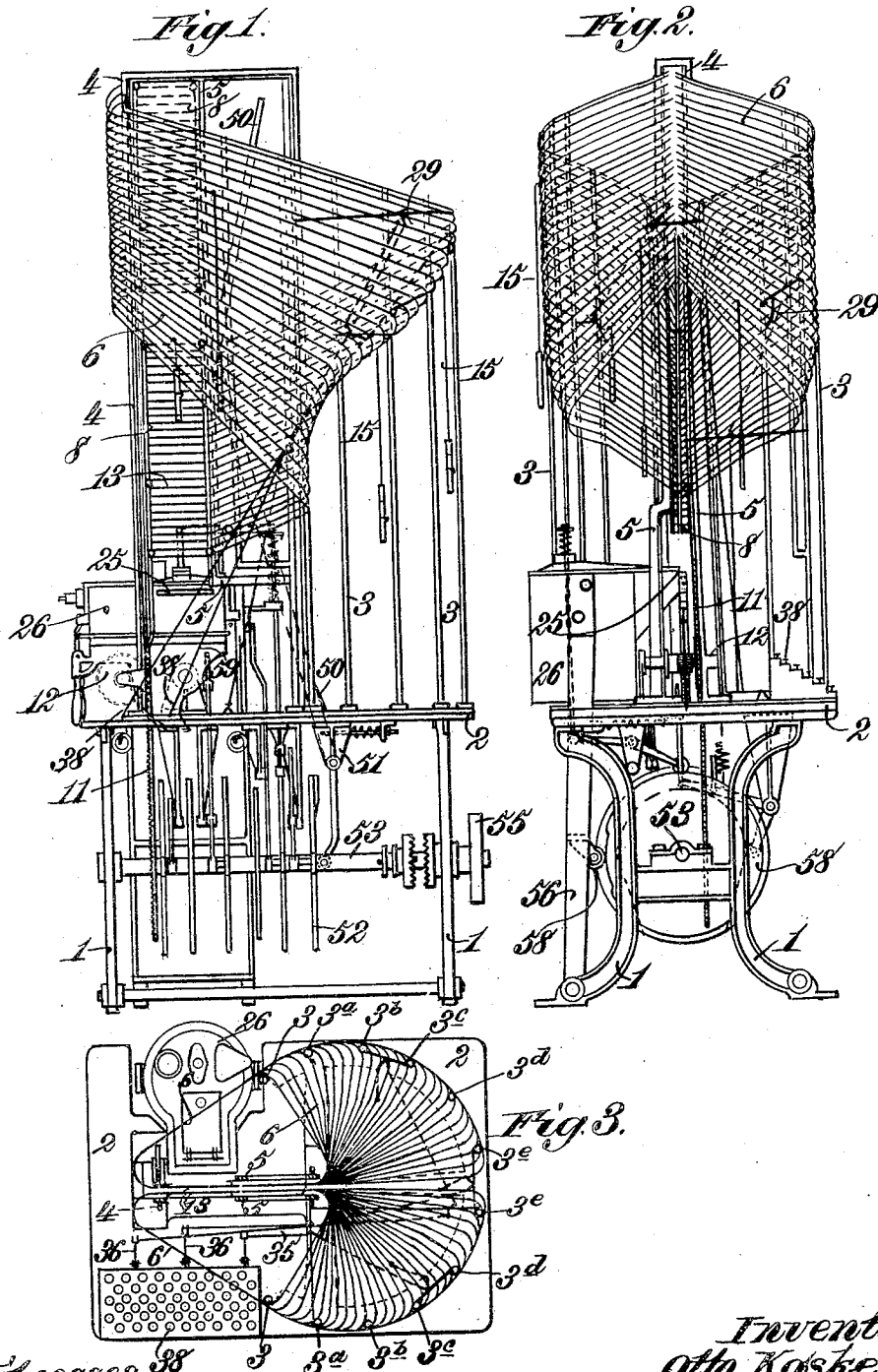


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TYPE SETTING AND CASTING MACHINE.
APPLICATION FILED MAY 18, 1908.

Patented Nov. 30, 1909.
3 SHEETS—SHEET 1.

941,932.



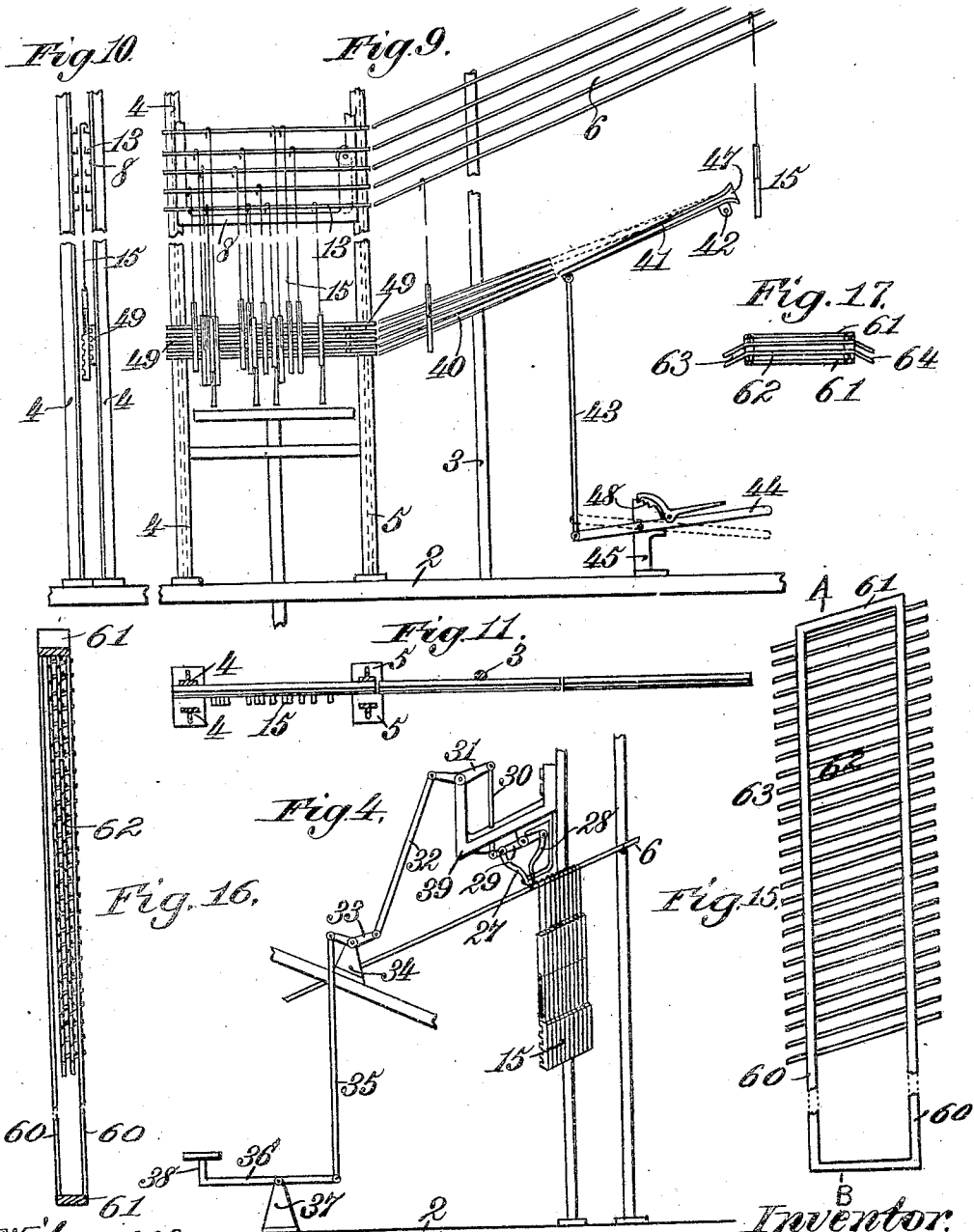
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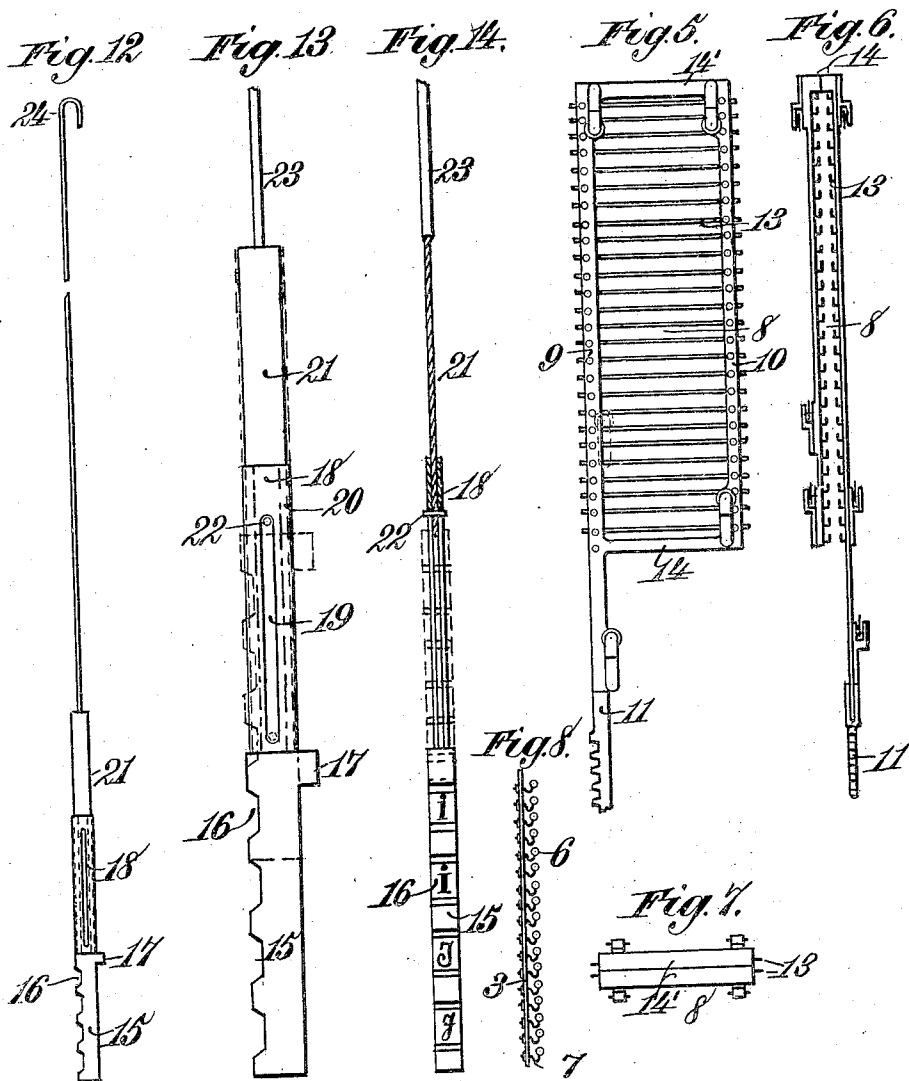
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UNITED STATES PATENT OFFICE.

OTTO KOSKE, OF ERFURT, GERMANY.

TYPE SETTING AND CASTING MACHINE.

941,932.

Specification of Letters Patent.

Patented Nov. 30, 1909.

Application filed May 18, 1908. Serial No. 433,551.

To all whom it may concern:

Be it known that I, OTTO KOSKE, a subject of the King of Prussia, and residing at Erfurt, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Type Setting and Casting Machines, of which the following is a specification.

The present invention relates to a new arrangement in type setting and casting machines, in which the matrices slide on endless wires through the machine, and to the employment of a new matrix for this purpose, as well as of a device on the same in order to bring into use as required different sorts of type, which are arranged on them simultaneously.

Arrangements have already been proposed which have in view similar or like purposes, as for example that described in the German patent specification 137,536, but there the arrangement and mounting of the guide wires is entirely different and the movements which the carriage must therefore make are very detailed and complicated.

In order that the invention may be clearly understood, reference is made to the accompanying drawing in which one embodiment is represented by way of example, and in which:

Figure 1 is a side elevation, Fig. 2 an end elevation and Fig. 3 a top plan view of a machine according to the present invention the matrix supporting rails of the carriage being shown diagrammatically. Fig. 4 shows diagrammatically the arrangement of the keys and their connection with the releasing device for the matrices. Fig. 5 shows the carriage for lifting the matrices in side elevation, Fig. 6 an end elevation, and Fig. 7 a top plan view of the same. Fig. 8 shows the attachment of the guide wires to the vertical holders of the machine. Figs. 9, 10 and 11 represent in side elevation, end elevation, and horizontal section respectively, the device for optionally changing the sorts of type and the driving device for the same. Fig. 12 is an elevation of one of the matrices which are employed, and Figs. 13 and 14 are elevations on an enlarged scale showing the device for shifting the matrix bars in two views, whereas Figs. 15, 16 and 17 are side elevation, sectional end elevation on the line A—B in Fig. 15, and transverse section respectively, of a device for changing the matrices.

Referring to the drawing, the holders or uprights 3 are arranged vertically in a circle on the base plate 2 (Fig. 1) which, with the feet 1, form the frame of the machine. The guide wires 6 situated one under another are attached to these holders by means of hooks 7 (Fig. 8) in such a manner that proceeding from the front vertical supports 4 as their highest point, they pass in two divisions approximately parallel to one another, bending around to the right and to the left, slanting continuously downward around the uprights 3 to the inner vertical supports 5 where their ends are attached. As Fig. 3 shows particularly clearly, the arrangement is such that all the wires 6 do not surround all the uprights 3 at the same time, but are divided into groups, those of the first going around the upright 3, those of the second around the upright 3^a, and so on.

The sliding carriage 8 (Figs. 5, 6 and 7) provided with roller slides between the supports 4 and 5 in guides and consists of two frames which are each composed of the two sides 9 and 10 and the cross pieces 14 and 14', and are connected with one another. The parts 14' are so thick that sufficient room remains between them in order that wires or rails 13 can be stretched in parallel rows between the uprights 9 and 10, leaving room between them for the passage of the matrices 15, and so arranged that they form the exact continuations of the guide wires 6 both in the upper and in the lower position of the carriage. With the side 10 of the carriage there is rigidly connected the downwardly extending rack 11 which meshes with the toothed wheel 12 (Fig. 2), so that when the latter rotates the carriage is driven downward or upward.

The matrices 15 (Fig. 12) are arranged in rows on the guide wires 6 in such manner that on each of the latter there are always only matrices of the same letter. According to Figs. 13 and 14, in which they are represented again on an enlarged scale, they consist of the matrix bars 15 in which the characters 16 of the desired sort of type are chased on one side, and which have a shoulder 17 on the opposite side. The matrix bars continue upward into a flat rod 18 in which a slot 19 is provided, and clasp a second rod 21 provided with two folds 20, on which second rod they can slide up and down. The amount of the movement is limited by a pin 22 which is attached on the rod or rail 21

and which moves in the slot 19. Further, there is attached to the rod or band 21 the wire 23 ending above in a hook 24 with which the matrices hang and slide on the guide wires 6.

The length of the wire 23 for each letter is made such that when the hooks 24 of the matrices are on the wires 6 leading to the rails 13 of the carriage, all the matrix bars are suspended at the same height, so that they may be transferred to the carriage in such a manner that their characters form a straight line, and when the casting mouth 25 of the casting pot 26 (Fig. 1) is brought up to them, they can be cast in one line. The matrices for forming the spaces are arranged like the letter matrices and are suspended slidably on one or more guide wires 6, only with the difference that the space bars have no characters but, as usual, consist of two wedges displaceable with regard to one another which justify the line in known manner when they are displaced reciprocally before the line is cast.

As Fig. 4 shows, the matrices 15 are each held on the wires 6 by two levers 27 and 28 clasping the wires like a fork until the matrix which is in front at any time is released by pressure on one of the keys 38 and then slides to the place of collection or to the carriage 13. For this purpose the levers 27 and 28 are movably suspended on a two-armed lever 29 arranged pivotally on the support 39 which is rigidly connected with the frame of the machine, and this lever 29 is moved on its part by means of the connecting-rod 30 of the bell-crank lever 31 likewise pivoted on the support 39, the connecting-rod 32 of the bell-crank lever 33 journaled on the bearing 34 connected with the frame, the connecting-rod 35, and the key-lever 36 rocking in the bearing 37 on the base plate 2 and carrying the key-button 38.

In order to be able to bring, as required, the different sorts of type, namely, the individual characters 16 of each matrix, to be cast, there is arranged below the guide wires 6 (Figs. 9 and 10) a tongue, movable around the pin 42 attached to the frame, which has a channel 41 having a funnel-shaped enlarged opening or mouth 47. This tongue is moved by the rod 43 and the lever 44 pivoted on the pedestal 45 attached to the base plate 2 and forms a switch or turn-out, by which the matrix bars 15, when they have entered with the shoulder 17 (Fig. 13) into the channel 41 of the tongue, are guided into one of the channels of a plate 40; the number of channels in this plate, according to the drawing four, corresponds to the number of the characters; the plate is attached to the frame, and the matrix bar is pushed up the rod 21 of the matrix (Figs. 13 and 14) and elevates the characters correspondingly without disengaging the hook of the

matrix, as will be hereinafter more fully described. The channels of the plate 40 are arranged slanting at first corresponding to the guide wires 6, but then spread apart like a fan, and run at last on the plate 49 horizontally corresponding to the rails 13 of the carriage.

In order to be able to use the same sort of type continuously, the tongue 41 can be fixed by means of the catch-hook 46 pivotally connected with the lever 44 and engaging in the teeth 48 of the pedestal 45.

The type setting machine is used as follows: The matrices are arranged in rows with their hooks 24 in groups on the appertaining wires or rails 6 behind one another, and in number corresponding to the frequency with which they are used, and are held by the lever 27 (Fig. 4) of the appertaining releasing device and prevented from sliding forward. By depressing the appertaining key 38, the two-armed lever 29 is rotated, whereupon the lever 28 first enters between the first and second matrix, and thereby stops the latter and the succeeding ones; when the lever 27 is moved still more the front matrix is released and then slides down on its guide to the carriage 13. Before it reaches this, the projection 17 (Fig. 13) of the matrix bar enters into the groove 41 of the turn-out and, according to the position of the same, is conducted into one of the grooves of the plate 40, the matrix rod 18 being pushed up on the rod 21, without the hook 24 leaving the wire 6 or the corresponding rail 13 of the carriage on to which it has been at last transferred. After the line has been justified in known manner, and after connection with the casting mouth 25 of the casting pot 26 has been made and opened again, the carriage with all the matrices suspended from it goes upward under the influence of the rack 11 engaging with the toothed wheel 12 until the rails of the carriage arrive in the same position as the upper ends of the wires 6 attached to the uprights 4. After the carriage with the matrices thereon has been elevated so that the rails of the carriage register with the upper ends of the wires 6, the matrices are distributed on the various wires along which they may gravitate and thus bring themselves into position for subsequent use. In the present instance, I have shown a transferring lever 50 for accomplishing this result, this lever being pivoted on a bracket 51 secured to the under side of the base plate 2 of the machine so that the lever will swing in a vertical plane, and the upper end of this lever is arranged to enter the space between the parallel rows of matrix supporting rails 13 of the carriage and by entering between these rows of rails the lever will engage the suspending hooks and wires of the matrices and will thereby push them toward the left

in Fig. 1 until the matrices have all been transferred to the guiding or supporting wires 6. This transferring lever 50 may be actuated at the appropriate time by any suitable mechanism, its lower end being shown in the present instance as provided with a roller arranged to cooperate with the raised part on a cam 52, and a suitable spring shown adjacent to the bracket 51 serves to retract the lever 50 after the roller on said lever passes the high part of the cam. The individual parts of the machine are moved in known manner by the shaft 53 mounted in the frame of the machine in such manner that the shaft is temporarily connected by means of a coupling 54 with the continuously rotating belt-pulley 55, or similar member for transmitting power, and after being rotated once by hand or automatically is disconnected from the same.

In the general view of the machine shown in Figs. 1, 2 and 3 various parts which have no particular importance for the present invention have either been only indicated, or only partially shown, for the sake of clearness.

In order to be able to exchange the matrices and to keep them all in order and in stock, a frame is provided which is represented in Figs. 15, 16 and 17. The same consists of four uprights 60 which are united by two strong crosspieces 61 in the manner of the carriage 8. Between each two uprights 60 there are rails or wires 62 arranged slanting in two parallel rows in such manner that there is still sufficient room left between them for the matrices. These rails are bent all in the same direction at the ends 63 and 64, which project at both sides beyond the uprights 60, and are distributed in such manner that these ends join on exactly with the guide wires 6. If the matrices are to be removed from the machine, while the carriage 8 is elevated, the ends 64 of the rails 60 are placed against the wires 6 which end at the uprights 5, and after all the matrices are released, they are transferred to the changing frame. Likewise for inserting new matrices into the machine, a filled frame is placed with the ends 63 of the rails 60 against the ends of the wires 6 attached to the uprights 4, whereupon the matrices are pushed over on to the wires. For securing the matrices on the frame while the same are not in use, suitably formed clamping devices, bolts, or the like, on one or both of the longitudinal sides are used which prevent the matrices sliding off.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a type setting and casting machine, the combination with a base plate, of a plurality of uprights arranged circularly thereon, a plurality of vertical supports arranged in pairs in two parallel planes on said base

plate, and a plurality of guide wires attached at one end to one pair of said vertical supports, conducted around one or more of said uprights in the form of a spiral, and attached at the other end to the other pair of said vertical supports at a distance from the former end equal to the pitch of the spiral.

2. In a type setting and casting machine, the combination with a base plate, of a plurality of uprights arranged circularly thereon, a plurality of vertical supports arranged in pairs in two parallel planes on said base plate, a plurality of guide wires attached at one end to one pair of said vertical supports, conducted around one or more of said uprights in the form of a spiral, and attached at the other end to the other pair of said vertical supports at a distance from the former end equal to the pitch of the spiral, and a carriage slidable vertically between said supports and having a plurality of rails corresponding to said guide wires.

3. In a type setting and casting machine, the combination with a base plate, of a plurality of uprights arranged circularly thereon, a plurality of vertical supports arranged in pairs in two parallel planes on said base plate, and a plurality of guide wires attached at one end to one pair of said vertical supports, conducted in groups to the right and to the left around one or more of said uprights in the form of a spiral, and attached at the other end to the other pair of said vertical supports at a distance from the former end equal to the pitch of the spiral.

4. In a type setting and casting machine, the combination with a base plate, of a plurality of uprights arranged circularly thereon, a plurality of vertical supports arranged in pairs in two parallel planes on said base plate, and a plurality of guide wires attached at one end to one pair of said vertical supports, conducted in two groups to the right and to the left and then in smaller groups around one or more of said uprights in the form of a spiral, and attached at the other end to the other pair of said vertical supports at a distance from the former end equal to the pitch of the spiral, the first smaller group on each side bending around the first uprights, the second smaller group on each side bending around the second upright, and so on, to the inside of the circle of uprights.

5. In a type setting and casting machine, in combination with a matrix bar, a wire, a rod attached thereto, a second rod slidable on the former rod, and said matrix bar connected with said second rod.

6. In a type setting and casting machine, in combination with a matrix bar, a wire, a rod attached thereto, a second rod having a

slot slidable on the former rod, a pin on the former rod movable in said slot, and said matrix bar connected with said second rod.

7. In a type setting and casting machine, the combination with a frame, matrix guiding and supporting means, and matrices each having a shoulder at one side of a tongue provided with a channel pivoted on the frame, said channel being adapted to receive the shoulder of a matrix bar, a plate provided with grooves fixed slantwise on said frame adjacent to the end of said tongue, and means on said frame for adjusting the position of and holding said tongue.

8. In a type setting and casting machine, the combination with a frame, matrix supporting means thereon, and matrices each having a shoulder at one side of a tongue provided with a channel pivoted on the frame, said channel being adapted to receive the shoulder of a matrix bar, a plate provided with grooves fixed slantwise on said frame adjacent to the end of said tongue, another plate having grooves corresponding to those of the former plate fixed horizontally in said frame abutting the end of the former plate, a lever having detent means for holding the same fixed on said frame, and a rod connecting said lever with said tongue.

9. The combination of a type-setting and casting machine embodying a series of suitably spaced wires for guiding the matrices during their circulating movements, and a changing frame provided with a series of rails arranged slantingly thereon, said rails corresponding in number and adapted to

register with the guide wires of the machine whereby a set of matrices may be interchanged between the guide wires and rails and maintained in predetermined order.

10. The combination of a type-setting and casting machine provided with a series of guide wires, a set of matrices adapted to circulate or travel along the respective wires, and a changing frame provided with a series of vertically spaced rails arranged slantingly thereon and having their ends offset laterally, said rails of the changing frame corresponding in number and adapted to register with the guide wires of the machine whereby a set of matrices may be interchanged between the machine and frame and maintained in predetermined order.

11. The combination of a type-setting and casting machine having duplicate sets of guide wires, a set of matrices adapted to traverse said wires, and a changing frame provided with matrix-receiving rails arranged slantingly and in two parallel rows, the rails of the changing frame corresponding in number and adapted to register with the guide wires of the machine, the ends of the rails being deflected laterally toward the same side of the frame whereby a set of matrices may be interchanged between the machine and frame and the matrices may be maintained in predetermined order.

In testimony whereof I have signed my name to this specification in the presence of two witnesses.

OTTO KOSKE.

Witnesses:

PAUL BOHN,
GUSTAV LAUTER, JR