Dec. 11, 1934. H. A. BURT 1,983,595

TYPOGRAPHICAL COMPOSING MACHINE

Filed Jan. 19, 1933 4 Sheets-Sheet 1

Fig. 1.

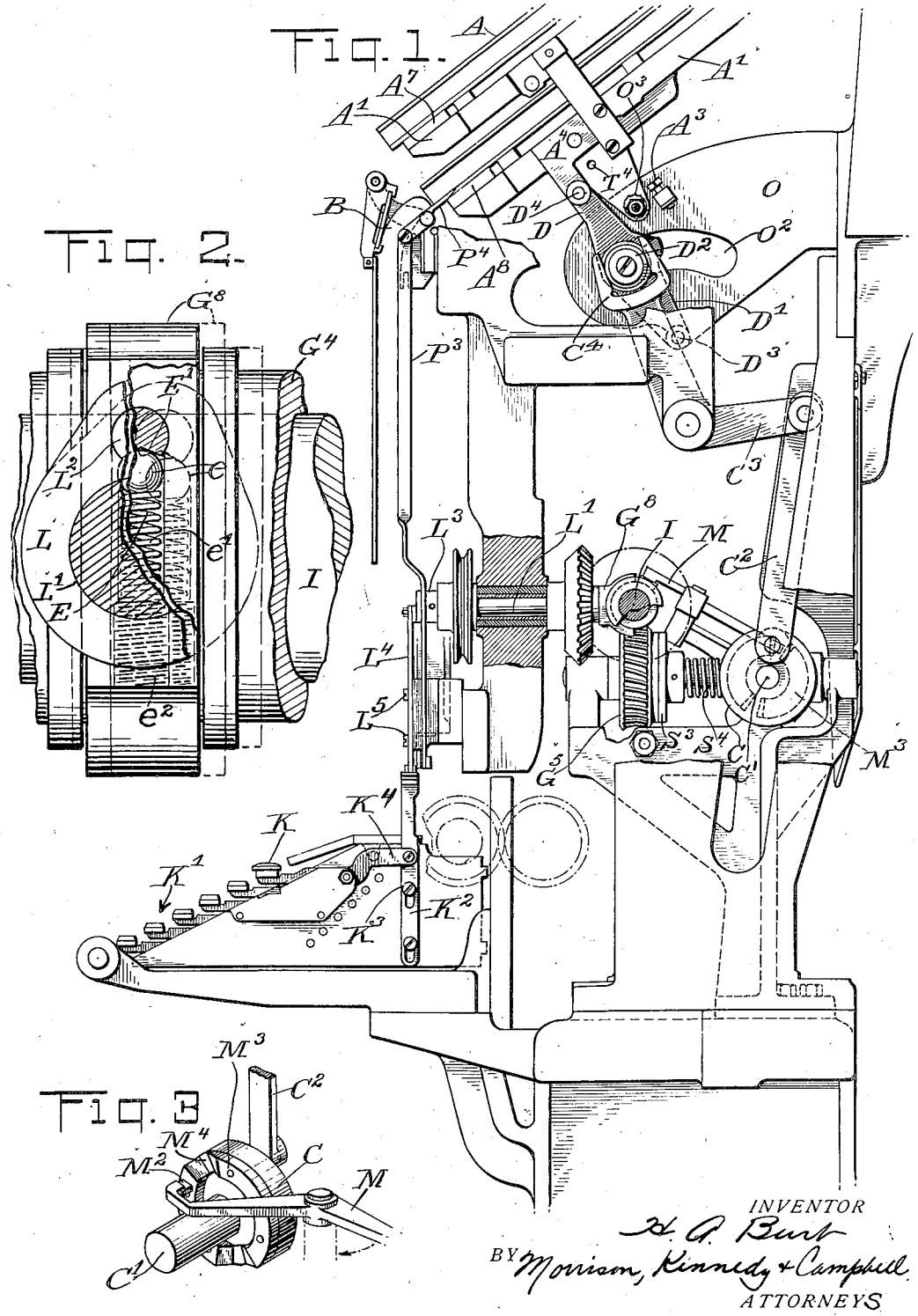


Fig. 2.

Fig. 3

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TYPOGRAPHICAL COMPOSING MACHINE

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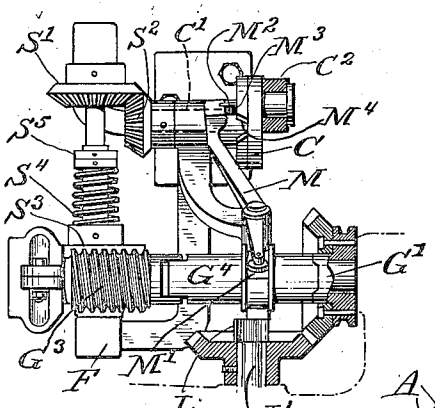


Fig. 4

Fig. 5

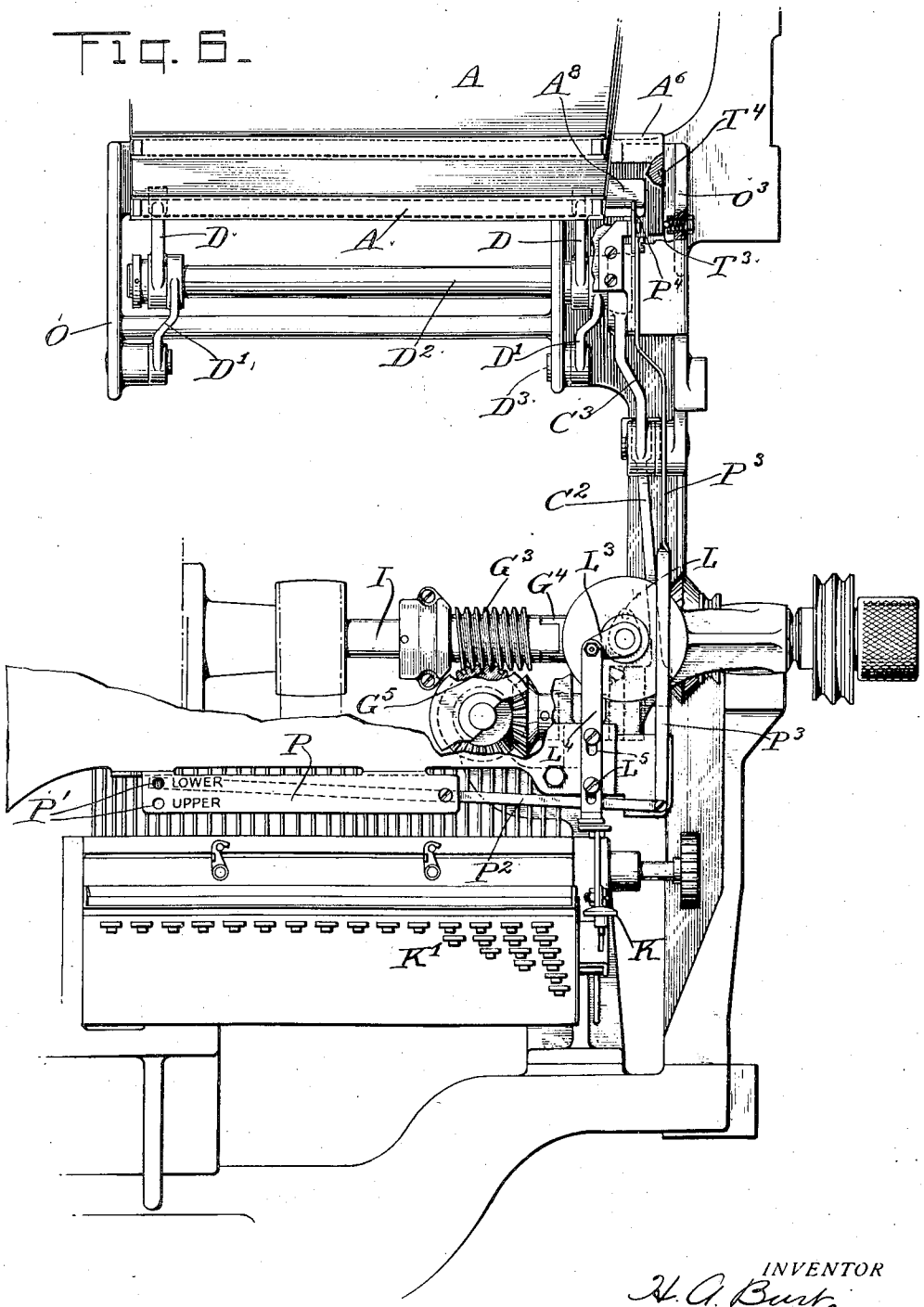
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Fig. 6.



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TYPOGRAPHICAL COMPOSING MACHINE

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Fig. 7.

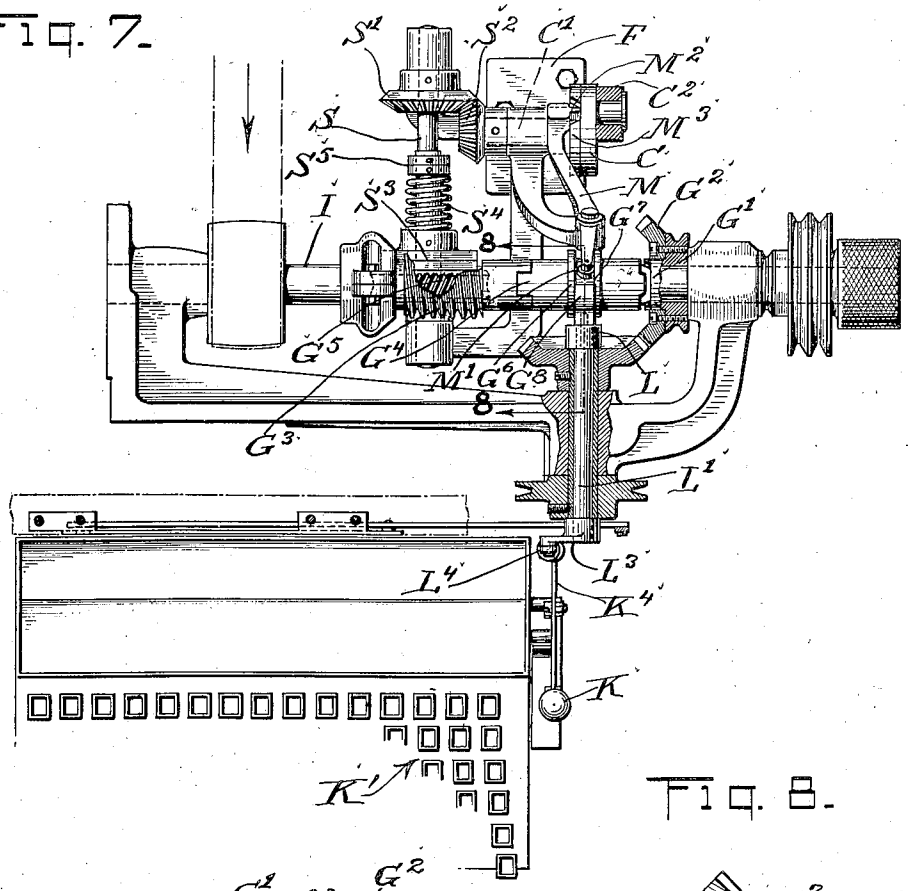


Fig. 8.

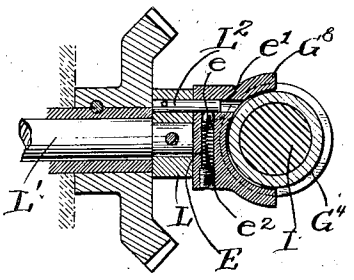
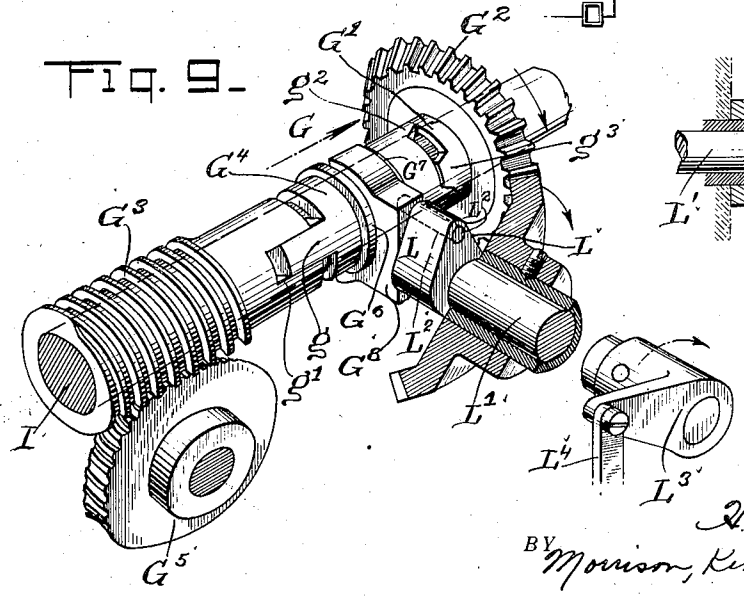


Fig. 9.



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UNITED STATES PATENT OFFICE

1,983,595

TYPOGRAPHICAL COMPOSING MACHINE

Harold A. Burt, St. Albans, N. Y., assignor to Mergenthaler Linotype Company, a corporation of New York

Application January 19, 1933, Serial No. 652,447

19 Claims. (Cl. 199—45)

This invention relates to typographical composing machines, such as linotype machines of the general organization represented in Letters Patent of the United States No. 436,532 to O. Mergenthaler, 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 above class equipped with a plurality of magazines movably mounted in the machine frame, so that any selected one may be brought into operative relation with the assembling devices.

According to the present invention, the shifting of a selected magazine into operative position is accomplished by power-actuated mechanism under the control of a light touch finger key conveniently located at the front of the machine adjacent the keyboard, and which operates a clutch for connecting the source of power with the magazine shifting mechanism. The arrangement is such that when a selected magazine is brought into operative position, the load on the magazine shifting mechanism is relieved sufficiently to allow the clutch to be automatically disengaged by a light spring. When the parts are in operation, however, the clutch is held positively engaged until the selected magazine has arrived in its operative position, whereupon the clutch is freed to be disengaged by the light spring referred to.

While the invention is applicable to other types of multiple magazine machines, in the preferred embodiment herein illustrated the magazines are mounted in separate or independent shift frames, hinged respectively at their upper ends adjacent the distributors and movable to bring any selected one into operative relation to the assembling devices without disturbing the connection of the magazines with the distributors.

In the accompanying drawings, the invention has been shown merely in preferred form and by way of example, and obviously many changes and variations may be made therein and in its mode of adaptation which will still be comprised within its spirit. It is to be understood, therefore, that the invention is not limited to any specific form or embodiment, except insofar as such limitations are specified in the claims.

Referring to the drawings:

Fig. 1 is a side elevation of a linotype machine equipped with the present improvements, showing the lower magazine in operative position;

Fig. 2 is a detail view, partly in section, of a portion of the clutch shifting mechanism;

Fig. 3 is a perspective view of a portion of the device employed for maintaining the clutch positively engaged until a selected magazine has arrived in its operative position;

Fig. 4 is a plan view of a portion of the magazine shifting mechanism, the clutch, and the device for positively maintaining the clutch active, said device and clutch being shown in their operative positions;

Fig. 5 is a view similar to Fig. 1, but showing the upper magazine in operative position;

Fig. 6 is a front elevation showing a portion of the magazine shifting mechanism, the light touch finger key for rendering the mechanism active, and an indicator to show which of the magazines is in operative position;

Fig. 7 is a plan view showing a part of the magazine shifting mechanism in normal position, the clutch, the device for positively holding the clutch engaged, the finger key, and the elements connecting the finger key with the clutch;

Fig. 8 is a sectional view taken on line 8—8 of Fig. 7, showing details of the mechanism for automatically disengaging the clutch; and

Fig. 9 is a perspective view, showing the clutch in engaged position, the means for engaging the clutch, and showing further the means whereby the clutch connects the power source to the driving elements of the magazine shifting mechanism.

The matrices of the regular fonts are stored in the superposed magazines A, only two of which are herein shown, but of which a greater number might be employed if desired. These magazines are supported upon the customary base frames A^1 hinged at their upper ends, as at A^2, and conjointly constituting a shift frame which is arranged to be swung upwardly and downwardly in the machine to locate either of the magazines in operative relation to the fixed assembler throat or raceway B.

The swinging of the respective shift frames to effect the interchange of the magazines supported thereby may be accomplished in any desired manner, the means herein employed being similar to those presented in the Kennedy Patent No. 1,386,786, and consisting essentially of a toggle system which, when straightened out or extended, raises the shift frame to place the lower

magazine in operative position (Fig. 1), and when collapsed allows the shift frame to swing downwardly to bring the upper magazine in operative position (Fig. 5). In the latter or lower position, the magazine shift frame banks upon a pair of set screws A^3 which are carried by the parallel side arms of a fixed U-shaped bracket O, and which are adjusted so as to locate the upper magazine in registration with the assembler throat B. In the former or raised position, the shift frame is supported directly by the associated toggle system, whose design is such that when extended the lower magazine will be properly located in operative relation to the throat B.

The toggle system comprises two pairs of links D, D^1 intermediately connected by a transverse rod D^2 to which the lower members D^1 are fastened, and on which the upper members D are loosely mounted. At their lower ends, the members D^1 are pivoted by pins or screws D^3 to the side arms of the bracket O, and at their upper ends, the members D are similarly pivoted by pins or screws D^4 to lugs A^4 depending from the lower base frame A^1. The rod D^2 is guided in curved slots O^2 of the bracket arms and is movable to and fro therein to effect the extension or collapse of the toggle members D, D^1. The movements of the rod D^2 are limited by the slots O^2, the front walls of which are so arranged that the rod, as it is rocked forwardly, will be allowed to pass dead center before it is stopped, and in this way lock the magazines in their raised position.

So far as described, the parts are or may be the same as those embodied in the commercial model 25 linotype, and in themselves constitute no part of the invention.

In the present embodiment, the means employed for extending and collapsing the toggle system include a crank C mounted on a stub shaft C^1 carried by a frame bracket F, a bell-crank lever C^3 centrally pivoted to the machine frame, and a link C^2 having its lower end connected to the crank C and its upper end to the rearwardly extending arm of the bell-crank lever. The upwardly extending arm of the bell-crank lever C^3 is provided at its extremity with a forked member C^4 straddling the end of the rod member D^2 to which the toggle members D, D^1 are connected. The arrangement of the parts is such that when the crank C is given a half rotation, it will in one case raise the magazines from the position shown in Fig. 5 to that shown in Fig. 1, coming to rest in the upper dead center position shown in the latter figure; whereas, in the other case, it will move the magazines from the position shown in Fig. 1 to that shown in Fig. 5, coming to rest in the lower dead center position shown in the latter figure. In this connection, it may be noted that a slight amount of lost motion is provided in the connections from the crank C so that it will be relieved of load as it passes through its upper and lower dead center positions after having operated the toggle system in raising or lowering the magazines. To be more specific, the load upon the crank is relieved or removed when the shift frame A^1 banks against the stops A^3 in bringing the upper magazine into operative position, and the same is true when the toggle rod member D^2 comes against the front ends of the slots O^2 in bringing the lower magazine into operative position. The purpose of this will presently appear.

The stub shaft C^1 which carries the crank C is adapted to be rotated by the "intermediate shaft" I and is connected to it, at will, to effect the shifting of the magazines. The connections for driving the stub shaft include a bevelled gear S^2 mounted on the shaft C^1 at the end opposite the crank, and a similar bevelled gear S^1 meshing therewith and pinned to a short fore-and-aft shaft S likewise carried by the frame bracket F. At the front end of the shaft S is a worm wheel G^5, adapted to be driven by an overlying worm G^3 loosely mounted on the intermediate shaft I, the worm and wheel constituting a reduction gearing between the intermediate shaft and the stub shaft C^1. The worm wheel G^5 is connected to the shaft S by a friction clutch S^3 consisting of two friction members, one fixed to the worm wheel G^5, and the other encircling the shaft S, the two being held in frictional driving contact by a compression spring S^4 likewise encircling the shaft. The compression spring banks against a collar S^5 pinned to the shaft S, and is sufficiently strong to hold the members of the friction clutch in driving contact under ordinary circumstances, but in the event of an interference, preventing rotation of the stub shaft C^1, the friction members will slip relatively to each other, thus preventing breakage of any of the parts.

When it is desired to shift the magazines, the worm G^3 may be connected for conjoint rotation with the intermediate shaft I by a clutch G, one member G^1 of which is keyed to the intermediate shaft I and carries one of the bevelled gears G^2 which drive the assembler devices. The other clutch member G^4 comprises a sleeve also loosely encircling the intermediate shaft and arranged for limited endwise movement along the shaft into and out of engagement with the clutch member G^1. At the right, the clutch member G^4 is provided with teeth g^2 adapted to cooperate with corresponding teeth g^3 formed on the clutch member G^1, and at the left, it is provided with projections g which protrude into corresponding recesses g^1 in the worm sleeve G^3, the clutch member G^4 and the worm being thus splined together to permit the clutch member to be moved into engagement with the companion clutch member G^1 while maintaining its driving connection with the worm. As a result of this arrangement, when the two clutch members are engaged, the worm G^3 will be caused to rotate with the intermediate shaft to drive the magazine shifting mechanism, whereas when the clutch members are disengaged, the driving connection is broken.

In order to effect its operation, the clutch member G^4 is provided with a pair of spaced parallel flanges G^6, G^7, forming between them a groove which receives a shifting fork G^8 adapted to be actuated in one direction to engage the clutch, and in the opposite direction to disengage the clutch. In order to shift the fork G^8 to engage the clutch, there is provided a crank arm L, operatively connected to the fork G^8 by a crank pin L^2, and carried at the rear end of a fore-and-aft shaft L^1, which extends through the sleeve carrying the gear and pulley of the assembler drive (see Guest Patent No. 1,665,261). At its front end, the shaft L^1 is provided with another crank arm L^3, by means of which the shaft is rotated in a clockwise direction to effect the engagement of the clutch G, the means for operating the crank including two vertical slide bars L^4 and K^2 arranged end to end, the upper one L^4 being connected, for limited vertical movement, to the front plate by pin and slot connections L^5 and pivoted at its upper end to the crank arm L^3, and the lower one similarly connected

by pin and slot connections K^3 to the keyboard frame (which is of the swinging variety as shown in the Rogers Patent No. 1,717,411), this latter bar being pivoted to the rear end K^4 of a pivoted finger key K. The key K is located at the right of the keyboard K^1 and is thus positioned within convenient reach of the operator. According to this arrangement, when the key K is depressed, the resultant upward movement of the bar K^2 is transmitted to the overlying bar L^4, which, through its operation of the crank arm L^3, rotates the shaft L^1 to move the clutch member G^4 into engagement with the clutch member G^1; whereupon the magazine shifting mechanism is brought into operation for the selection of one magazine or the other according to the position of the crank C.

The clutch members are automatically disengaged when the selected magazine is arrested in its operative position in the manner before described. As shown in Figs. 2 and 3, there is provided for this purpose a ball and spring detent E in the forked clutch shift member G^8 cooperating with an overlying recess E^1 in the connecting pin L^2. When the forked member G^8 is shifted to the right by the operation of the finger key K, the pin L^2 is moved by the crank L through a small arc to the position shown in dotted lines in Fig. 2, causing the ball *e* to be depressed against the force of the spring e^1, but the size of the recess E^1 in the pin is such that the ball does not pass out of the recess in this position, but merely tracks upon the side of the recess as shown, the ball *e* at all times exerting a force on the pin tending to restore it to normal position. This force of the spring is not sufficient to restore the pin L^2 so long as the load of the magazines is on the clutch, but as soon as this load is removed, as when one or the other of the magazines is brought to rest in operative position by its respective stops, and the crank C rotated slightly past dead center, the spring e^1 then exerts sufficient force to rock the crank L and restore the fork shifting member G^8 to normal position, thereby automatically disengaging the clutch. To facilitate the operation of the ball and spring detent E, the cooperating teeth g^2, g^3 of the clutch members G^1, G^4 are tapered to eliminate any inter-surface friction during the disengagement thereof. The tension of the spring e^1 may be adjusted by means of a set screw e^2 threaded into the spring recess, the screw also serving to retain the spring e^1 in the recess.

In order to prevent the release of the clutch G until the selected magazine is arrested in its operative position, means are provided for retaining the clutch positively engaged until that time arrives in the operation of the magazine shifting mechanism. For this purpose, there is provided a lever M, pivoted intermediate its ends of an extension of the bracket F, and having its forward end equipped with a bearing roller M^1 projecting into the groove on the clutch sleeve member G^4, the rear end of the lever being provided with a projection M^2 adapted to ride upon a face cam M^3 rotating with the stub shaft C^1 and preferably formed integrally with the crank member C. The face cam M^3 is recessed at diametrically opposite portions of its bearing surface, as at M^4, so that when either of the magazines is in operative position, one or the other of the cam recesses alines with the projection M^2 on the lever and permits the clutch to be disengaged. When the clutch G is engaged by the operation of the finger key K, involving the movement of the clutch sleeve G^4 to the right, the lever M through its connection therewith will be caused to swing about its pivot to withdraw the projection M^2 out of the cam recess M^4, which at the time happens to be in use, and as the stub shaft C^1 commences to rotate, the lever projection will ride upon a high portion of the face cam M^3 and thus hold the clutch G against premature disengagement until the stub shaft has rotated through 180°, or what is the same thing, until the opposite recess in the cam M^3 arrives adjacent the end of the lever, which position, as mentioned above, will correspond to one in which the selected magazine is in its operative position, and the load on the clutch removed.

The shift frame A^1 is counterbalanced by a tension spring T, the effect of which is transmitted to the shift frame through a lever T^1 pivoted on the machine frame, and pivotally connected at one end to a depending lug A^5 on the shift frame, and having its other end held against the tension of the spring T which is anchored to a depending arm T^2 fastened to the main frame.

It may sometimes happen, however, in the normal operation of the machine, that a large number of matrices will have been removed from the magazines, and at such times the weight of the magazines will not be sufficient to prevent a slight rebound when the shift frame A^1 banks up against the stops A^3 on arriving in its lowermost position. In order to prevent such rebound, a ball and spring detent T^3 is provided in the frame member O^3, adapted to cooperate with a recess T^4 in a lug A^6 depending from the shift frame A^1 when the latter is in its lowermost position. The cooperation of the detent with its recess successfully counteracts any tendency of the magazines to rebound.

It is also desirable to indicate to the operator which of the magazines is in operative position, and for this purpose an indicator is provided, consisting of a plate P arranged above the keyboard in full view of the operator, and which is provided at its left end with a pair of apertures P^1, one marked with the legend "lower" and the other with the legend "upper". A rod P^2 is pivoted behind the plate and at the right end thereof, and is connected for operation by the magazines in such a way that when the lower magazine is in operative position, the left end of the rod P^2 will be opposite the aperture marked "lower", whereas when the upper magazine is in operative position, the end of said rod will be opposite the aperture marked "upper". The end of the rod P^2 may be painted a suitable color, as for instance white, so as more noticeably to bring its location to the operator's attention. The rod P^2 is actuated about its pivot from one position to another by a link P^3, connected at the right end of the rod and extending upwardly to another pivoted element P^4 having its rear end projecting into the path of laterally extending lugs A^7, A^8 on the magazine base frames. When the upper magazine is in operative position, the laterally extending lug A^7 thereon will contact with the pivoted member P^4 to raise the link P^3 and rock the rod P^2 into the position wherein its left end is opposite the aperture marked "upper", whereas when the magazines are raised to present the lower one in operative position, the laterally extending lug A^8 on this magazine frame will rock the pivoted member P^4 to actuate the link P^3 downwardly

and present the left end of the pivoted rod member P^2 opposite the aperture marked "lower", the indicating device thus enabling the operator to determine at a glance, which magazine is at that time in operating relation with the assembler throat B.

When it is desired to raise or lower the magazines to bring a selected one into operative position, it is merely necessary to touch the finger key K. This operation shifts the clutch sleeve G^4 to the right into engagement with the clutch member G^1, integrally secured to the intermediate shaft I, and thus causes the worm G^3 to rotate with the shaft to effect the consequent operation of the magazine shifting mechanism. If the magazines happen to be in the upper position shown in Fig. 1, the bell crank lever C^3 will be rocked in a clockwise direction by the crank C and link C^2, as the stub shaft C^1 begins to rotate and thus collapses the toggle links D, D^1. As the shift frame comes to rest on the set screws A^3, the crank C will be approaching its lower dead center position, and when it arrives in that position, the load thereon will be removed or relieved due to lost motion provided in the connections. When the load is released in this manner, the spring operated detent E associated with the clutch will be rendered operative and the clutch fork member G^5 shifted to disengage the clutch, it being remembered that should the load for any reason be removed from the clutch before the selected magazine has arrived in operative position, such disengagement is prevented by the end of lever M^2 riding on the high part of face cam M^3. When the operator wishes to bring the lower magazine into operative position, it is only necessary again to press the finger key K as before, the various parts being again rendered operative to rock the bell crank lever C^3 forwardly to straighten out the toggle joints D, D^1, and thus bring the lower magazine into proper position for use. The load of the magazines, in this position, being borne by the toggle members and the rod D^2, as it banks against the forward ends of the slots O^2, there is of course no load on the clutch which consequently is automatically disengaged.

The invention thus provides a power-operated magazine shift under the control of a light touch finger key, which may be depressed and released like the other keys of the keyboard, the desired or selected magazine being automatically brought into proper operative relation with the assembler devices without further thought or effort on the part of the operator.

In the accompanying drawings, the invention has been shown merely in preferred form and by way of example, and obviously many variations and modifications may be made therein without departing from the spirit of the invention. It is to be understood, therefore, that the invention is not to be limited, except insofar as such limitations are specified in the appended claims.

Having thus described my invention, what I claim is:

1. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place one or another of the magazines in operative position with respect to said throat, a clutch for connecting a source of power to drive said mechanism, means for engaging said clutch, and means controlled by the load on the clutch and acting automatically to disengage the same when the desired magazine is in operative position.

2. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place one or another of the magazines in operative position with respect to said throat, a clutch for connecting a source of power to drive said mechanism, means for engaging said clutch, means controlled by the load on the clutch and acting automatically to disengage the same when the desired magazine is in operative position, and a device for holding the clutch positively engaged until the desired magazine is in operative position.

3. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place one or another of the magazines in operative position with respect to said throat, stationary arresting means for determining said operative position, a source of power, means for connecting the source of power to the shifting mechanism, and means controlled by the arrest of the selected magazine in operative position to disconnect the shifting mechanism from the source of power.

4. In a typographical composing machine, the combination of a pair of magazines pivotally mounted therein, mechanism for shifting the magazines to present either one in operative position, means operatively associated with each of the magazines for determining the operative position thereof by positively arresting the movement of the magazines, a source of power, means for connecting the source of power to the magazine shifting mechanism, and automatic means actuated after the arrest of the selected magazine in operative position to disconnect the shifting mechanism from the source of power.

5. A combination according to claim 3, including means actuated by the shifting mechanism to maintain the power source positively connected until the selected magazine is brought into operative position.

6. In a typographical composing machine, the combination of a plurality of magazines movably mounted thereon, mechanism for shifting the magazines to bring a selected one thereof into operative position, a source of power, a clutch for connecting the source of power with the magazine shifting mechanism, means for engaging the clutch to inaugurate the operation of the shifting mechanism, means functioning automatically to disengage said clutch when the load thereon is removed, and means acting to arrest the selected magazine in operative position and thereby remove the load on the clutch.

7. In a typographical composing machine, the combination of a plurality of magazines movably mounted thereon, mechanism for shifting the magazines including a rotatable crank adapted during different operative phases of its rotation to present a different one of said magazines in operative position, said mechanism also including connections whereby the load on the crank is removed between said operative phases of rotation, a source of power, means including a clutch for connecting said power source to drive the crank, and means rendered operative by the removal of said load automatically to disengage said clutch.

8. In a typographical composing machine, the combination of a plurality of magazines movably mounted thereon, and adapted to be shifted between arresting devices to present one or another of said magazines in operative position, shifting mechanism including a rotatable crank adapted during different operative phases of rotation to move the magazines toward one or the other of said arresting devices, said mechanism also including connections whereby the load on the crank is removed when said magazines are brought to rest by either of said arresting devices, a source of power, means including a clutch for connecting said power source to drive the crank, and means rendered operative by the removal of said load automatically to disengage said clutch.

9. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place one or another of the magazines in operative position with respect thereto, the intermediate shaft, a worm loosely mounted on said shaft and having a worm wheel associated therewith for driving said mechanism, a clutch also mounted on said shaft adapted when engaged to cause the intermediate shaft to drive the worm, and means for engaging said clutch.

10. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place one or another of the magazines in operative position with respect thereto, the intermediate shaft, a worm loosely mounted on said shaft and having a worm wheel associated therewith for driving said mechanism, a clutch also mounted on said shaft and adapted when engaged to cause the intermediate shaft to drive the worm, and means controlled by the load on the clutch and acting automatically to disengage the same when the load on the clutch is removed.

11. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place one or another of the magazines in operative position with respect thereto, said shifting mechanism including a driven shaft adapted when rotated through part of a revolution, to shift one magazine out of operative position and bring another magazine into operative position, a high speed drive shaft, means comprising a reduction gearing for connecting the drive shaft with the driven shaft whereby the driven shaft may be rotated through the required part of a revolution to bring a selected magazine into operative position, said reduction gearing including a worm wheel loosely mounted on the drive shaft, and a clutch for connecting the worm wheel for integral rotation with the drive shaft.

12. In a typographical composing machine, the combination of a plurality of magazines movably mounted therein, mechanism for shifting the magazines to bring a selected one thereof into operative position, said mechanism including a crank acting to shift the magazines as the crank is rotated between dead center positions, means for arresting a selected magazine in operative position as the crank approaches a dead center position, thereby relieving the load of the magazines from the crank, a source of power, a clutch for connecting the source of power to drive the crank, means including a crank and pin adapted when actuated to shift the clutch into engagement, and means including a light spring cooperating with a recess in the pin for disengaging the clutch, said spring being rendered operative to effect such disengagement when the crank of the magazine shifting mechanism arrives in dead center position and the load thereon relieved.

13. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place one or another of the magazines in operative position with respect thereto, a source of power, means including a clutch for connecting said source of power to drive said mechanism, a shifting device associated with the clutch, a crank arm, a pin for connecting the arm with the shifting device, said arm being adapted upon being rocked in one direction to shift said clutch into engagement, a recess in the pin, and a ball and spring detent engaging always in said recess and acting constantly to rock the crank in the return direction to disengage the clutch, said detent being inoperative to effect disengagement until the load on the clutch is relieved.

14. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place either one of the magazines in operative relation with the throat, a source of power, a clutch for connecting the source of power with the shifting mechanism, means for engaging said clutch, means for disengaging said clutch, and a device for positively maintaining said shifting mechanism in operation until a selected magazine has been brought into operative position, whereupon said device is rendered inactive and the means for disengaging the clutch thereby rendered operable.

15. In a typographical composing machine, the combination of a plurality of magazines movably mounted therein, mechanism for shifting the magazines to bring a selected one thereof into operative position, magazine arresting means for determining said operative position, a source of power, means for connecting the source of power to the magazine shifting mechanism, and a device operated by the magazine shifting mechanism and acting positively to maintain said connection until the selected magazine is arrested by its associated arresting means, whereupon said device is rendered ineffective to maintain said connection.

16. In a typographical composing machine, the combination of a plurality of magazines movably mounted therein, mechanism for shifting the magazines to bring a selected one thereof into operative position, said mechanism including a crank acting to shift the magazines as the crank is rotated between dead center positions, means for arresting a selected magazine in operative position as the crank approaches a dead center position, thereby relieving the load of the magazines from the crank, a source of power, a clutch for connecting the source of power to drive the crank, a cam mounted for integral rotation with said crank, and means associated with the cam and operated thereby for positively maintaining said connection, said cam having regions corresponding to the dead center positions of the crank where the connection maintaining means are ineffective.

17. In a typographical composing machine, the combination of a plurality of magazines, an as-

sembler throat, mechanism including a crank for relatively shifting said magazines and assembler throat to place a selected one of the magazines in operative position with respect to said throat, a source of power, means including a clutch for connecting said source of power to drive the crank, means operating automatically to disengage said clutch when the load thereon is removed, and a device including a cam mounted for rotation with the crank, and acting to maintain the clutch positively engaged until the selected magazine arrives in operative position.

18. In a typographical composing machine, the combination of a plurality of magazines, an assembler throat, mechanism for relatively shifting said magazines and assembler throat to place one or another of said magazines in operative position with respect to said throat, a source of power, a clutch adapted when engaged to connect the source of power with said shifting mechanism to bring a selected magazine into operative position, means including a light spring acting automatically to disengage said clutch when the selected magazine is brought into operative position, and means including a finger key operable against the force of said spring for engaging the clutch when desired.

19. In a typographical composing machine having a shiftable magazine frame, the combination of a stop for arresting the frame, and independent automatic means cooperating with the frame when it banks against the stop to prevent rebound thereof.

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