No. 646,971. Patented Apr. 10, 1900.

A. FRASER & F. ROSE.

AUTOMATIC TYPE DISTRIBUTING APPARATUS.

(Application filed Dec. 22, 1897.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1A.

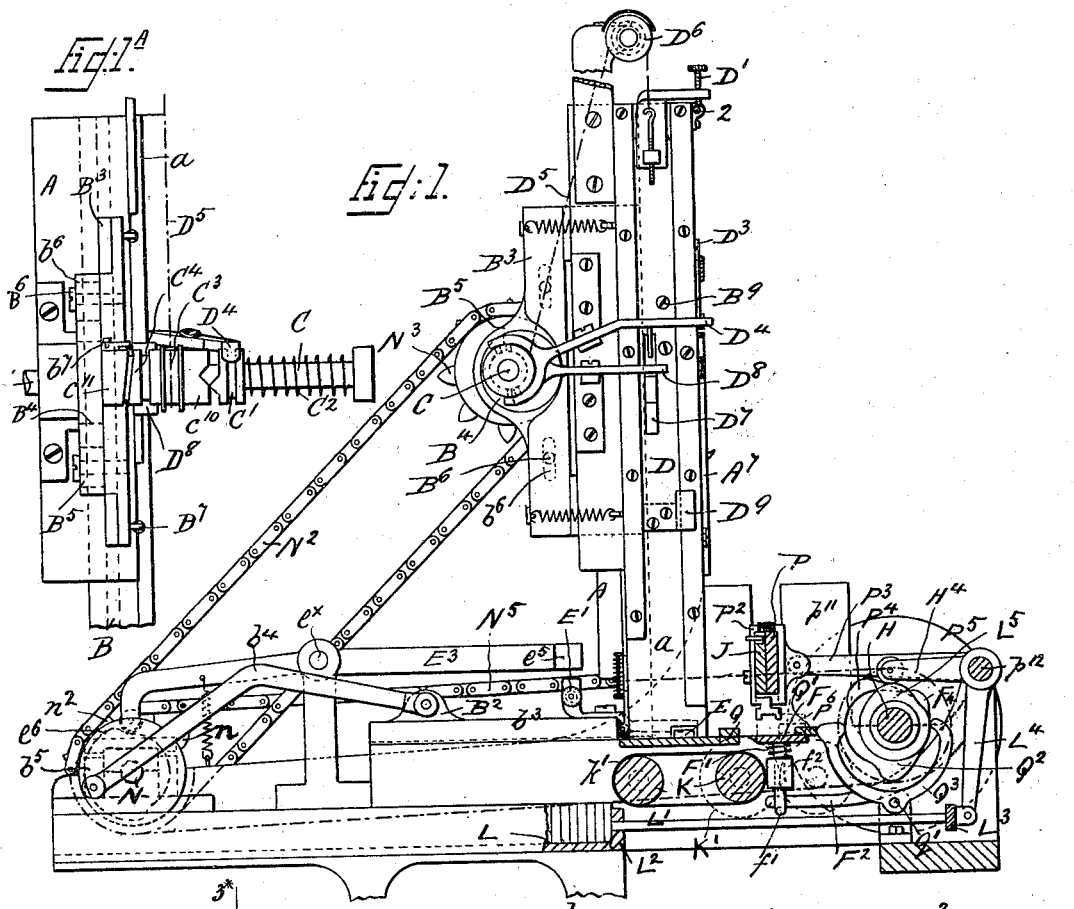
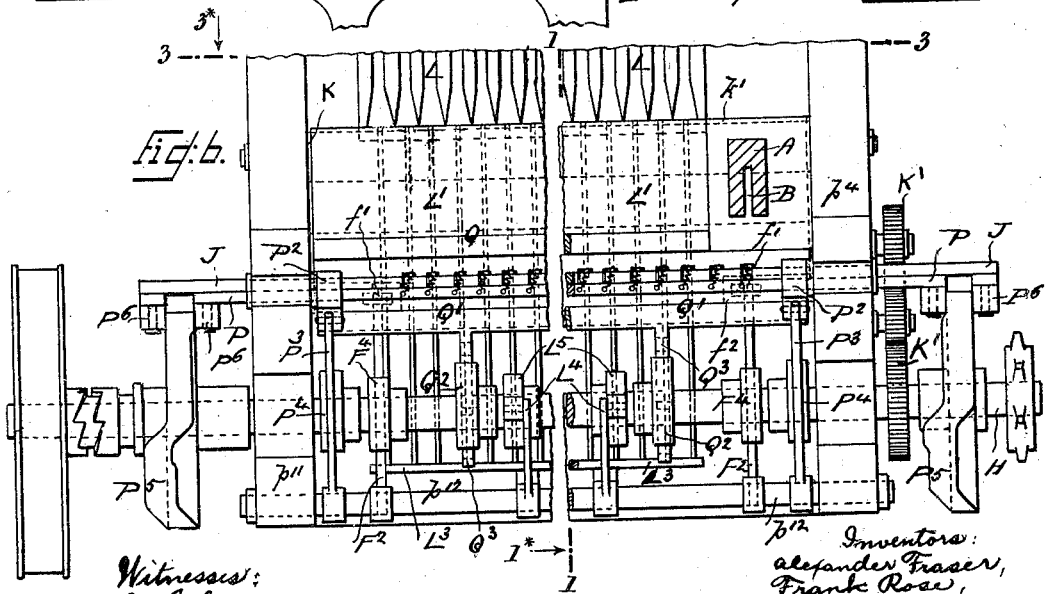


Fig. 1.

Fig. 6.



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AUTOMATIC TYPE DISTRIBUTING APPARATUS.

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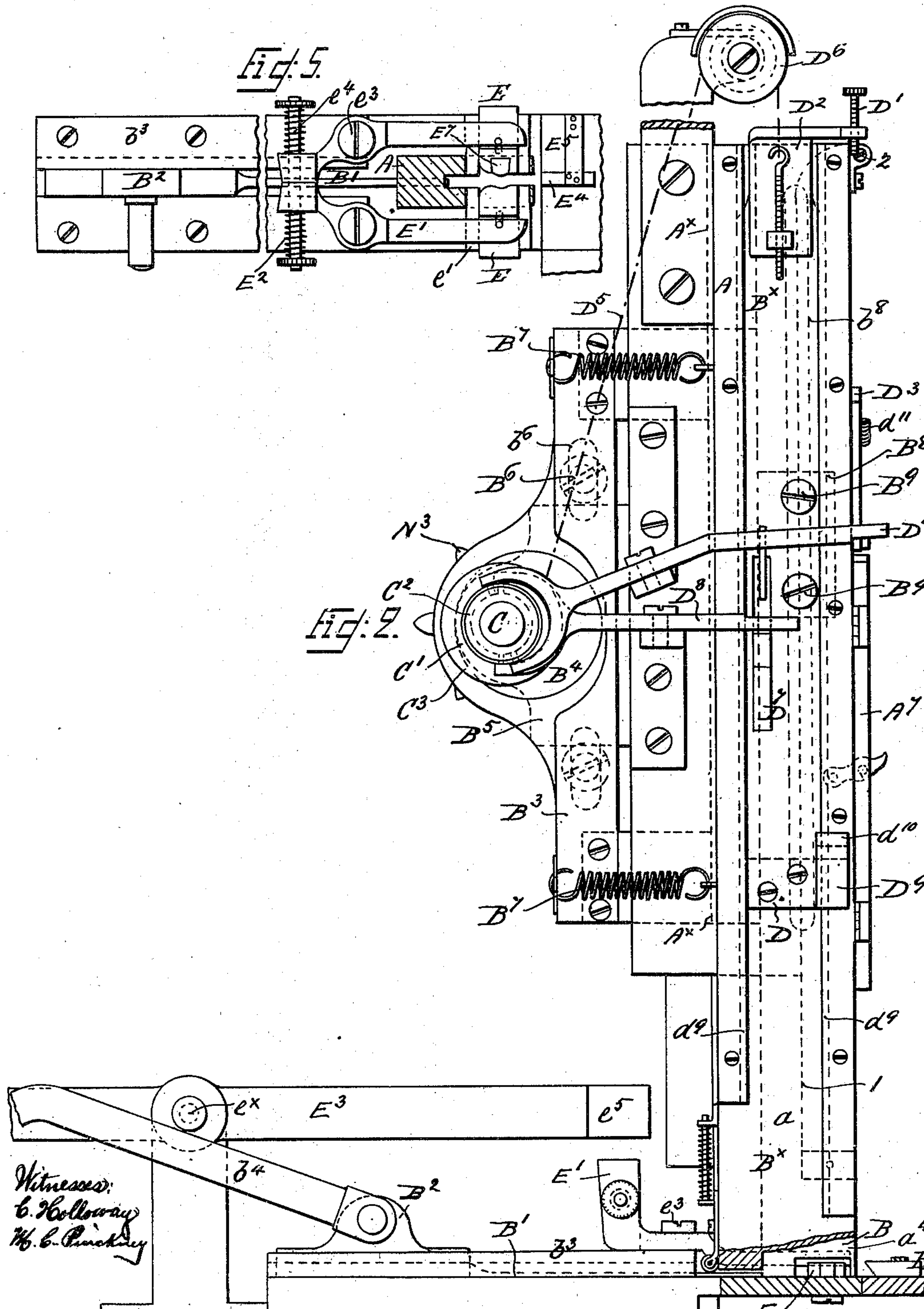
(No Model.) 4 Sheets—Sheet 2.

Fig: 5.

Fig: 7.



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No. 646,971. Patented Apr. 10, 1900.

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AUTOMATIC TYPE DISTRIBUTING APPARATUS.

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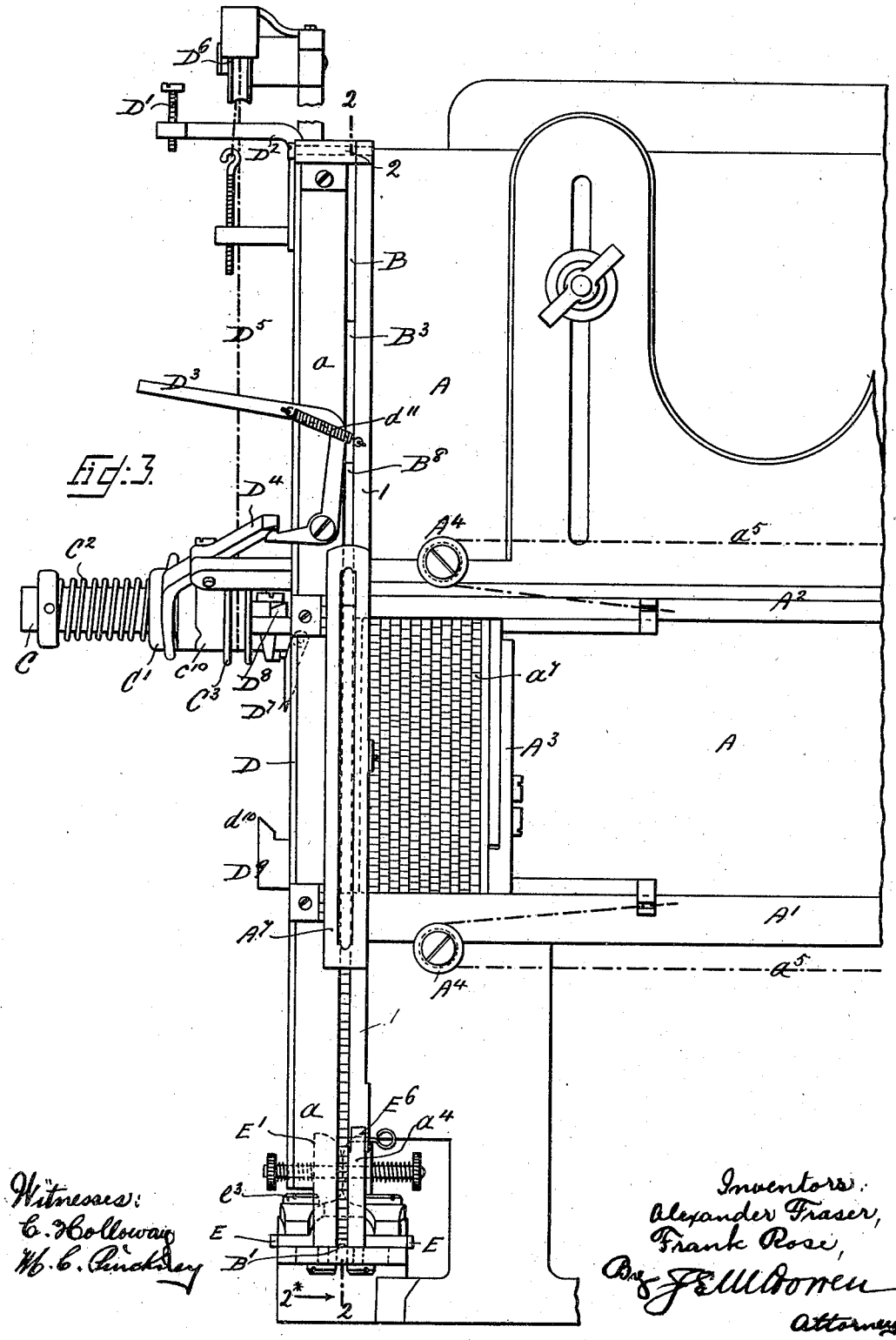
(No Model.) 4 Sheets—Sheet 3.

Fig. 3.



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AUTOMATIC TYPE DISTRIBUTING APPARATUS.

(Application filed Dec. 22, 1897.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 7.

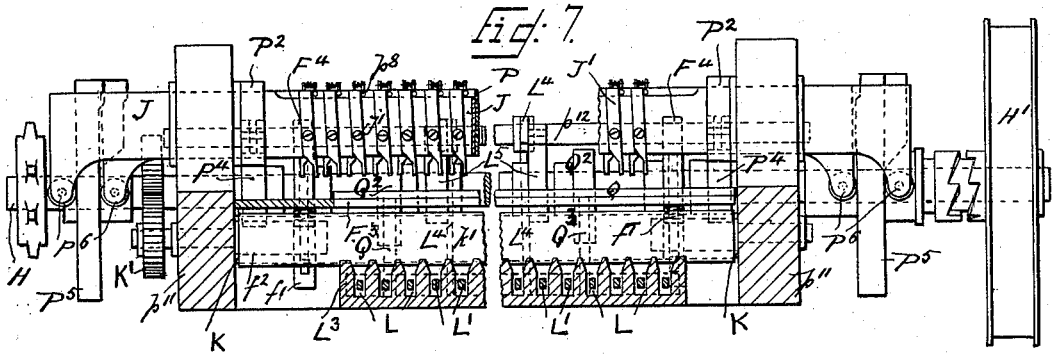


Fig. 8.

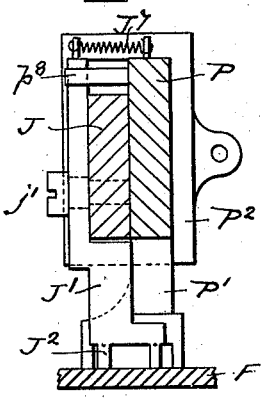


Fig. 4.

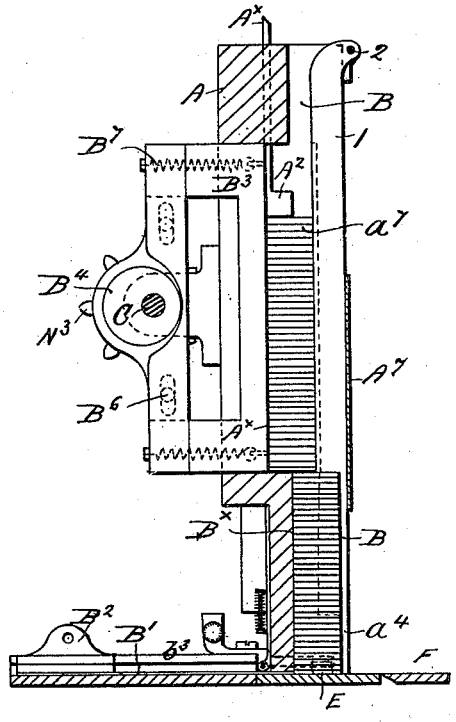


Fig. 9.

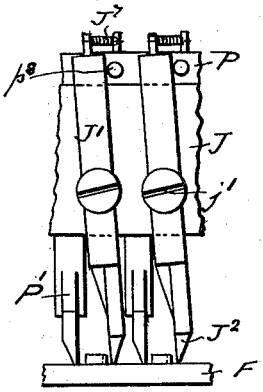
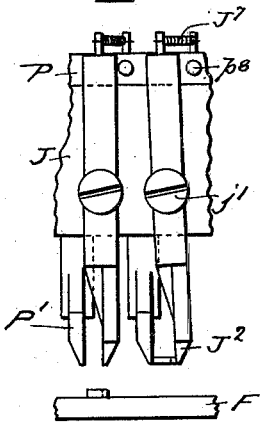


Fig. 10.



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UNITED STATES PATENT OFFICE.

ALEXANDER FRASER, OF EDINBURGH, SCOTLAND, AND FRANK ROSE, OF LONDON, ENGLAND.

AUTOMATIC TYPE-DISTRIBUTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 646,971, dated April 10, 1900.

Application filed December 22, 1897. Serial No. 662,988. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER FRASER, residing at Edinburgh, Scotland, and FRANK ROSE, residing at London, England, subjects of the Queen of Great Britain and Ireland, have invented certain new and useful Improvements in Automatic Type-Distributing Apparatus, (for which we have obtained British Patent No. 8,504, dated April 30, 1894,) of which the following is a specification.

This invention relates to the distribution of printing-types, formed with notches across one edge in different positions for different denominations of type, from pages of such types after having been used for printing into cases channeled to receive types of different denominations in their respective channels and of the like denomination in each channel for renewed use in composing; and it consists in improved arrangements and combinations of mechanism whereby such distribution may be automatically effected in a more expeditious and accurate manner than is done by type-distributing machines heretofore proposed.

Attempts have been heretofore made to effect the automatic distribution of type. Our invention is designed to provide a simple and satisfactory apparatus for this purpose and which shall be capable of general use.

In the improved machine the types to be distributed are in the form of a page placed upon its side edge and in a vertical or nearly-vertical galley, so that the types lie in a horizontal or nearly-horizontal position therein, and the lines of types are arranged vertically in column-like formation and are collectively advanced in the galley, so that each column in turn is caused to pass into alinement with a column-groove, into which it is then horizontally advanced forwardly of the page and in which it then gravitates, with the types of the column still lying horizontally in superposed relation, and from the bottom of which the lowermost types are individually and successively separated by being further advanced endwise onto a horizontal platform arranged parallel with and in advance and laterally of the galley and adapted to be raised and lowered and along which platform the separated types, while still occupying a horizontal position, are simultaneously shifted laterally step by step until they are in the desired relation to their respective distribution-channels by selecting mechanism, consisting of rigid jaws and coacting pronged feelers which collectively are adapted to be lowered onto the platform when in its raised position and to grip and support those types thereon which are not in the desired relation to their respective distribution-channels without so acting upon those types which are in the desired relation to their respective distribution-channels, leaving the latter freely resting upon the platform, which is then lowered below the plane of the gripped types, and the types resting thereon are collectively caused, by a reciprocating bar and continuously-traveling band common to the series, to be transferred from the platform and tilted erect into the entrances to their respective distribution-channels, whereupon and upon the platform being raised to its type-receiving level the grip-supported unlocated types are collectively laterally traversed a step forward along the platform and are again released thereon by the selecting mechanism, which is then raised and retrograded a step and again lowered onto the platform to repeat the operation, and so on.

On the accompanying drawings, Figure 1 is an end elevation, partly in section, showing the relative positions of the coacting parts of the improved apparatus, the galley and the type-separating mechanism being shown in end elevation and the type selecting and distributing mechanism being shown in sectional elevation on the line 1 1, Fig. 6, looking in the direction of the arrow 1*. Fig. 1[A] is a back elevation of part of the galley mechanism. Fig. 2 is an enlarged and more detailed end view of the galley, more clearly showing the mechanisms for separating the columns of type from the page of types and the individual types from the column of types and showing the same apart from the type selecting and distributing mechanism. Fig. 3 is a front elevation of the galley and type-separating mechanism. Fig. 4 is a reduced sectional elevation on the line 2 2, Fig. 3, through the column-groove, looking in the direction of the arrow 2*, showing the mech-

anism for separating the vertical columns of types from the page of types in the galley. Fig. 5 is a plan of the mechanism for separating the lowermost types individually from the separated vertical column of types in the galley column-groove and of supporting the separated column of types in such groove, the lower part or delivery end of the galley column-groove being shown in section. Fig. 6 is a plan of the two ends of the type selecting and distributing mechanism, the lower part or delivery end of the galley column-groove being shown in section. Fig. 7 is a sectional elevation on the line 3 3, Fig. 6, looking in the direction of the arrow 3*, showing the type selecting and distributing mechanism in back elevation. Fig. 8 is an enlarged view of the type-selecting mechanism, showing the same in transverse section; and Figs. 9 and 10 are back elevations thereof, showing the same in action.

A is the galley, Figs. 1 to 4, which is arranged vertically, or nearly so, and consists of a plate having a fixed bottom fence A′, between which and an upper adjustable fence A^2 the page a^7 of types to be distributed is placed on its lower side edge with the lines of types arranged vertically in column form, Figs. 3 and 4, and with all the types lying horizontally, Fig. 3.

A^3 is a pusher drawn by cords a^5, passing around pulleys A^4, and acted on by a spring-barrel or other suitable means adapted to press the page of types laterally toward the column-separating device and so as to press the respective vertical lines or columns of the page in turn into alinement with such device and with a column-groove.

B is the column-groove, Figs. 2, 3, 4, and 6, which is formed in the galley somewhat in advance of the position occupied by the page of types by a projecting end part a and by an opposite lower projecting part a^4 and by an opposite upper part 1, which is hinged to the part a at 2 and extends down to where it abuts against and engages with a mortise-joint E^6 with the fixed part a^4 and can be turned up about its hinge to facilitate access to the column-groove. The column-groove extends from the galley-top downwardly to a point at which each type in succession is separated from its next adjacent type, as hereinafter described, and the respective vertical lines or columns of the page of types are (when laterally shifted into alinement therewith by the pusher A^3) separately advanced into the groove forwardly of the page of types by a column-separator B^3, Figs. 2 and 4, the lines A* A* (dotted in Fig. 2) indicating the face of the galley-plate, and the lines B* B* (dotted in Fig. 2) indicating the inner edge of the column-groove to which the column of types is advanced by the column-separator, and in Fig. 2 the forward edge of the latter in its normal position. The column-separator is made as an open rectangular frame and (Fig. 4) is guided in the galley-frame and is intermittently and horizontally reciprocated therein by an eccentric B^4 on a shaft C, which intermittently is driven from the main shaft H of the apparatus by a counter-shaft N and sprocket-wheels H^4 n' n^2 N^3 and connecting pitch-chains N^5 N^2, the eccentric B^4 working in a circular opening in a plate B^5, made with slots b^6, engaging with pins B^6, projecting from the column-separator B^3, and by the aid of springs B^7 reciprocating the separator once for each revolution of the shaft C. The column-separator remains in the forward position shown, Fig. 2, while any types remain in the column-groove in front of it and during such time arrests the type page a^7 and prevents the next adjacent column of types in the galley from being laterally shifted, but when the types in the column-groove have descended so far that there are none directly in front of the column-separator, Fig. 4, the separator is withdrawn by the semirotation of the eccentric B^4 until its front edge comes into alinement with the front of the galley-plate A and back of the type page a^7, (the lines A* in Figs. 2 and 4,) and it then allows the pressure of the page-pusher A^3 on the type page a^7 in the galley to cause the first adjacent column thereof to be laterally shifted into alinement with the column-separator, which on its return forward movement, effected by the completion of the rotation of the eccentric B^4, advances such column into the column-groove. This intermittent operation of the eccentric B^4 is caused to be effected as follows: As the individual types are successively separated from the bottom of the column of types in the column-groove, as hereinafter described, the column of types in such groove gravitates therein, and when the column has descended far enough (when its top one clears the level of the galley-face A′ and the bottom edge of the column-separator) for a fresh column of types to be transferred from the galley to the column-groove on top of the type column already therein, an adjustable screw-pin D′, Figs. 1 to 3, (carried by a bracket D^2, projecting from a long narrow plate D, which slides in a guiding-groove d^9 in the outer wall of the column-groove and is connected by pins B^9, working in a slot b^8 in such wall, with a follower B^8, Figs. 2 and 3, which rests on the type-column and descends therewith,) acts on a detent-lever D^3, which has been holding but now releases a clutch-lever D^4, controlling a clutch C′, Figs. 2 and 3, on the shaft C, and a spring C^2 makes the clutch engage with a counterpart clutch c^{10} on the boss of a small barrel C^3, which winds a cord or small chain D^5, passing around a suitably-located upper pulley D^6 and attached to the slide D, and thus causes the slide to be drawn up. As the slide rises a projecting piece D^7, Figs. 1 to 3, pivoted to it, acts on the inside of a clutch-lever D^8, controlling a second clutch C^4, Fig. 1_V, on the shaft C, making it engage with a counterpart clutch c^{11}, formed on the boss of the eccentric B^4, whereupon the ec-

centric makes a single revolution, withdrawing and advancing the column-separator, as hereinbefore described, and as it completes its revolution a projection b^7 on its boss moves the clutch C^4 out of gear with the eccentric-clutch c^{11}. When the slide D again descends, the piece D^7 turns up in passing the lever D^8 without acting on it. The winding-up action of the barrel C^3 is stopped by a piece D^9 on the bottom end of the slide, a beveled point d^{10} on the piece encountering the outside of the lever D^4 and making it move the clutch C′ out of gear with the clutch c^{10}, while the lever D^4 is caught and held by the lever D^3, which is held up by a spring d^{11}. By these means the transfer of the several vertical columns of types from the galley to the column-groove is automatically effected in the required succession.

A door A^7, fitted with glass to allow the types to be seen, is hinged to the front of the column-groove and can be opened, if required, to clear any obstruction.

The types are successively separated from the bottom of the column of types in the column-groove by a pusher B′, Figs. 1 to 5, secured to a slide B^2, which is reciprocated in side guides b^3 by a rod b^4, actuated by a cam or eccentric b^5 on the shaft N.

To support the superposed column of types in the column-groove while the lowermost one of the column is being separated from the column and to prevent the frictional contact of the latter type while being pushed out from carrying the next upper type with it, so as to prevent more than one type at a time from being separated from the column thereof, a pair of presser-blocks E, Figs. 1 to 5, is so arranged at the lower part and on each side of the galley column-groove as to bear on both sides of the lower types of the column and to support the latter while each bottom type is being separated, the pressers being separated, when the separator B′ has returned to its normal position after having pushed out a type, so as then to allow the column of types to further gravitate in the column-groove. The presser-blocks E, one of which is fitted with a piece of rubber E^7, which bears against the type column, slide in cross-guides e' and are controlled by levers E′, centered on screw-pins e^3, the back ends of the levers, which extend upwardly and are wedge-shaped, as indicated by dotted lines in Fig. 3, being normally pressed together by adjustable springs E^2 on a spindle e^4, passing through them, so as to separate the blocks when the type-separator has receded, and being separated by a wedge e^5 on the end of a lever E^3, which is centered at $e^\times$ and is actuated by a cam e^6 on the shaft N, so as when the type-separator is advancing to cause the pressers to grip the lower types of the column thereof. As each type is thus separately thrust out by the separator B′ it passes under a small piece E^4, held by a light spring e^5, which steadies the type and prevents it from jumping or tilting, and is received in a horizontal position upon and transversely of a long horizontal platform F, Figs. 1, 4, and 7 to 10, which runs parallel with the face of the galley in advance and laterally thereof and is adapted to be lowered and raised, as hereinafter described, (the types being pushed onto the platform when in its raised position,) and along which platform the type so ejected from the column-groove, together with any others already on the platform, are then laterally shifted by the type-selecting mechanism hereinafter described until the types are respectively shifted into the desired relation to their respective distribution-channels, when they are transferred thereto, as also hereinafter described.

The platform is fitted with depending rods f', guided by parts f^2, projecting inwardly from the end frames p^{11} of the machine-frame and is raised and supported by springs F′, located between it and such parts f^2 and is lowered by levers F^2, operated by cams F^4 on the shaft H, working in slots in the rods f', the cams being timed to lower the platform, together with the located types supported thereon, for the transfer of the latter to their respective distribution-channels, as hereinafter described, while the unlocated types are supported by the type-selecting mechanism, and to allow of the platform being raised by the springs F′ to receive the type separated from the type column, and for the grip-supported unlocated types to be redeposited thereon by the selecting mechanism, and of their being laterally shifted therealong by means of the latter mechanism, which will now be described.

The type-selecting mechanism, Figs. 1 and 6 to 10, is arranged above and parallel to the platform and is formed with a feeler-bar J and with a coacting gripper-bar P. The feeler-bar has centered on its back face, as at j', a series of feeler-levers J′, the depending ends of which are made each with one or more prongs J^3, corresponding to the notches of a particular type, and the gripper-bar is formed with rigid jaws P′, adapted to act each one in concert with one of the feeler-levers. The upper ends of the feeler-levers are connected by springs J^7 to pins on the gripper-bar, which is fitted with other pins p^8, which limit the action of the springs. The gripper and feeler bars are guided horizontally in boxes P^2, in which the gripper-bar has a limited longitudinal movement independently of the feeler-bar, and the two bars have also a joint longitudinal movement, such movements being effected by edge cams P^5 on the shaft H, acting between small rollers P^6, fitted to the ends of the bars. The independent endway movement of the gripper-bar in the one direction serves to open apart the type-selecting mechanism by means of the pins p^8, acting on the levers against the springs J^7, and the return endway movement of such bar causes the clos-

ing of such mechanism by allowing the springs J^7 then to close the levers toward the gripper-jaws, while the endway movement of the two bars together in the one direction and when the selecting mechanism is closed, and which is effected while the selecting mechanism is resting on the platform, serves to traverse the types laterally along the platform away from the galley column-groove, as aforesaid, and the return endway movement of such bars together when the selecting mechanism is open, and which is effected when the selecting mechanism is raised clear above the types resting on the platform, serves to retrograde the selecting mechanism a step to repeat its cycle of movements.

The movements of the gripper and feeler bars are guided by the end frames p^{11}, and their rising and falling movements are effected by their boxes P^2 being acted upon by levers P^3, centered on a shaft p^{12} and actuated by cams P^4 on the shaft H, whereby as each type is separated from the column-groove and pushed onto the platform the feeler and gripper bars are allowed to descend with their jaws and feelers separated apart and into contact with the platform, Figs. 8 and 9, each jaw at the back of a type (if there is one at the place) and each feeler at the front of a type. The gripper-bar is then slightly moved endwise by one of the cams P^5 longitudinally in relation to the feeler-bar, which allows the springs J^7 to cause the feeler-levers to feel the types and in combination with the gripper-jaws to grip any types the notches of which do not coincide with the feeler-prongs, Fig. 10. In the case of any type if the feeler at any time acting on it corresponds with its notches the feeler-prongs enter the notches, but owing to the action of the spring J^7 on the feeler being limited by the projection p^8 do not grip the type against the opposite jaw, but leave it resting on the platform, by which it is then lowered to the level of the distribution-channels, Fig. 10. At a lower level and rearward of the platform is a traveling band k', supported by rollers K, one of which is continuously driven by gearing K' from the shaft H. At a still-lower level and rearward of the band k' is arranged the series of distribution-channels L, each for receiving types of a particular denomination and each receiving only types allowed to drop with the platform by the feeler proper to it. The pitch of the entrances of the channels L is equal to the movement of the types at one step, and their entrances are flared to facilitate the entrance of the types. Pushers L' enter the channels L after each deposit of the types therein and push forward the dropped types thereinto to make space to subsequently receive any types similarly dropped. The pushers L' are guided through holes in a bar L^2 and are secured at their outer ends to a common bar L^3, which is operated by levers L^4, acted on by cams L^5 on the shaft H. While released from the selecting mechanism and resting on the platform the types are dressed against a fixed back bar Q by a front bar Q', which acts on the faces of the types and may be faced with leather or other suitable material that will not injure the types and is reciprocated by cams Q^2 on the shaft H, the bar Q' having fixed to it curved arms Q^3, which are centered at q' and bear on opposite edges of the cams. When the types resting on the platform are gripped by the jaws and feelers on the descent of the latter after their retrograde movement, as aforesaid, the types gripped by the jaws and feelers are supported thereby, Fig. 10, and the ungripped and located types resting on the platform are caused to descend with the platform, Fig. 10, and as the latter descends the bar Q' moves over it and pushes the types thereon sufficiently over its rear edge for them to be frictionally acted on by the band k', and thereby drawn from off the platform, carried rearwardly, and turned down erect into the ends of their respective distribution-channels. The platform then rises to its type-receiving position, whereupon the gripped types collectively are, by a joint longitudinal movement of the bars P J effected by the cams P^5, laterally advanced a step forward along the platform and are then released thereon by a reverse lateral movement of the gripper-bar in relation to the feeler-bar by the other of the cams P^5, and the two bars are then together raised by the cams P^4 and retrograded by the two cams P^5 to their former positions in readiness for a repetition of the operation.

The shaft H is fitted with a pulley H' for a driving-belt, which acts on the shaft through a clutch.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In automatic type-distributing apparatus; in combination; a galley, A, adapted to contain a page of types placed on its side edge with the lines of types arranged vertically in column-like formation and with the types in a practically-horizontal position; an automatic pusher, A^3, constantly tending to press the types out of the galley and serving to laterally eject the same column by column therefrom; a horizontally-reciprocating column-pusher, B^3, intermittently actuated by an eccentric, B^4, on a rotating shaft, C, with the assistance of springs, B^7, and serving, in its forward position, to close the galley-exit, and, when withdrawn, to allow the foremost column of types in the galley to be laterally pushed therefrom, and, in its return movement, to push such column of types forwardly into a downwardly-extending column-groove, B; a gravitating column-follower, B^8, and slide serving to aid the descent by gravity of the column of types in the column-groove (as the types are successively pushed out from the

bottom thereof) until such types are clear below the column-pusher; clutch mechanism released by the column-follower when such types are clear below the column-pusher, and serving to automatically raise the follower to clear above such pusher; clutch mechanism released by the ascent of the follower and serving to cause the eccentric, B^4, to actuate the column-pusher so as to push a fresh column of types into the column-groove; a horizontally-reciprocating pusher, B′, serving for pushing each type in succession from the bottom of the column-groove; and an intermittently-acting pressing device, E, serving to grip the lowermost types in the column-groove so as to prevent more than one type from being pushed out at a time, as set forth.

2. In automatic type-distributing apparatus having mechanism serving to separate types one at a time from a series thereof; in combination; a platform, F, adapted to rise and fall and to receive such separated types transversely of its length when in its raised position and to lower such types as are in the required position for distribution to the plane of their removal from the platform; a bar, Q′, serving to dress all the types on the platform, when in its raised position, and to push the lowered types from off the platform, when in its lowered position; a superposed feeler-bar, J, carrying a series of pivotally-supported spring-pronged feelers respectively corresponding to the notches of a particular denomination of type and having a limited movement, combined with a gripper-bar, P, carrying a series of rigid jaws adapted to act each one in concert with an opposite feeler; a continuously-traveling band, k', arranged at the level of the lowest position of the platform; an adjacent series of type-channels, L; a type-pusher, L′; and a rotating shaft, H, fitted with cams, P^4, P^5, F^4, Q^2, L^5, serving for lowering the feeler and gripper bars until the separated feelers and jaws touch the platform and causing the feelers to feel the types thereon and to grip against the jaws those thereof the notches of which they do not enter, lowering the platform with the ungripped types upon it and the types thereon sufficiently over the back edge of the platform for them to be frictionally acted upon by the roller-band and transferred thereby to their appropriate distribution-channels, raising the platform into its type-receiving position, laterally shifting the feeler and gripper bars together with the gripped types a step along the platform, releasing the gripping action of the feeler and gripper bars so as to release the types they gripped on the platform in their new positions, raising and retrograding the feeler and gripper bars in readiness for a repetition of said operations, and causing the pushers, L′, to push the dropped types into their respective distribution-channels, as set forth.

3. In combination; a platform adapted to receive types separated apart and arranged transversely of its length; combined gripper and feeler bars respectively having fixed jaws adapted to engage with the backs of the types resting on the platform and movable feeler-levers respectively corresponding with particular denominations of type and adapted to engage with the notched faces of the types; and means respectively for lowering and raising the platform, shifting the gripper-bar longitudinally in relation to the feeler-bar when resting on the platform to cause the jaws and feelers to close together and to grip the types the notches of which the feelers do not enter, shifting the gripper and feeler bars longitudinally to laterally advance the gripped types a step along the platform after the platform has been lowered with its located types and cleared thereof and again raised, reshifting the gripper-bar longitudinally in relation to the feeler-bar to cause the jaws and feelers to release the gripped types on the platform in their new positions, and raising, retrograding and lowering the gripper and feeler bars for a repetition of the operation, as set forth.

4. In combination; a platform adapted to receive types separated apart and arranged transversely of its length; a bar resting on the platform and adapted to dress the types freely resting thereon in its raised position and to remove the located types therefrom in its lowered position; a rotating roller-band adapted to receive the located types from the platform and to carry them rearward and tilt them erect; a channeled type-receptacle adapted to receive the types transferred by the roller-band; pusher-bars serving to push the located types along their distribution-channels; and means respectively for lowering and raising the platform, rearwardly and forwardly reciprocating the bar serving to dress the types on the platform and to remove the located types therefrom, continuously rotating the roller-band, and horizontally reciprocating the pusher serving to push the types along their respective distribution-channels, as set forth.

Signed by the said ALEXANDER FRASER at Edinburgh, Scotland, this 10th day of December, 1897.

ALEXANDER FRASER.

Witnesses:
WM. JAMES HARDIE,
HUGH PATERSON.

Signed by the said FRANK ROSE at London, England, this 11th day of December, 1897.

FRANK ROSE.

Witnesses:
CHARLES AUBREY DAY,
AUBREY BURTON DAY.