(117.) DAVID B. THOMPSON. 2 Sheets--Sheet 1.

Type Distributing Machine.

No. 122,744. Patented Jan. 16, 1872.

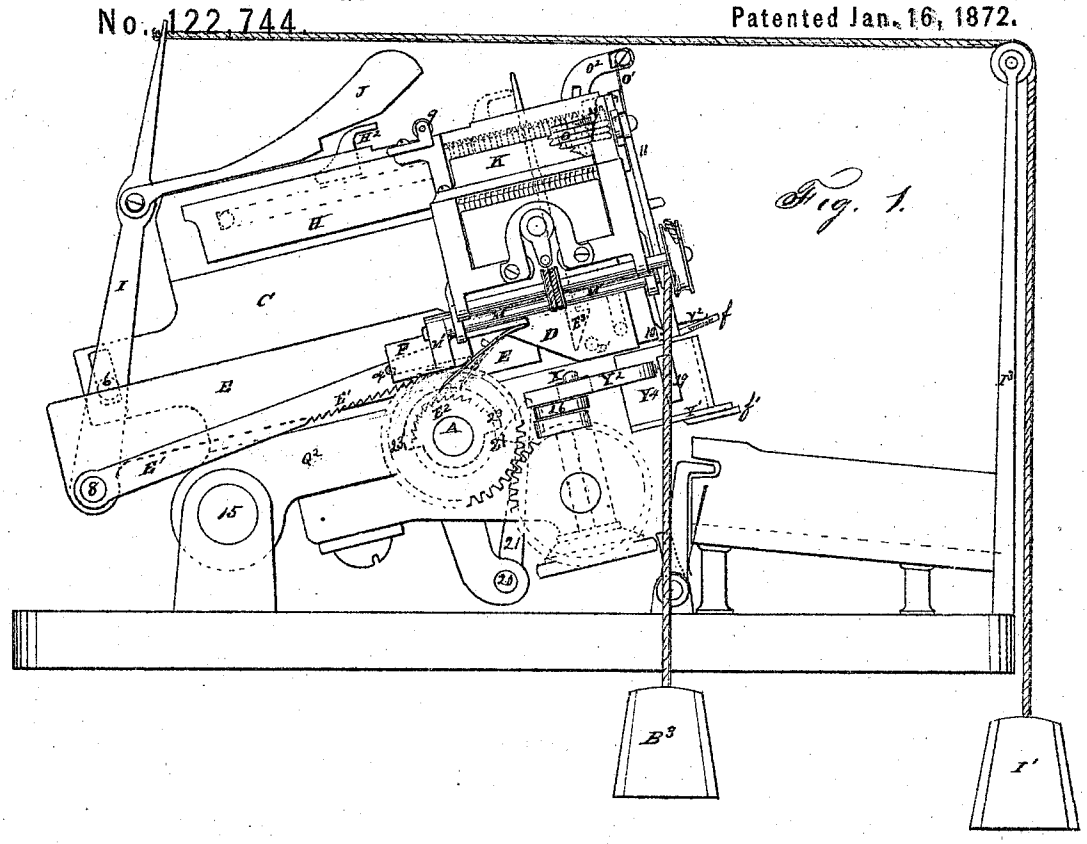
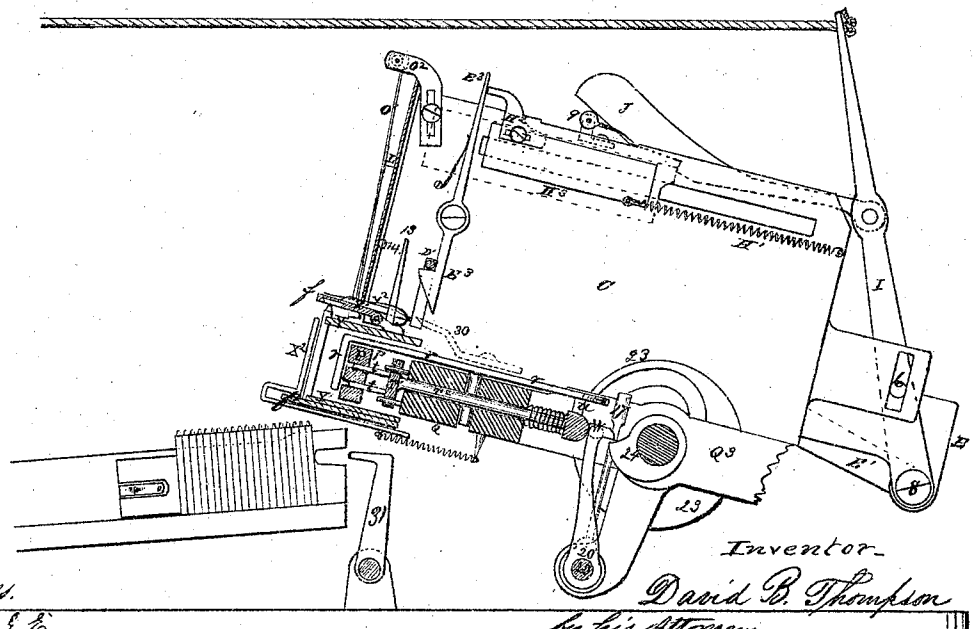


Fig. 1.

Fig. 2.



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(117.) 2 Sheets--Sheet 2.

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Fig. 3.

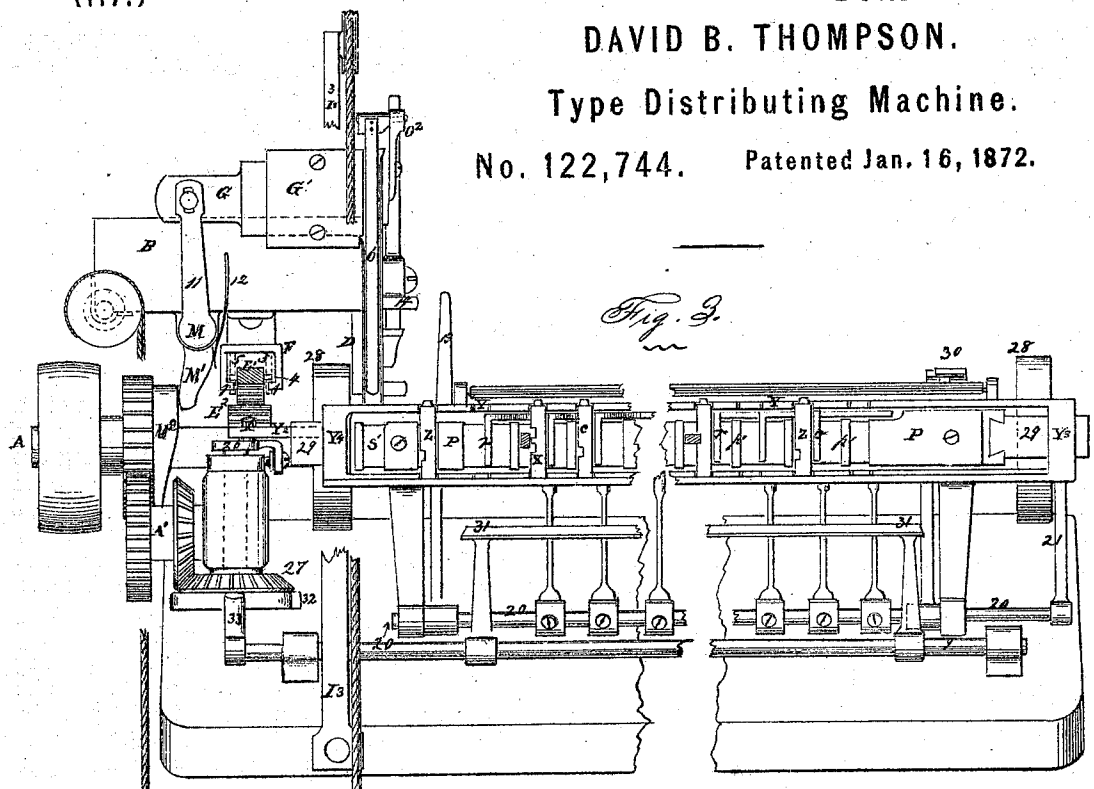
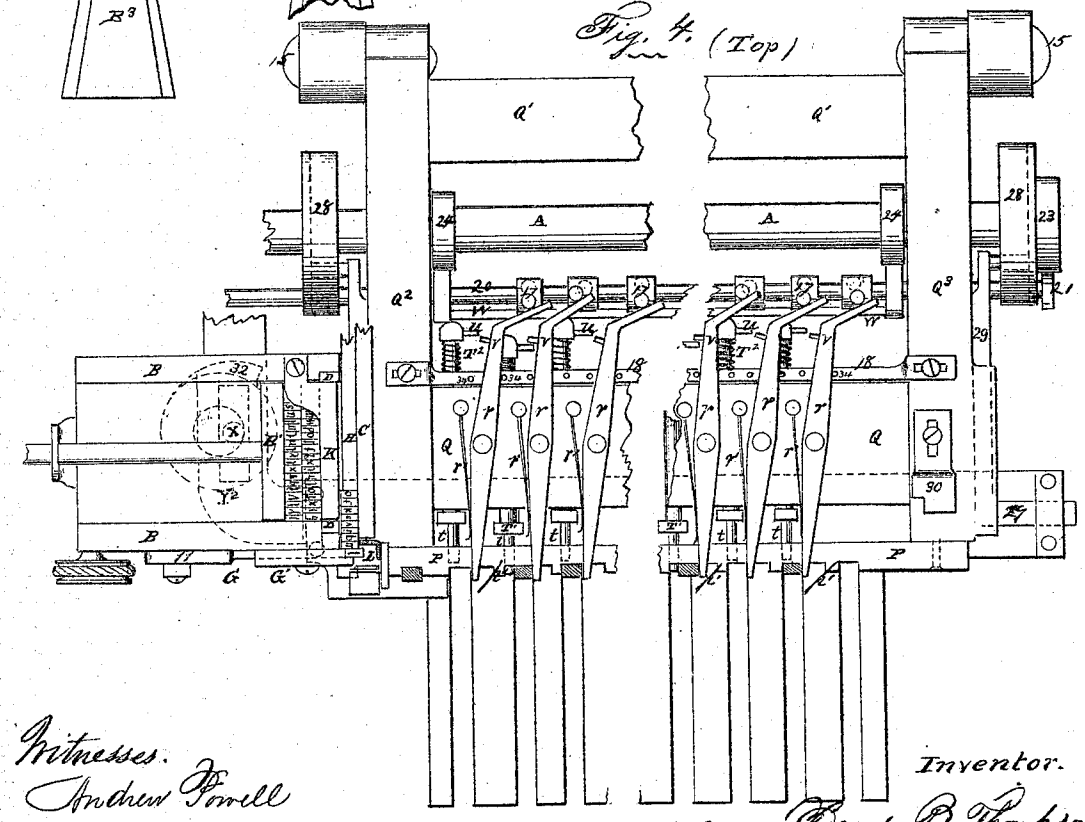


Fig. 4. (Top)



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UNITED STATES PATENT OFFICE.

DAVID B. THOMPSON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN TYPE-DISTRIBUTING MACHINES.

Specification forming part of Letters Patent No. 122,744, dated January 16, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, DAVID B. THOMPSON, of Brooklyn, county of Kings and State of New York, have invented certain new and useful Improvements in Machinery for Distributing Type, of which the following is a specification:

My improvements relate chiefly to combinations of devices for feeding the types both in column or page and by the line, with other devices which separate the types from the column and take them one by one and present them to mechanism for ascertaining the character they bear, which mechanism also conveys them to and deposits them in the several receptacles respectively provided for the various characters; and said invention may be said to consist in the combination with a selecting mechanism, substantially such as hereinafter described, of a competent feeding mechanism to take the type in column, separate them, and present them one by one to the selecting mechanism; also, in certain new and useful arrangements and combinations of the various parts of the said feeding and of the selecting mechanism, as hereinafter set forth; also, in arranging the selecting mechanism in a frame set on trunnions, in order that it may be elevated for access to the parts beneath.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same, referring to the drawing hereto annexed which forms part of this specification.

Figure 1 is an elevation of that end of the machine where the feeding apparatus is located, and illustrates said apparatus. Fig. 2 is a reversed and sectional view, showing the construction and illustrating the operation of the selecting mechanism. Fig. 3 is a front view of the selecting mechanism and part of the feeding apparatus, as seen from points perpendicular to the angle of inclination of the front thereof, represented in Fig. 1. Fig. 4 is a top view of the same, as seen from points perpendicular to the inclination thereof, as aforesaid.

Referring to said drawing, A represents the driving-shaft, from which all movements are derived. B represents a "galley" for receiving and holding a column or page of type, having a slide, B^1, moved by a weight, B^3, attached to a cord that passes over a pulley at the side of the galley. At the end of the galley is a vertical plate or abutment, C, being part of the frame of the machine and sustaining the various parts of the feeding apparatus. Said plate abuts against and closes the end of the galley, and the column is forced toward it by the galley-slide B^1. Immediately adjacent to the abutment and working up through the bottom of the galley is a line-lifter, D, consisting of a vertical slide in thickness not exceeding the width of the type, and of width equaling that of the column, the office of which is to separate from the column the line of type nearest the abutment and lift the line to the position indicated by the dotted outlines of type in Fig. 1. The lower edge of this line-lifter is cut off diagonally, and, when about to lift a line of type, rests on a horizontal bar, E, near the front end thereof, which is also cut off in a like diagonal line representing inclined planes. The lifter D is actuated by the motion of the bar E, communicated thereto by a rack, E^1, operated by a ratchet-pinion, E^2, on the driving-shaft, and, when elevated, said lifter is held by a latch or hook, E^3, Fig. 2, which takes under a lug, D′, on the lifter, Figs. 1 and 2. The rack is connected at the rear end to the bar E by a pivot, 8, thereby allowing of a vibrating motion of the forward end thereof, which slides through a guide, F, made fast by its upper side to the galley. This guide has inward-bent lips or bearers 1, Fig. 3, which take under pins 4, projecting from each side of the rack, and bear it up, withholding it from contact with the pinion E^2 during the retreat of said rack and until the proper time arrives in the operation of the machine for engagement with its pinion E^2, a single revolution of which advances the rack E^1, and with it the bar E, the required distance to effect the elevation of the line-lifter D. During the last part of the advancement of the rack its pins 4 are taken up by yielding inclines 5 at each side of the rack, being made fast to the guide F, which, yielding to the pressure of the pins 4 as the rack advances, let the pins pass between the inclines 5 and bearers 1, whereupon said inclines react and close against the under side of the bearers 1, and thus form a continuation thereof beyond the forward end of the said guide; and when the rack retreats the pin, as seen dotted, rides over the front end

of said bearer to the upper side thereof, Fig. 1. It will therefore be understood that while the rack has advanced by the pinion E^2 a given distance, it is also then disengaged from said pinion by the act of so advancing; and by the act of retreating it is re-engaged therewith, as heretofore specified. The retreat of the rack is effected in unison with and during the forward movement of a sliding plate, H, Fig. 1, which lies parallel with and follows or pushes the elevated line of type (dotted) toward a device or blade, G, for detaching the types one by one from the line for delivery to the selecting mechanism. A part of this line-follower is shown in Fig. 4. The advancement of the line-follower is produced by the force of a weight, I^1, applied, through a cord passing over a pulley on a standard, I^3, to the upper extremity of a lever, I, pivoted at 6 to part of the abutment C, and having attached to it a pawl-catch, J, notched underneath, to take over the rear end of the line-follower. Such weight is required to exert sufficient force to overcome the friction of the lever I, the rack E^1, the line-follower H, and the line of type in its guides, keeping the line in motion as the types are detached one by one therefrom, and also straining a minor spring, H^1, Fig. 2, the purpose of which is to retract the follower H after the delivery of each line, as seen in Fig. 1. While the line follower advances the lower end of the lever I is drawing back the bar E and rack E^1, pivoted thereto at 8, and the pawl-catch J approaches a stop-roller 9 on the abutment C; and as the last of the types of the delivering line are being detached, and it becomes necessary to lift another line, a dog, H^2, on a plate, H^3, Fig. 2, made fast to the follower, strikes the upper end of the latch E^3, unhooking it from the lug D' on the lifter D, which lifter instantly descends to the bar E; at the same moment the pawl-catch J comes in contact with the roller-stop 9, which lifts the pawl and disconnects it from the follower H when the lever I, still obeying the impulse of its weight, completes the retreat of the rack E^1, which then falls on and is re-engaged with the pinion E^2, as aforesaid. As the follower H is released from the pawl it is at once returned by the minor spring H^1 to the position for starting a new line, whereupon the slide B^1 follows up with the column and brings such line over the line-lifter. All the above movements of the lifter's descent, the return of the line-follower, and the re-engagement of the rack with its pinion take place at nearly the same instant, and their respective positions at this juncture are shown in Fig. 1. After this the first turn of the driving shaft A and pinion E^2 advances the rack E^1 and bar E and raises the line-lifter D, elevating the next line of type. The elevated line is supported in guides on either side, consisting of the abutment C on one side and on the other by a cross-bar, K, which also lies across and above the end of the column of type, and prevents the lifter from raising more than one line at a time.

At every revolution of the driving-shaft, as the line of type is advanced by the line-follower, a single type is removed from the end of the delivering-line by the detaching-blade G, Figs. 3 and 4. Said blade is slightly thinner than the thinnest type. It is arranged to slide in suitable bearings G′, and is operated by a lever, 11, moved in any convenient manner, and in this instance by a revolving cam, M^2, on the driving-shaft A, through a rock-shaft, M, and lever M^1, to draw it back, and by a strong spring, 12, which shoots it forward. The outer bearing of the blade G projects over the end of the delivering line of type which abuts against it, Fig. 4; and the operation of the detaching-blade is to force out the last type of the line from between such line and the aforesaid outer bearing of the blade and into an open recess beyond the end of the abutment C, which recess is occupied by a vertical channel-way, L, Figs. 2 and 4, that is capable of a vibratory motion, being hinged at the lower end 10, Fig. 1, to the frame of the machine; and at the upper end said channel is cut away on the side next to the detaching-blade G for the admission of each type as it is separated and removed from the line. Such type, just previous to being thus removed, is held against the end of the galley by several flexion springs, seen at O in Fig. 1. One or more of these springs, usually the upper one, is short, and when the delivering-line has been reduced to two or three type the short spring falls behind them and supports them while the lifter D descends for another line. The channel L, whenever a type is discharged therein, receives a vibratory motion to complete the clearance of the type, and such type is prevented from leaving the channel and from turning therein by a spring and yielding mouth-piece, O^1, hinged to an adjustable bracket, O^2, secured to the abutment C, Figs. 1 and 2.

Having now shown the construction and operation of that part of my invention used for feeding in the types to the machine, I will next proceed to describe the mechanism by which each type is manipulated in ascertaining the character thereof, selecting it from the remainder, finding its place, and discharging it therein. Each type, when received into the channel I, soon finds its way—though not instantly—to the first in order of a series of divisions or type-cells, called a receiving-cell, located immediately under the mouth of said channel. Said type-cells correspond in number with that of the characters to be distributed, and are arranged on the front of a bar, P, Figs. 2, 3, and 4. As these cells and the devices for each are all substantially similar, to avoid useless repetition I have represented the machine as broken away and a part removed, Figs. 3 and 4. The frame of the machine has longitudinal beams Q Q^1 and lateral beams Q^2 Q^3, which at the rear side are provided with trunnions 15, set and turning in upright supports whereon the machine may be erected, or inverted for inspection of the parts beneath.

The front of the machine is elevated, as seen in Figs. 1 and 2, and hence the types, when placed in the cells, will naturally incline backward and lie against the face of the division-bar P—in other words, on the backs of their cells.

These cells, formed between ribs p', are each sufficiently wide to take in the type flatwise, and also to receive the extremities of levers r that reach across the face of the bar P, occupying one side of the cell; but the bodies of said levers are at right angles thereto, and lie across the top of the longitudinal beam Q, on which they vibrate, having pivots fixed therein working freely in said beam, as illustrated in Fig. 2. Immediately adjacent to the ribs p', and arranged for being protruded into the cells, are small pins t, Figs. 2 and 4, made fast to holders T^1, having stems T^2 that pass through the beam Q, one stem to each lever r, the first object of which pins is to feel or test the type when placed in the cell, and ascertain its character, and they also perform other offices. The number, location, and thickness of the testing-pins varies in each type-cell, and is determined by the number, location, and depth of nicks formed on each type in the edge thereof to distinguish them one from the other. The levers are forced toward the type in the cell by means of yielding-fingers 17, acting on angular rear portions of the levers; and said levers are moved and held back by springs r'. Such back motion is governed in extent for adjustment to adapt the machine to work type of different width by means of stops on an adjustable strip, 18, secured by screws passing through slots thereon with the frame Q^2 Q^3. The yielding fingers 17 are fixed to a rock-shaft, 20, having at one end an arm, 21, reaching up to and actuated by a revolving cam, 23, represented in dotted lines in Fig. 1. The testing-pins are forced into the type-cells by a vibrating bar, w, operated by cams 24, Fig. 4, the bar in turn acting on the heads of the stems T^2 of the pin-holders; and spiral springs around the stems retract them. Projecting upward and outward from said stems are arms u, Figs. 2 and 4, which arms, when the testing-pins are forced forward, are caught and held, for a moment, by suitable catches u on the side of each of the levers r while the types are being placed in the cells and tested. The operation of seizing the types and conveying them to and placing them in the testing-cells is performed by a carrying frame, Y, and co-operating devices thereon. Said frame may be described as consisting of upper and lower type-plates Y Y^1, having recesses in their front edge to correspond with the type-cells, and firmly secured to or cast in one with end blocks Y^3 Y^4, which latter also serve for the bearings of the carrying frame. Said frame has a reciprocating motion endwise, for the purpose of conveying the type from opposite one cell to the front of the next; and the types are lifted out of and laid in the cells by a lateral motion of the frame. The longitudinal movement is produced by a revolving crank-pin, X, and slide, working in a slotted branch of the frame, extending from the end block Y^4. (See Fig. 1, and dotted lines in Fig. 4.) Said crank-pin is fixed in a crank, 26, on the upper end of an upright shaft, having at its lower end a bevel-gear, 27, meshing in and driven by a like gear-wheel on a secondary shaft, A′, operated from the main shaft A by spur-wheels, as seen in Figs. 1 and 3. The crank 26 has a collared screw passing through it into the shaft, and thereby the throw of the crank, and hence the stroke of the frame endwise may be shortened or lengthened to adapt the machine to any given width of type. The lateral motion of the frame is produced by face cams 28, acting on studs in the sides of L-formed slides 29, fitted to slide on the outer side of the cross-beams Q^1 Q^2. The carrying-frame is furnished with clamping-bars or leaves, f f', to assist in handling the type—one, f', arranged below and made fast to the lower recessed type-plate Y^1, and projecting slightly forward to form a shelf, and the other, f, above, and hinged at its rear edge to constitute a flap or leaf, and projecting over and beyond the recesses of the upper type-plate Y. As the types are carried forward by the carrying frame, their lower ends rest on the lower clamping-plate or shelf f', and they are firmly held thereto by the leaf f having an elastic under surface just over the type which bears on and holds them with a yielding pressure exerted by a spring, v^2; and when about to be deposited in the cells, the leaf f is lifted by a cue, X′, on its rear edge coming in contact with a cam-plate, 30, fixed to the frame Q^3. Said type are also held under control by an outside appliance to keep them snugly in the recesses of the type-plates Y Y^1, and guide them when being finally discharged from the cells. This purpose is served by a face-plate, X^2, Fig. 2, (not shown in front view to avoid confusion.) Said face-plate may extend the entire length of the carrying-frame, with which it moves; and its shape is such as to form its own guide, being bent outward, and back over the shelf f', on which it slides in and out, as operated by part of the lateral motion of the frame Y, which, after placing the types in the cells, backs away, and leaves the plate resting on the face of the bar P. An alternative of the face-plate may consist of a number of spring fingers arranged on an operating rock-shaft, and acting on or acted upon by a suitable stop to release their pressure from the type when they are to be discharged. Beneath each type-cell, and extending out in front of the machine, are suitable channels, Fig. 4, one for each character, and as the types are discharged from the machine at each revolution of the main shaft, or a trip, 33, attached to a pusher, 31, worked by a cam, 32, on the bevel-gear 27, Fig. 3, pushes forward the line of type in the channel.

Operation.

At the time the type is received into the channel L, the spike 13 on the carrying-frame Y, while the latter is in the act of moving lat-

erally outward, strikes a projection, 14, on the channel, imparting a vibratory motion thereto. And as said frame so moves outward the upper recessed plate Y forms a gate or cut-off, preventing the type then in the channel from entering at the instant the first or receiving-cell S is under the channel; but when the said frame moves back, the type escapes into the said cell, and behind the face-plate X^2, Fig. 2. In the outward movement aforesaid of the frame, the recessed type-plates Y Y^1 take the type and lift it out beyond the ribs p', and by the longitudinal motion convey the type opposite the next adjacent cell. Meantime, another type has been taken in the channel, and stands on the frame Y in readiness to occupy the receiving-cell just vacated, and escapes into such cell when permitted by the motion of the frame, as in the former case; a fresh type passing into the receiving-cell at every revolution of the machine, and at every revolution lifted out and passed along to the testing-cells, and then carrying and holding devices which accept and discharge the type or types into their final places, or reject them; whereupon the same motions of the frame take up all type so rejected and convey them to other cells to be again tested; and so on till each type has been placed in the cell adapted to accept it, and from thence released and finally discharged. The acceptance or rejection of a given type is determined and accomplished as follows: At each outward (or lifting) movement of the frame the testing-pins t are forced into the cells throughout the whole series, and are held there by catches V on the rear of the levers r, falling behind arms u on the stems T^2 of the pin-holders T. And at each inward or depositing movement of the frame Y, the levers r, throughout the whole series, are moved laterally toward the testing-pins. When the location, depth, or number of the pins in the cells does not correspond with that of the indentations on the type, as illustrated by types, Fig. 3, such type is rejected and detained in the cell awaiting the next arrival of the carrying frame to be conveyed to another cell for an additional test, but whenever the location of the said pins does so correspond, as indicated by types C and Z, is accepted. The said indentations or nicks in the type permit each type to pass to and lie against the division rib p', which causes the outer end of the lever r to move laterally in that direction a distance sufficient to disengage the catch V on the rear thereof from the stem of the pin-holder of the pins in that cell, when said pins instantly withdraw from that cell, discharging the type into the channel beneath provided for that character. The type C, therefore, soon finds its place of final discharge, whereas type Z would traverse the whole series of divisions.

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

1. The combination, with the line-follower aforesaid, and tripping devices J and 9 or their equivalent, of the weight I′, to move the line of type toward the detaching-blade, and the minor spring H′ to throw back said follower when the line is exhausted, substantially as described.

2. The combination of the rack and pinion E^1 E^2, and inclined planes on the rack-bar F and line-lifter D, operating to elevate said lifter, substantially as specified.

3. The combination, with the line-follower H, the weight I′, and the rack E^1 of the lever I, pawl-catch J, and stop 9, to trip said pawl, so as to throw said lever and draw back the rack in readiness to be re-engaged with its pinion aforesaid, substantially as set forth.

4. The mechanism or its equivalent for automatically disengaging the rack E^1 from its pinion when the line of type shall have been elevated, in combination with the mechanism or its equivalent for automatically re-engaging such rack with its pinion, when another line is to be elevated, substantially as specified.

5. The combination, with the line-follower and detaching blade aforesaid, of the vibrating channel-way L, for the purposes and substantially as described.

6. The combination, with such vibrating channel-way, of the adjustable spring mouth-piece O′, for the purposes set forth.

7. In combination, the carrying-frame Y, having an adjustable longitudinal stroke, and the adjusting strip 18, having stops 34 thereon, acting in connection with the type-levers r, in the manner specified, whereby the machine is adaptable to work type of various widths, as specified.

8. The arrangement of the selecting mechanism on trunnions, so that it may be erected or inverted, for the purposes set forth.

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(117)