

(No Model.)

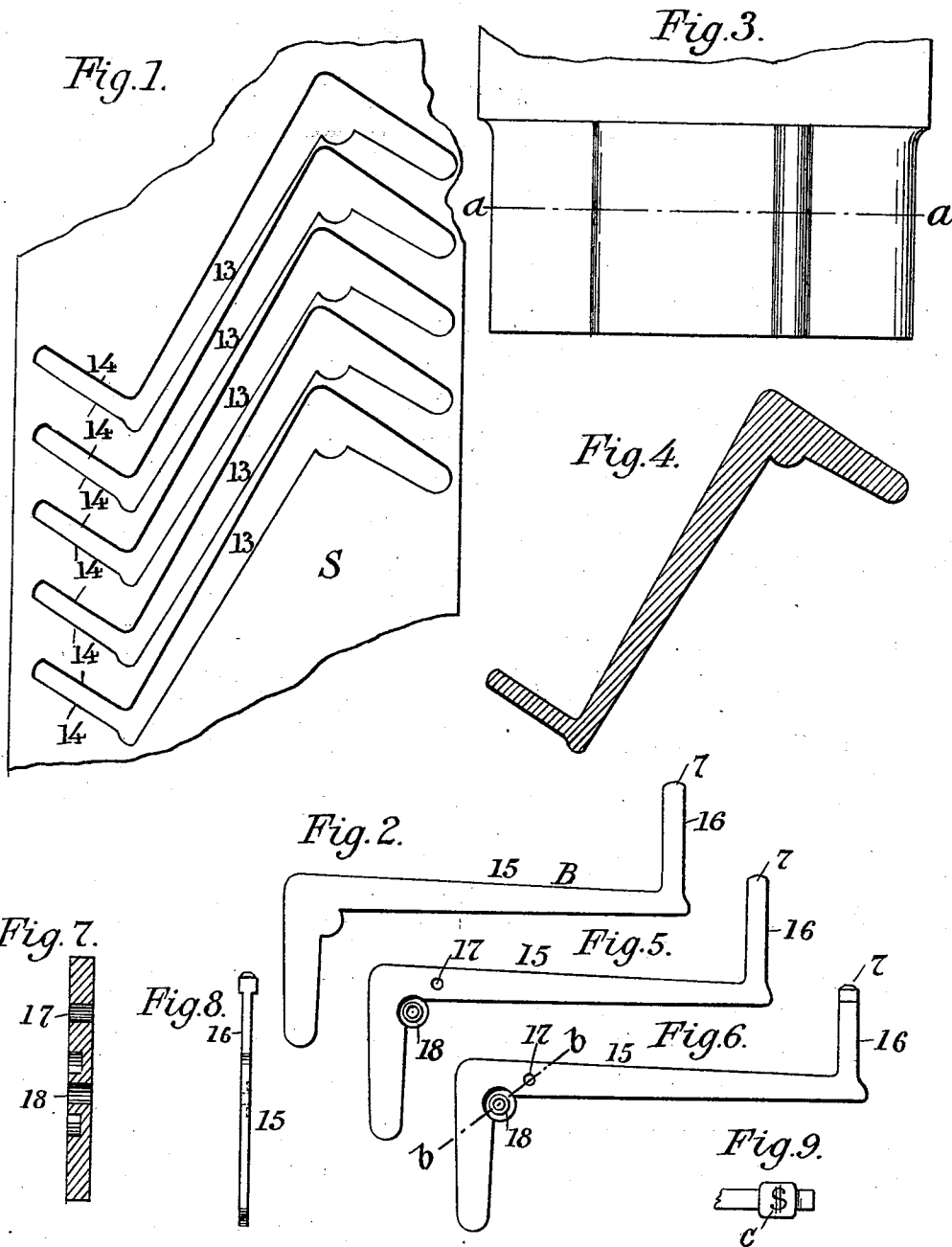
3 Sheets—Sheet 1.

J. M. FAIRFIELD.

APPARATUS FOR MAKING ALIGNED TYPE BARS FOR WRITING MACHINES.

No. 553,521.

Patented Jan. 28, 1896.



Witnesses:
J. S. Boren,
Fred. J. Dole.

Inventor:
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by his Attorney
F. H. Richard.

(No Model.)

3 Sheets—Sheet 2.

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Fig. 11

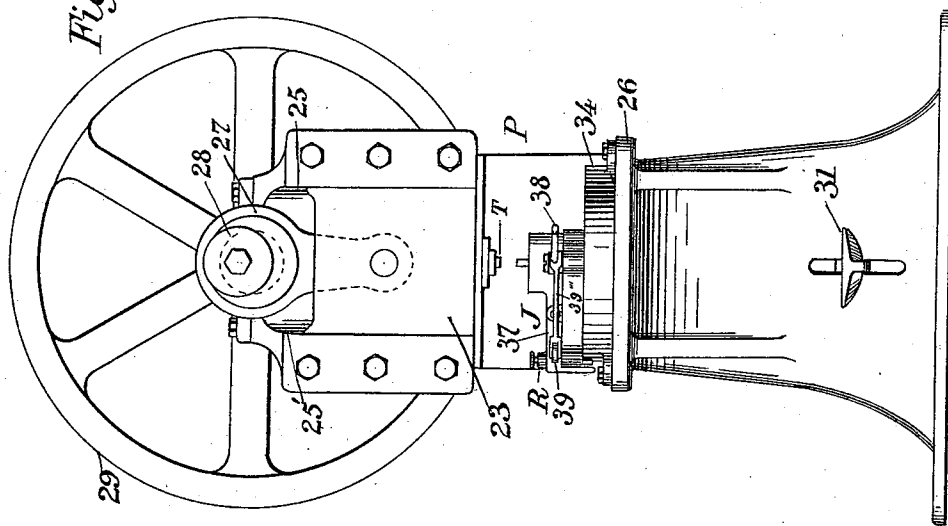
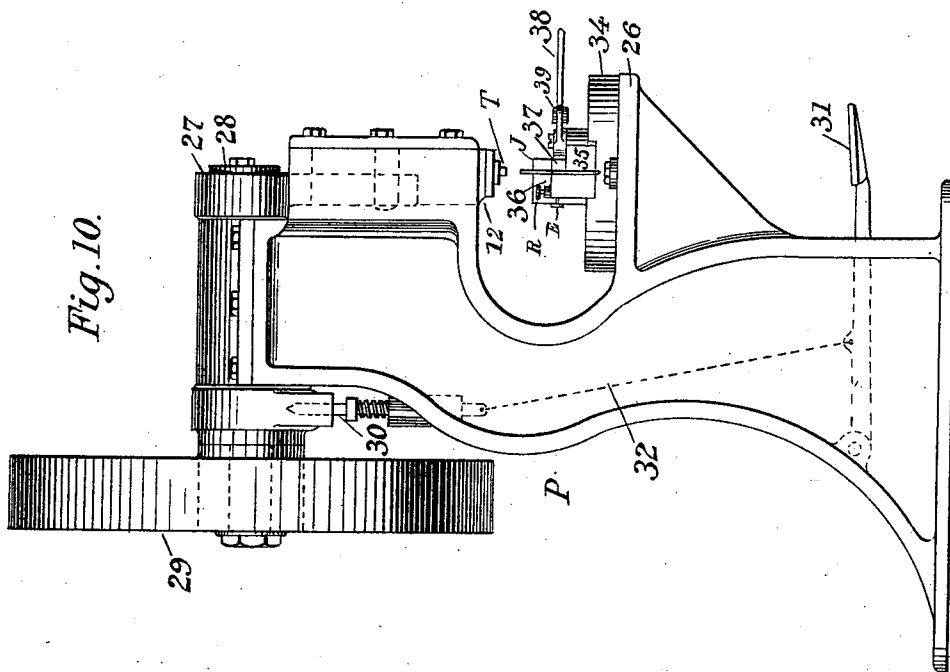


Fig. 10.



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(No Model.)

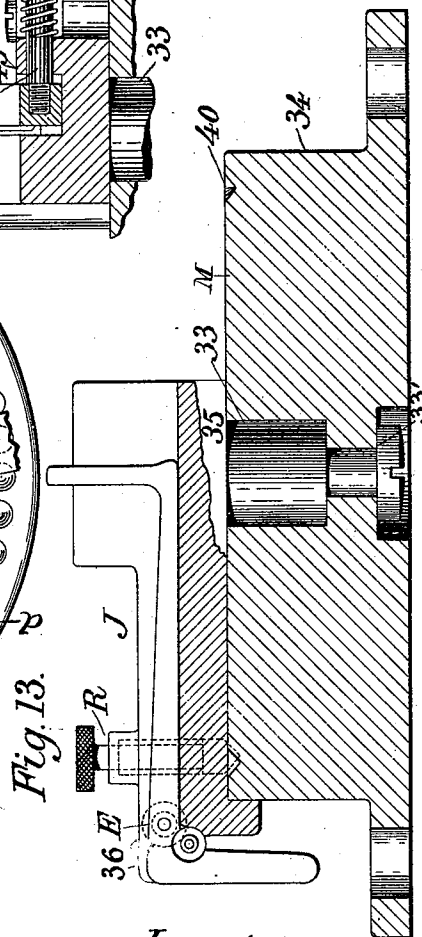
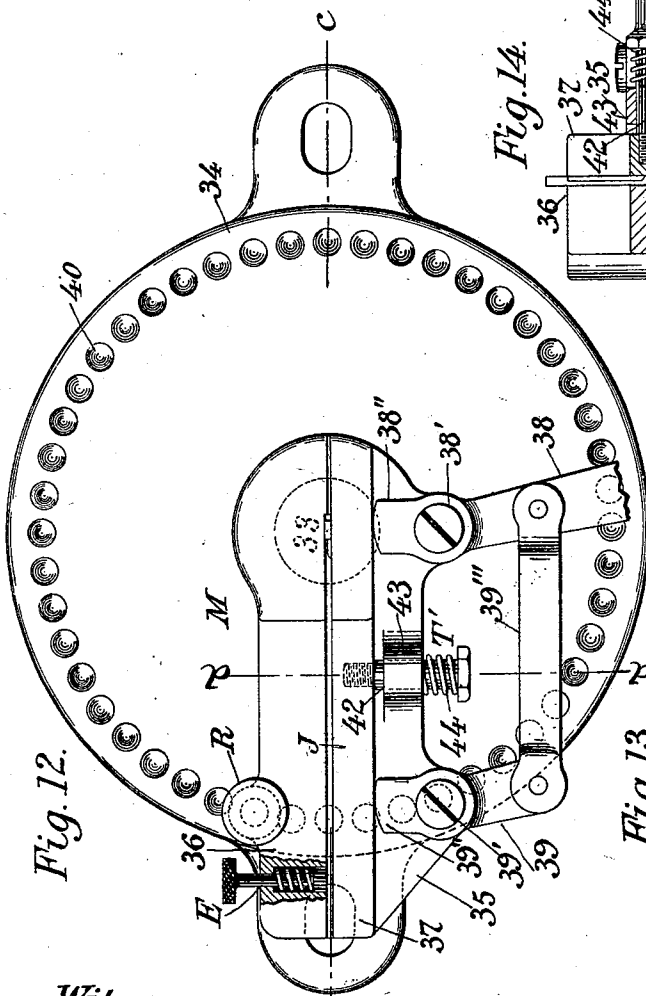
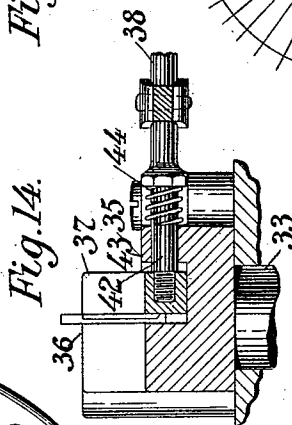
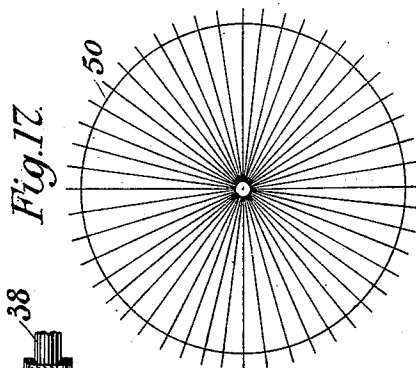
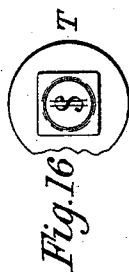
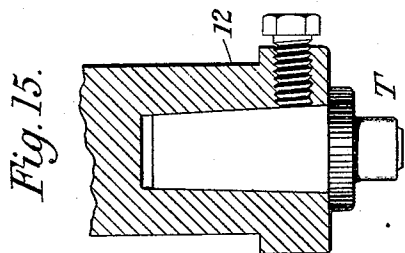
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UNITED STATES PATENT OFFICE.

JOHN M. FAIRFIELD, OF HARTFORD, CONNECTICUT.

APPARATUS FOR MAKING ALIGNED TYPE-BARS FOR WRITING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 553,521, dated January 28, 1896.

Application filed May 11, 1895. Serial No. 548,925. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. FAIRFIELD, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Making Aligned Type-Bars for Writing-Machines, of which the following is a specification.

This invention relates to the art of making precisionized or aligned type-bars for writing-machines.

The object of my present invention is, primarily, to furnish an improved apparatus whereby a complement or complete set of improved and precisionized or aligned type-bars may be independently or successively made, each having an integral and angularly-disposed impression-arm and a gage-point at opposite ends, respectively, thereof, and also having a character compressed in and upon the working face of the type-arm of said type-bar in axial alignment with the longitudinal axis of said arm and at an arbitrarily-precise perpendicular distance from the gage-point of said type-bar, and with the transverse axis of said character at an angular plane relatively to the longitudinal axis of the type-bar, corresponding precisely with the angular position of the printing-line of a writing-machine, relatively to the plane of movement of this particular type-bar when assembled in working position in said machine, to thereby produce a complement of type-bars for a writing-machine, each bar of which has a character thereof, simultaneously formed and aligned preparatory to placing the type-bar in working position in the writing-machine, and thus obviating the necessity for aligning the several type-bars, after the complement of bars is assembled in a writing-machine, as has been necessary with type-bars as heretofore made.

Another object of my invention is to furnish an improved apparatus, whereby a series of type-bars, (comprising a complement of type-bars for a writing-machine,) each having an integral and angularly-disposed type-arm with a character impressed in and upon the working face thereof, with the transverse axis of said character at an angular plane relatively to the longitudinal axis of the type-bar,

corresponding precisely with the angular position of the printing-line of the writing-machine, relatively to the plane of movement of this particular type-bar when assembled in working position in said machine, may be made with precision and economy, and whereby the necessity for aligning said type-bars after the same are assembled in a machine is obviated.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan view of a sheet-metal strip or blank from which my improved type-bar blank is preferably made, said figure showing said blank after a number of type-bar blanks have been stamped or punched out therefrom. Fig. 2 is a side view of a type-bar blank as stamped out from the sheet-metal strip. Fig. 3 is a side view of a punch adapted to be used for stamping out the type-bar blank from the sheet-metal strip. Fig. 4 is a cross-section of said punch, taken on dotted line *a a*, Fig. 3, looking downward. Fig. 5 is a side view similar to Fig. 2 of the type-bar blank after the same has been drilled or punched to form the gage-point or pivot-bearing and the connecting-rod bearing at one end thereof. Fig. 6 is a side view similar to Fig. 5 of a completed type-bar, said type-bar having a character formed in and upon the working face of the integral and angularly-disposed type-arm or impression-arm. Fig. 7 is a sectional view, on an enlarged scale, of a portion of the type-bar, taken in dotted line *b b*, Fig. 6. Fig. 8 is an end view of the type-bar as seen from the left hand in Fig. 6. Fig. 9 is a plan view, on a relatively large scale, of the working end of the type-bar. Fig. 10 is a side elevation, upon a relatively small scale, of one form of apparatus for impressing characters upon type-bars in accordance with my present invention. Fig. 11 is a front elevation of the apparatus shown in Fig. 10. Fig. 12 is a plan view, on a relatively large scale, of a type-bar blank carrying, indicating, and positioning device used in connection with and constituting one of the elements of the machine shown in Figs. 10 and 11. Fig. 13 is a vertical cross-section of the device shown in Fig. 12, taken in dotted line *c c*, said figure, and shows the type-bar blank in position to

be acted upon by the character-forming die. Fig. 14 is a cross-section of a portion of the blank-carrier, taken in dotted line $d d$, Fig. 12, looking toward the right hand in said figure. Fig. 15 is a vertical longitudinal section of a portion of a die-chuck, upon a relatively large scale, showing a die in working position in said chuck. Fig. 16 is an under side view of the die shown in Fig. 15. Fig. 17 is a diagram illustrating the working positions of a series of type-bars when assembled in a writing-machine, the radial lines representing the type-bars, the relatively large circle representing the pivot-bearings of said type-bars, and the relatively small circle concentric to the large circle representing the printing-point or impression-point of the writing-machine.

Like characters represent like parts in all the figures of the drawings.

In making a complement of precisionized or aligned type-bars for a writing-machine in accordance with my improved method, successive portions, as 13, of a sheet-metal strip S, are cut or stamped out between lines 14 to produce a type-bar blank B of angular configuration, as shown in Fig. 2, which blank comprises the main body portion 15 and the angularly-disposed type-arm or impression-arm 16 integral near the working end of the body portion 15. Each type-bar blank will then have formed, near the end thereof most remote from the type-arm 16 and at an arbitrarily precise perpendicular distance from the longitudinal axis of the working face of said arm 16, a gage-point 18, which in the present instance is shown as a transverse opening, and constitutes the pivot-bearing for the type-bar when assembled in the working position in a writing-machine; and said bar will also have formed therein, preferably at this operation, a pivot-bearing 17 for the type-bar-actuating rod, which is shown located above and slightly at one side of the pivot-bearing 18, after which the type-bar blank will be positioned and a character C formed, as hereinafter described, in the working end of its type-arm 16.

It will be obvious that the gage-points 17 of the several type-bar blanks of the complement of blanks may be located at one side and be independent of the pivot-bearings of said blanks, it being understood that it is simply necessary to have the gage-points of all the blanks at corresponding distances from the longitudinal axes of the type-arms of said blanks, respectively, said gage-points of each blank constituting an instrumentality for determining the positioning of the character subsequently formed in the working face of the type-arm of said blank relatively to the pivot-bearing thereof, so as to secure corresponding uniformity in the positioning of the characters of all of the type-bars, as will be hereinafter more fully described.

As an instrumentality for forming the char-

acters in the working faces of the type-arms of the successive type-bar blanks in axial alignment with the longitudinal axes of said arms, and at arbitrarily-precise distances from the gage-points of said blanks, respectively, and with the transverse axes of said characters at angular planes relatively to the longitudinal axes of said blank, respectively, corresponding precisely with the angular position of the printing-line of a writing-machine, relatively to the planes of movement of said bars, respectively, when assembled in a working position in said machine, I have provided a reciprocative character-forming member or impression-tool T, and a type-bar blank-carrying member (designated in a general way by J) in position and adapted for holding the type-bar blank with the working faces of the type-arm 16 thereof in axial alignment with the working face of a character-forming member T; and for the purpose of securing the requisite angular positioning of the successive characters upon the type-arms of the blanks, as above noted, one of said members will be circumferentially adjustable relative to the other member.

The type-bar blank-carrier and the character-forming member T are, for convenience, shown in the drawings in connection with ordinary power-press P, which has the usual reciprocative tool-holder or chuck 12, carried by a tool-carrier or slide 23, supported for reciprocative movement between guideways 25 and 25' on the overhanging head of the frame of the machine and above the bed 26 of said frame, which slide is actuated by means of an eccentric 27 upon the shaft 28, journaled in the head of the machine, as shown most clearly in Figs. 10 and 11, said shaft being provided with the usual driving-pulley 29, which is preferably rotatably mounted upon said shaft. An operative engagement between the driving-pulley and shaft is effected in the usual manner by a clutch 30, which is operated by any suitable clutch-actuating mechanism, such as a treadle 31, and a clutch-operating rod 32, connecting the treadle and the clutch. This clutch and the actuating means therefor may be of any usual construction and organization, and, inasmuch as they constitute no material part of my present invention, it is deemed unnecessary to give a detailed description thereof.

In the preferred form thereof, herein shown and described, the blank-carrier J, which is in the nature of a vise or clamp, is pivotally supported in axial alignment with the character-forming tool T, and is adapted for movement in the arc of a circle concentric to said axis. The said carrier has a depending arbor 33 at the inner end thereof, rotatably seated in a socket or bearing 33', formed in the upper face of a carrier-supporting block 34, which block is adapted to be and is shown removably secured upon a bed or table 26 of the press P.

The carrier-supporting block 34, which is shown circular in form with the periphery thereof concentric to the axis of the blank-carrier rotatably supported thereon, and the rotatable blank-carrier J practically constitute together an indicator, (designated in a general way by M,) through the medium of which the angular position of the blank, relatively to the transverse axis of the character-forming tool, may be accurately located, the supporting block and the carrier constituting, practically, the dial-plate and pointer-carrier, respectively, of the indicator, as will be hereinafter more fully described. This blank-carrier consists, in the form thereof herein shown, of a main body portion 35 having a fixed blank-engaging jaw 36 at one side thereof, and a movable jaw 37, supported for movement toward and from the fixed jaw 36 upon the main body portion 35.

As a convenient means for effecting a clamping movement of the movable jaw 37, relatively to the fixed jaw 36, I have provided, in connection with the main body portion of the carrier, a clamping means, which is shown as two connected levers 38 and 39, fulcrumed at 38' and 39', respectively, upon the main body portion 35 of the carrier, one at each end thereof, and having cam-faces 38'' and 39'' at the working ends respectively thereof, in position and adapted for engaging the movable jaw and closing the same relatively to the fixed jaw.

At the outer end of the type-bar carrier I have provided a blank-engaging and positioning device, (designated in a general way by E,) adapted for coacting with the gage-point upon the type-bar blank, to effect the requisite longitudinal positioning of said blank, relatively to the character-forming tool, and thereby insure a formation of the character, at an arbitrarily-precise distance, relatively to the pivot-bearings of the blank. This blank-engaging and positioning device, in the form thereof herein shown, consists of a detent or spring-actuated pin, seated in the transverse opening in the outer end of the fixed member, and in position and adapted for engaging in the pivot-bearing 18 of the type-bar blank, as will be understood by reference to Fig. 12 of the drawings.

By the term "transverse axis," as herein applied to the character-forming tool, is meant that axis whose angular position, relative to the longitudinal axis of the blank-carrier, corresponds to the angular position of the printing-line of the writing-machine relatively to the plane of movement of a particular type-bar.

As a convenient means for facilitating circumferential adjustment of the blank-carrier, to bring the same to an arbitrarily-precise angular position, relatively to the transverse axis, *ut supra*, of the character-forming tool, and for indicating such angular position with accuracy, the blank-carrier-supporting block,

which also constitutes the dial-plate of the indicator, has a series of stop-notches or indicating-points 40, formed circumferentially in the upper face near the periphery thereof, and the blank-carrier J, which also constitutes a pointer-carrier, is provided near the outer end thereof with a pointer (designated in a general way by R) in position and adapted for registering, successively, with the indicating-points in the upper face of the carrier-supporting block. This pointer is herein shown in the nature of a spring-actuated lock-bolt, carried by the blank-carrier in position and adapted for successively entering the stop-notches 40 and for holding the carrier in its adjusted position. Thus it will be seen that the indicating-points 40 and the pointer R also constitute locking means for preventing accidental movement of the blank-carrier after the same has been set in the required angular position. These stop-notches or indicating-points on the carrier-supporting block are concentrically disposed relatively to the axis of said carrier-supporting block, and their radial axes will correspond in position precisely with the radial path of movement of the several type-bars when assembled in working position in a writing-machine.

To avoid multiplicity in the figures of the drawings I have only shown one character-forming tool; but it will be understood that in practice a series of tools having different characters at their working ends will be employed for forming the different characters in the successive type-blanks of a complement of blanks. These character-forming tools will all be of substantially the same construction with the exception that the working faces thereof will have different characters thereon. The shanks of said tools will preferably be square in cross-section, as shown in Figs. 15 and 16, and will fit a cross-sectionally-squared socket in the tool-holder, so as to facilitate the assembling of said tool, relatively to the tool-holder in its working position, and prevent rotation of said tool in said holder.

As a convenient means for automatically effecting an opening movement of the jaw 37 of the blank-carrier, relatively to the jaw 36, when the clamping-levers 38 and 39 are released, I have provided, in connection with the movable jaw 37, a retracting device, (designated in a general way by T'), which retracting device in the preferred form thereof herein shown consists of a headed bolt 42, which extends through a bearing 43 in the base 35 of the blank-carrier, and is screwed at its inner end into the movable jaw 37 of said carrier, and a retracting-spring 44, carried upon said bolt intermediate to its head and to the bearing 43, as most clearly shown in Fig 14 of the drawings. By this construction and organization of retracting device it will be seen that upon the releasing move-

ment of the levers 38 and 39 the retracting-spring 44 will automatically throw the bolt 42 outward, together with the jaw 37 in connection therewith.

5 As a convenient means for actuating the two clamping - levers 38 and 39 simultaneously, said levers are preferably connected together by a strap 39^m, and one of said levers will, in practice, have a handle extend-
10 ing outwardly beyond the peripheral line of the carrier-supporting block 34 and in convenient position to be grasped. (See Figs. 10 and 12.)

15 In Fig. 17 of the drawings I have shown in diagram the striking positions of a series of type-bars corresponding to the positions they would occupy when assembled in a machine, the relatively large circular line 50 representing the concentric plane of the pivot-bearings
20 of said bars, the relatively small circle in the center of said circle 50 representing the impression-point or printing-point of the several bars.

25 Having thus described my invention, what I claim is—

1. In an apparatus for forming and simultaneously aligning characters of type-bar blanks, a blank-carrying member and a character-forming member supported, and adapted,
30 one of them for movement in a path concentric to the axis of the other; and means in connection with and adapted for securing the movable member in its adjusted position, relatively to the other member, substantially
35 as described, and for the purpose set forth.

2. In an apparatus for forming and simultaneously aligning characters of type-bar blanks, a reciprocatory character-forming member and a blank-clamping member, one
40 of which members is adapted for concentric movement relatively to the other member; an indicator in connection with and adapted for indicating the angular position of one of said members, relatively to the transverse-
45 axis of the other of said members; and means for reciprocating the character-forming member, substantially as described, and for the purpose set forth.

3. In an apparatus of the class specified, the combination with the reciprocatory character-forming tool having a character upon the working-face thereof, and with means for actuating said tool; of a type-bar-blank carrying
50 and clamping device having its axis of rotation in vertical alignment with the axis of the character-forming tool and adapted for movement in a path concentric to the axis of said tool; and means, in connection with said
55 blank-carrying and clamping device, and adapted for holding said device at an arbitrarily-precise angle, relatively to the transverse-axis of the character-forming die, substantially as described, and for the purpose set forth.

65 4. In an apparatus for forming and simul-

taneously aligning the characters upon type-bar blanks, the combination with the character-forming tool; of a blank-carrier having gaging means in position and adapted for engaging the blank at an arbitrarily-precise distance from that part of said blank in alignment with the axis of the character-forming tool, and for successively positioning successive blanks transversely of the vertical axis
70 of the character-forming tool, to bring the characters formed thereon, at arbitrarily-precise distances from the pivot-bearings of said blanks, substantially as described.

5. In an apparatus for forming characters upon type-bar blanks, the combination with
80 a reciprocative character-forming die; of a type-bar blank-carrier comprising two clamping-jaws, one of which is movable toward and from the other; means in connection with and adapted for effecting a clamping movement
85 of the movable-jaw; a retracting device in connection with and adapted for automatically retracting the movable-jaw and movable independently of the clamping means; and a gage carried by one of said jaws, and adapted
90 for coacting with the type-bar blank, held between the jaws to position the same, substantially as described.

6. In an apparatus of the class specified, the combination with a character-forming member;
95 of a carrier-supporting block having a series of stop devices; a blank-clamping carrier supported thereon for movement in a path concentric to the axis of the character-forming member; and means carried by said carrier for engaging the stop devices to secure
100 said carrier in adjusted position relatively to the character-forming member, substantially as described.

7. In an apparatus of the class specified, the combination with a reciprocatory character-forming member; means for reciprocating
105 said member; of a circular carrier-supporting block having a series of stop-notches adjacent to the periphery thereof; of a blank-clamping carrier supported thereon for movement in a path concentric to the axis of the character-forming member; means carried by said carrier for engaging the stop-notches to secure
110 said carrier in adjusted position relatively to the character-forming member; and gaging means carried by said carrier for positioning the blanks carried by said carrier, substantially as described.

8. In an apparatus of the class specified, the combination with a character-forming member;
120 of a carrier-supporting block having a series of stop devices; a blank-clamping carrier supported thereon for movement in a path concentric to the axis of the character-forming member, and comprising a fixed jaw and a movable jaw; clamping means comprising
125 a lever having a cam supported to engage the movable jaw to actuate said movable jaw relatively to its companion fixed jaw; spring
130

operated retracting means for said movable
clamping-jaw in connection with, and adapted
for automatically retracting, the movable jaw
and movable independently of the clamping
5 means; and means carried by said carrier for
engaging the stop devices to secure said car-
rier in adjusted position relatively to the

character-forming member, substantially as
described.

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