B. CADE.

LINE CASTING AND TYPE COMPOSING MACHINE.

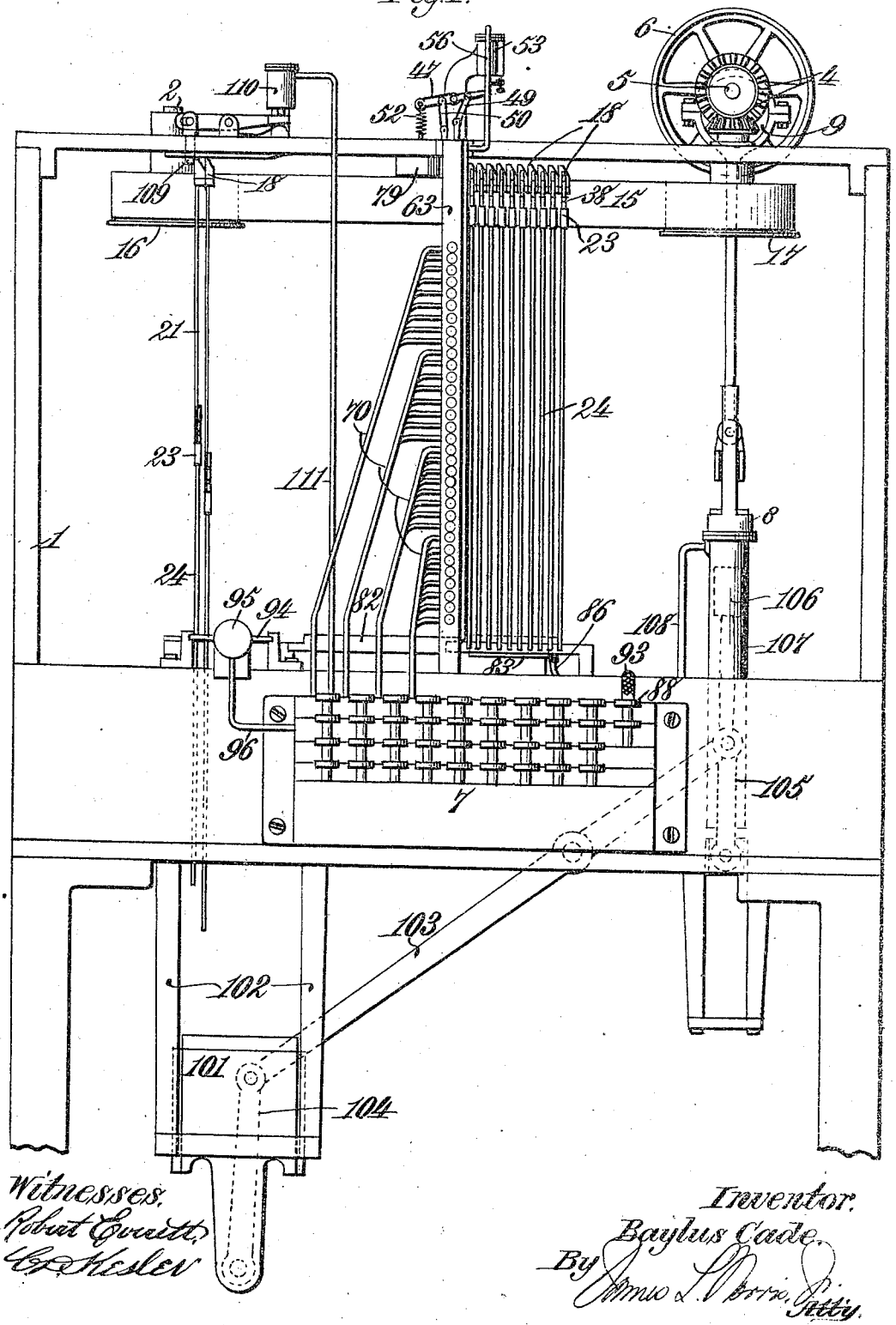
APPLICATION FILED MAR. 14, 1910. RENEWED DEC. 9, 1910.

1,002,220.

Patented Sept. 5, 1911.

5 SHEETS—SHEET 1.

Fig. 1.



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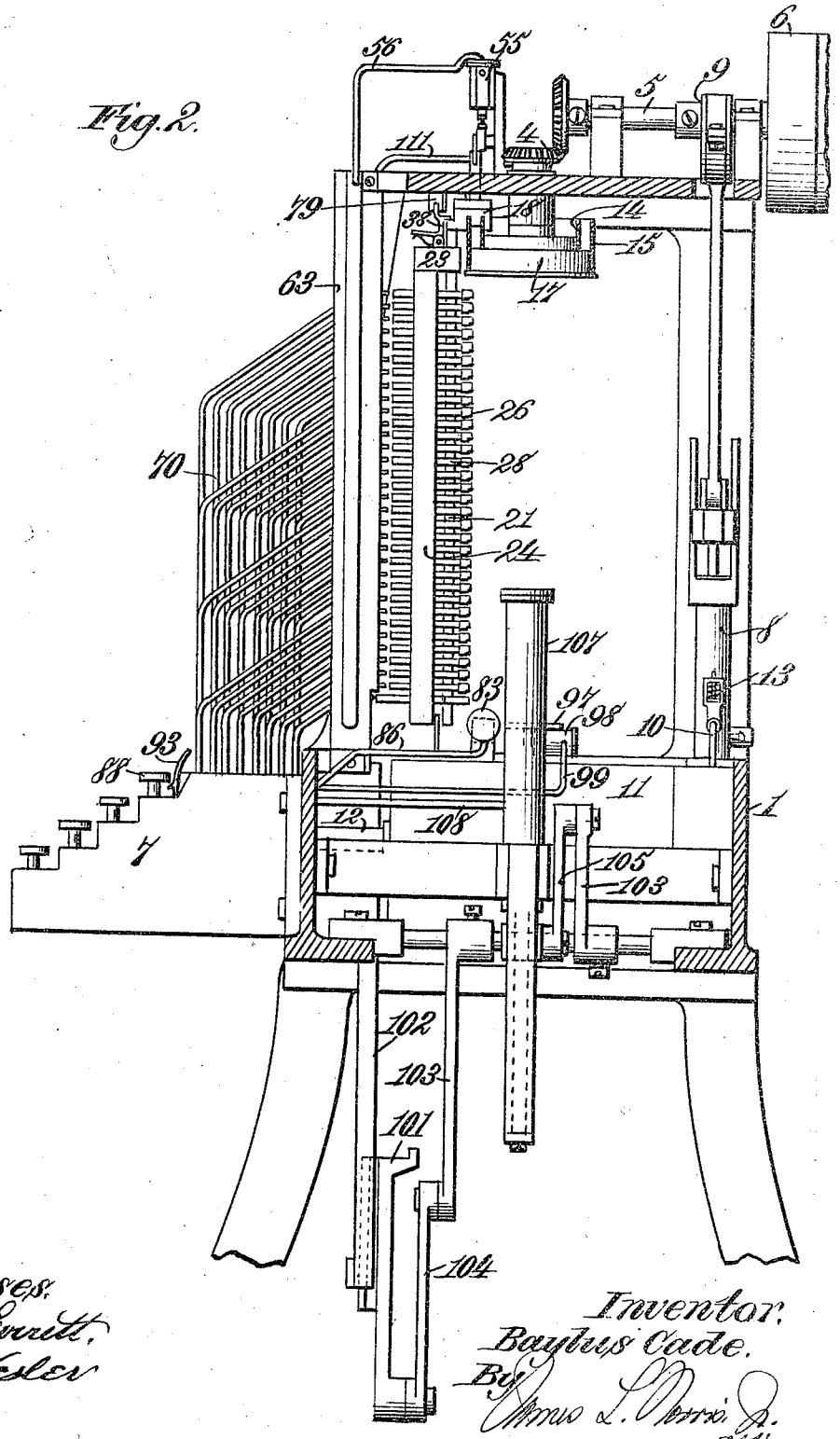
5 SHEETS—SHEET 2.

Fig. 2.



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5 SHEETS—SHEET 3.

Fig. 3.

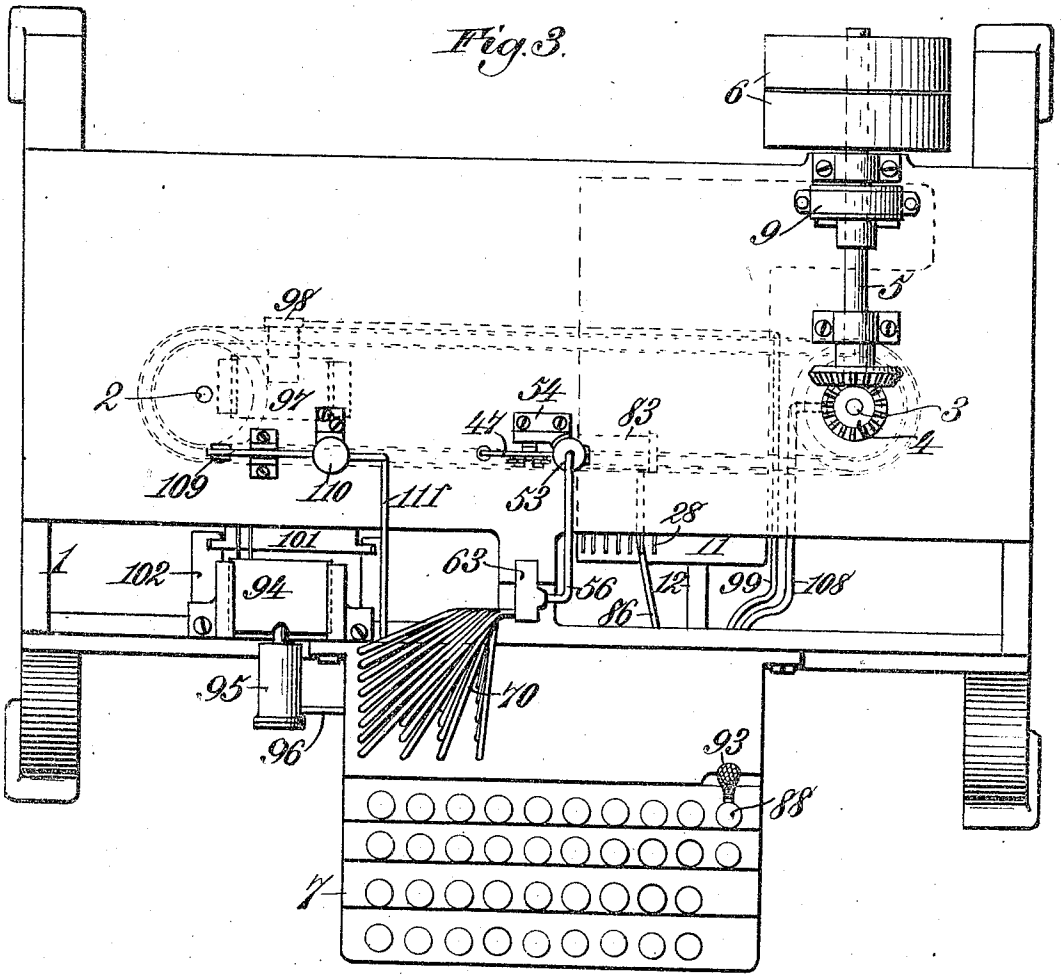
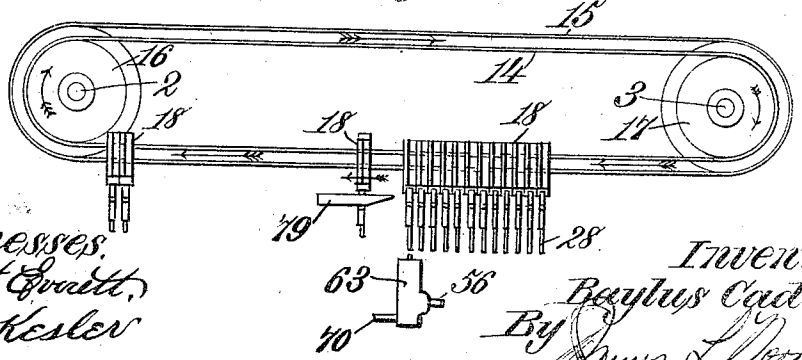


Fig. 4.



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5 SHEETS—SHEET 4.

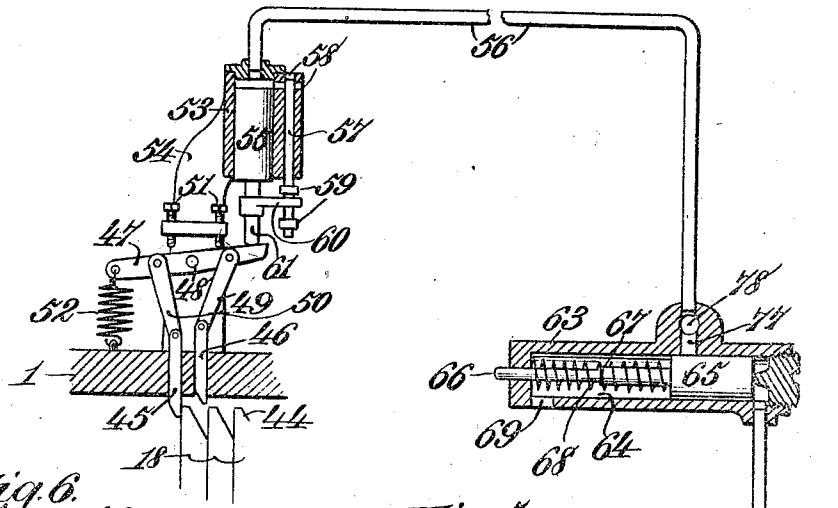


Fig. 6.

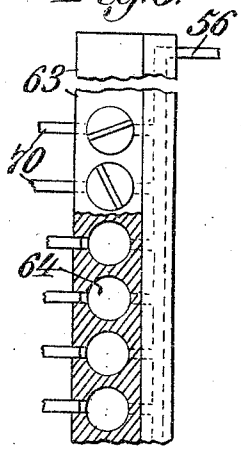


Fig. 5.

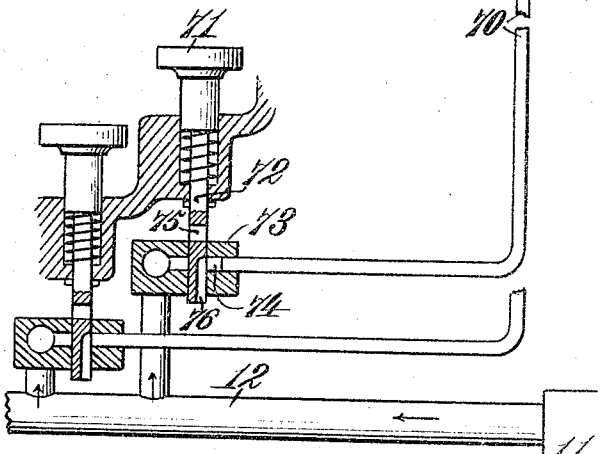


Fig. 7.

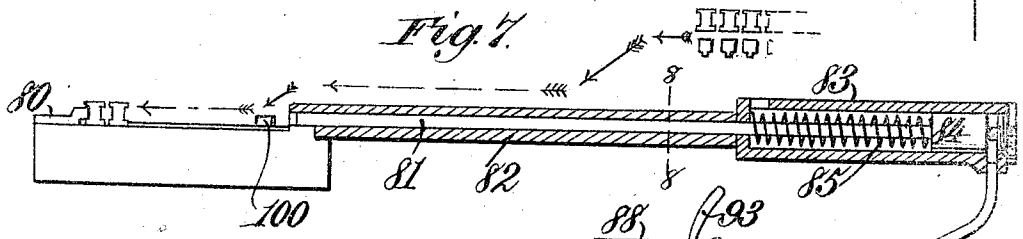
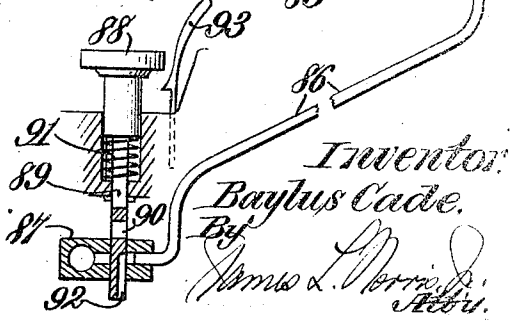


Fig. 8.



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5 SHEETS—SHEET 5.

Fig. 9.

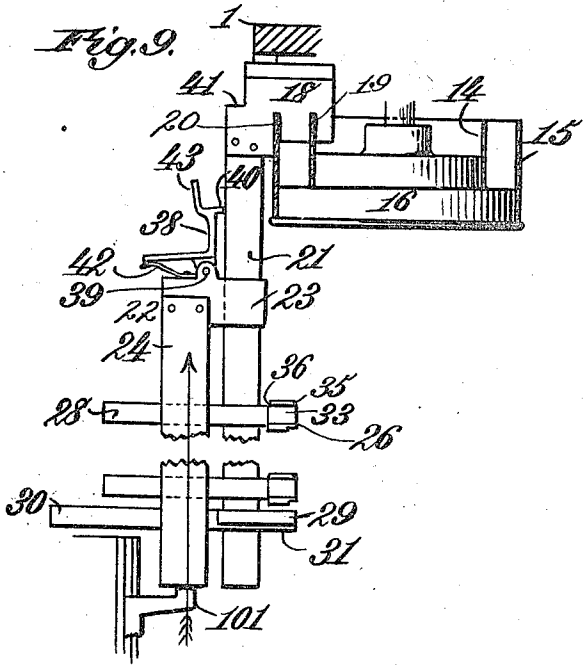


Fig. 10.

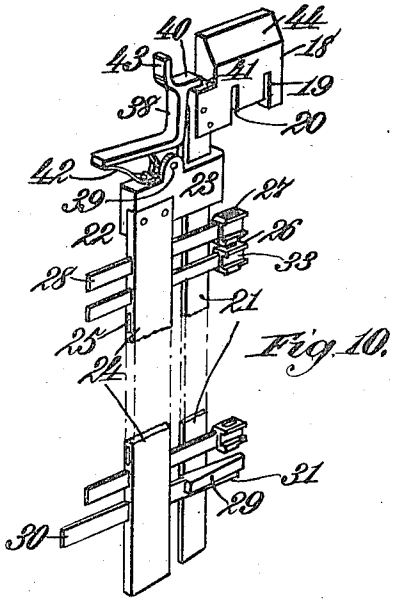


Fig. 11.

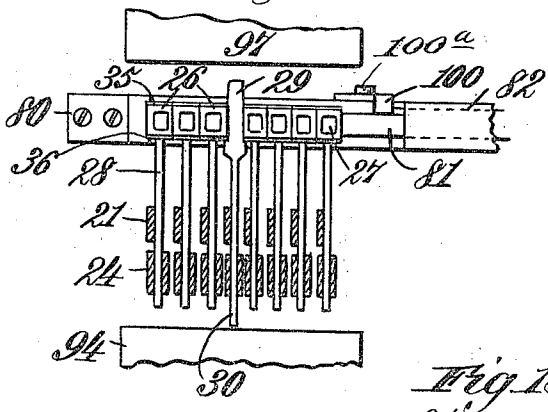


Fig. 12.

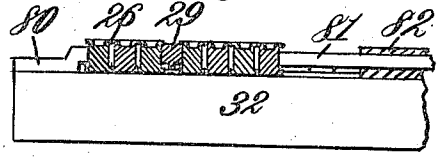


Fig. 14.

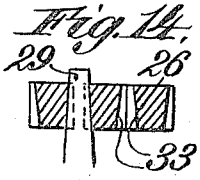
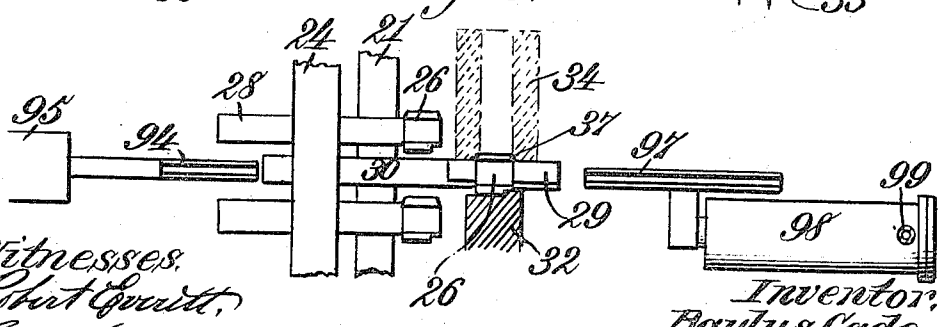


Fig. 13.



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C. E. Kesler

Inventor:
Boyles Cade
By Innis & Norris, Attys.

UNITED STATES PATENT OFFICE.

BAYLUS CADE, OF SHELBY, NORTH CAROLINA.

LINE-CASTING AND TYPE-COMPOSING MACHINE.

1,002,220. Specification of Letters Patent. Patented Sept. 5, 1911.

Application filed March 14, 1910, Serial No. 549,084. Renewed December 9, 1910. Serial No. 596,510.

To all whom it may concern:

Be it known that I, BAYLUS CADE, a citizen of the United States, residing at Shelby, in the county of Cleveland and State of North Carolina, have invented new and useful Improvements in Line-Casting and Type-Composing Machines, of which the following is a specification.

My present invention relates to improvements in line composing and type-casting machines of the class wherein type bars are cast from matrices which are selected by manipulation of the keyboard and are composed upon an assembling rail, the type bar being cast directly from the line of composed and assembled matrices.

The present invention is an improvement upon the composing and line casting machine as disclosed in Letters Patent, No. 920,021, granted to me on April 27, 1909, and it has for its object primarily to simplify and improve the construction of the machine whereby the capacity of the machine may be increased, the machine may be operated with greater facility, and better results may be obtained. To these ends, the invention provides an improved operating mechanism for the machine including a keyboard and pneumatic devices controllable from the keyboard for performing the various operations necessary, such as the selection of the matrices, the release of the matrix carriers so that they may move toward the assembling and casting point, the clamping of the composed matrices on the assembling rail, the justification and restoring of the matrices and also the elevation of the matrices at the completion of each casting operation.

Another object of the present invention is to provide a plurality of matrix carriers which are preferably acted upon constantly by conveying means which tends to impart a circulating movement to such matrix carriers, in combination with selecting devices operative from the keyboard, matrix holding and releasing means for successively holding each set of matrices in operative relation with the selecting devices and releasing such matrix carriers after the desired matrix therein has been selected, the circulating means also serving to automatically return the matrix carriers to the selecting point after the completion of each casting operation.

A further object of the invention is to provide an improved form of matrix carrier which involves a member which is preferably maintained in operative relation with the circulating means, and the matrices are carried by a shiftable part of the carrier, the parts of the carrier being normally retained in a predetermined position so that the matrices will appropriately register with the selecting means by a catch which catch, however, is automatically released after a matrix in this particular carrier has been selected.

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 novel features being pointed out particularly in the claims at the end of the specification.

In the accompanying drawing: Figure 1 represents a front elevation of a line composing and type casting machine constructed in accordance with my present invention; Fig. 2 represents the machine shown in Fig. 1 in side elevation as viewed from the right, the right hand end of the frame, however, being broken away so as to show certain parts of the machine more clearly; Fig. 3 is a plan view of the machine as shown in the two preceding figures; Fig. 4 is a detail diagrammatic view showing in plan the matrices, the circulating means or conveyer, the matrix selecting means, and a device for automatically permitting the selected matrix to move into engagement with the assembling rail; Fig. 5 is a diagrammatic view of one of the units of the machine including a part of the keyboard, the corresponding matrix selecting device, and the releasing device for the matrix carriers; Fig. 6 is a view showing in detail the construction of the row of matrix selecting devices; Fig. 7 is a detail view of the assembling rail, the matrix clamp which is coöperative with the rail, and one of the keys of the keyboard which controls the operation of the clamp; Fig. 8 represents a transverse section of the clamp on the line 8—8 of Fig. 7; Fig. 9 is a diagrammatic view showing the manner in which the elevator operates to restore the matrices to normal position with respect to their carriers; Fig. 10 is a perspective view of one of the matrix carriers showing the matrices in normal position thereon; Fig. 11 is a detail view of the assembling rail showing a row of matrices thereon, the justifying

device and the matrix restoring device; Fig. 12 represents the assembling rail and a row of matrices thereon in elevation, the justifying wedge being shown in section; Fig. 13 is a detail view showing a portion of one of the matrix carriers in elevation, one of the matrices being shown in position upon the assembling rail which latter is represented in section, the matrix justifying and restoring devices are shown in elevation, and the casting mold is indicated in dotted lines; and Fig. 14 is a detail sectional view showing the manner in which justification of the matrices is effected.

Similar parts are designated by the same reference characters in the several views.

In the accompanying drawing, I have shown one embodiment of a line composing and type casting machine. It will be understood, however, that this embodiment of the invention is shown essentially as an example and that certain modifications and changes may be made in the structure and in the relative arrangement of the parts in carrying the invention into effect, whereby the invention may be applied to the best advantage according to the circumstances of each particular case.

In the present instance, the machine comprises generally a frame 1 which may be of any suitable shape and dimensions to accommodate the different mechanisms of the machine. A pair of vertical shafts 2 and 3 are journaled preferably in the upper portion of the frame and one of these shafts is driven by suitable gearing, such as the bevel gear 4 from a power shaft 5, the latter being provided with pulleys 6 or other power-receiving or transmitting means.

In the present instance, the various mechanisms of the machine, are actuated by compressed air which air, however, is under the control of a keyboard 7. Compressed air may be received from any external source. In order, however, that each machine may be self-contained or complete in itself, I prefer to equip each machine with an air pump or compressor 8 which may be driven from the power shaft 5 by any suitable means, such for instance as an eccentric 9, and the compressed air from the cylinder is conducted by a pipe 10 to a suitable reservoir or chamber 11, the latter supplying compressed air to the keyboard through one or more pipes 12. A relief valve 13 is shown upon the pipe 10 in order to relieve any undue or excess of pressure that might be developed by the pump or compressor.

The shafts 2 and 3 form part of a conveyer for effecting a circulating movement of the matrix carriers. In the present instance, the circulating means is in the form of a pair of endless bands 14 and 15 which may be composed of thin steel or other suitable flexible material, and these bands are maintained in parallel relation by means of stepped pulleys 16 and 17 which are mounted respectively on the shafts 2 and 3. The endless bands receive a constant motion from the pulley 17 which is driven from the power shaft 5.

According to the present invention, a plurality of matrix carriers, each in the form of a bar or frame, is used. Each matrix carrier or frame contains a set of matrices which set includes the necessary matrices to make up a font. The matrices of each carrier or frame are capable of being selected and shifted relatively to the carrier or frame into a position to be assembled upon an assembling rail for the casting operation, and each matrix carrier or frame with its font of matrices is supported and suspended upon the traveling bonds. The number of matrix carriers used may be determined by the length of the line to be composed or by other conditions. Each matrix carrier in the present instance is composed of a head 18 which is provided on its under side with a pair of upwardly extending slots 19 and 20 in which the bands 14 and 15 respectively may be seated a vertical guide or shank 21 which is rigidly secured in a suitable manner to the head, and a shiftable matrix frame 22 which is capable of vertical movement upon and with respect to the vertical shank 21. The shiftable matrix-carrying frame 22 consists in the present instance of a head 23 which embraces the shank 21 as a guide and a vertical bar 24 which is rigidly attached to the head, this bar being provided with a number of slots 25 which are arranged preferably horizontally therein and correspond in number to the number of matrices of the carrier, and each matrix in the present instance embodies a head 26 bearing a character 27 in intaglio upon its upper face, and the head of the matrix is supported by a bar 28 which is slidable horizontally in the respective slot 25 in the bar 24. The bars 28 of the several matrices lie immediately at one side of the vertical shank 21 of the matrix carrier while the heads of the matrices are arranged in front of this shank. The lowermost slot 25 in the bar 24 is provided in the present instance with a combined spacer and justifying wedge which consists of a head 29, the lateral sides of which are tapered, and this head is carried by a bar 30 which is slidable horizontally in the lowermost slot 25 in the bar 24. The tapered head 29 is preferably of a height less than that of the matrix, it being provided on the under side with a rib 31 which is adapted to rest upon the assembling rail 32 so as to support the wedge surfaces at the proper elevation, and the opposed lateral faces of each matrix are undercut or grooved as at 33 (Fig. 14), these undercut or grooved portions having a taper corresponding to

the taper of the wedge whereby this wedge when inserted between any two adjacent matrices assembled upon the rail 32 will have a firm seating upon the respective matrices, as shown diagrammatically in Fig. 14. The characters of the matrices as before stated are in intaglio thereon, and the depth of the character faces of the matrices is such that the taper portions of the characters, when the matrices are assembled upon the rail, will be at a level below the top of the spacing wedge 29 as shown in Fig. 12.

In order to provide a close joint or seal between the mold 34 and the matrices, each matrix face has its front and rear edges beveled as at 35 and 36, and the mold 34 has correspondingly beveled surfaces 37 which seat upon the beveled surfaces upon the line of matrices and thereby serve not only to prevent escape of any of the casting metal, but registration is thereby effected between the mold and the line of assembled matrices. The under side of the mold rests upon the top of the spacing wedge 29 and thereby prevents the escape of casting metal at this point. Each matrix frame 22 is normally held in a predetermined elevated position with respect to the carrier, this result being accomplished in the present instance by means of a latch 38 which may be attached to one of the parts, it being pivotally mounted at 39 upon the head 23 and is provided with a projection 40 adapted to snap over and become locked upon a shoulder 41 formed as a part of the head 18. The latch is moved into and normally held in locked position by means of a spring 42, and the free end of the latch is provided with an upturned releasing projection 43, the operation of which will be hereinafter described. One of the lateral faces of the carrier head 18 is beveled as at 44 for a purpose to be hereinafter described.

In composing the matrices, according to the present invention, the several matrix carriers are brought into a position one behind the other by means of the traveling bands, which bands have a frictional engagement with and support the matrix carriers, as illustrated diagrammatically in Fig. 4. When the matrix carriers are in this position, the foremost carrier occupies such a position that the several matrices are in register or operative relation with a series of selecting devices which are controlled by the keyboard 7. This foremost matrix carrier is held in operative relation to the selecting devices by means of an escapement which is shown in detail in Fig. 5, the supporting bands sliding past the matrix carrier while the same is held by the escapement. This escapement embodies a pair of oppositely movable pallets 45 and 46 which are suitably guided upon a portion of the machine frame 1 and are so related that one of these pallets engages and forms an obstruction for the forward face of the foremost carrier head 18 while at the same time the pallet 46 is in a slightly retracted position, but as the forward pallet 45 moves toward retracted position, the pallet 46 will move into a position to engage the second carrier head and thereby hold back the following matrix carriers while the foremost carrier is permitted to move with the traveling bands into a position to permit the selected matrix in this frame to drop upon the assembling rail. While the matrix carriers are held back by the escapement, the traveling bands slip or slide in the seats 19 and 20 of the carrier heads. The bevel surface 44 at the rear side of each carrier head permits the rear pallet 46 to move into position in front of the following carrier before the foremost carrier is completely released.

Any suitable means may be provided for actuating the pallets in reverse directions to successively release the matrix carriers, and the present invention provides means for actuating the escapement from the keyboard and immediately after any one of the matrices has been selected and moved into position to engage the assembling rail. In the present instance, the escapement actuating means embodies a lever 47 which is fulcrumed at 48 upon a relatively fixed part of the machine frame, and a pair of links 49 and 50 operatively connect this lever to the respective pallets. Set-screws 51 may be provided for appropriately adjusting the throw of the escapement, these set-screws being arranged in the present instance to cooperate with the lever 47 at opposite sides of its pivot or fulcrum. A tension spring 52 acts upon the escapement lever 47 to return the same and yieldingly hold it in the position shown in Fig. 5. According to the present invention, the escapement lever 47 is actuated by a pneumatic or fluid-actuated motor which in the present instance is in the form of a cylinder 53 which may be rigidly supported upon a bracket 54 forming a part of the machine frame, and a piston or plunger 55 is mounted to reciprocate in the cylinder and its end bears upon that end of the escapement lever 47 opposite to the spring 52. A pipe 56 serves to conduct fluid pressure to the cylinder and in rear of the plunger so that when such fluid is admitted to the cylinder, the plunger will be forced out of the cylinder and bearing upon the escapement lever will rock the latter so as to retract the forward pallet 45 and move the rear pallet 46 into position to engage the second matrix carrier of the set. The pallets should immediately reverse their position after the foremost matrix carrier has been released, and any suitable means may be provided for accomplishing this result. In the present instance, the reversal of the

pallets is effected by the spring 52, and in order to permit the escape of the fluid in rear of the plunger 55, a valve 57 is provided which controls an escape port 58, this valve having a pair of opposed stops 59 between which an arm 60 operates. This arm 60 is permitted a limited movement relatively to the valve and between the opposed stops 59 to the plunger, it having one end rigidly engaging the stem 61 of the plunger and is adapted to alternately engage the opposed stops 59 which are spaced longitudinally of the valve stem.

Normally the parts occupy the position shown in Fig. 5, the valve 57 closing the vent 58. Air upon entering the cylinder will force the piston downwardly, thereby actuating the escapement and during the first part of the movement of the plunger, the valve 57 remains in this position until a further movement of the plunger brings the forward side of the arm 60 into such a position as to engage the lower stop and thereby draw the valve 57 into a position to open the vent 58, the fluid in rear of the plunger being thereby vented to the atmosphere and permitting the plunger to be returned to the normal position shown in Fig. 5 under the action of the spring 52. The final retracting movement of the plunger causes the arm 60 to engage the upper stop 59 and thereby move the valve 57 into a position to close the vent 58.

The selecting devices which are controllable by the keyboard and serve to move the selected matrix in each carrier into position to drop upon the assembling rail consist in the present instance of a vertically arranged bar 63 which is secured upon the machine frame in vertical position and is just outside of the path of the matrix carriers as they travel with the bands as shown diagrammatically in Fig. 4. This bar forms cylinders for a plurality of pneumatic motors that are of a number preferably corresponding to the number of matrices of each carrier. A convenient way of constructing these motors is to bore the bar 63 so as to form a vertical series of cylinders or chambers 64, and a plunger 65 is fitted into each of these chambers and has a stem 66 which extends through an opening in the rear side of the bar, the stem of each plunger being arranged to register with and to press against the bar 28 of a corresponding matrix and thereby push the selected matrix rearwardly in its frame. A shoulder 67 may be formed upon each stem for the purpose of limiting its stroke, and a compression spring 68 may surround the stem and serve as means for retracting the plunger after it has properly operated upon the selected matrix. A vent opening 69 may be formed in advance of the plunger to avoid compression of any air at this point, and a pipe 70 communicates with the opposite end of the chamber or cylinder in rear of the plunger, this pipe 70 serving to convey fluid pressure to the chamber to actuate the plunger. The fluid supplied to each matrix selecting device through the pipe 70 is controlled by an appropriate key of the keyboard. In the present instance, 71 represents a key of the keyboard which has a stem 72 which operates in a valve casing 73. This casing receives fluid under pressure from the pipe 12 leading from the reservoir 11, the casing having a passage 74 while the stem 72 of the key has a port 75 which, when the key is depressed, forms a continuous communication for the compressed fluid through the passage 74 and thereby admits compressed fluid to the matrix selecting device. When, however, the key is in elevated position, it will interrupt the flow of fluid through the passage 74 and will present a vent passage 76 to the passage 74 which communicates with the pipe 70 and thereby permits of any fluid pressure remaining in rear of the plunger 65 to escape the atmosphere whereby this plunger 65 may be returned to normal retracted position as shown in Fig. 5 under the action of the spring 68.

In order that the escapement may be actuated from the same key of the keyboard and automatically immediately after the selecting device has pushed the selected matrix into position to drop upon the assembling rail, I conduct fluid from the cylinder 64 and utilize the plunger 65 therein as a controlling valve for the plunger of the escapement. In the present instance, this result is accomplished by providing the cylinder or chamber 64 with a port 77 which is in advance of the point at which the pipe 70 communicates with this cylinder whereby after the plunger 65 has moved a distance sufficient to move the selected matrix in position to drop upon the assembling rail, such plunger will uncover this port 77 and thereby permit fluid pressure to proceed to the pneumatic motor for the escapement. The ports 77 of the several matrix selecting devices communicate with a common passage 78 which in turn communicates with the pipe 56 leading to the escapement motor.

The casting point is beyond or at one side of the matrix selecting devices, the casting taking place while the matrices are assembled and clamped upon the assembling rail 32 as shown in Figs. 11, 12 and 13.

After each matrix carrier is released by the escapement and is removed from the range of the selecting devices and carried to the casting point by the traveling bands or conveyer, the projection 43 of the latch upon the respective matrix carrier is engaged by a releasing cam 79 which as shown may be in the form of a wedge fixed to a

stationary part of the machine. The releasing of the latch 38 permits the matrix-containing frame 24 to drop until the selected matrix which has been previously selected and pushed rearwardly in this frame is received by the assembling rail 32. The matrices are successively selected and assembled upon this rail and the rail is provided with a clamp for securing the matrices in alinement during the casting operation. In the present instance, the clamp involves a relatively fixed member 80 which is secured to one end of the assembling rail and a relatively movable member 81, the line of matrices being arranged between the two members of the clamp and movement of the member 81 serves to firmly secure the matrices. This member 81 is preferably inclosed within a supporting casing 82 one end of which may rest upon the adjacent end of the assembling rail while its opposite end is attached to a fluid pressure cylinder 83, the latter containing a piston 84 which is attached to the movable clamp member 81, and a spring such as 85 may serve to normally hold the member 81 in retracted position. The clamp is preferably controllable from the keyboard and in the present instance, air or other fluid under pressure may be admitted to the rear end of the cylinder 83 by a pipe 86 which leads from a valve casing 87 arranged at the keyboard, and the key 88 is provided with a stem 89 which has a port 90 which when the key is depressed will admit fluid pressure to the pipe 86 to force the piston 84 to the left in Fig. 7 and thereby clamp the line of matrices, and when the key is elevated under the action of its retracting spring 91, an escape groove 92 will be placed in communication with the pipe 86 and will thereby vent the air from the rear of the piston 84 and will permit the clamp to open. In order that the clamp may remain in closed position for a period sufficient to enable the casting operation to be completed, a latch 93 may be provided for holding the key 88 in depressed position.

After a line of matrices has been brought into position upon the assembling rail, the line may be justified by means of the tapered spacers 29, the shanks 30 of which are longer than the shanks 28 of the matrices, and these elongated shanks 30 of the spacers are arranged to be engaged by a justifying bar 94 which, according to the present invention, is actuated by a pneumatic motor 95, the latter receiving motive fluid through a pipe 96 and is provided with a suitable controlling key upon the keyboard. After the casting operation has been completed, the matrices and also the spacers or justifying devices may be all returned to their normal position with respect to their supporting frame by means of a bar 97 which is arranged in rear of the assembling rail and adapted to reciprocate above the assembling rail, and this bar may also be actuated by a pneumatic motor 98, this motor receiving motive fluid from a pipe 99 and this pipe is also provided with a controlling key upon the keyboard.

In Fig. 11, I have shown an adjustable stop 100 at one end of the assembling rail which is adjustable by the screw 100^a and permits the machine to be adjusted for lines of different lengths.

After the matrices and spacers have been restored to the normal positions with respect to the frame 24, these frames are all returned to their normal elevated position and are held in such position by the latches 38. This result is accomplished in the present instance by means of an elevator 101 which is mounted to move vertically upon suitable guides 102 formed as a part of the machine frame, the elevator engaging the lower ends of the frames 24, and this elevator may be actuated through the lever 103 and the links 104 and 105 by a plunger 106 and cylinder 107, the latter receiving fluid pressure through the pipe 108 under the control of a suitable key upon the keyboard.

While the line of matrices rest upon the assembling rail, the carriers are held by means of a detent 109 which engages the head 18 of the foremost carrier. This detent normally occupies the position shown in Fig. 1 and is provided with a pnumatic motor 110 by means of which it may be retracted after the elevator has restored the matrix frames to normal elevated position, this motor in the present instance being supplied with motive fluid through a pipe 111 and under the control of a suitable key upon the keyboard. After the matrix carriers have been released by this detent, the traveling bands 14 and 15 impart a circulating movement to the carriers, thereby returning them to a position where the escapement successively positions and releases them with respect to the selecting devices.

I claim as my invention:

1. In a line composing and type casting machine, the combination of a plurality of matrix carriers each having a series of transversely shiftable matrices spaced longitudinally thereon, matrix selecting means for shifting said matrices transversely, and means for shifting said matrix carriers in a direction transverse to their length to position them successively in operative relation to said selecting means.

2. In a line composing and type casting machine, the combination of a plurality of matrix carriers, each having a series of individually movable matrices spaced longitudinally thereon, matrix selecting devices spaced to correspond with the spacing of

the matrices on each carrier and operative to move the respective matrices into selected position, and means for shifting the matrix carriers in a direction transverse to their length to position the series of matrices thereon successively in operative relation to the selecting devices.

3. In a line composing and type casting machine, the combination of a plurality of matrix carriers each having a series of individually movable matrices spaced longitudinally thereon, matrix selecting means operative upon the movable matrices of each carrier, means for shifting the matrix carriers in a direction transverse to their length to position them successively in operative relation to the selecting means, and an assembling rail arranged to receive the selected matrices by a further transverse movement of the matrix carriers.

4. In a line composing and type casting machine, the combination of a plurality of matrix carriers, matrix selecting means, a continuously moving conveyer freely suspending the matrix carriers and operative to introduce the matrix carriers to said selecting means, to remove the matrix carriers from the selecting means, and for returning them to the selecting means.

5. In a line composing and type casting machine, the combination of a plurality of matrix carriers, matrix selecting means, a traveling device for freely and frictionally suspending and conveying the carriers to an operative position with respect to the selecting means, and a device for successively positioning the matrix carriers in operative relation to said selecting means.

6. In a line composing and type casting machine, the combination of a plurality of matrix carriers, a traveling band for freely and frictionally suspending and imparting circulating movement to the matrix carriers, selecting means arranged at one point with respect to the path of movement of the matrix carriers, an assembling rail located beyond the selecting means, and a releasing device for successively positioning the matrix carriers in operative relation to the selecting means and for permitting the selected matrices to assemble upon said rail.

7. In a line composing and type casting machine, the combination of an endless continuously moving band, a plurality of matrix carriers suspended on said band, each having a plurality of matrices, matrix selecting means, an escapement for successively positioning the matrix carriers in operative relation to the selecting means, and an assembling rail to receive the selected matrices.

8. In a line composing and type casting machine, the combination of an endless traveling conveyer, a plurality of matrix carriers operatively related to the conveyer, each carrier being provided with a series of vertically movable superposed matrices, matrix selecting means, an escapement for successively positioning and releasing the matrix carriers with respect to the selecting means, an assembling rail to receive and aline the selected matrices, and an elevator to restore the matrices to normal position with respect to the carriers.

9. In a line composing and type casting machine, the combination of an endless traveling conveyer, a plurality of matrix carriers suspended thereon, each carrier bearing a series of matrices which are movable vertically and arranged in superposed relation, matrix selecting means, an escapement for successively positioning and releasing the matrix carriers with respect to the selecting means, a key-board coöperative with the selecting means, and means for actuating the escapement immediately subsequent to the actuation of each unit of the selecting means.

10. In a line composing and type casting machine, the combination of a plurality of matrix carriers, each carrier being provided with a set of superposed vertically movable matrices, means for imparting movement to the matrix carriers in a direction transverse to their length, a series of selecting devices, corresponding to the matrices of each carrier, a key-board operatively associated with the selecting devices, an escapement for successively positioning and releasing each matrix carrier with respect to the selecting devices and a pneumatic motor controlled by one of the selecting devices of the series for causing releasing movement of the escapement after one of the selecting devices of the series has completed its operation.

11. In a line composing and type casting machine, the combination of a traveling conveyer, a plurality of matrix carriers suspended thereon, each carrier having a vertically movable matrix supporting frame, and a latch for retaining the matrix supporting frame in normal elevated position, matrix selecting means, a device for successively positioning and releasing each matrix carrier with respect to said selecting means and a device to coöperate with the latch of each carrier after its release to permit the matrix supporting frame of the carrier to drop and thereby carry the selected matrix into casting position.

12. In a line composing and type casting machine, the combination of a traveling member, a plurality of matrix carriers adapted to be shifted by said member, each carrier embodying a vertically movable frame containing a series of superposed matrices, a matrix selecting means, an assembling rail, a device for successively posi-

tioning and releasing each of the matrix carriers with respect to said selecting means, each matrix carrier being provided with a latch for retaining the matrix containing frame in normal elevated position, a device for releasing said latch as the respective matrix carrier is released from the selecting means whereby the selected matrices may drop upon the assembling rail, a stop for arresting the movement of the matrix carriers while the selected matrices rest upon the assembling rail and an elevator operative to restore the matrix containing frames to normal elevated position.

13. In a line composing and type casting machine, the combination of a traveling member, a set of matrix carriers adapted to be shifted thereby, each matrix carrier embodying a vertically shiftable frame containing a set of laterally movable matrices in superposed relation, a latch for holding the matrix containing frame in normal elevated position, a set of vertically spaced matrix selecting devices, an escapement for successively positioning and releasing each matrix carrier with respect to the selecting devices, the selecting devices being arranged to shift the selected matrix laterally, a device for releasing the latch of each matrix carrier to permit the respective matrix containing frame to drop and thereby carry the selected matrix to the assembling rail, a device for restoring the selected matrices to normal position with respect to the matrix containing frames, and an elevator operative subsequently to the matrix restoring device for returning the matrix containing frames to normal elevated position.

14. In a line composing and type casting machine, the combination of a plurality of matrix carriers, each embodying a vertically movable frame containing a series of vertically spaced matrices and a justifying device, a latch for normally retaining the matrix containing frame in elevated position, selecting means, an escapement for successively positioning and releasing each matrix carrier with respect to the selecting means, a device for releasing the latch of each matrix carrier as the latter is released from the selecting means whereby the matrix containing frame is permitted to drop, an assembling rail to receive the selected matrices, a member operative upon the justifying devices to expand a line of assembled matrices, a device for restoring the selected matrices and justifying devices to normal position with respect to their frames and an elevator for returning the matrix containing frames to normal elevated position.

15. In a line composing and type casting machine, the combination of a pair of endless traveling bands arranged in parallel relation, a plurality of matrix carriers, each carrier having a head provided with seats to rest upon the said bands, a vertically movable frame, containing a set of vertically spaced matrices and a latch for normally holding the matrix containing frame in elevated position, selecting devices arranged to coöperate with the matrices of each carrier, an escapement for successively positioning and releasing each matrix carrier with respect to the matrix selecting devices and an assembling rail to receive and aline the selected matrices.

16. In a line composing and type casting machine, the combination of a plurality of matrix carriers, a series of pneumatically actuated matrix selecting devices, a pneumatically actuated escapement for successively positioning and releasing each matrix carrier with respect to the selecting devices, the escapement being automatically controlled by any one of the selecting devices of the series and a pneumatic key-board operatively related to said selecting devices.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

BAYLUS CADE.

Witnesses:
CLARENCE A. BATEMAN,
CHAS. S. HYER.