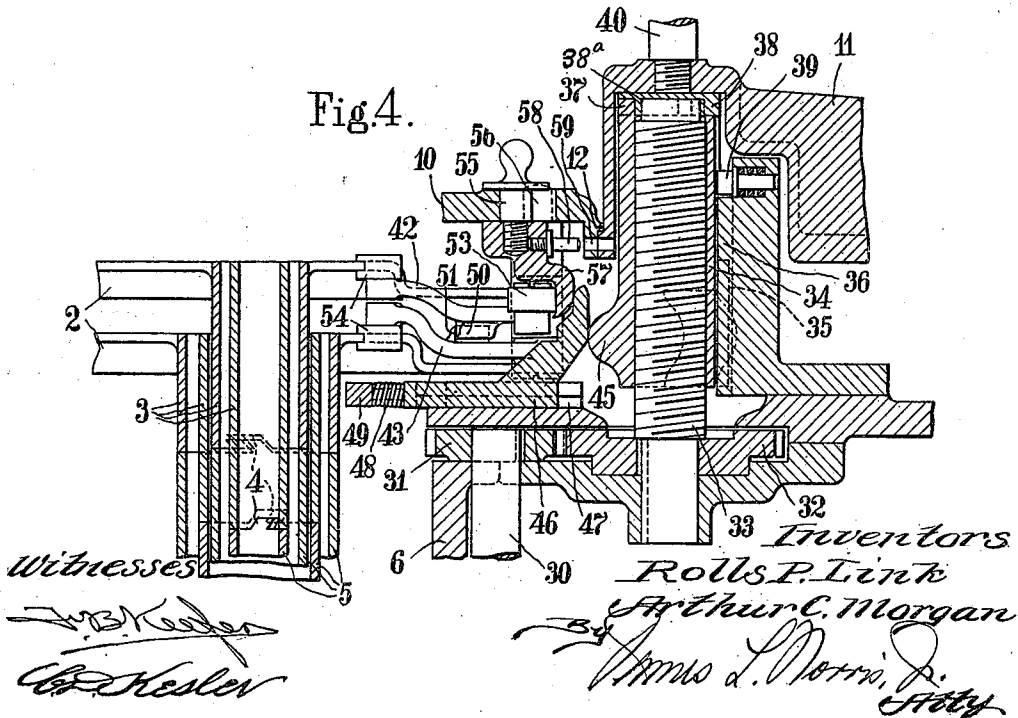
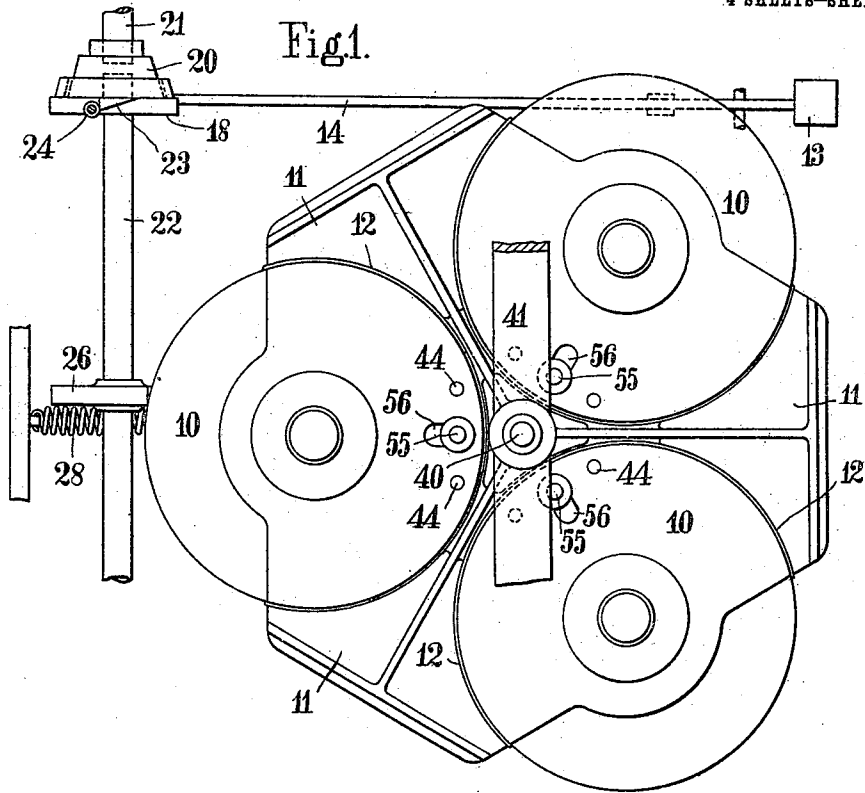


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APPLICATION FILED MAR. 17, 1910.

979,864.

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4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

Fig. 2.

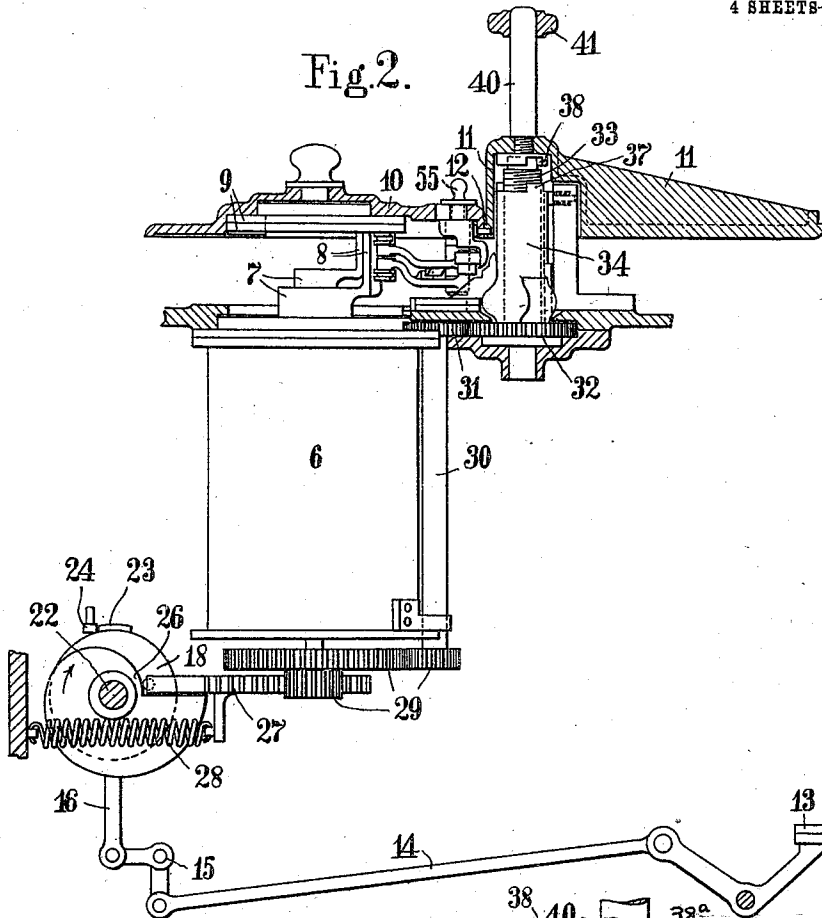
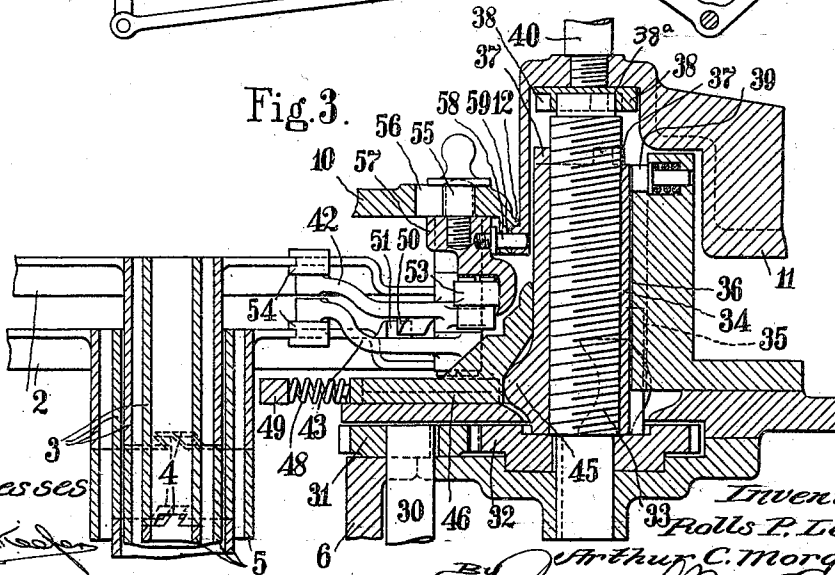


Fig. 3.



Witnesses

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4 SHEETS—SHEET 3.

Fig. 5.

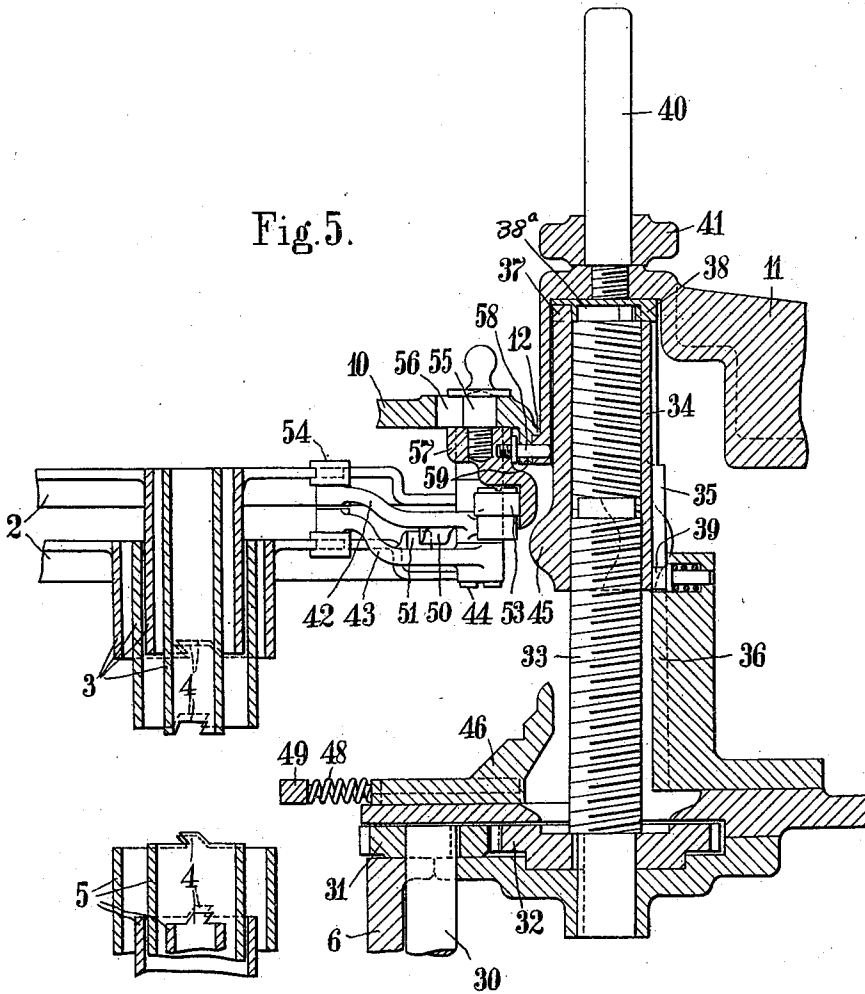
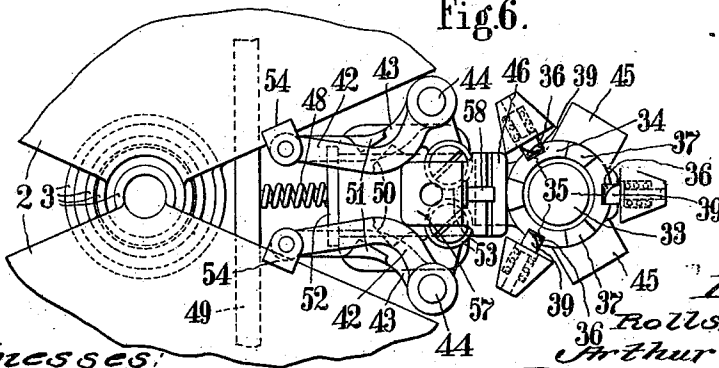


Fig. 6.



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4 SHEETS-SHEET 4.

Fig. 7.

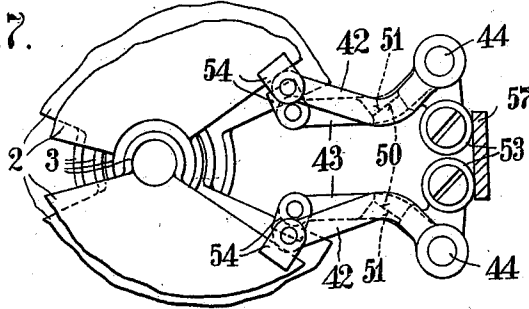


Fig. 8.

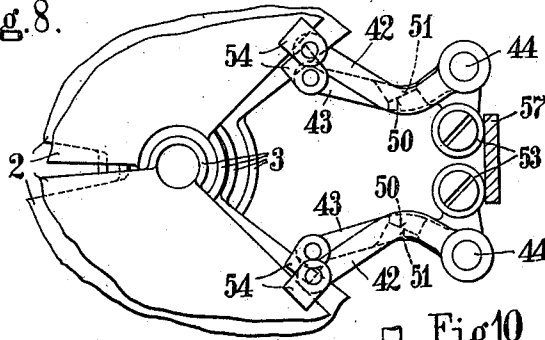


Fig. 10.

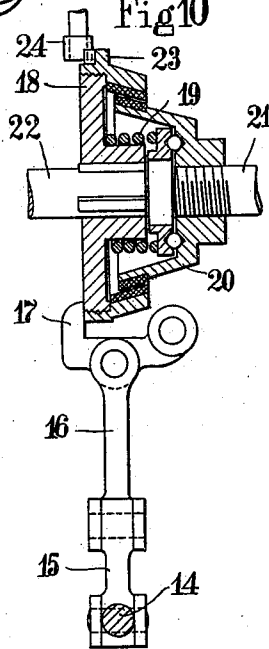


Fig. 9.

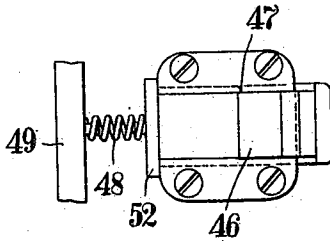
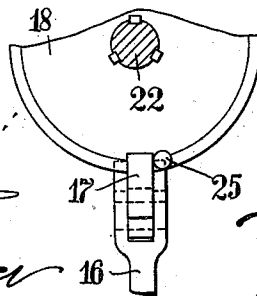


Fig. 11.



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UNITED STATES PATENT OFFICE.

ROLLS PERCIVAL LINK AND ARTHUR CHARLES MORGAN, OF LONDON, ENGLAND,
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TYPE CASTING AND COMPOSING MACHINE.

979,864.

Specification of Letters Patent. Patented Dec. 27, 1910.

Application filed March 17, 1910. Serial No. 550,011.

To all whom it may concern:

Be it known that we, ROLLS PERCIVAL LINK and ARTHUR CHARLES MORGAN, subjects of the King of Great Britain, residing at London, England, have invented new and useful Improvements in Type Casting and Composing Machines, of which the following is a specification.

This invention relates to type casting and composing machines of the kind wherein the matrices, which are presented one at a time to a casting mold by which separate types are cast, are distributed among two or more magazines which are mounted on a rotary or other movable support by which any magazine can, at will, be brought into position to present the matrices therein to the casting mechanism.

According to the present invention the magazines are carried by a frame which on the depression of a key or like device, is successively raised, rotated and lowered by mechanism controlled by the key. Preferably the arrangement is such that successive depressions of the key or the like serve to bring the magazines to the operative position in the order of their arrangement in the frame.

The mechanism set in operation by the key or like device for selecting the magazines as required, and for controlling the same so that the required magazine is brought to the operative position, may be actuated by a suitable motor or by manual power.

In the particular arrangement hereinafter described, each magazine comprises a number of matrix carrying sectors which are separable from their operating means, and which are bolted to a plate lodged in a hole provided therefor in the said frame. The raising, rotating and lowering of this frame are accomplished by a nut working on a screw-threaded shaft. The nut is restrained from rotation during its upward movement until it reaches its highest position, whereupon it is released by spring latches and allowed to rotate with the screw-threaded shaft through one-third of a revolution (when three magazines are provided). This moves one magazine out of alinement and another magazine into alinement with the sector operating means. The direction of rotation of the screw-threaded shaft is then reversed so that the nut descends lower-

ing the alined magazine to its operative position.

The screw-threaded shaft is rotated a definite number of times, first in one direction and then in the reverse direction, by a shaft driven through a clutch which is preferably stopped automatically when the rack has made one complete to and fro movement.

In order to unlock the joints coupling the sectors to the sector operating means, the nut is provided with a cam surface which acts through levers to impart the necessary rotary movement to the sectors to unlock these joints before the nut commences to raise the frame. The sectors of a magazine which is being lowered into the operative position are likewise turned by a similar cam acting through corresponding levers whereby a proper engagement of the said sectors with the sector operating means is insured.

In many constructions it will be inconvenient to arrange the bayonet or like joints of the several sectors so that they are all unlocked by the same angular travel. The lever with the longest travel is therefore alone moved directly by the cam, in such a case, and the other lever or levers are moved by a lug or lugs on the first mentioned lever. The ends of these levers may be provided with pivoted clips or grooved rollers for engaging the sectors.

The plates carrying the magazines are locked in the frame above mentioned, by means of a bolt which can be withdrawn by hand. This bolt operates to unlock the magazine from the frame and, at the same time, if necessary, through the levers above mentioned, to unlock the sectors from their operating means, so that any magazine can be removed from the frame and another magazine substituted therefor. With this arrangement a magazine can be lifted out of the operative position and replaced by another magazine either automatically on the depression of a key, or by hand, as may be most convenient.

Referring to the accompanying drawings:—Figure 1 is a plan of a magazine changing mechanism embodying the present improvements, and Fig. 2 is a side elevation of the same partly in vertical central section. Fig. 3 is an enlarged view of parts shown in Fig. 2 represented in the positions

respectively occupied by the same when at rest. Figs. 4 and 5 are views similar to Fig. 3 showing the movable parts in other positions respectively occupied by the same during their operation. Fig. 6 is a plan of parts shown in Fig. 3. Figs. 7 and 8 are detail views illustrating the operation of levers, shown also in Fig. 6, employed to unlock the sectors. Fig. 9 is a detail plan of a slider employed to move the levers for unlocking the sectors. Fig. 10 is a detail view of a preferred form of driving clutch, shown in central section, and a detent controlling the operation of this clutch, and Fig. 11 shows parts of Fig. 10 viewed from the left of that figure.

As shown in these drawings each magazine comprises four sectors 2 arranged in pairs in different planes, the members of each pair being disposed symmetrically about a center line, when in their positions of rest. These sectors are provided with tubular extensions 3 which are adapted to be connected by bayonet or like joints 4 (Fig. 3), to sector operating means represented as tubular parts or sleeves 5, contained in a cylinder 6, Fig. 2. Each pair of sectors in the same plane are connected one to the other by springs (not shown), in order to hold the joints connecting the sectors to the said tubular parts or sleeves, in their locked positions. The sectors comprised in each magazine are supported by sleeves 7 provided with extensions 8 supporting flanges 9 which are bolted together and to a plate 10. Three magazines thus arranged are mounted in recesses in a frame 11 by means of rims 12 on the plates 10 resting on the said frame which is actuated, as hereinafter described, to move the magazine so that any one of the same, at will, can be brought into position within the cylinder 6 in order that the matrices contained therein may be available for use.

In Figs. 1 and 2, a key 13 is shown which, when depressed, acts through a link 14, bell-crank lever 15 and link 16, to draw down a detent 17 to release a member 18 of a driving clutch. The said member 18 is then moved by a spring 19 into engagement with the other clutch member 20 which is fast on a constantly rotating shaft 21, see Fig. 10. When this clutch is operative, a shaft 22, to which the clutch member 18 is keyed, is driven by the shaft 21. When the shaft 22 has moved through nearly one revolution, a cam 23 on the movable member 18 of the clutch encounters and slides past a fixed pin or roller 24 supported on a suitable part of the frame work of the mechanism. The clutch member 18 is thus moved to its inoperative position against the thrust of the spring 19. As the cam 23 passes the pin or roller 24, the detent 17 rises to lock the clutch in its inoperative position. The

momentum of the shaft is sufficient to cause the cam 23 to over-run the pin or roller 24 so that the shaft continues to rotate until a lug 25 (Fig. 11), on the clutch member 18, is stopped by the said detent thus insuring that the shaft 22 is always brought to rest at the end of each complete revolution and in exactly the same position.

A cam 26 on the shaft 22 is arranged to move a rack bar 27 in one direction and then release this bar so that it can be brought back to its original position by a spring 28. This rack bar actuates a train of gearing 29 driving a shaft 30 carrying a pinion 31 in gear with a toothed wheel 32 keyed to a screw-threaded shaft 33. From this description it will be readily understood that, when the key 13 is depressed, the shaft 33 is first rotated in one direction through a given number of revolutions, depending on the stroke imparted to the rack bar by the cam 26, and also depending on the velocity ratio of the toothed gearing 29 and 31, 32. After this the rack bar 27 is released by the cam 26 and is then drawn back by the spring 28. This causes the shaft 33 to rotate in the reverse direction until it is brought back to its original position.

A nut 34 mounted on the screw-threaded shaft 33 is normally restrained from rotating with this shaft by the engagement of grooves 35 formed therein, with ribs 36 projecting from fixed parts of the frame. When the shaft 33 is rotated, the nut is raised and clutch teeth 37 provided on the same, enter between corresponding teeth 38 provided on the underside of the frame 11 (see Fig. 4). Further upward movement of the nut then raises the said frame carrying with it the magazines.

At the upper ends of the ribs 36, spring controlled latches 39 are arranged to form continuations of the ribs 36. Prior to the release of the rack bar by the cam 26, the grooves 35 pass off from the upper ends of the ribs 36 (see Fig. 5), and press against the latches 39 which yield and allow the nut to rotate with the shaft. By the engagement of the teeth 37, 38, the frame 11 is also carried along by the nut in this rotary movement which ceases when the frame has moved through one-third of a revolution, or a little more, the cam 26 and the upper ends of the ribs being properly adjusted to give this result. Each groove 35 in this movement is advanced from one latch 39 to the next, respectively.

The shaft 33 immediately after the release of the bar 27 by the cam 26, is rotated in a reverse direction by the action of the spring 28. If the grooves in the nut are not already in engagement with the latches the nut is turned back with the shaft until stopped by the said latches which are arranged to permit the nut to rotate in one

direction only. The nut, restrained from rotation first by the latches and then by the ribs 36 descends and lowers the frame 11 to its original position.

5 By means of this mechanism, on actuating the key 13, any magazine in the cylinder 6 can, in successive stages, be first raised and then moved laterally away from the latter while another magazine can be brought into
10 alinement with the cylinder and then lowered into the required position therein, so that by successive actuations of this key each of the magazines carried by the frame 11, can be brought to the operative position, in turn.
15 The frame 11 is provided with a central rod 40 passing through a guide-bar 41 to prevent tilting or other undesired movements of the said frame, while in motion, or while at rest in its raised position. When the
20 frame is lowered a socket or recess 38^a provided centrally between the teeth 38 engages on a cylindrical part of the shaft 33 thus affording a firm support to the frame in this position also.

25 As above mentioned, in the construction shown, the sectors comprised in a magazine are connected to the sector operating means by bayonet joints 4. It is therefore necessary, before a magazine lodged in the cylinder 6 can be lifted out of the same, to unlock these joints. For this purpose, as shown
30 in Figs. 3 to 8, each magazine comprises one pair of levers 42, 42, provided to unlock the joints of the upper sectors, and a second pair of levers 43, 43 provided to unlock the joints
35 of the lower pair of sectors. These levers turn about pivot pins 44 carried on the plate 10. In order to actuate these levers, cams 45 provided on the nut 34, are arranged to
40 act on a slider 46, mounted in a guideway 47 provided in a fixed part of the frame. Each cam is brought, in turn, to its operative position opposite the said slider by the rotary advancing movement of the nut. The
45 slider 46 is advanced toward the cam by a spring 48 supported by a fixed part 49 of the frame.

As soon as the nut 34 commences to rise, the slider is moved back by the cam 45 which
50 is opposite thereto, and causes the levers 42 to turn the upper pair of sectors against the force of their controlling springs from the position of rest shown in Fig. 6 to the position shown in Fig. 7. Lugs 50 provided on
55 these levers then engage lugs 51 on the levers 43 so that thereafter both pairs of levers move together until they occupy the positions shown in Fig. 8. This position of the levers corresponds to the position of the nut as shown in Fig. 4. In this position the
60 sectors are unlocked from the sector operating means, the teeth 37 have entered between the teeth 38 and, as the nut continues to ascend, the frame 11 is raised carrying with
65 it the magazines. During the further up-

ward movement of the nut, the slider 46, under the action of the spring 48, moves back toward the right, traveling along the cam 45 until a stop piece 52 on the said slider engages the guideway 47. At the same time
70 the spring controlled sectors press back the levers 42, 43 to their original positions after the interengaging parts of the joints have been moved clear away from one another.

After the frame has rotated to bring a
75 fresh magazine into alinement with the cylinder 6, the nut again descends, as hereinabove described, and the slider is moved to open the sectors so that the parts of the joints formed thereon can engage the cor-
80 responding parts on the sector operating sleeves. When the magazine has been lowered into the cylinder 6 and the members of the joints 4 are opposite each other, the frame 11 ceases to descend but the cam
85 continues to move down until the slider 46 has been brought to the position shown in Fig. 3, by its spring 48, permitting the sectors to come to their normal positions of rest, as shown in Fig. 6. The arrangement of the
90 lugs 50 and 51 is not essential as both pairs of levers may obviously be moved directly by the slider and, if necessary, these levers may be made of different lengths to give
95 the desired angular travel to the sectors.

The ends of the levers acted upon by the slider are provided with rollers 53, and the other ends of these levers are provided with
100 suitable forks 54 to engage the edges of the sectors. These forks, as shown in the drawings are pivoted to the levers. However, if desired, grooved rollers may be used in place thereof.

To provide means whereby a magazine can be withdrawn from the frame 11 by
105 hand and another magazine substituted therefor without requiring the nut 33 and co-operating parts to be actuated, even when the magazine to be withdrawn is in its operative position in the cylinder 6, a sliding
110 pin 55 is arranged in a slot 56 in the plate 10. This pin is formed with a part, which can be conveniently grasped by the hand of an operator, extending out of the slot, and
115 the said pin carries a plate 57 which is so arranged that, when the pin 55 is moved toward the left, Fig. 3, the levers 42, 43 are operated to unlock the sector joints 4.

A bolt 58 is employed to enter a hole 59
120 in the frame 11 and lock the magazine to the said frame when the rim 12 of the plate 10 is properly seated thereon. This bolt projects from the plate 57 so that when the latter is moved, for example to unlock the
125 levers 42, 43 as above described, the bolt is withdrawn and the magazine can be lifted from the frame, as required.

What we claim is:—

1. In a type casting and composing machine, a plurality of magazines each com-
130

prising matrix-carrying sectors, sector operating means, a frame supporting the magazines, and means for raising the frame to remove one magazine away from the sector operating means, and for rotating and lowering the said frame to bring another magazine into operative relation with the said sector operating means.

2. In a type casting and composing machine, a frame supporting a plurality of magazines, a rotary screw-threaded shaft, a nut engaging the threads of the said shaft, means for preventing rotation of the nut, and means for, at times, releasing the said nut to allow it to rotate with the shaft.

3. In a type casting and composing machine, a frame supporting a plurality of magazines, a screw-threaded shaft, a nut engaging the threads of said shaft, and fixed ribs engaging slots in the said nut.

4. In a type casting and composing machine, a frame supporting a plurality of magazines, a screw-threaded shaft, a nut engaging the threads of said shaft, fixed ribs engaging slots in said nuts, and spring latches in alinement with the said fixed ribs.

5. In a type casting and composing machine, a frame supporting a plurality of magazines, a screw-threaded shaft, a nut engaging the threads of said shaft, fixed ribs engaging slots in the said nuts, means for rotating the said shaft first in one direction and then in the opposite direction, and spring latches in alinement with the said fixed ribs.

6. In a type casting and composing machine, a frame supporting a plurality of magazines, a screw-threaded shaft, a nut engaging the threads of said shaft, means for preventing rotation of the nut, means for releasing the said nut to allow it to rotate with the shaft, means for reversing the direction of rotation of the shaft, and means for preventing rotation of the nut after the direction of rotation of the shaft is reversed.

7. In a type casting and composing machine, a frame supporting a plurality of magazines, a rotary screw-threaded shaft, a nut engaging the threads of said shaft, a rotary cam, and gearing comprising a rack and pinion mechanism forming an operative driving connection between the said cam and the said shaft.

8. In a type casting and composing machine, a frame supporting a plurality of magazines, a rotary screw-threaded shaft, a nut engaging the threads of said shaft, a toothed rack, gearing forming an operative driving connection between the said rack and the rotary shaft, a cam for moving the said rack in one direction and a spring for retracting the said rack to its initial position.

9. In a type casting and composing machine,

a frame supporting a plurality of magazines, a rotary screw-threaded shaft, a nut engaging the threads of said shaft, a cam, an operative driving connection between the said cam and the said shaft, a clutch for driving the said cam, means for moving the said clutch to its operative position, and means for automatically disengaging the said clutch and stopping the rotation of the cam when the latter has completed one revolution.

10. In a type casting and composing machine, a frame supporting a plurality of magazines, a rotary screw threaded shaft, a nut engaging the threads of said shaft, fixed ribs engaging slots in the said nut to prevent rotation thereof, a rack and pinion mechanism for rotating the said shaft, a cam for moving the said rack in one direction, a spring for returning the said rack and shaft to their initial positions, and spring latches in alinement with the said fixed ribs to permit rotation of the nut with the shaft in one direction and to prevent rotation of the nut in the opposite direction.

11. In a type casting and composing machine, a frame supporting a plurality of magazines, a screw-threaded shaft, a nut engaging the threads of said shaft, mechanism for rotating the said shaft in one direction, fixed ribs engaging slots in the said nut to prevent rotation of the nut until it has traveled a predetermined distance, whereupon the said nut passes off the said ribs and is allowed to rotate with the shaft in one direction, means for reversing the direction of rotation of the shaft, and means for stopping rotation of the nut and guiding the slots therein back into engagement with the fixed ribs.

12. In a type casting and composing machine, a frame supporting a plurality of magazines, a rotary screw-threaded shaft, a nut engaging the threads of said shaft, means for preventing rotation of the nut, means for releasing the said nut to allow it to rotate, at times, with the shaft, and inter-engaging clutch teeth on the said nut and frame, respectively.

13. In a type casting and composing machine, a plurality of magazines, a plurality of sectors in each magazine, sector operating means, a frame supporting the magazines, means for raising the frame to lift the sectors comprised in one magazine away from the sector operating means, and means for successively rotating and lowering the frame to bring the sectors of another magazine into engagement with the said sector operating means.

14. In a type casting and composing machine, a plurality of magazines, a plurality of sectors in each magazine, sector operating means, complementary parts of disconnectible joints formed on the said sectors and

the said sector operating means, respectively, a frame; means for successively raising, rotating and lowering the said frame to move one magazine away from and to bring another magazine to the sector operating means, and means for rotating the sectors to bring the parts of the said joints into their unlocked positions.

15. In a type casting and composing machine, a magazine comprising a plurality of sectors, sector operating means, complementary parts of disconnectible joints formed on the said sectors and sector operating means, respectively, and means for rotating the said sectors to bring the parts of the said joints to their unlocked positions.

16. In a type casting and composing machine, a magazine comprising a plurality of sectors, sector operating means, complementary parts of disconnectible joints formed on the said sectors and sector operating means, respectively, and pivoted levers operated to rotate the said sectors to bring the parts of the said joints to their unlocked positions.

17. In a type casting and composing machine, a plurality of magazines, a plurality of sectors in each magazine, sector operating means, complementary parts of disconnectible joints formed on the said sectors and sector operating means, respectively, pivoted levers operated to rotate the said sectors to bring the parts of the said joints to their unlocked positions, a frame carrying the said magazines, a rotary screw-threaded shaft, a nut traveling on the threads of the said shaft and operating to raise, rotate and lower the said frame, and a cam on the said nut to operate the said pivoted levers.

18. In a type casting and composing machine, a magazine comprising a plurality of sectors, sector operating means, complementary parts of disconnectible joints formed on the said sectors and sector operating means, respectively, pivoted levers operated to bring the parts of the said joints to their unlocked positions, and a cam for operating the said levers.

19. In a type casting and composing machine, a magazine comprising a plurality of sectors, sector operating means, complementary

tary parts of disconnectible joints formed on the said sectors and sector operating means, respectively, pivoted levers operated to rotate the said sectors to bring the parts of the said joints to their unlocked positions, a slider, and a cam operating the said levers through the said slider.

20. In a type casting and composing machine, a magazine comprising a plurality of sectors, sector operating means, complementary parts of disconnectible joints formed on the said sectors and sector operating means, respectively, pivoted levers operated to rotate the said sectors to bring the parts of the said joints to their unlocked positions, a slider, a spring for moving the said slider in one direction, and a cam for moving the said slider against the thrust of the said spring to operate the said levers.

21. In a type casting and composing machine, a magazine comprising a plurality of sectors arranged in pairs, sector operating means, complementary parts of disconnectible joints formed on the said sectors and sector operating means, respectively, pivoted levers arranged in pairs corresponding to the pairs of sectors, interengaging lugs on the said levers, and a cam acting through one pair of levers, and the said lugs, to move all the levers to rotate the sectors to bring the parts of the said joints to their unlocked positions.

22. In a type casting and composing machine, a magazine comprising a plurality of sectors, sector operating means, complementary parts of disconnectible joints formed on the said sectors and sector operating means, respectively, pivoted levers operated to bring the parts of the said joints to their unlocked positions, and hand operated means for operating the said levers.

23. In a type casting and composing machine, a plurality of magazines, a frame having recesses therein, plates supporting the magazines and hand operated sliding pins for locking the said plates in the said recesses.

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