Nov. 10, 1925. 1,561,245

D. S. KENNEDY

TYPOGRAPHICAL MACHINE

Filed Aug. 18, 1923 3 Sheets-Sheet 1

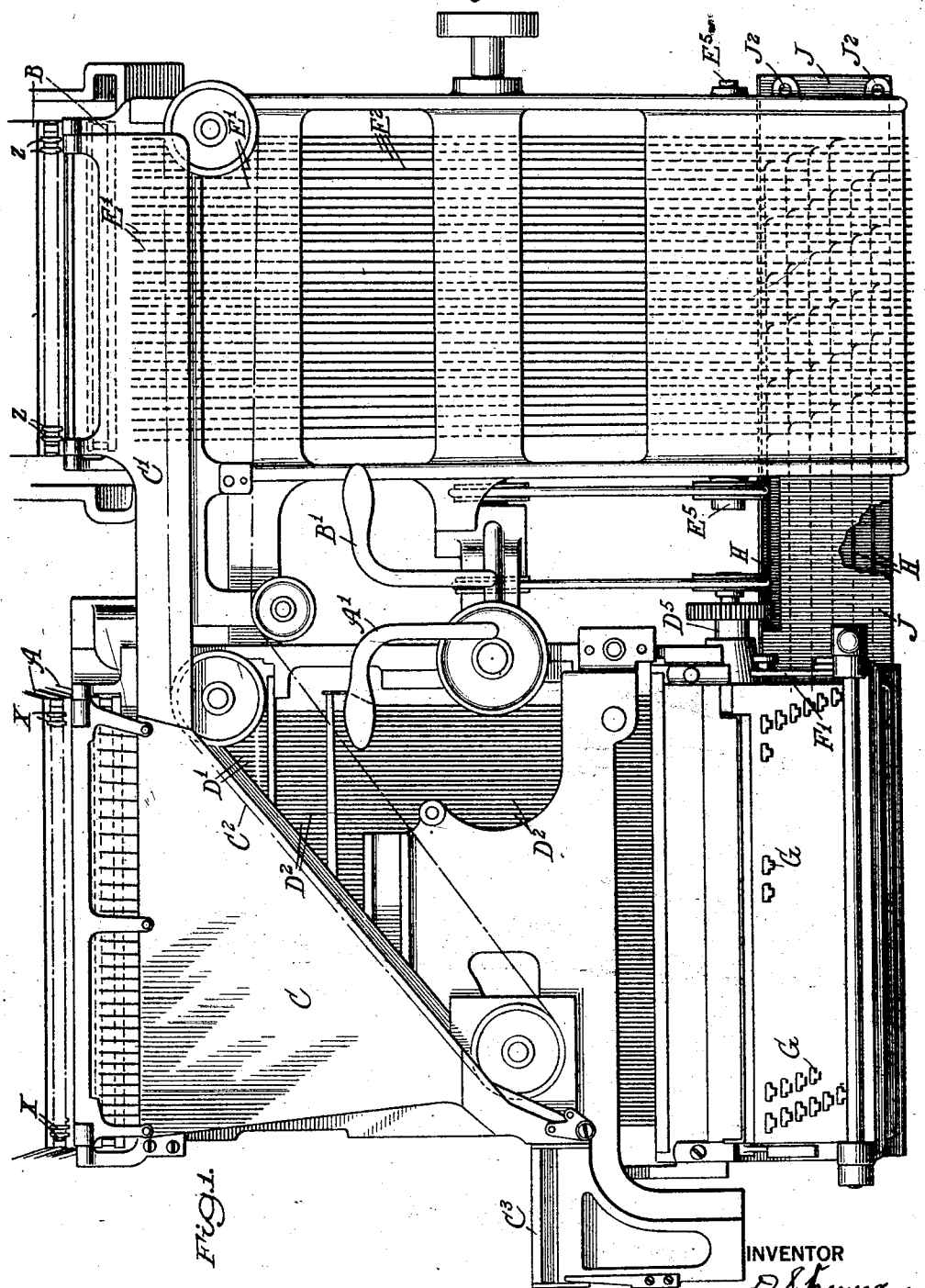


Fig. 1.

INVENTOR
D. S. Kennedy
BY
Rogers, Kennedy & Campbell
ATTORNEYS

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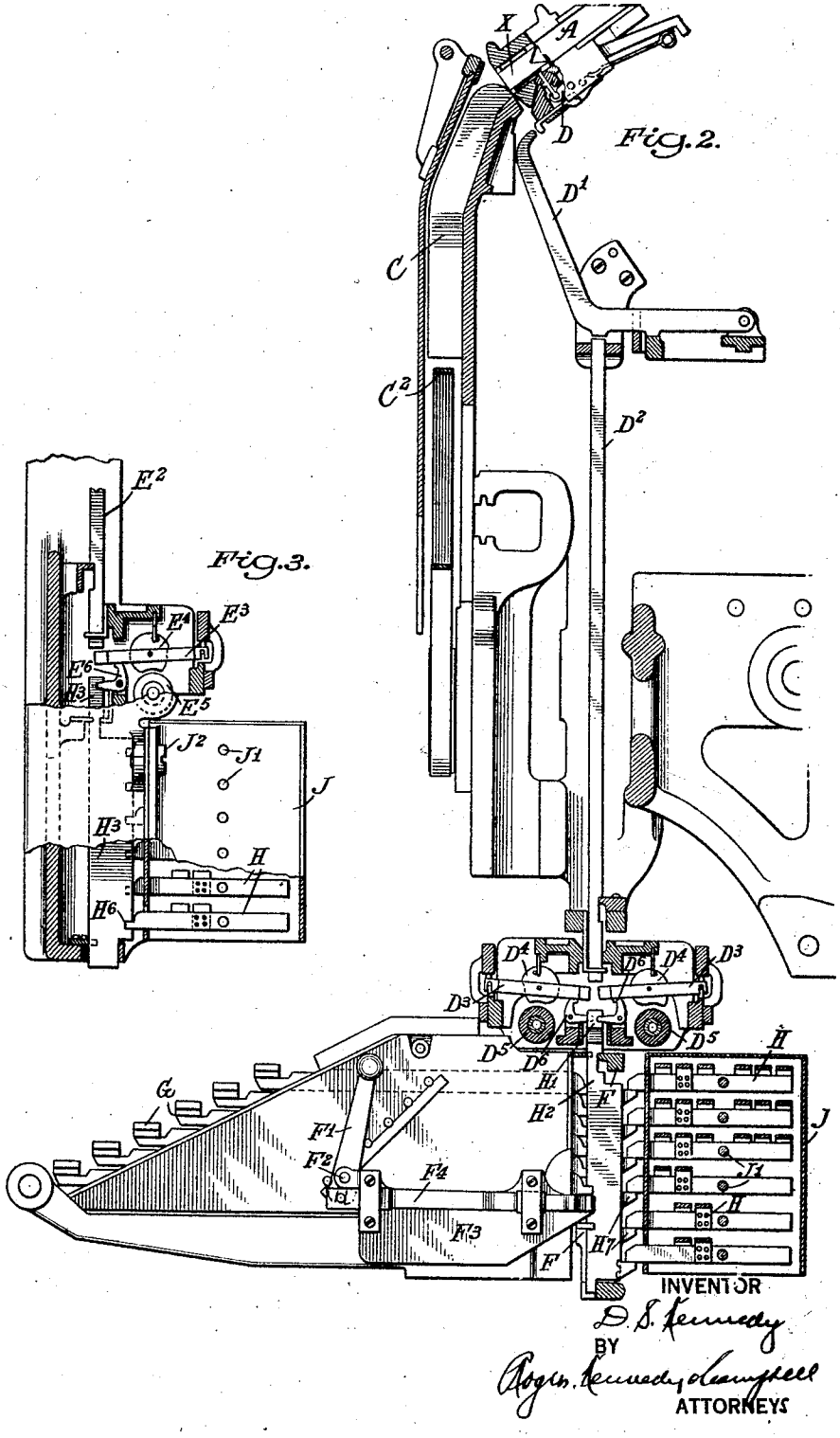


Fig. 2.

Fig. 3.

INVENTOR

D. S. Kennedy

BY

Rogers, Kennedy & Campbell

ATTORNEYS

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D. S. KENNEDY

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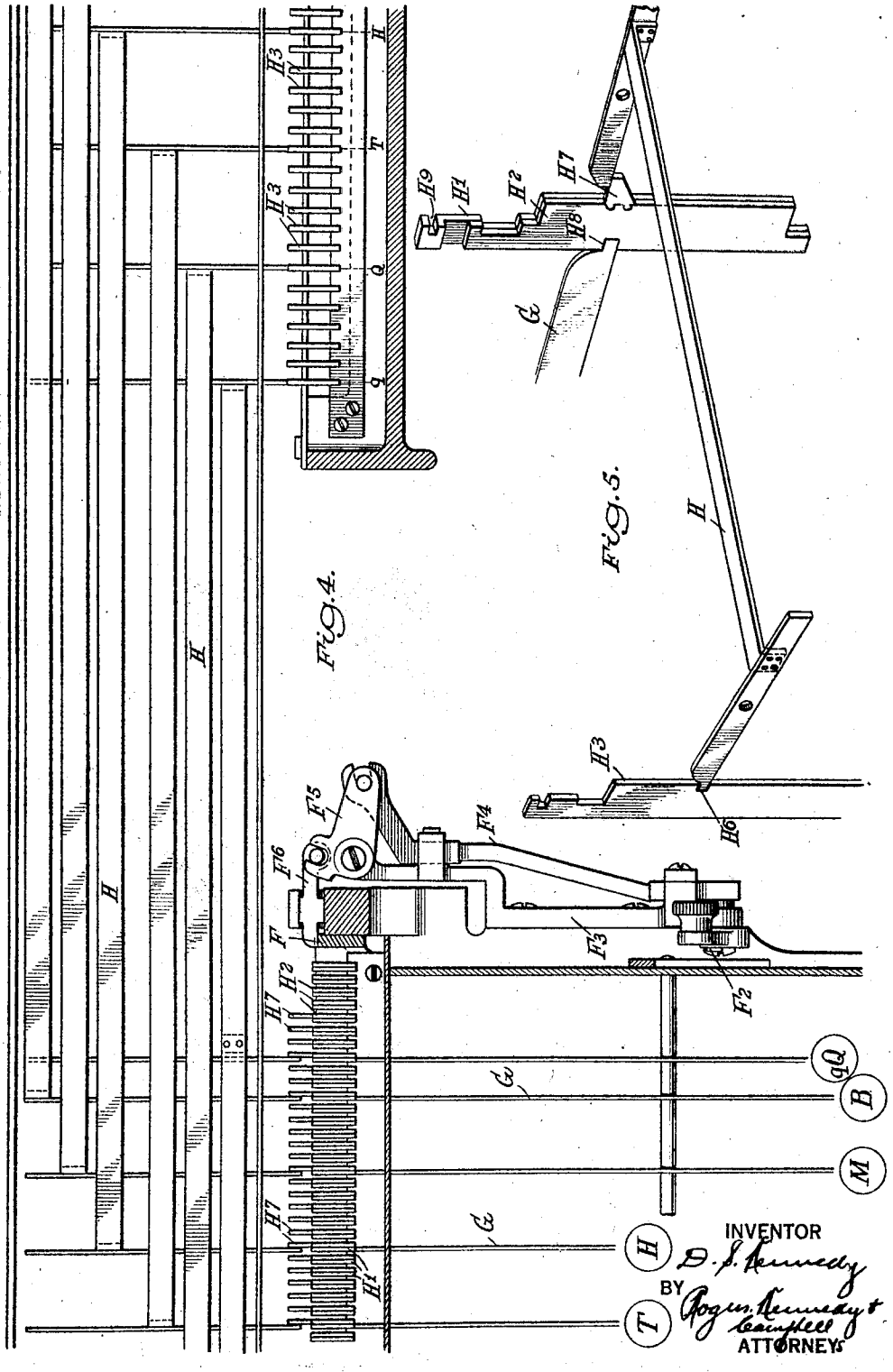


Fig. 4.

Fig. 5.

Patented Nov. 10, 1925. 1,561,245

# UNITED STATES PATENT OFFICE.

DAVID S. KENNEDY, OF BROOKLYN, NEW YORK, ASSIGNOR TO MERGENTHALER LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

## TYPOGRAPHICAL MACHINE.

Application filed August 18, 1923. Serial No. 658,033.

*To all whom it may concern:*

Be it known that I, DAVID S. KENNEDY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Typographical Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to typographical machines, such as linotype machines of the general organization represented in Letters Patent of the United States to O. Mergenthaler No. 436,532, wherein circulating matrices are released from a magazine in the order in which their characters are to appear in print, and then assembled in line, the composed line transferred to the face of a mold, the mold filled with molten metal to form a slug or linotype against the matrices which produce the type characters thereon, and the matrices thereafter elevated and returned through distributing mechanism to the magazine from which they started.

More particularly, it relates to machines of the kind presented in prior Letters Patent Nos. 1,309,416, 1,373,942, and 1,433,087, wherein the matrix magazines are arranged side by side or in "tandem," and wherein the matrices are drawn from the different magazines by manipulation of a single keyboard common to them all.

The present invention is directed to certain improvements in machines of the class stated, as will be fully set forth in the detailed description to follow.

In the accompanying drawings, I have illustrated my improvements merely in preferred form and by way of example, and as applied to the particular style of machine mentioned, but obviously many changes and variations may be made therein, and in their mode of application, which will still be comprised within the spirit of my invention. Further, my improvements are readily adaptable to other forms of typographical machines, such as those that handle type or dies, instead of matrices. Generally speaking, I desire it to be understood that I do not limit myself to any specific form or embodiment, except in so far as such limitations are specified in the claims.

Referring to the drawings:

Fig. 1 is a front elevation of a linotype machine equipped with my improvements;

Fig. 2 is essentially a vertical section taken through the main magazine and the associated keyboard devices;

Fig. 3 is a side elevation, partly in section, of the keyboard devices associated with the auxiliary magazine;

Fig. 4 is a transverse section, showing in plan, a group of connecting bails and the manner in which they cooperate with the actuating slides of the two sets of cam yokes; and

Fig. 5 is a detail perspective view of one of the connecting bails and its associated actuating slides.

In the embodiment illustrated, which is given purely by way of example, the matrices X of the regular fonts are stored in two superposed main magazines A, while the matrices Z of the supplemental fonts are similarly stored in two superposed auxiliary magazines B, the latter being arranged at the side of or in tandem with the main magazines. The main magazines A are of the customary trapezoidal form, each having its grooved channels (ninety in number) converging toward its lower end and spaced apart to accommodate the smaller matrices of the regular fonts, whereas, the auxiliary magazines B are of plain rectangular shape, each having its grooved channels (thirty-four in number) parallel throughout and more widely spaced apart to accommodate the larger matrices of the supplemental fonts. Cooperating with the magazines, is a common assembler entrance having a main portion C arranged to receive the matrices X from a selected one of the main magazines A, and an auxiliary portion $C^1$ arranged to receive the matrices Z from a selected one of the auxiliary magazines B, it being observed that both portions C and $C^1$ discharge the matrices onto an assembling belt $C^2$, which delivers them to an assembler $C^3$,

wherein they are composed in line. Both the main and auxiliary magazines are movably mounted so that by the operation of hand levers $A^1$ and $B^1$, any selected pair may be brought into operative relation to the common assembler entrance. Any of the well known forms of mounting may be employed for this purpose, such as that embodied in the commercial model 14 machine, but it is preferred to make use of the particular form of mounting shown and described in my prior Letters Patent No. 1,459,978, which latter form is of such character as to permit the shifting of the magazines without disturbing their operative connection with the distributing mechanism.

Each of the magazines A is provided with matrix releasing escapements D, one for each channel thereof, and these escapements, or those belonging to the magazine in operative position, are actuated by a set of vertically movable reeds $D^2$ which act thereon through intermediate pivoted levers $D^1$. The auxiliary magazines B are provided with similar escapements actuated in the same fashion by a second set of vertically movable reeds $E^2$ through intermediate pivoted levers $E^1$. According to the present invention, the two sets of actuating reeds are operated by two corresponding sets of power driven elements under the control of a single keyboard G, means being provided for shifting the control of the proper finger keys of said keyboard to either set of power driven elements, so as thus to effect the release of matrices from the operative main or auxiliary magazine, as desired.

The power driven elements for the main set of reeds $D^2$ are of well known construction, comprising two banks or series of pivoted yokes or levers $D^3$, rotary cams or eccentrics $D^4$ journalled thereon, two power driven rolls $D^5$, and two rows of trip dogs $D^6$, all operating in the usual way. The power driven elements for the auxiliary set of reeds $E^2$ are of the same construction, comprising a single bank or series of pivoted yokes or levers $E^3$, rotary cams or eccentrics $E^4$ journalled thereon, a single power driven roll $E^5$, and a single row of trip dogs $E^6$.

When it is desired to draw matrices from the main magazine in operative position, the various finger keys G (ninety in number) are connected directly to the respective trip dogs $D^6$ of the main set of cam yokes $D^3$; whereas, when it is desired to draw matrices from the auxiliary magazine in operative position, certain selected finger keys only (thirty-four in number) are connected indirectly to the respective trip dogs $E^6$ of the auxiliary set of cam yokes $E^3$, provision being made in either case to disconnect the appropriate finger keys from the trip dogs of one set while they are connected to the trip dogs of the other set. This is accomplished, in the present instance, by the employment of three series of slides $H^1$, $H^2$ and $H^3$, and a series of transverse substantially U-shaped rocking bails H. The slides $H^3$ are arranged in the vertical planes of the cam yokes $E^3$ and are connected to the respective trip dogs $E^6$ (Fig. 3), while the slides $H^1$ and $H^2$, disposed in pairs, are arranged in the vertical planes of the cam yokes $D^3$ and are adjustable laterally so as to be alternately engaged with the corresponding finger keys G, it being noted that the slides $H^1$ are connected to the respective trip dogs $D^6$ and that the slides $H^2$ terminate short of said trip dogs so as to be entirely free thereof (Fig. 2). Both the slides $H^1$ and $H^2$ are formed in their forward edges with notches $H^8$ to provide for their alternate engagement with the finger keys G, and the slides $H^1$ are also formed at their upper ends with notches $H^9$ to make connection with the trip dogs $D^6$, these notches $H^9$ being of such lateral extent, although not necessarily so, as to maintain the connection between the slides and trip dogs in either position of the slides. The bails H are located at the rear and serve to connect the slides $H^3$ with as many different slides $H^2$ when the latter are engaged with the finger keys G, each bail having its arm at one end engaged in a notch $H^6$ formed in the rear edge of the corresponding slide $H^3$, and its arm at the opposite end arranged above and in engaging relation to a projecting lug $H^7$ on the rear edge of the free slide $H^2$ (Fig. 5).

According to the above arrangement, when the finger keys G are engaged with the active slides $H^1$, the latter through their direct connection with the trip dogs $D^6$ throw the associated cam yokes $D^3$ into action and cause the operation of the corresponding escapement actuating reeds $D^2$, the bails H at this time being unaffected due to the disengagement of the lugs $H^7$ from the cooperating arms of the bails. In this condition of the parts, as indicated in Fig. 4, the keyboard is connected to the main magazine in operative position and will effect the release of the matrices X therefrom. When, however, the finger keys (i. e., those selected for the purpose) are engaged with the free slides $H^2$, the latter do not affect the overlying cam yokes $D^3$, but, through the medium of the bails H, transmit the motion of the finger keys to the distant actuating slides $H^3$, which thus actuate the trip dogs $E^6$ and throw the cam yokes $E^3$ into action for the operation of the escapement actuating reeds $E^2$. In this condition of the parts, as indicated, as to one of the keys, in Fig. 5, the keyboard is connected to the auxiliary magazine in operative position and will effect the release of

the matrices Z therefrom. In this way, and simply by shifting the slides $H^1$ and $H^2$ in one direction or the other, the proper finger keys of the keyboard may be operatively connected to the cam yokes of either set, as desired. To effect such shifting of the slides $H^1$, $H^2$, they are carried by a supporting frame F, adjustable longitudinally in opposite directions to locate either set of slides in engagement with the finger keys, as above described. Such adjustment of the supporting frame is effected by means of a hand lever $F^1$ pivoted at $F^2$ to a supporting bracket $F^3$ attached to the side of the keyboard frame. The lower end of the hand lever $F^1$ is forked to receive a pin, projecting inwardly from the forward end of a link $F^4$, sliding in guideways of the supporting bracket $F^3$ and connected at its rear end to the longer arm of a horizontal bell crank lever $F^5$, whose shorter arm is connected to an extension $F^6$ of the supporting frame. Hence, by moving the hand lever forwardly or backwardly, the supporting frame may be shifted to the right or left, as the case may be, to bring either set of slides $H^1$ or $H^2$ into use. In the present embodiment, as may have been gathered from the preceding description, each of the finger keys has associated with it a pair of slides $H^1$ and $H^2$, although of the latter only those which are intended to operate the bails H are provided with the rearwardly projecting lugs $H^7$. Consequently, when the frame F is shifted to the left to engage the free slides $H^2$ with the finger keys, the entire keyboard will be disconnected from the trip dogs $D^6$ of the main set of cam yokes $D^3$ and connected in part only to the trip dogs $E^6$ of the auxiliary set of cam yokes $E^3$. However, this particular arrangement is not at all essential, as the supporting frame could be made to carry only the slides $H^1$ and $H^2$ associated with the particular finger keys common to the two sets of cam yokes, in which event the remaining finger keys would maintain their connection with the respective trip dogs of the main set.

Referring now to the bails H, they are enclosed within a box or casing J and are mounted in superposed relation upon a smaller number of pivot rods $J^1$, each of which is common to a plurality of bails, thus affording a neat, compact arrangement of the parts. The arms of the bails project forwardly through slotted openings in the front wall of the box or casing J so as to make engagement with the slides $H^2$ and $H^3$ in the manner before described, such slotted openings being long enough to permit a limited rocking movement of the bails, as required. The box or casing J is detachably connected to the framework, as by means of screws $J^2$ or similar fastening devices, so that it with the contained parts may be applied to or removed from the machine as a unit, the loose engagement between the bail arms and the slides being made and broken as the unit is applied or removed.

The employment of two distinct sets of cam yokes for operating the escapement actuating reeds of the main and auxiliary magazines, as contemplated by the present invention, is very advantageous, in that the transverse rocking bails or other motion transmission devices do not have to bear any part of the load which is imposed upon the reeds during the actuation of the escapements, but are subject only to such strains as are involved in tripping the cam yokes, which are altogether negligible. However, in certain aspects, the invention could be carried out by locating the bails at a different point in the connections. Thus, the bails might be connected directly to the escapement actuating reeds of the auxiliary magazine and arranged above the cam yokes of the main magazine, in which event the slides $H^1$ and $H^2$ would be located between such cam yokes and the respective escapement actuating reeds of that magazine.

As previously stated, I have herein shown my invention only in preferred form and by way of example, and as applied to a machine of the class mentioned, and obviously many modifications and alterations therein, and in their mode of application, will suggest themselves to those skilled in the art without departure from its scope. I, therefore, desire it to be understood that I do not limit myself to any specific construction or arrangement of the parts, except in so far as such limitations are specified in the claims.

Having thus described my invention, its construction and mode of operation, what I claim and desire to secure by Letters Patent of the United States, is as follows:

1. In a typographical machine, the combination of two magazines arranged side by side, or in tandem, and each provided with escapements, two sets of escapement actuating devices, one for each magazine, two corresponding independent sets of power driven elements for operating said devices, a keyboard, and means for shifting the control of the appropriate finger keys of said keyboard to either set of power driven elements, as required.

2. In a typographical machine, the combination of two magazines arranged side by side, or in tandem, and each provided with escapements, two sets of escapement actuating devices, one for each magazine, two corresponding independent sets of power driven elements for operating said devices, a keyboard, and intermediate adjustable means through which the appropriate finger

keys of said keyboard may be operatively connected to the respective power driven elements of either set.

3. In a typographical machine, the combination of two magazines arranged side by side, or in tandem, and each provided with escapements, two sets of escapement actuating devices, one for each magazine, two corresponding independent sets of power driven elements for operating said devices, a keyboard, different series of connections through which the appropriate finger keys of said keyboard control the operation of the power driven elements of the two sets, and means for rendering one or the other series of connections active, as required.

4. In a typographical machine, the combination of two magazines arranged side by side, or in tandem, and each provided with escapements, two sets of escapement actuating devices, one for each magazine, two corresponding independent sets of power driven elements for operating said devices, a keyboard, direct connections through which the finger keys of said keyboard control the power driven elements of one set, indirect connections through which the proper finger keys control the power driven elements of the other set, and means for causing said finger keys to act through the direct or indirect connections, as required.

5. In a typographical machine, the combination of a main magazine provided with a given number of escapements, an auxiliary magazine arranged at the side thereof and provided with a materially less number of escapements, two sets of escapement actuating devices, one for each magazine, two corresponding independent sets of power driven elements for operating said devices, a keyboard, and adjustable means operative under one adjustment to connect the various finger keys of said keyboard to the respective power driven elements of the main magazine, and operative under another adjustment to connect certain selected finger keys to the respective power driven elements of the auxiliary magazine.

6. In a typographical machine, the combination of a main magazine provided with a given number of escapements, an auxiliary magazine arranged at the side thereof and provided with a materially less number of escapements, two sets of escapement actuating devices, one for each magazine, two corresponding independent sets of power driven elements for operating said devices, a keyboard, direct connections through which the various finger keys of said keyboard control the respective power driven elements of the main magazine, indirect connections through which certain selected finger keys control the respective power driven elements of the auxiliary magazine, and means for causing said keys to act through the direct or indirect connections, as required.

7. In a keyboard mechanism for typographical machines of the class described, the combination of a set of cam yokes for operating the escapement actuating devices of a main magazine, a second independent set of cam yokes arranged at the side thereof for operating the escapement actuating devices of an auxiliary magazine, trip dogs controlling the operation of said cam yokes, a series of finger keys common to the corresponding cam yokes of the two sets, and means for operatively connecting said finger keys to the trip dogs of either set, as required.

8. In a keyboard mechanism for typographical machines of the class described, the combination of a set of cam yokes for operating the escapement actuating devices of a main magazine, a second independent set of cam yokes arranged at the side thereof for operating the escapement actuating devices of an auxiliary magazine, trip dogs controlling the operation of said cam yokes, a series of finger keys common to the corresponding cam yokes of the two sets, different series of connections leading from said finger keys to the respective trip dogs of the two sets, and means for rendering one or the other series of connections active, as required.

9. In a keyboard mechanism for typographical machines of the class described, the combination of a set of cam yokes for operating the escapement actuating devices of a main magazine, a second set of cam yokes arranged at the side thereof for operating the escapement actuating devices of an auxiliary magazine, trip dogs controlling the operation of said cam yokes a series of finger keys common to the corresponding cam yokes of the two sets, a pair of slides arranged between each such finger key and the respective trip dog of the main set, one of said slides being free and the other active as regards said trip dog, means for effecting the alternate engagement of the free and active slides with the corresponding finger keys, and connecting members, idle when the active slides are engaged with the finger keys but operative when the free slides are so engaged, to transmit the motion of said free slides to the trip dogs of the auxiliary set of cam yokes.

10. In a keyboard mechanism for typographical machines of the class described, the combination of a set of cam yokes for operating the escapement actuating devices of a main magazine, a second set of cam yokes arranged at the side thereof for operating the escapement actuating devices of an auxiliary magazine, trip dogs controlling the operation of said cam yokes, a series of finger keys common to the corresponding

cam yokes of the two sets, a pair of slides arranged between each such finger key and the respective trip dog of the main set, one of said slides being free and the other active as regards said trip dog, a supporting frame for said slides shiftable in opposite directions to effect the alternate engagement of the free and active slides with the corresponding finger keys, and motion transmission devices constantly connected to the trip dogs of the auxiliary set of cam yokes and arranged to be actuated by the free slides when the latter are engaged with the finger keys.

11. In a keyboard mechanism for typographical machines of the class described, the combination of a set of cam yokes for operating the escapement actuating devices of a main magazine, a second set of cam yokes arranged at the side thereof for operating the escapement actuating devices of an auxiliary magazine, trip dogs controlling the operation of said cam yokes, a series of finger keys common to the corresponding cam yokes of the two sets, a pair of slides arranged between each such finger key and the respective trip dog of the main set, one of said slides being free and the other active as regards said trip dog, means for effecting the alternate engagement of the free and active slides with the corresponding finger keys, active slides connected to the trip dogs of the auxiliary set of cam yokes, and transverse rocking bails, idle when the active slides of the main set of cam yokes are engaged with the finger keys but operative when the free slides thereof are so engaged, to transmit the motion of said free slides to the active slides of the auxiliary set of cam yokes.

12. In a keyboard mechanism for typographical machines of the class described, the combination of set of cam yokes for operating the escapement actuating devices of a main magazine, a second set of cam yokes arranged at the side thereof for operating the escapement actuating devices of an auxiliary magazine, trip dogs controlling the operation of said cam yokes, a series of finger keys common to the corresponding cam yokes of the two sets, a pair of slides arranged between each such finger key and the respective trip dog of the main set, one of said slides being free and the other active as regards said trip dog, a supporting frame for said slides shiftable in opposite directions to effect the alternate engagement of the free and active slides with the corresponding finger keys, active slides connected to the trip dogs of the auxiliary set of cam yokes, and transverse rocking bails constantly engaged at one end with the active slides of the auxiliary set of cam yokes and arranged to be engaged at the opposite end by the free slides of the main set of cam yokes when such free slides are engaged with the finger keys.

13. A combination as specified in claim 11, characterized by the fact that the rocking bails therein recited are supported upon a smaller number of pivot rods, each of which is common to a plurality of bails.

14. A combination as specified in claim 11, characterized by the fact that the rocking bails therein recited are mounted in a supporting box or casing which is detachably connected to the framework so as to be applied to or removed from the machine as a unit.

15. In a typographical machine, the combination of a main magazine provided with escapements, an auxiliary magazine arranged at the side thereof and also provided with escapements, two sets of escapement actuating devices, one for each magazine, a series of finger keys common to the corresponding actuating devices of the two sets, a pair of slides arranged between each such finger key and the respective escapement actuating device of the main set, one of said slides being free and the other active as regards said device, means for effecting the alternate connection of the free and active slides with the corresponding finger keys, and connecting members, idle when the active slides are connected with the finger keys but operative when the free slides are so connected, to transmit the motion of said free slides to the escapement actuating devices of the auxiliary set.

16. In a typographical machine, the combination of a main magazine provided with escapements, an auxiliary magazine arranged at the side thereof and also provided with escapements, two sets of escapement actuating devices, one for each magazine, a series of finger keys common to the corresponding actuating devices of the two sets, a pair of slides arranged between each such finger key and the respective escapement actuating device of the main set, one of said slides being free and the other active as regards said device, means for effecting the alternate connection of the free and active slides with the corresponding finger keys, and transverse rocking bails constantly connected at one end with the escapement actuating devices of the auxiliary set and arranged to be connected at the opposite end with the free slides of the main set of escapement actuating devices when such free slides are connected with the finger keys.

17. In a typographical machine, the combination of a main magazine provided with escapements, an auxiliary magazine arranged at the side thereof and also provided with escapements, two sets of escapement actuating devices, one for each magazine, a series of finger keys common to the corresponding actuating devices of the two

sets, a pair of slides arranged between each such finger key and the respective escapement actuating device of the main set, one of said slides being free and the other active as regards said device, a supporting frame for said slides shiftable in opposite directions to effect the alternate engagement of the free and active slides with the corresponding finger keys, and motion transmission devices constantly connected to the escapement actuating devices of the auxiliary set and arranged to be actuated by the free slides of the main set of escapement actuating devices when such free slides are connected with the finger keys.

In testimony whereof, I have affixed my signature hereto.

DAVID S. KENNEDY.