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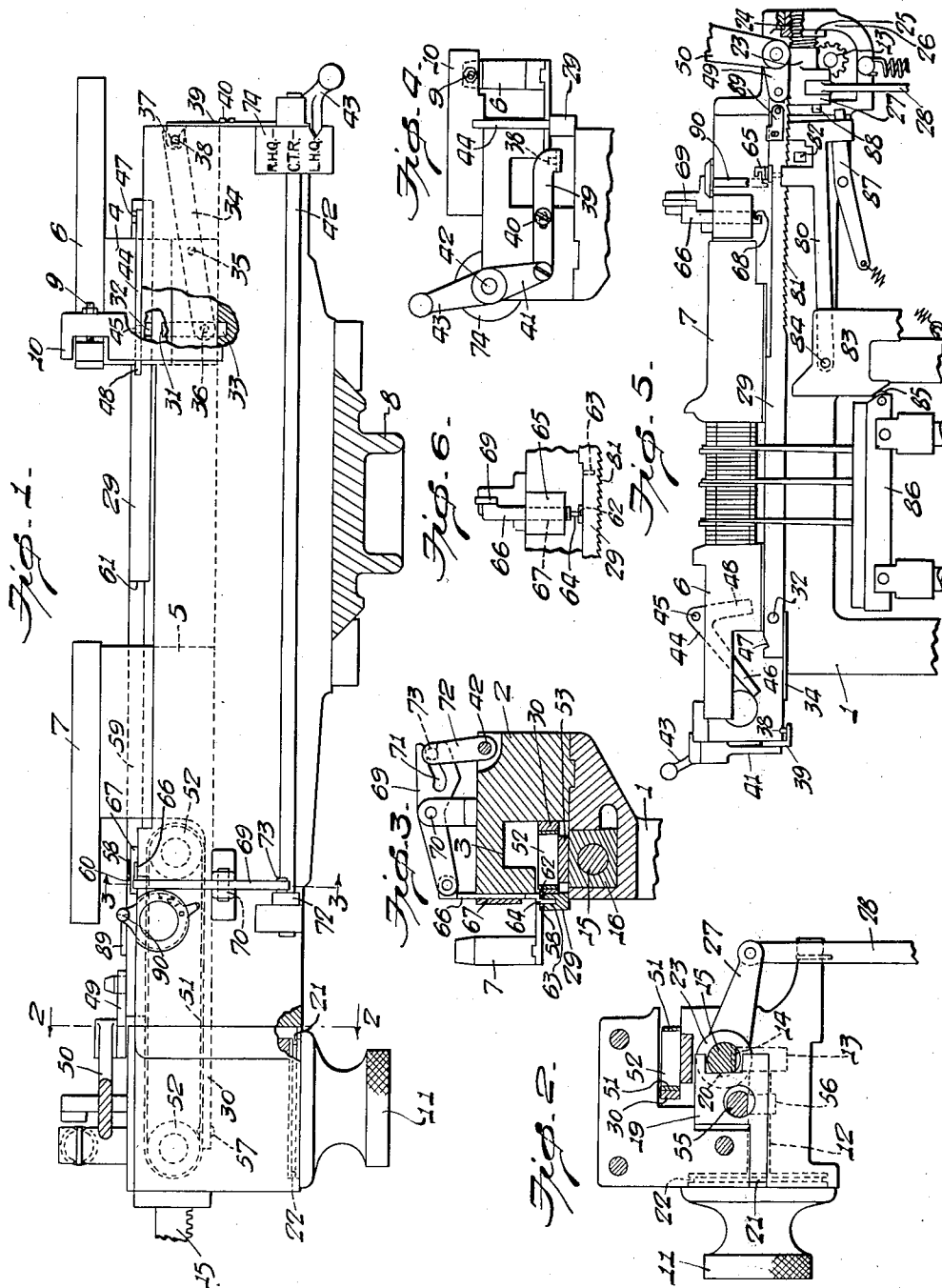
R. H. TURNER

1,980,962

LINE CASTING MACHINE

Filed Nov. 27, 1933

2 Sheets-Sheet 1



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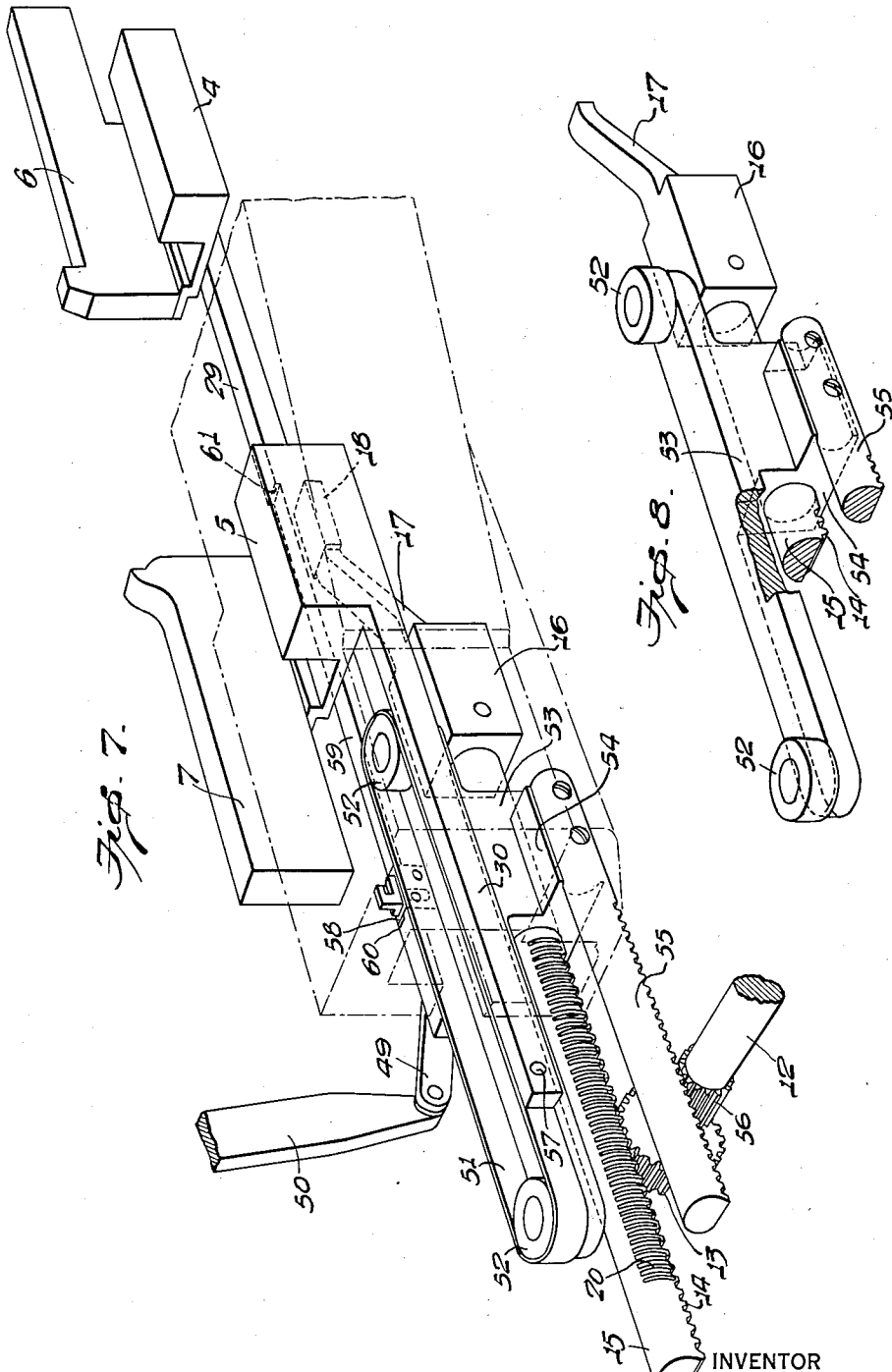
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LINE CASTING MACHINE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

1,980,962

LINE CASTING MACHINE

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Application November 27, 1933, Serial No. 699,977

20 Claims. (Cl. 199—50)

The present invention relates to line casting machines and more especially to those of the general class disclosed in U. S. Letters Patent No. 433,532 granted September 16, 1890, wherein lines of character bearing matrices are assembled and presented in front of a mold and clamped endwise by a vise while metal is injected into the mold to cast type bars or slugs from the matrix lines.

The invention relates more particularly to means for rendering one or the other or both of the vise jaws of machines of this general class operative to close against matrix lines of different lengths in order to fill out blank portions of short or incomplete lines cast on slugs of a common length. More specifically, the invention relates to improvements in quadding and centering mechanism for line casting machines of this class, wherein one or the other of the vise jaws or both of the vise jaws will be operated automatically to move inwardly against and to confine matrix lines of less than column width so that the operator need only compose the matrices for any given line and then send such line into the casting mechanism of the machine in the usual manner and such lines will be automatically quadded out at one or the other end or will be centered, according to the setting of the machine.

Mechanism for accomplishing this general purpose is disclosed in U. S. application of Samuel E. Sperry, Serial No. 612,349, filed May 19, 1932, but in the improved device according to the present invention the quadding and centering mechanism is so coordinated with other elements of the machine associated with the vise jaws that greater facility is afforded in making adjustments. More particularly, the improved mechanism according to the present invention for moving the vise jaws is so constructed and arranged that the usual adjustable left-hand jaw may be set at any time for casting lines of different lengths, irrespective of whether the two jaws are coupled together or which of the jaws may at the time be connected with the jaw moving element of the device.

To these and other ends, the invention consists in certain improvements and combinations and arrangements of parts all as will be hereinafter more fully described, the features of novelty being pointed out particularly in the claims at the end of this specification.

In the accompanying drawings:

Figure 1 is a top plan view, partly in section, of the vise mechanism of a line casting machine embodying the present invention;

Figure 2 is a vertical section taken on the line 2—2 in Figure 1 and looking in the direction of the arrows;

Figure 3 is a vertical section taken on the line 3—3 in Figure 1 and looking in the direction of the arrows;

Figure 4 is an end elevation of the structure shown in Figure 1 as viewed from the right;

Figure 5 is a rear elevation of the vise mechanism shown in Figure 1, on a reduced scale, showing a matrix line centered by the vise jaws;

Figure 6 is a detail view of the means for disconnecting the left-hand jaw from the jaw moving means to permit quadding with the right-hand jaw;

Figure 7 is a perspective view, on an enlarged scale, showing the right-hand and left-hand jaws and the improved means for coupling the jaws and for adjusting the left-hand jaw; and

Figure 8 is a detail perspective view of portions of the jaw coupling and adjusting means.

Similar parts are designated by the same reference characters in the different figures.

The quadding and centering mechanism provided by the present invention is especially applicable to line casting machines of the general class disclosed in the above-noted patent, it being applied to the usual vise mechanism thereof, and since the composing of the matrix lines received by the vise mechanism and the casting of the type bars or slugs from the lines while held or clamped by the vise mechanism may be accomplished in the manner usual in machines of this class and well known to those skilled in the art, it is deemed sufficient for the purposes of the present invention to show and described the invention as applied to the vise mechanism of such machine.

In the accompanying drawings, 1 represents the upper portion of the usual vise frame, the cap 2 of which is formed with a guideway 3 in which the jaw blocks 4 and 5 are slidable, these jaw blocks having the right-hand and left-hand vise jaws 6 and 7 fixed thereto so that the vise jaws, which are adapted to receive the matrix lines between them, are movable toward and from one another to close against and release the interposed matrix lines. 8 represents the slide of the usual vertically movable first elevator as commonly used in machines of this class to lower the matrix lines into position between the vise jaws and in front of the mold prior to each cast and to lift the matrix lines from between the jaws after each cast has been made.

The right-hand jaw 6 rests against a stop 9 when in its normal fully open or line receiving

position, as shown in Figure 1, this stop being fixed to the vise cap, as by a bracket 10 suitably fastened to the vise cap. The left hand jaw 7, which is adjustable so that it may be set for the casting of type bars or slugs from matrix lines of different line measures to conform with different desired column widths, is provided with a setting or adjusting device which may be similar to that disclosed in U. S. Letters Patent No. 1,108,758 granted August 25, 1914, it being deemed sufficient for the purposes of the present invention to describe such device as comprising a manually rotatable and axially shiftable knob 11, the shaft 12 of which is rotatable and shiftable axially in the vise cap, said shaft having a pinion or gear 13 fixed thereon and meshing with rack teeth 14 formed on the under side of a bar 15, this bar being movable longitudinally in the vise cap and fixed at its inner end to a block 16 which is guided to slide in the vise cap in parallelism with the direction of movement of the jaw 7. The block 16 carries an abutment 17 which is located at the outer side and in the path of an abutment lug 18 fixed to the jaw block 5 carrying the left-hand jaw 7. A detent 19 is slidably mounted in the vise cap to move transversely of the bar 15, this detent being engageable with locking teeth 20 formed on the forward side of the bar 15. The detent 19 is formed with a laterally extending lug 21 at its forward end which fits into a circumferential groove 22 formed in the adjusting knob 11. By this arrangement, while the knob 11 is in its rear position, the detent 19 will engage the teeth 20 in the bar 15, thereby locking the latter against longitudinal movement and thereby holding the abutment 17 in position to limit the outward movement of the jaw 7, but a forward pull of the knob 11 will withdraw the detent 19 from engagement with the bar 15, thereby unlocking the latter, and rotation of the knob 11 will cause the pinion 13 to shift the bar 15 longitudinally, in one or the other direction as may be necessary to position the abutment 17 at the appropriate point to engage the abutment lug 18 and thereby determine the outermost position for the jaw 7 to conform with the desired line measure for which the vise is to be set. After the bar 15 has been set in the desired position, it is locked therein by rearward movement of the knob 11 which returns the detent 19 to locking engagement with said bar. The left hand jaw setting device just described is also preferably provided with means for forcing the left-hand jaw 7 inwardly against each matrix line to clamp or lock it immediately prior to the casting operation, for which purpose a sleeve 23 is mounted rotatably on the bar 15 in a position to bear against the locking detent 19 at one end and the other end of this sleeve is screw-threaded as at 24 into a nut or bushing 25 fixed in a part 26 attached to the vise cap, the sleeve having a crank 27 fixed thereon and connected to a link 28 the lower end of which is connected to the left-hand vise jaw closing lever commonly used in machines of this class and which moves upwardly during justification to expand spacebands in the line, if such are present therein, such upward movement of the link 28 rotating the sleeve 23 and the latter thereby acting through the detent 19 to force the bar 15 inwardly and thereby clamp the left-hand vise jaw 7 against the matrix line.

The right hand jaw 6 is provided with a bar or extension 29 and the left-hand jaw 7 is provided with a bar or extension 30, these bars being guided to move longitudinally of the vise cap in par-

allelism with the direction of movement of the vise jaws and serving to close and open them. The bar or extension 30 is fixed to the jaw block 5 of the left-hand jaw 7 but the bar or extension 29 is provided with means for connecting and disconnecting it with respect to the right-hand jaw 6, the means provided for this purpose being like that disclosed in the application hereinbefore referred to and comprising a locking pin 31 which is guided to reciprocate transversely in the jaw block 4 and is engageable in an aperture 32 in the bar 29 when shifted in one direction thereby connecting the bar 29 to the jaw 6 and being disengageable from said aperture to disconnect the bar 29 from the jaw 6 when shifted in the opposite direction. The vise cap 2 may also be provided with a recess 33 in which the pin 31 may engage when retracted from the aperture 32 and thereby lock the jaw 6 in its normal fully open position against its stop 9. The connecting and disconnecting pin 31 for the jaw 6 may be shifted into connecting or disconnecting position by a lever 34 pivotally mounted at 35 on the jaw block 4 and engaging at one end a projection 36 on said pin and having a fork 37 at its opposite end in which a pin 38 carried by a slide 39 may engage, this slide being supported on the vise cap by screw 40 so that it may be shifted longitudinally in one direction or the other thereby rocking the lever 34 and shifting the pin 31 into its jaw connecting or disconnecting position. The link 39 is preferably pivotally connected to an arm 41 fixed on a shaft 42, the latter being mounted rotatably in suitable bearings on the vise cap and being provided with a lever or handle 43 for rotating it into different set positions, as will hereinafter appear.

A latch is provided for the right-hand jaw 6 for retaining it in its normal fully open position against its stop 9, the latch 44 provided in the present instance being pivoted at 45 to the bracket 10 and having an arm 46 which is engageable in a notch 47 in the bar or extension 29 when the bar 29 is in its normal position corresponding to the fully open position of the jaw 6, the latch having another arm 48 which projects into the path of one of the jaws of the usual first elevator and being movable thereby, as said elevator lowers a matrix line into position between the vise jaws, to trip the latch and thereby release the bar 29, as described in the hereinbefore mentioned application. The bar 29 is also connected by a link 49 to the arm 50 of a jaw closing and opening device which may be like that shown and described in the hereinbefore described application, this arm being swung alternately in opposite directions by movement derived from a suitable moving part of the machine to close one or the other or both of the jaws after a matrix line has been introduced between them and to open such jaw or jaws after a cast has been made from the matrix line.

The present invention provides novel and improved means for connecting the vise jaws and for causing equidistant movement thereof toward and from one another, as in centering matrix lines. Such coupling means, as shown in the present instance, comprises a continuous flexible steel belt, chain or similar endless member 51 arranged to travel over a pair of rollers or pulleys 52 which are rotatably mounted on a carriage 53, the rollers or pulleys being spaced apart a distance from center to center somewhat greater than the maximum distance which the vise jaws are capable of being set apart from one another

in the machine. The carriage 53 for the pulleys and endless coupling member straddles or slides upon the bar 15 in order to accommodate it in the space available in the usual vise cap, and it has an extension 54 which is fixed, as by the screws shown, to a toothed or rack bar 55, this rack bar extending parallel to the bar 15 so that it extends over the shaft 12, and the latter has a pinion 56 which is fixed thereon and meshes with the rack teeth on the bar 55, the pinion 56 for the bar 55 having a diameter which is one-half the diameter of the pinion 13 for the bar 15.

The bar or extension 30 fixed to the block 5 of the left-hand jaw 7 is fixed, as by a rivet 57, to one side of the flexible belt or member 51. The bar or extension 29 for moving the right-hand jaw 6 is provided with means for detachably connecting it to the opposite side of the flexible belt or member 51. The connecting and disconnecting means between the bar 29 and belt 51, as shown in the present instance, comprises an angle plate 58 which is riveted or otherwise suitably fixed to the respective side of the belt 51 so that it projects laterally therefrom and overlies the bar 29, the latter being provided with a recessed portion 59 along which the overhanging portion of the angle plate may travel, this recessed portion forming shoulders 60 and 61 at its ends which are spaced apart a suitable distance to serve as stops or abutments for the angle plate at either extreme position of the right-hand jaw 6. The angle plate 58 and the bar 29 adjacent to the shoulder 60 are provided with apertures 62 and 63 respectively to receive a locking pin 64, this pin being reciprocable vertically and serving, when in its lowered position as shown in Figures 3, 5 and 7, to connect the bar 29 to the belt 51 and disconnecting said bar and belt when lifted, as in Figure 6. In order to shift the pin 64 to thus connect and disconnect the right-hand jaw bar 29 with respect to the coupling belt 51, the upper end of the pin 64 is formed with a hook or lock 65 and an operating pin 66, movable vertically in a guideway 67 formed in the vise cap, is provided with a complementary hook or lock 68, the hook 65 on the pin 64 being engageable with the hook 68 on the pin 66 when the bar 29 carries the pin 64 into a position beneath the pin 66, these hooks however permitting the pin 64 and angle plate 58 to move from beneath the pin 66. The pin 66 is pivotally connected at its upper end to a lever 69 which is pivotally mounted at 70 on the upper side of the vise cap, this lever having a cam slot 71 formed therein, and the shaft 42 has an arm 72 fixed thereon, this arm carrying a pin 73 which operates in the cam slot 71.

The shaft 42 controls the connection and disconnection of the angle plate 58 and bar 29 and also controls the connection and disconnection of the bar 29 and the right-hand jaw 6, it being rotatable into one or another of three different positions to set the device for right-hand quadding, centering, or left-hand quadding, and to facilitate the setting of this shaft, a dial 74 is preferably provided having appropriate indications thereon for cooperation with a pointer on the setting handle 43, the cam slot 71 in lever 69 being so shaped and the pin 73 so positioned therein that when the pointer registers with the indicia "L. H. Q." indicating left-hand quadding, the pin 64 will be lowered so that it connects the angle plate 58 with the bar 29, at which time the pin 31 will be retracted from and in disengaged relation with the bar 29 for the right

hand jaw 6; when the pointer registers with the indication "CTR." indicating centering, the pin 64 will be in its lowered position and will connect the angle plate 58 and bar 29, at which time the pin 31 will engage in the aperture 32 in the bar 29 and thus connect this bar to the right hand jaw 6, and when the shaft 42 is rotated into a position to bring the indicator into register with the indication "R. H. Q." indicating right-hand quadding, the pin 73 will be moved into the inner end of the slot 71 and will actuate the lever 69 and pin 66 to lift the pin 64 out of engagement with the aperture 63 in the bar 29, at which time the pin 31 will be engaged in the aperture 32 so that it connects the bar 29 to the right-hand vise jaw 6, assuming this setting of the device to be made while the right-hand jaw 6 is in its normal or fully open position against its stop 9, at which time the hook 68 on the pin 66 will be in lifting engagement with the hook 65 on the pin 64. Rotation of the shaft 42 into any one of these three positions will thus selectively set the device for quadding with one or the other of the jaws or for centering with both jaws. The hook 65 on the pin 64, when lifted, enters the guideway 67 for the lifting pin 66, as shown in Figure 6, whereby the pin 64, which remains in engagement with the angle plate 58, will hold the endless belt or flexible member 51 against movement and will thereby hold the left-hand jaw 7, which is connected to the belt or member 51, from inward movement while quadding is being performed with the right-hand jaw 6. During adjustment of the left-hand jaw 7 by manipulation of the knob 11 in the manner hereinbefore described in order to locate this jaw at different distances from the right-hand jaw to suit the requirements for casting lines of different lengths, the rotation of the shaft 12, which acts through the pinion 13 to shift the bar 15 to set the left-hand jaw stop 17 in the different positions required for different line measures, concurrently causes the pinion 56 on this shaft to shift the bar 55 in the same direction, the bar 55 carrying with it the carriage 53 to which it is connected and the jaw coupling belt or member 51 mounted on the carriage, but since the pinion 56 is one-half the diameter of the pinion 13, the jaw coupling carriage 53 will be shifted at one-half the speed of the left-hand jaw stop 17 or through one-half the distance this jaw stop is moved.

According to the present invention, the left-hand vise jaw 7 can be adjusted to set it at different positions for casting from matrix lines of different line measures while both jaws remain connected to the coupling belt or member 51 or while the right-hand jaw 6 is disconnected therefrom, so that the adjustment can be made while the shaft 42 is set in any of its three positions hereinbefore described and manipulation of the left-hand jaw setting device will always effect the adjustment of the left-hand jaw, irrespective of whether or not it is connected to the other or right-hand jaw. For example, assuming the pin 64 to be engaged in the right-hand jaw bar 29, it will be seen that since the bar 29 is locked in its normal position corresponding to the normal or fully open position of the right-hand jaw 6, by the latch 44, movement of the carriage 53 will alter the relative positions of the connecting points 57 and 64 of the left-hand and right-hand jaws respectively to the coupling belt 51, but since the pin 64 will not change its location but will remain fixed through its engagement with the

bar 29 which is held by the latch 44 and is normally connected to the right-hand jaw 6 which normally rests against its stop 9, only the connecting point 57 of the left-hand jaw 7 will actually move when the carriage 53 is moved either inwardly or outwardly, the connecting point 57 between the left-hand jaw and the coupling belt 51 being at the opposite side of said belt from the side thereof at which the pin 64 is located.

However, since the carriage 53 moves at one-half the speed of movement of the left-hand jaw stop 17 and the actual movement of the coupling belt 51 is confined only to the side thereof to which the left-hand jaw 7 is connected by the bar or extension 30, the left-hand jaw 7 will be moved either inwardly or outwardly, according to the direction in which the shaft 12 is rotated, at the same speed as and concurrently with the inward or outward movement of the left-hand jaw stop 17, and this jaw stop will therefore remain in operating relationship with the abutment lug 18 during the various adjustments of the left-hand jaw. If the pin 64 is lifted out of engagement with the bar 29 for the right-hand jaw 6, the same action just described takes place since, although inward or outward movement of the carriage 53 will advance the centers of the belt rollers 52 at one-half the speed of movement of the left-hand jaw stop 17 in the same direction, the side of the coupling belt 51 carrying the angle plate 58 will be held stationary due to the engagement of the pin 64 in the angle plate and the holding of the lifted pin 64 stationary by the engagement of its hook 65 in the stationary guideway 67, in consequence of which the flexible belt or member 51 is caused to travel around its rollers or pulleys with all of its traveling motion confined to the side thereof to which the bar 30 for the left-hand jaw 7 is connected. In either case, the power applied by the endless traveling belt 51 to move the left-hand jaw either inwardly or outwardly is derived from the bar 55 actuated by the pinion 56, although when adjusting the left-hand jaw 7 inwardly, its inward movement under the action of the belt 51 will be assisted by the inward pressure of the left-hand jaw stop 17 against the abutment lug 18 connected to the left-hand jaw.

When both right-hand and left-hand jaws are coupled by the traveling belt 51 by engagement of the pin 31 with the bar 29 and the engagement of the pin 64 with said bar, as in centering, movement imparted to one side of the belt 51 by the reciprocation of the bar 29 under the action of the arm 50, to either close or open the right-hand jaw 6, will cause equal but opposite and corresponding closing or opening movement of the left-hand jaw 7 by the travel of the endless belt 51 around its rollers or pulleys 52 while the carriage 53 on which these rollers are mounted is held stationary by the detent 19 which locks the shaft 12 from rotation through its locking engagement with the bar 15 and hence prevents shifting of the bar 55.

The mode of operation of the quadding and centering mechanism is as follows:—The to and fro swing of the vise jaw moving arm 50 reciprocates the bar 29, first toward the left in Figure 1, after a matrix line has been lowered into position between the vise jaws and prior to the casting operation, and then toward the right in said figure after the cast has been made. If the shaft 42 is set to bring its indicator into register with the indication "CTR.", the pin 31 carried by the right-hand jaw 6 will be engaged with the

bar 29, thus connecting the right-hand jaw thereto and the pin 64 will be lowered, thereby connecting the bar 29 to the angle plate 58 attached to the endless or traveling belt 51, and the left-hand movement of the bar 29 will then cause both jaws to move inwardly equidistantly and thereby center a matrix line between them, the movement of the bar 29 and the right-hand jaw 6 connected thereto in one direction being transmitted to an equal extent but opposite direction to the left-hand jaw 7 through the coupling belt or member 51, the jaws being shown in such centered relation in Figure 5, and the return motion or movement of the bar 29 to the right in Figure 1 will return both jaws to their normal open or full line receiving position, the movement of the bar 29 toward the right being transmitted to an equal extent but opposite direction to the left-hand jaw 7, through the coupling belt 51. If the shaft 42 is set with its indicator in register with the indicating mark "R. H. Q.", the pin 31 will remain in position to connect the right hand jaw 6 to the bar 29 but the pin 64 will be lifted out of engagement with the bar 29 so that the belt 51 and the left-hand jaw 7 connected thereto will be disconnected from the bar 29, and the reciprocations of the latter by the jaw moving arm 50 will cause only the right-hand jaw 6 to be closed against the line and then opened while the left-hand jaw 7 remains in its normal open position, the line being then quadded only at its right hand end. When the shaft 42 is set in a position where its indicator registers with the indication "L. H. Q.", the pin 31 will be withdrawn from the bar 29 so that the right-hand jaw 6 is disconnected therefrom but the pin 64 will be in its lowered position and will connect the angle plate 58 on the belt 51 with the bar 29, and the reciprocations of the bar 29 under the jaw closing and opening movements of the arm 50 will cause the belt 51 to travel respectively in directions to close and open the left-hand jaw 7 connected to this belt, whereby quadding will be done at only the left-hand end of the line.

During justification of full lines or of lines quadded by the right-hand jaw, the left-hand jaw 7 is supported or held firmly against outward movement under the action of the wedges of the spacebands spreading the line, by the left-hand jaw stop 17 which the abutment lug 18 on the left-hand jaw block backs up against, the jaw stop 17 being substantially a part of the jaw adjusting bar 15 which is locked by the detent 19, and this detent also functions as a locking member for the carriage 53 so that this detent serves to lock said carriage during justification of centered lines and lines quadded by the left-hand jaw and to lock said carriage in its different set positions under all conditions after adjusting it to each new position.

Means is preferably employed for locking one or the other jaw or both jaws against the matrix line after being closed against it in the manner hereinbefore described. Such means is shown in Figure 5 which is like the locking means disclosed in the application hereinbefore referred to, such locking means comprising a locking pawl 80 having ratchet-like teeth thereon engageable with similar teeth 81 on the under side of the bar 29, the pawl 80 being normally retained in disengaged relation with the bar 29 by a block 82 and controlled by a pawl 89 pivoted on the rack bar 29 and movable from beneath a pin 90 after the jaw or jaws have closed against a line composed more than a predetermined

amount short of full line measure, the pin 90 being adjustable to permit lines composed to within, for example 2 or 3 ems of full line measure, to be expanded to full line measure when justified.

5 The pawl 80 is reciprocated by a cam 83 to which it is pivotally connected at 84, the cam 83 being engageable by a roller 85 carried by the justification bar 86 while the latter ascends to expand the spacebands in the matrix line between the jaws, movement of the pawl 80 toward the right
10 in Figure 5 under the action of the roller 85 on the cam 83, releasing said pawl from the block 82 and from the controlling pin 90 if the line is short and is to be quadded or centered, permitting the pawl 80 to engage the teeth 81 on the bar 29 and to lock this bar against movement and thus prevent opening movement of the vise jaw or jaws connected thereto. Such locking
15 of the jaw moving bar 29 takes place after the movable jaw or jaws have been closed against a short line in the manner hereinbefore described and during justification of the line, and after a cast has been made from the line, the pawl 80 is disengaged from the bar 29 by a lever 87 which
20 is depressed by the pivot pin 88 for the link 28 when the latter moves downwardly following the usual justifying actions in the machine and after a cast has been made from the line, such unlocking of the bar 29 permitting movement
25 thereof by the jaw moving arm 50 to return the jaw or jaws connected thereto to normal open or full line receiving position. Full lines introduced between the vise jaws and containing the usual expansible spacebands will be expanded to full line measure since the jaw closing
30 movement of the rack bar 29 will not be sufficient to carry the pawl 89 from beneath the pin 90 and hence the pawl 80 will be held in non-locking relation with the rack bar 29.

40 It will be understood, of course, that the rear faces of the right-hand and left-hand jaws engage the face of the mold in which the type bars or slugs are cast, so that the inward movement of one or the other or both of the jaws will close
45 the respective end or ends of the mold slot or cavity not closed by the matrix lines and such end or ends of the cast slugs beyond the characters thereon will be blank. Obviously, the slugs may all be cast of the same length, notwithstanding variations in the lengths of the
50 matrix lines from which they are cast.

It will also be understood that the quadding out of either end of short lines and the centering of such lines is accomplished by the means
55 and in the manner hereinbefore described, either with or without spacebands in such lines, and that full lines or lines composed to substantially the full measure for which the jaws are set and containing the usual expansible spacebands
60 will be justified to full line measure, irrespective of whether the device is set for quadding of lines at either end or for centering.

I claim as my invention:—

65 1. In a line casting machine having a matrix line receiving vise embodying a pair of jaws movable toward and from one another, a jaw moving device, a coupling device connecting the jaws and operative by said jaw moving device to cause simultaneous movement of the jaws to-
70 ward and from one another, and means for shifting the position of said coupling device to thereby move one of the jaws independently of the other jaw while the jaws are connected by the coupling device.

75 2. In a line casting machine having a matrix

line receiving vise embodying a pair of relatively movable jaws one of which is adjustable to set it in different normal open positions, a coupling device between the jaws for causing simultaneous movement thereof toward and from one another,
80 means for shifting said coupling device into different operative positions relatively to the jaws to thereby set the adjustable jaw in different normal open positions independently of the other jaw while the jaws are coupled by the coupling
85 device, and means for locking the coupling device in each of said different operative positions.

3. In a line casting machine having a matrix line receiving vise embodying a pair of relatively movable jaws one of which is adjustable independently of the other jaw to set it in different
90 normal open positions, and an adjustable stop for setting said adjustable jaw, a coupling device connecting the jaws and operative to cause simultaneous movement thereof toward and from one another, a setting device connected to said
95 stop and coupling device for adjusting said stop and for concurrently adjusting the operative position of the coupling device in conformity therewith to thereby adjust the normal open position
100 of the adjustable jaw independently of the other jaw, and means common to said stop and coupling device for locking them in different adjusted positions.

4. In a line casting machine having a matrix
105 line receiving vise embodying a pair of movable jaws, a coupling device connecting the jaws and operative to cause simultaneous movement thereof toward and from one another, said coupling device being disconnectable with respect to one
110 of the jaws, and means for shifting the operative position of said coupling device to thereby operate it to move one of the jaws independently of the other jaw irrespective of whether the coupling device is connected to one or both of the jaws.
115

5. In a line casting machine having a matrix line receiving vise embodying a pair of jaws movable toward one another from normal open positions, a coupling device between the jaws for causing simultaneous movement thereof toward
120 one another, an adjustable stop for determining the normal open position of one of the jaws independently of the other jaw, and means for shifting the range of operation of the coupling device to conform with different adjustments of said
125 jaw stop.

6. In a line casting machine having a matrix line receiving vise embodying a pair of jaws movable toward and from one another, a coupling device between the jaws for causing simultaneous
130 movement thereof toward and from one another, a stop capable of being set in different positions to determine the normal position of one of the jaws independently of the other jaw, and means controlled by the stop setting means for adjusting the coupling device in conformity therewith.
135

7. In a line casting machine having a matrix line receiving vise embodying a pair of relatively movable jaws, a member common to said jaws for moving them toward and from one another,
140 means for adjusting one of the jaws to set it at different distances from the other jaw, and means operative by said adjusting means and active upon said common member to adjust the latter to conform with different settings of the adjustable
145 jaw.

8. In a line casting machine having a pair of relatively movable matrix line confining vise jaws, a power operated jaw actuating device, a motion transmitting coupling between the jaws for mov-
150

ing them equi-distantly toward and from one another, said coupling being shiftable in position to set one of the jaws at different distances from the other jaw, and means for connecting the power operated device to and disconnecting it from said coupling at different positions of said coupling.

9. In a line casting machine having a pair of relatively movable jaws, one of which is adjustable to set it at different distances from the other jaw, adjusting means for setting the adjustable jaw, a motion transmitting member between the jaws for moving them equi-distantly toward and from one another, said member being adjustable to conform with different settings of the adjustable jaw, a power operated jaw actuating device, means for connecting said power operated device to and disconnecting it from said motion transmitting member, and means for holding said member in connecting relation with the power operated device during adjustments of said member.

10. In a line casting machine having a pair of relatively movable jaws, one of which is adjustable to set it at different distances from the other jaw, a power operated jaw actuating member, a motion transmitting member between the jaws for moving them equi-distantly toward and from one another, said member being adjustable to conform with different settings of the adjustable jaw, means for connecting said power operated device to and disconnecting it from one of the jaws and said motion transmitting member respectively, and means for holding said motion transmitting member, during adjustments thereof and while disconnected from said power operated device, in position to be connected to said power operated device.

11. In a line casting machine having a pair of spaced relatively movable matrix line confining jaws, a looped element having a mounting supporting it to travel endwise and having its opposite running sides connected to the respective jaws, and means for adjusting the position of the mounting for said element to thereby alter the spaced relation between the jaws.

12. In a line casting machine having a pair of oppositely movable matrix line confining jaws, an endless element having means for supporting it to travel with its opposite sides moving in opposite directions, means for connecting the opposite sides of said element to the respective jaws, and means for adjusting said element to thereby alter the relative positions of the respective jaw connections therewith.

13. In a line casting machine having a pair of oppositely movable line confining jaws, one of which is adjustable to set it at different distances from the other jaw, a looped element having its opposite sides connected to the respective jaws, and means supporting said element for endwise travel to cause equi-distant opposite movement of the jaws and for bodily adjustment to set the adjustable jaw in different positions.

14. In a line casting machine having a pair of relatively movable matrix line confining jaws one of which is adjustable to set it at different distances from the other jaw, an endless element having opposite sides thereof connected to the respective jaws, means for supporting said element for endwise travel and also for bodily adjustment, and setting means for the adjustable jaw connected to the supporting means for said

element and operative to effect the bodily adjustment thereof.

15. In a line casting machine having a vise embodying a pair of relatively movable matrix line confining jaws, an endless element having oppositely positioned sides, a carriage supporting said element to travel with its opposite sides movable in relatively opposite directions, means for connecting the opposite sides of said element to the respective jaws to cause simultaneous movement thereof in opposite directions, and means for adjusting the carriage and said element in the direction in which the sides of said element extend.

16. In a line casting machine having a vise embodying a pair of relatively movable matrix line confining jaws, one of which is adjustable to determine its normal position with respect to that of the other jaw, a looped element having oppositely positioned sides, a carriage supporting said element to travel with its opposite sides movable in relatively opposite directions, said carriage and the looped element thereon being adjustable, means for setting the adjustable jaw and concurrently adjusting said carriage in conformity therewith, a power operated jaw actuating device, a member for connecting said jaw actuating device to and disconnecting it from one side of said looped element, and means co-operative with said member while in its disconnecting position to hold the respective side of said looped member against movement during adjustment of said carriage.

17. In a line casting machine having a vise embodying a pair of relatively movable matrix line confining jaws, one of which is adjustable to set it in different normal open positions, an adjustable stop for setting said adjustable jaw, a coupling device between the jaws for causing equidistant movement thereof in opposite directions, said coupling device being adjustable in the direction of adjustment of said stop, and setting means for adjusting said stop to set the adjustable jaw and for concurrently adjusting the coupling device at one half the speed of movement of said stop.

18. In a line casting machine having a vise embodying a pair of relatively movable matrix line confining jaws, one of which is adjustable to set it in different normal open positions, an adjustable stop for setting said adjustable jaw, a looped element having oppositely positioned sides, a carriage supporting said element to travel with its opposite sides movable in relatively opposite directions, said carriage being adjustable in the direction in which its opposite sides extend, means for connecting the opposite sides of said element to the respective jaws to cause equalized movement thereof in opposite directions, a setting device connected to said stop and to said carriage for adjusting them concurrently, and means for holding said setting device in different set positions.

19. In a line casting machine having a vise embodying relatively movable matrix line confining jaws, one of which is adjustable independently of the other jaw to set it in different normal open positions, and an adjustable stop for setting said adjustable jaw, an endless flexible element having oppositely positioned sides, a carriage supporting said element to travel with its opposite sides movable in reverse directions, said carriage being adjustable in the direction of movement of said adjustable stop, means for connecting the sides of said element to the respective jaws, rack

bars connected to said stop and carriage respectively, a shaft having a pair of pinions thereon cooperative with the respective rack bars for setting them and said stop and carriage in different positions, the pinion for the rack bar connected to the carriage being one-half the diameter of the other pinion, and means for holding said rack bars in different set positions.

20. In a line casting machine having a pair of matrix line confining jaws movable inwardly from their normal open positions, one of said jaws being adjustable relatively to the other jaw to set it in different normal positions an adjustable stop for determining the normal position of the adjustable jaw, and a jaw moving device, a jaw coupling device having reversely movable sides, means for connecting one side of the coupling device to the adjustable jaw, a member having means for connecting it to and disconnecting it from the other jaw and connected to said jaw moving device, a connecting device for connecting and disconnecting said member and the side of the coupling device opposite to that to which the adjustable jaw is connected, a carriage on which said coupling device is mounted to travel to equalize the movements of the jaws when connected thereby, said carriage and coupling device being adjustable in the direction of adjustment of said adjustable stop, a setting device for adjusting said stop and for concurrently adjusting said carriage and coupling device in conformity therewith, and means to cooperate with said connecting device while in disconnecting position relatively to said member to hold the respective side of the coupling device from movement during adjustment of said carriage.

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