis which lies perpendicular to the rectilinear path, a type face milling cutter mounted adjacent the rectilinear path to rotate about an axis which lies transversely of the rectilinear path in spaced relation thereto, substantially V-shaped type metal cutting teeth on the milling cutter for cutting grooves in the type faces of a slug carried by the table, means to rotate the cutter, means yieldingly to advance the milling cutter toward the rectilinear path and the teeth thereof into the path of movement of a type slug carried by the table as the latter advances with the carriage along the rectilinear path, and a stepped disk mounted on each side of the rectilinear path to rotate about an axis which lies perpendicular thereto, said disks cooperating to arrest at a variety of levels the advance of the milling cutter under the influence of the yielding means and thereby regulate the width of grooves cut in type faces on a slug carried by the table.

15. In a machine for producing an interrupted type face, a carriage mounted to move in a rectilinear path, a slug supporting table mounted on the carriage to rotate about an axis which lies perpendicular to the rectilinear path, a type face milling cutter mounted adjacent the rectilinear path to rotate about an axis which lies transversely of the rectilinear path in spaced relation thereto, substantially V-shaped type metal cutting teeth on the milling cutter for cutting grooves in the type faces of a slug carried by the table, means to rotate the cutter, means yieldingly to advance the milling cutter toward the rectilinear path and the teeth thereof into the path of movement of a type slug carried by the table as the latter advances with the carriage along the rectilinear path, a stepped disk mounted on each side of the rectilinear path to rotate about an axis which lies perpendicular thereto, said disks cooperating to arrest at a variety of levels the advance of the milling cutter under the influence of the yielding means and thereby regulate the width of grooves cut in type faces on a slug carried by the table, and means to hold the table in a variety of positions about the perpendicular axis to regulate the angle at which the grooves are cut in the type faces.

GEORGE A. SIMMS.

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| 1,983,452 | Hargraves | Dec. 4, 1934 |
| 1,998,193 | Hedly | Apr. 16, 1935 |
| 2,131,289 | Klein | Sept. 27, 1938 |
| 2,456,608 | Alger | Dec. 21, 1948 |