

March 27, 1945.

M. TREJO ET AL

2,372,407

TYPOGRAPHICAL MACHINE

Filed April 11, 1942

3 Sheets-Sheet 1

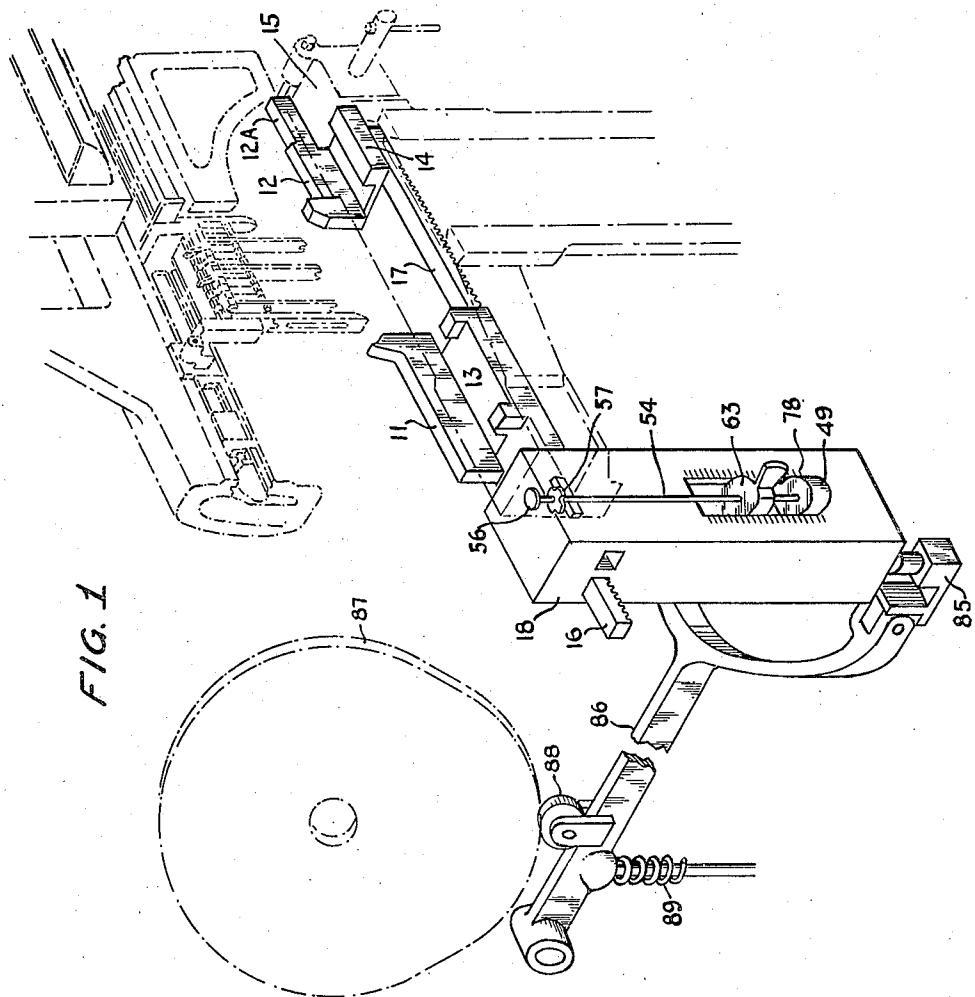


FIG. 1

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FIG. 2

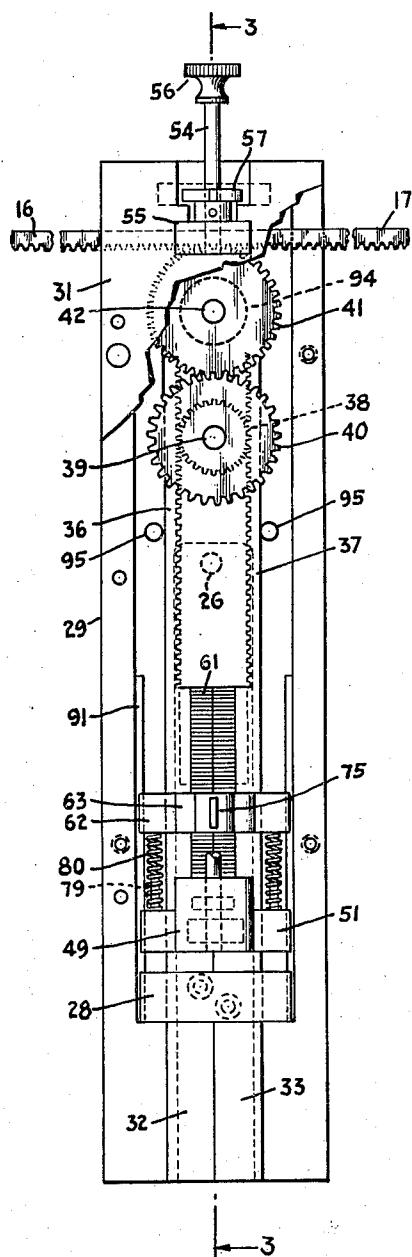
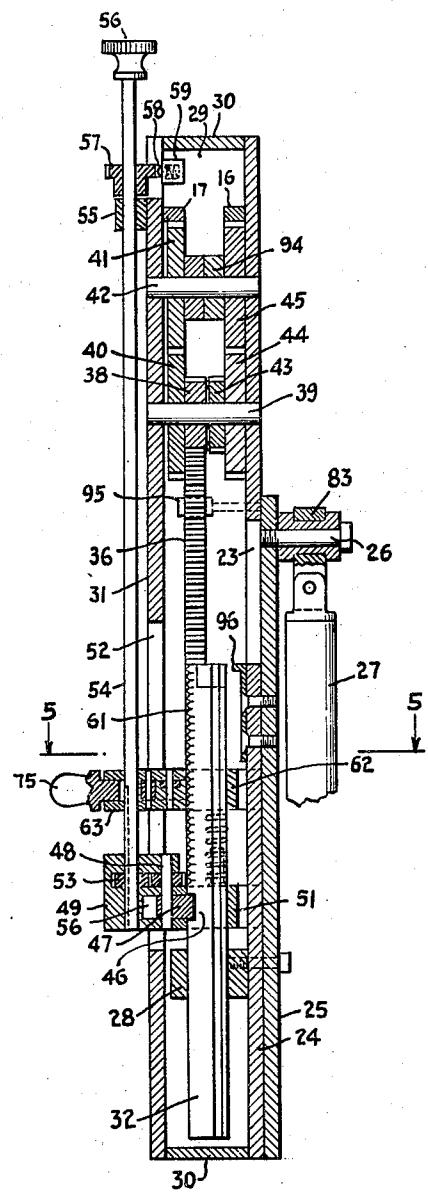


FIG. 3



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FIG. 4

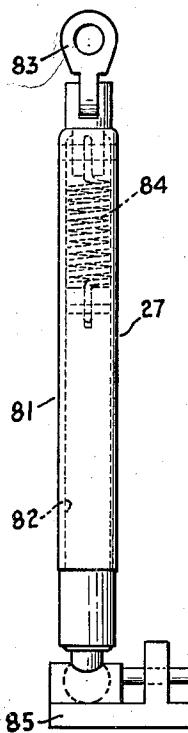


FIG. 5

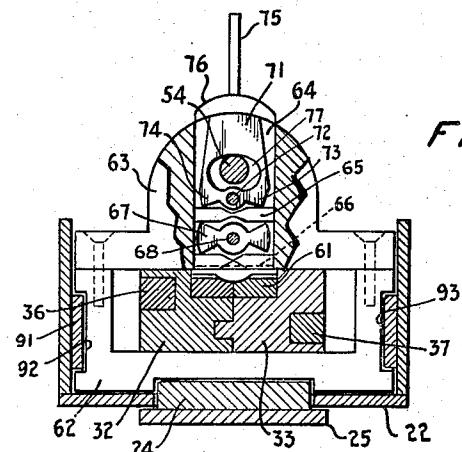
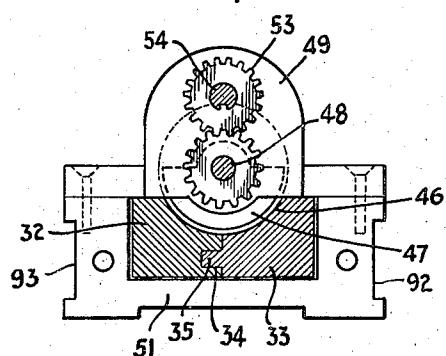


FIG. 6



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2,372,407

TYPOGRAPHICAL MACHINE

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Application April 11, 1942, Serial No. 438,604

13 Claims. (Cl. 199—50)

Our invention relates to improvements in typographical machines and more particularly to means for automatically centering lines of matrices for use in casting type slugs.

Linotype and similar machines have heretofore required a special construction of the entire vise mechanism and associated apparatus for the automatic centering of lines of matrices; and converting existing machines having no such operation has meant re-building that portion of the machine. This could only be done at the factory and involves very large expense to the owner of the machine as well as a considerable loss of use of the machine while the change-over is being made.

It is one object of our invention to provide an attachment which can be readily fitted to existing Linotype or similar machines in a few hours at the printing establishment and which will provide the machine with the automatic centering operations.

Another object of our invention is to provide a mechanism by which the operator of the machine can quickly and easily adjust the centering device so that the geographic center of the matrices can be chosen at will anywhere between the outer limits of the maximum width of the line of type.

Other and further objects of our invention will be apparent from this specification.

One embodiment of our invention is shown in the accompanying drawings in which—

Figure 1 is a perspective view of a portion of a Linotype machine showing the centering mechanism of our invention applied thereto.

Fig. 2 is a front elevation of a portion of the centering mechanism with the cover and other parts broken away to facilitate illustration.

Fig. 3 is a vertical central section on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged detail of the operating link for our centering mechanism.

Fig. 5 is a cross section on the line 5—5 of Fig. 2, showing the centering selector in enlarged detail, with certain parts broken away.

Fig. 6 is an enlarged detail and end elevation of the rack actuator showing the racks in cross section.

It will be understood that the showing in the drawings is by way of illustration only and we do not wish to be limited to the construction shown.

Our improved centering device includes vise closing mechanism and operates in conjunction with certain of the existing apparatus so that in

applying the same to an existing Linotype machine, the vise closing mechanism assembly is removed and our attachment is substituted therefor. In cases where the device is intended to center anywhere along the entire line of type, then it is necessary to substitute a longer vise jaw on the right hand side of the vise mechanism.

The centering means comprises generally a pair of racks connected to operate the vise mechanism, and arranged to be severally or independently moved to actuate the vise mechanism in accordance with the selected point of centering. These racks are operated through a link connected to the justification lever and actuated made.

Referring to the drawings, the Linotype machine assembles the matrices and space bands in a line in the normal way delivering the same to a vise mechanism comprising a pair of vise jaws

11 and 12. As explained, if both jaws are to be movable over the full width of the line, then jaw 12 is provided with an extension 12A which will keep the metal feed slot (not shown) covered. The vise jaws have integral blocks 13 and 14 respectively, which are slidable on the head 15. Block 13 has rigidly connected thereto a rack bar 16 and block 14 has a rack bar 17 rigidly secured thereto, the rack 17 extending through a groove in the underside of the block 13, and the two racks terminate beyond the side of the head 15 in position to be actuated by a vise closing mechanism.

Our vise closing and centering mechanism is enclosed in casing 18, shown more in detail in Figs. 2 and 3. One of the side walls 21 of the casing has a suitable bracket plate (not shown) secured thereto by means of which the mechanism is mounted on the machine. The casing 18 is completed by a back wall 22, a side wall 29, end walls 30 and a front cover plate 31.

The back wall 22 of the casing is slotted as indicated at 23 for receiving the slide bar 24 which is properly secured to a clamping plate 25, that is slidable over the outer surface of the rear plate 22, and is of a size to cover the slot 23 at all times. A stub shaft 26 is mounted near the upper end of this clamping plate on which one end of the operating link 27, to be more fully hereinafter described, is pivotally mounted. Secured near the lower end of the slide 24 so as to reciprocate therewith is a foot 28 having the shape of a hollow rectangular block.

A pair of reciprocal bars 32 and 33 are slidably mounted within the casing, these bars being arranged for conjoint reciprocation as well as for

reciprocation independently of each other. These bars extend through the central opening in the foot 28 which also acts somewhat as a lower guide for the bars. The bar 32 has a groove 34 (Fig. 6) and the bar 33 a tongue 35 operating in that groove to also aid in the guiding of the bars.

At their upper ends the bars 32 and 33 are provided respectively with upwardly extending racks 36 and 37, which face inwardly toward each other, these racks being spaced apart both laterally and from front to rear. The rack 36 meshes with a pinion 38 which is loosely mounted upon an axle 39 that is supported in the rear plate 22 and cover 31. As gear 40 is secured to the pinion 38, and this gear meshes with an idler gear 41 which, in turn, engages with the vise jaw operating rack bar 17. The gear 41 is rotatively mounted on axle 42 which is parallel to the axle 39. In a similar manner rack 37 engages a pinion 43, also on the axle 39, which has a gear 44 connected thereto that meshes with an idler gear 45 that is loosely mounted on the axle 42 and meshes with the other vise jaw operating rack bar 16. Thus, as we are about to describe, the bars 32 and 33 are reciprocated and the vise jaws are moved in and out to close and open the same.

The upper face of each of the bars 32 and 33 is provided with a slot 46 (Fig. 6) in the shape of a sector of a circle, the two slots normally being aligned horizontally so that the combined slots form a somewhat semi-circular segment. Arranged to move in the slots 46 is a semi-circular cam 47 which is fast upon a shaft 48 that is mounted for rotation in a housing 49. The housing is carried by an intermediate block 51 which surrounds the bars 32 and 33 and is free to move thereon, the housing projecting outwardly through a slot 52 in the cover 31 (Fig. 3) and normally resting at the bottom thereof. The shaft 48 also carries one of a pair of gears 53, the second one of which is located in the projecting part of the housing and is secured to the operating rod 54. This rod extends above the top of the casing 18 through a guide 55 and has at its upper end an adjusting knob 56. By turning the knob the position of the cam 47 will be adjusted so that the cam assumes either of four positions for each one-quarter turn, (1) engaging both of the bars 32 and 33, as shown in Fig. 6, or (2) engaging only the bar 32, or (3) engaging only the bar 33, or (4) engaging neither bar, as may be desired in the operation of the machine. The rod 54 passes through an indexing device such as the notched disc 57, rotatably mounted on the guide 55, the notches of which are engaged by the spring pressed ball detent 58 that is suitably mounted in a cup 59 secured to the rear of the cover 31.

The upper face of each of the bars 32 and 33 is provided also with a series of small, closely spaced serrations 61. Surrounding the bars 32 and 33 in the area of these serrations is an upper slideable block 62 which carries a housing 63 that also projects through the slot 52 in the cover 31. A slot 64 (Fig. 5) extends through the housing from its top to the block 62. A pair of matching hollow pawl members 65 occupy the lower part of the slot 64 and are free to move up and down therein. Each member has a toothed bottom end 66 adapted to engage with the serrations 61 of the bars 32 and 33, respectively. A wing shaped bar 67, mounted upon a transverse shaft 68 in the housing 63 fits in the hollow of the members 65 so as to move one of the members oppositely

to the other. This is done through the action of the cam 71 which is pivoted at 72 and has lobes 73 and 74 on the bottom thereof on either side of the pivot, which lobes engage with the tops of the members 65. At its outer end the cam has a handle 75 and a cover 76 for the end of the slot 64. The cam 71 also has a somewhat elliptical shaped slot 77 therein for the free passage of the operating rod 54 of the rotatable cam mechanism that is carried by the intermediate block 51.

When the handle 75 is moved to the right (Fig. 5) the right-hand member 65 is lowered so that its teeth 66 engage the serrations 61 of the bar 33. This will rock the winged bar 67 on its pivot 68 to lift the left hand member 65. When the handle 75 is moved to the left the reverse action takes place, and when the handle 75 is in the central or neutral position the teeth of the members 65 are out of engagement with the serrations 61. A suitable index 78 in measurements of ems will be provided on the cover plate co-extensive with the serrations 61.

The bars 32 and 33 are reciprocated through the operations of the flexible link 27, shown in detail in Fig. 4. This link comprises a tubular shaft 81 receiving the rod 82 and having at its upper end the link 83 which is mounted on the pivot 26 (Fig. 3). The link and rod are connected by a coiled spring 84, this arrangement being provided to eliminate the danger of breakage or jamming in the operation of the centering apparatus. One end of the rod 82 is pivotally connected to the holder 85 (Figs. 1 and 4) which in turn is secured to one arm of the justification lever 86 that is moved vertically by the action of the cam 87 and cam wheel 88 against the action of spring 89, as is customary in these machines.

In their up and down movements the foot 28 and the blocks 51 and 62 are also guided by bars 91 (Fig. 2) received in slots 92 and 93 (Figs. 5 and 6) in the sides of the blocks 62 and 51 respectively. The upper ends of the racks 32 and 33 are guided in their up and down movements by the guide roller 94 on the axle 42 and the guide rollers 95.

The described apparatus operates substantially in the following manner: If the vise jaws are to be operated simultaneously to center the line of matrices on the geographic center of the line, the linotype operator adjusts the cam 47 by means of the knob 56 to engage both bars 32 and 33, as shown in Fig. 6, and places the handle 75 in the neutral position. Assuming the cam 47 is so adjusted, the cam 87 will be rotated to permit the justification lever 86 to rise, thereby raising the link 27 which will move the clamping plate 25 and slide 24 upwardly, carrying with it the foot 28. This foot will engage the intermediate block 51, having therein the cam 47, and move this block upwardly. Since the cam 47 now engages both of the bars 32 and 33 these bars will be lifted in the continued upward movement of the slide 24. Both racks 36 and 37 will be simultaneously raised to operate both vise jaw rack bars 16 and 17 in opposite directions to close the same an equal amount.

On its upper side the intermediate block 51 carries a pair of pins 79 having thereon coiled springs 80 which normally engage the block 62. In the upward movement of the intermediate block 51, the springs 80 will be compressed and will move the upper block 62, but since the handle 75 of the block 62 is now in the neutral position, this block moves up idly. The upper limit of

movement is determined by the engagement of the slide 24 with the upper end of its slot 23. In the upward movement of the block 51 the rod 54 moves freely upward in the slot 17, guide 55 and index disc 57.

As the justification lever 86 is lowered, the slide 24 is lowered to the bottom of the slot 23, carrying with it the foot 28, and the blocks 51 and 62 return by gravity to their lower positions, as do the bars 32 and 33. Thus the vise jaws are reopened ready for action on the next line of matrices. Ordinarily, the weight of the bars and associated parts is sufficient to effect this return but if for any reason the mechanism fails to begin its return movement then the upper block 62 will be engaged by the finger 95, which is carried by the slide bar 24, and the further downward movement thereof will be sufficient to release the blocks and start their downward movement. If for any reason the mechanism should be out of order so that the blocks would not move, then the spring and construction of the operating link 27 is such that the justification lever can be returned to its lower position without damaging the centering or other mechanism.

If now it is desired to center a line of matrices, or a single matrix, on some point to the left of the geographic center of the full line, say at five ems, the operator will move the upper block 62 vertically to the proper position as shown by the index scale 78, and move the handle 75 to the right thereby lowering the right-hand (Fig. 5) member 65 to engage the teeth thereof with the serrations 61 of the bar 33. The operator will also turn the knob 56 to adjust the cam 47 so that it is in engagement only with the bar 32. With these adjustments, upon the upward movement of the slide 24 and the foot 28, only the bar 32 will be raised by means of the block 51 and its cam 47, and until the intermediate block 51 engages with the upper block 62 in its new position the bar 33 will remain stationary. Accordingly, the rack 36 and the associated rack bar 17 of vise jaw 12 will travel much further than the other vise jaw. Upon the further upward movement of the slide 24, the bars 32 and 33 will be raised simultaneously to then close the vise jaws about the five em center selected, but the vise jaw 11 has had to travel only a short distance.

If it is desired to center the matrix or matrices on some point to the right of the geographical center, the cam 47 and the handle 75 will be moved to the opposite positions and the reverse operations of the bars 32 and 33 will be effected. It is obvious that any centering point may be selected in the full length of the line and that the vise jaws will be relatively moved accordingly.

Modifications may be made in the arrangement and location of parts within the spirit and scope of our invention, and such modifications are intended to be covered within the scope of the appended claims.

We claim:

1. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, rack bars connected thereto, gears engaging said rack bars, other racks and pinions connected to said gears and operable to move the vise jaw rack bars in opposite directions, means for selectively moving either of said other racks a different distance from the other to thereby select the centering point for less than a complete line, said means consisting of serrated portions on said

other racks, slidably mounted pawls movable to engage said serrated members respectively, cam means adjustable to cooperate with said other racks so that either one may be moved independently of the other, and means for moving said pawls and cam means vertically.

2. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, rack bars connected thereto, gears engaging said rack bars, other racks and pinions connected to said gears, and means for selectively moving either of said other racks a different distance from the other to thereby select the centering point for less than a complete line, said means consisting of serrated portions on said other racks, and slidably mounted pawls movable to engage said serrated members respectively.

3. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, rack bars connected thereto, gears engaging said rack bars, other racks and pinions connected to said gears and operable to move the vise jaw rack bars in opposite directions, cam means adjustable to cooperate with said latter rack bars so that they may move either independently or both simultaneously, and means for adjusting said cam means.

4. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, rack bars connected thereto, gears engaging said rack bars, other racks and pinions connected to said gears and operable to move the vise jaw rack bars in opposite directions, and means for selectively moving either of said other rack bars a greater distance than the other thus moving the connected vise jaw a greater distance than the other.

5. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, rack bars connected thereto, gears engaging said rack bars, other racks and pinions connected to said gears and operable to move the vise jaw rack bars in opposite directions, and means for selectively moving either or both of said other racks to actuate said vise jaw rack bars.

6. In a line composing and type casting machine, vise closing and line centering means comprising a pair of vise jaws independently movable over the entire width of the line, laterally extending rack bars attached to the vise jaws, means for reciprocating the rack bars to center less than a full line of matrices on any selected center within the width of the full line, and means for adjusting said mechanism to select the desired center.

7. In a line composing and type casting machine, vise closing and line centering means comprising a pair of vise jaws independently movable over the entire width of the line, laterally extending rack bars attached to the vise jaws, mechanism for reciprocating the rack bars to center less than a full line of matrices on any selected center within the width of the full line, means for adjusting said mechanism to select the desired center, said machine also having a justification lever, and a connection from said lever to said mechanism whereby the latter is actuated.

8. In a line composing and type casting machine, vise closing and line centering means comprising a pair of vise jaws independently movable over the entire width of the line, laterally ex-

tending rack bars attached to the vise jaws, gears connected to said rack bars for reciprocating the same and mechanism for rotating said gears having a pair of racks connected to said gears, and means for reciprocating said racks, said means having an adjustment to select any desired center within the full width of the line about which the vise jaws will be moved.

9. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, laterally extending rack bars attached thereto, gearing engaging the rack bars and rotatable to move the vise jaws relatively to each other, rack means connected to the gearing to rotate the same, and means for moving the rack means and including an adjustable pawl which is movable to control the movement of the rack means in accordance with the desired center for the matrices being acted upon by the vise jaws.

10. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, laterally extending rack bars attached thereto, gearing engaging the rack bars and rotatable to move the vise jaws relatively to each other, rack means connected to the gearing to rotate the same, a justification lever on said machine, and means for moving the rack means comprising a plurality of teeth on said rack means, a pawl for engaging the teeth, the pawl being adjustable to engage various ones of said teeth to determine the movement of said rack means and thereby select the center for setting the matrices being acted upon by the vise jaws, and connections from said pawl to the justification lever whereby the pawl and rack means are moved to close the vise jaws.

11. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, laterally extending rack bars attached thereto, gearing engaging the rack bars and rotatable to move the vise jaws relatively to each other, a pair of racks connected to the gearing to rotate the same, serrations on each of said racks, a block surrounding said racks and carrying a housing, the same being adjustable along the serrations; a pair of pawls mounted in the housing and movable to engage the serrations, a cam for moving one or the other of the pawls in engagement with said serrations respectively in the ad-

justed positions of the block and housing, connections from said housing to a lever on said machine whereby the vise jaws are moved in accordance with the adjustment of the block, and a justification lever on said machine to which said connections are made.

12. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, laterally extending rack bars attached thereto, gearing engaging the rack bars and rotatable to move the vise jaws relatively to each other, a pair of racks connected to the gearing to rotate the same, each of said racks having a slot therein having the shape of a sector of a circle, said slots being aligned when the vise jaws are open, a block surrounding the racks and carrying a housing, a cam rotatably mounted in the housing and adjustable to engage selectively either or both of said slots, means for adjusting the cam to select its position, a justification lever for said machine, and connections from said lever to said block whereby the block and its cam means are moved to move the racks to thereby close the vise jaws.

13. In a line composing and type casting machine, vise closing and line centering means comprising a pair of independently movable vise jaws, laterally extending rack bars attached thereto, gearing engaging the rack bars and rotatable to move the vise jaws relatively to each other, a pair of racks connected to the gearing to rotate the same, serrations along each of said racks, a block surrounding the racks and carrying a housing, the block being adjustable along the serrations, a pair of pawls in the housing, means for moving the pawls into engagement with the serrations of the rack bars respectively in the adjusted positions of the block, each of said racks also having a slot therein, a second block surrounding the racks and carrying a housing, cam means mounted in the housing and adjustable to engage either of said slots, and operable to engage the slot of the opposite rack from the one having its serrations engaged by one of said pawls, a justification lever for said machine, and connections from said blocks to said lever whereby the blocks are moved to move the racks and associated vise jaws.

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