

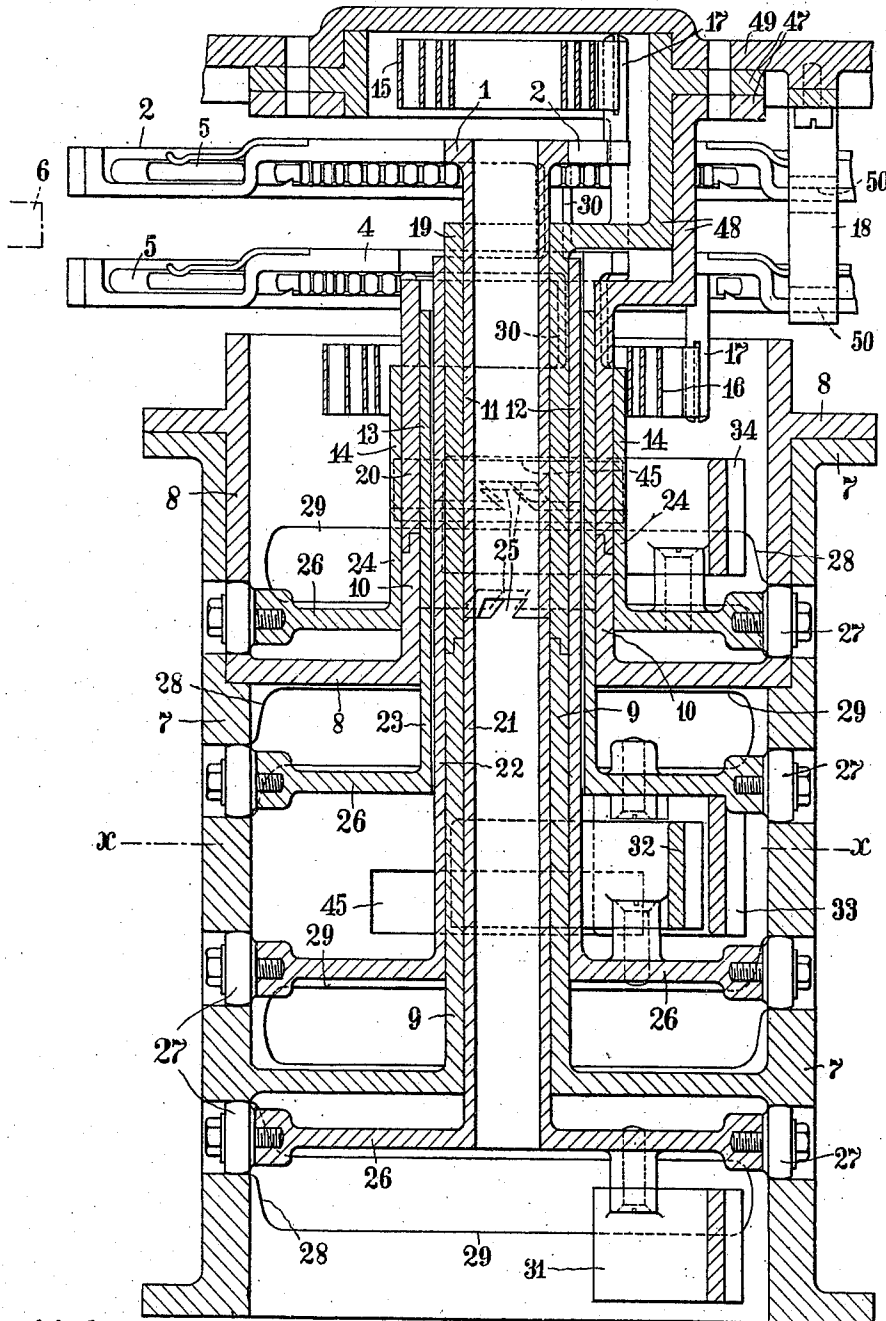
R. P. LINK & A. C. MORGAN.
 TYPE CASTING AND COMPOSING MACHINE AND TYPE WRITER.
 APPLICATION FILED MAR. 17, 1910.

984,947.

Patented Feb. 21, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



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Fig. 2.

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3 SHEETS—SHEET 2.

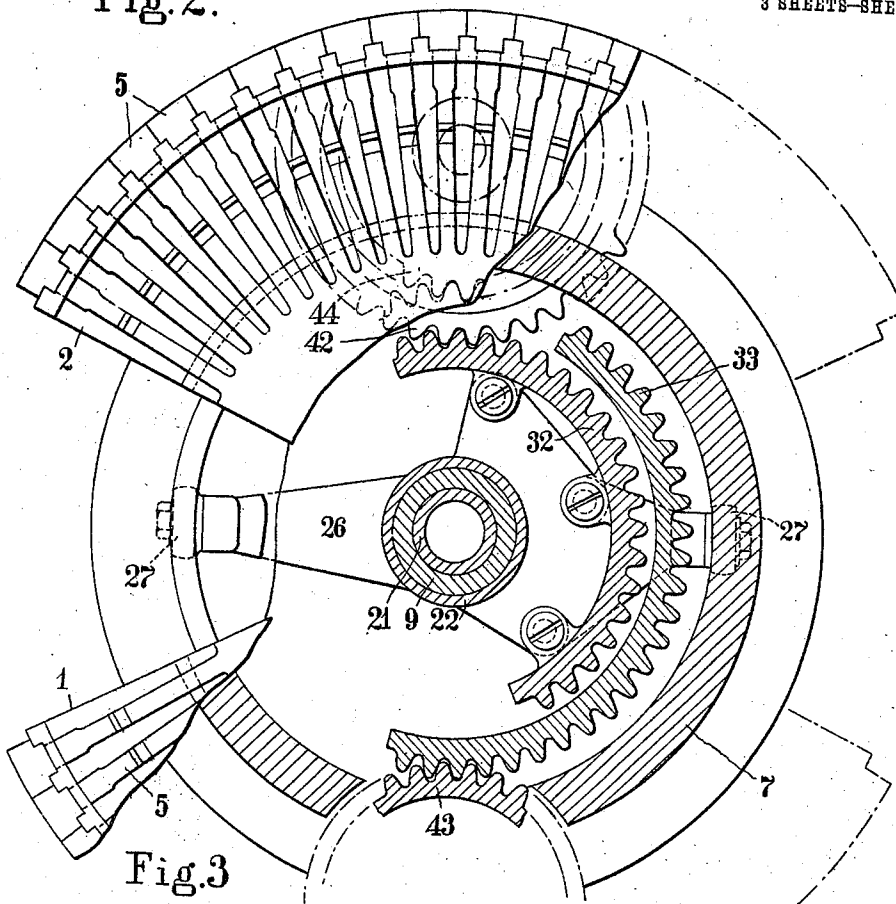
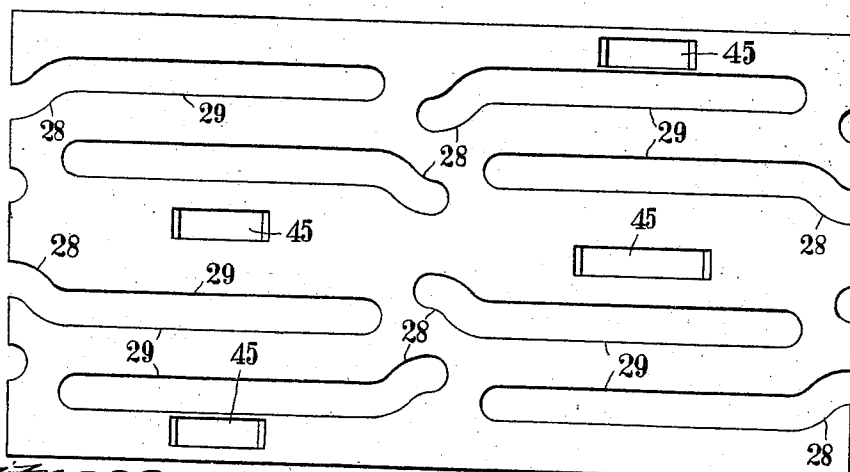


Fig. 3



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3 SHEETS-SHEET 3.

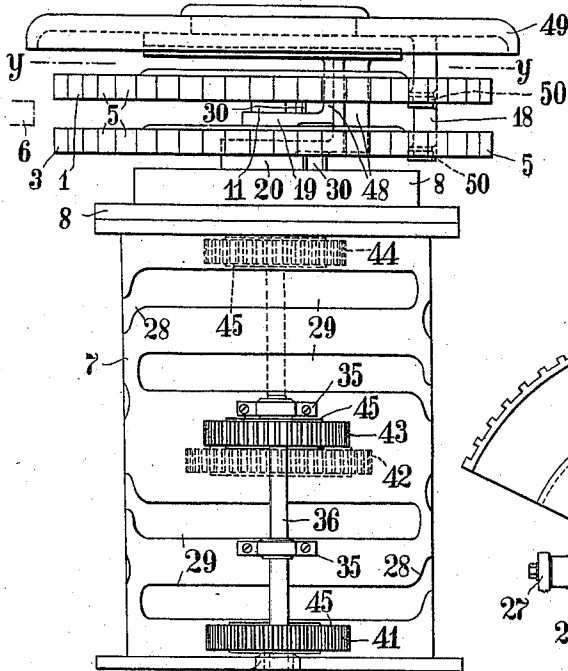


Fig. 4.

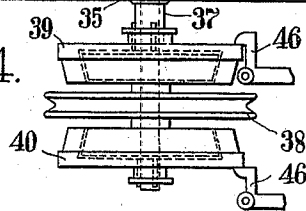


Fig. 5.

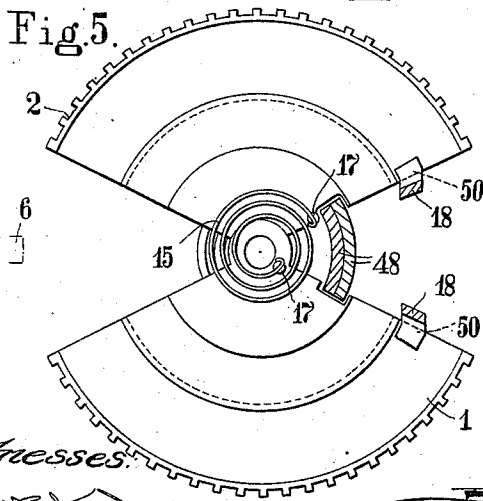


Fig. 6.

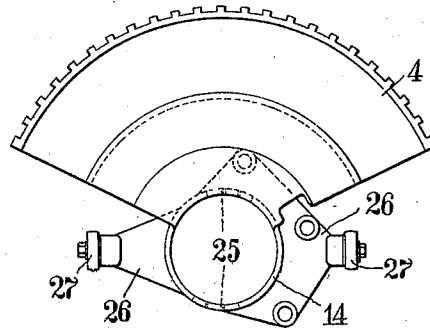
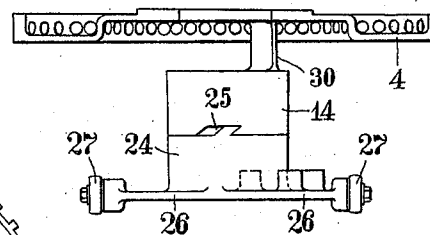


Fig. 7.



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UNITED STATES PATENT OFFICE.

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TYPE CASTING AND COMPOSING MACHINE AND TYPE-WRITER.

984,947.

Specification of Letters Patent.

Patented Feb. 21, 1911.

Application filed March 17, 1910. Serial No. 550,012.

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 and Type-Writers, of which the following is a specification.

This invention relates to type casting and composing machines of the kind that present individual matrices one at a time to a casting mold, by which separate types are cast, such types being subsequently assembled in a clip or holder.

The said invention relates more particularly to the magazines that contain the matrices from which the types are cast, and to the means for operating the parts that carry the matrices.

In a construction of magazine heretofore suggested for use in a typewriting machine the type are distributed on two type-wheels which, in their positions of rest are symmetrically arranged on opposite sides of a plane passing through the printing point, and are separately movable into this plane, so that any one type on one wheel and the type occupying the corresponding position on the other wheel are both brought to the printing point by equal movements of the type-wheels on which they are respectively carried. In machines of the kind referred to, the time allowed for the performance of a whole series of operative movements to bring any one matrix or type to the mold or the printing position and to return the parts to their initial positions, must be long enough to enable the greatest of these movements to be made. When the matrices or types are arranged all around the circumference of a wheel the difference between the least and the greatest movements to bring different matrices or types to the mold or printing position is inconveniently large and the time to be allowed for each complete series of operative movements is in consequence comparatively long.

According to the present invention, in a magazine for type casting and composing machines, and type-writers, of the kind wherein the matrices or types are carried by rotatable and laterally movable matrix carriers or type carriers by which the matrices are presented one at a time to the casting mold, or the types are brought one at a time

to the printing point, the matrices or types are distributed on a number of rotatable and axially movable sectors each of which, when in its normal position or position of rest, is out of the plane of the casting mold, or printing point, and when required for use is brought into this plane. By thus employing sectors arranged in this manner in place of wheel-shaped carriers, a greater number of carriers can be provided in one magazine whereby the difference between the least and the greatest operative movements of each carrier is reduced, and the inertia of the movable parts is reduced also. From this it follows that the time to be allowed for the greatest movement is more nearly equal to the time required for the least movement.

As applied to a type casting and composing machine, in the preferred arrangement, there are four sectors but any one of such sectors or any two may in special cases be omitted. When four sectors are provided they normally rest in two planes one above and the other below the casting plane, and when any matrix is to be used for casting purposes, the sector carrying such matrix is moved up or down, as the case may be, to bring it into the casting plane, and the same is also rotated to bring the matrices, in turn, opposite the casting mold. It will be seen that two of the sectors move up to the casting plane and two move down. The sectors in each plane are preferably symmetrically arranged therein so that one of them turns to the right and the other to the left to bring the matrices therein opposite the casting mold. The sectors may be operated directly by selecting keys, but preferably they are operated by motive mechanism controlled by selecting keys, thus relieving the operator of work and allowing a quick speed to be attained. The vertical movement of the sectors is preferably effected and controlled by cam grooves in a cam cylinder with which grooves parts connected to the sectors engage. The first stage of the rotary movement of a sector is that in which the sector is moved into the casting plane, and the remaining stage of the rotary movement brings the matrices, in turn, opposite the casting mold.

The magazine is arranged above and concentric with the cam cylinder aforesaid, which cylinder, on opposite sides thereof, is furnished with bearings supporting pairs of

concentric driving shafts, making four shafts in all, one for each sector. The driving connection with the sectors is conveniently made through pinions on the shafts gearing with toothed segments on parts which are detachably connected to the sectors, but levers or racks and pinions may be used for this purpose. The shafts are driven from a common driving shaft through the intervention of clutches one or other of which is put in gear, by the depression of a key, to move each sector, as required, and the sector thus moved is subsequently returned to its position of rest by a spring.

The cam cylinder is preferably constructed in two axially alined portions each of which is furnished with a central sleeve forming inner and outer bearing surfaces for tubular parts which are constructed with bayonet or other detachable joints for connection to similar tubular parts formed on the sectors. The first named tubular parts are constructed with flanges or arms which carry rollers working in the said cam grooves in the cam cylinder, and also constructed to carry the toothed segments or equivalent means whereby motion is transmitted to the sectors. The bayonet or other joints in the tubular parts before mentioned permit the sectors to be removed from the cam cylinder and other sectors substituted in their place, when required. The upper portions of the central sleeves also come away with the sectors and serve to retain the latter in concentric positions ready for rapid replacement in the working position when required. From the above it will be apparent that what we have called a magazine comprises the sectors and the tubular parts formed thereon together with the upper parts of the central sleeves referred to. One or more suitable catches are provided to hold up the sectors on the central sleeves when the magazine is removed from the cam cylinder.

A machine comprising parts constructed in accordance with the present invention can also be used as a type writer, in which case the matrices are replaced by male types.

In the accompanying drawings, which show how the said invention may be conveniently and advantageously carried into practice, Figure 1 shows, in central section, a magazine comprising four sectors, a cam cylinder and means for operating the sectors. Fig. 2 is a plan of parts shown in Fig. 1, partly in section on the line x, x , Fig. 1. Fig. 3 shows a development of the cam grooves formed in the cam cylinder shown in Fig. 1. Fig. 4 is an elevation of the magazine, cam cylinder and operating means illustrated in Fig. 1. Fig. 5 is a plan of parts shown in Fig. 4, partly in section on the line y, y . Fig. 6 is a plan, and Fig. 7 a side view of a single sector and a

tubular extension of the same, shown separately. Figs. 3 to 7 are drawn to a reduced scale.

As shown in these drawings, the magazine comprises four sectors, 1, 2, 3, 4, carrying matrices 5. These matrices are separately movable in a radial direction in the sectors, in the known manner. The sectors 1, 2 are arranged above the plane of the casting mold 6, and the sectors 3, 4 are arranged below this plane. The sectors 1, 2 are arranged symmetrically on opposite sides of the casting mold and the sectors 3, 4 are likewise symmetrically arranged on opposite sides of the casting mold below the sectors 1, 2. These sectors are rotatably mounted in a cam cylinder which, as shown, comprises two parts 7, 8, in axial alinement. Each of these parts is provided with a central sleeve 9, 10, respectively, which are formed with inner and outer bearing surfaces for supporting tubular parts 11, 12, 13, 14 integral with or rigidly attached to the sectors 1, 2, 3, 4, respectively. The members of each pair of sectors 1, 2 or 3, 4, are connected by springs 15, 16, respectively, the ends of which are secured to pins 17 provided therefor on the sectors. These springs draw the sectors to their positions of rest against stops 18.

The sleeves 9, 10 are provided with removable extensions 19, 20 centered on the sleeve by a convenient form of joint. The said sleeves and their extensions form bearing surfaces for tubular parts 21, 22, 23, 24 corresponding to and forming extensions of the tubular parts 11, 12, 13, 14 to which they are respectively connected by bayonet or like joints 25. Each tubular part 21, 22, 23, 24 is provided with a pair of arms 26 carrying rollers 27 traveling in cam grooves each comprising an inclined part 28 and a straight part 29 formed in the walls of the cam cylinder 7, 8. The necks 30 connecting the matrix-carrying parts to the tubular parts are suitably shaped and arranged to permit each sector to rotate through the required angle, when moved into the plane of the casting mold, to allow of all the matrices being brought in succession opposite to the casting position. The said tubular parts 21, 22, 23, 24 are provided with bosses which carry segmental racks 31, 32, 33, 34. On the exterior of the cam cylinder, on opposite sides thereof, bearings 35 are provided. The bearings on one side, as shown in Fig. 4, support a shaft 36 to which a pinion 43 is keyed. A tubular shaft 37 is sleeved on the shaft 36 and has a pinion 41 keyed thereon. Each shaft is independently driven by a pulley 38 through a corresponding clutch 39, 40. A similar arrangement of shafts and clutches is provided on the opposite side of the cam cylinder. There are thus provided four shafts each of which carries

a pinion 31, 32, 43 or 44, respectively, extending into the cam cylinder through slots 45 and each engaging one of the segmental racks 31, 32, 33 or 34.

5 Normally the clutches 39, 40 on both sides of the cam cylinder are inoperative but each clutch can be rendered operative at will by a movement of its controlling lever or tripping pawl 46, whereupon the corresponding
10 sector is moved to bring one of the matrices 5 carried thereby, into alinement with the casting mold 6. For example, by putting into operation the clutch 39 shown in Fig. 4, the pinion 41 is set in rotation and drives
15 the segmental rack 31. This rack, starting from a position in vertical alinement with the position in which the rack 33 is shown in Fig. 2, is rotated in a clockwise direction carrying with it the tubular parts 21, 11
20 supporting the sector 1. At the commencement of this rotary movement the rollers 27 on the arms 26 carried by the tubular part 21 move downwardly in the inclined parts 28 of the lowermost pair of cam grooves (see
25 Fig. 3), until the sector 1 is brought down to the plane of the casting mold. The face of the pinion 41 is made sufficiently wide to permit the rack to slide axially thereon without coming out of engagement. This downward movement is completed before the matrix nearest to the leading edge of the sector arrives opposite the mold. Thereafter the sector 1 rotates horizontally presenting each matrix in turn in alinement with the said
35 mold.

In order that magazines comprising a number of sectors may be rapidly and easily interchanged, the tubular parts carrying the sectors are made, as hereinabove mentioned,
40 in two parts connected by bayonet or like joints and the central sleeves of the cam cylinder also are each made in two parts connected by a scarf or like joint to keep the two parts in alinement. With joints made
45 as shown in the accompanying drawing, on moving the sectors 1, 2, 3, 4 against the pull of the springs 15, 16, for example by hand, while the lower tubular parts 21, 22, 23, 24 remain in their positions of rest, the joints
50 25 are unlocked. The sectors 1, 2, 3, 4 and the tubular parts 11, 12, 13, 14 together with the parts 19, 20 of the central sleeves can then be lifted out from the cam cylinder. The parts 19, 20 of the sleeves serve as means
55 for supporting the sectors ready for replacement in the cam cylinder, and as an additional convenience these parts 19, 20 can be bolted together by bolts passing through flanges 47 carried by brackets 48 integral
60 with the said parts. The stops 18 as shown, are carried by a plate 49 to which these flanges are bolted, notches 50 being provided in the stops 18 to prevent axial displacement of the sectors when the magazine is removed
65 from the cam cylinder.

In practice different magazines are employed to carry matrices for casting types of different fonts, or parts of the same font, and in each magazine, as a matter of convenience, as hereinbefore suggested, the most
70 used characters are arranged nearest to the forward edge of the sector so that the latter is moved the least distance to bring the most used matrices to the casting position.

When the present improvements are ap-
75 plied to type writing machines the printing position corresponds to the position of the casting mold.

What we claim is:—

1. In a matrix magazine, a plurality of
80 matrix carrying sectors which in their positions of rest are out of the single plane into which each sector is brought for use, and means for separately moving each of the said sectors one at a time at different times
85 into this single operative plane, the initial part of the said movement being in part axial to bring the moving sector into the said single plane of operation and the subsequent part of the said movement being ro-
90 tary to bring the matrices carried by the segments in turn to a single definite position of use.

2. In a matrix magazine, a plurality of
95 matrix carrying sectors which in their positions of rest are out of the operative plane, means for separately moving the said sectors one at a time at different times into the operative plane, and for rotating the said
100 sectors to bring the matrices carried thereby, in turn, to a single definite position of use, and means for returning the said sectors to their initial positions.

3. In a matrix magazine, a plurality of
105 sectors carrying matrices, tubular parts supporting the said sectors, arms extending from the said tubular parts, means for rotating the said arms, and cam grooves guiding the said arms during their rotary move-
110 ments.

4. In a matrix magazine, a plurality of
sectors carrying matrices, tubular parts supporting the said sectors, concentric sleeves forming bearings for the said tubular parts,
115 arms extending from the said tubular parts, means for rotating the said arms, and cam grooves guiding the said arms during their rotary movements.

5. In a matrix magazine, a plurality of
120 sectors carrying matrices, tubular parts comprising separable portions supporting the said sectors, toothed quadrants supported by the said tubular parts, means for locking together the said separable portions of the tubular parts, and rotary gear wheels in en-
125 gagement with the said toothed quadrants.

6. In a matrix magazine, a plurality of
sectors carrying matrices, tubular parts comprising separable portions supporting the
130 said sectors, toothed quadrants supported by

the said tubular parts, means for locking together the said separable portions of the tubular parts, rotary gear wheels in engagement with the said toothed quadrants, and
 5 clutches controlling the times of rotation of the said gear wheels.

7. In a matrix magazine, a plurality of sectors carrying matrices, tubular parts supporting the said sectors, arms extending
 10 from the said tubular parts, cam grooves guiding the said arms, toothed quadrants supported by the said tubular parts, and rotary gear wheels in engagement with the said toothed quadrants.

8. In a matrix magazine, a plurality of sectors carrying matrices, tubular parts supporting the said sectors, arms extending from the said tubular parts, cam grooves guiding the said arms, toothed quadrants supported
 20 by the said tubular parts, rotary gear wheels in engagement with said toothed quadrants and clutches controlling the times of rotation of the said gear wheels.

9. In a matrix magazine, a plurality of sectors carrying matrices, tubular parts supporting the said sectors, concentric sleeves forming bearings for the said tubular parts, arms and toothed quadrants supported by the said tubular parts, cam grooves guiding the
 30 said arms, rotary gear wheels in engagement with the said toothed quadrants, and clutches controlling the times of rotation of the said gear wheels.

10. In a matrix magazine, a plurality of matrix carrying sectors, tubular parts comprising separable portions detachably supporting the said sectors, concentric sleeves comprising separable portions and forming bearings for the said tubular parts, means
 40 for locking together the said separable portions of the tubular parts and sleeves, respectively, means for imparting to the said sectors a movement which is partly axial and partly rotary, and springs for returning the said sectors to their initial positions.
 45

11. In a magazine, a plurality of sectors carrying matrices, tubular parts comprising separable portions supporting the said sectors, and means for locking together the said
 50 separable portions, respectively.

12. In a magazine, a plurality of sectors

carrying matrices, tubular parts comprising separable portions supporting the said sectors, concentric sleeves comprising separable portions forming bearings for the said tubular parts, and means for locking together
 55 the said separable portions of the tubular parts and the sleeves, respectively.

13. In a magazine, a plurality of sectors carrying matrices, tubular parts comprising
 60 separable portions supporting the said sectors, concentric sleeves comprising separable portions forming bearings for the said tubular parts, means for locking together the said separable portions of the tubular parts and
 65 the sleeves respectively, brackets and flanges formed on parts of the said concentric sleeves, and a plate to which the said flanges are bolted.

14. In a matrix magazine, a plurality of sectors carrying matrices, tubular parts supporting the said sectors, concentric sleeves forming bearings for the said tubular parts, means for moving said sectors to bring the
 70 matrices carried thereby, in turn, to the position of use, springs for returning the said sectors to their initial positions and stops against which the sectors are drawn by the said springs.
 75

15. In a matrix magazine, a plurality of sectors carrying matrices, tubular parts supporting the said sectors, concentric sleeves forming bearings for the said tubular parts, brackets and flanges formed on the said concentric sleeves, a plate to which the said
 85 flanges are bolted, stops on the said plate, and springs for drawing the said sectors into contact with the said stops.

16. In a matrix magazine, a plurality of sectors carrying matrices, tubular parts supporting the said sectors, concentric sleeves forming bearings for the said tubular parts, brackets and flanges formed on the said concentric sleeves, a plate to which the said
 90 flanges are bolted, stops on the said plate, catches on the said stops, and springs for drawing the said sectors into the said catches.
 95

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