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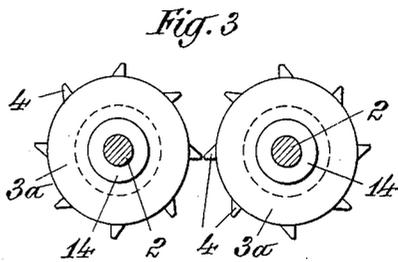
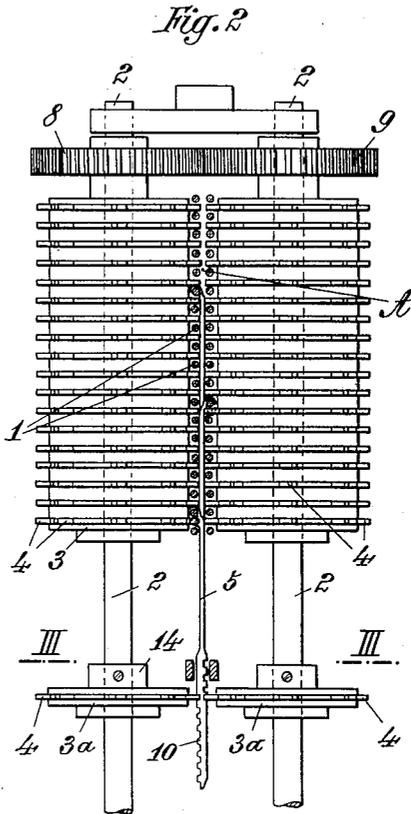
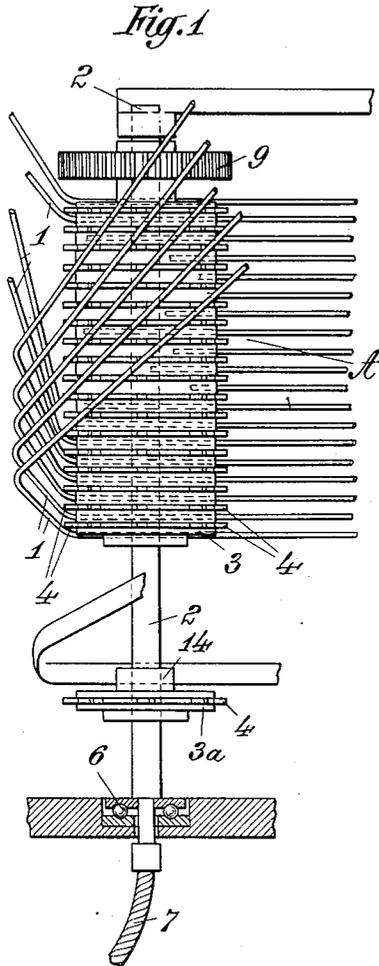
W. BLUME

1,925,170

MATRIX SETTING AND TYPE LINE CASTING MACHINE

Filed April 17, 1933

2 Sheets-Sheet 1



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MATRIX SETTING AND TYPE LINE CASTING MACHINE

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Fig. 4

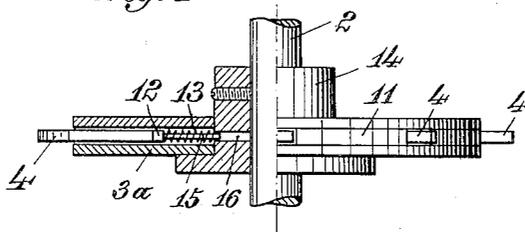
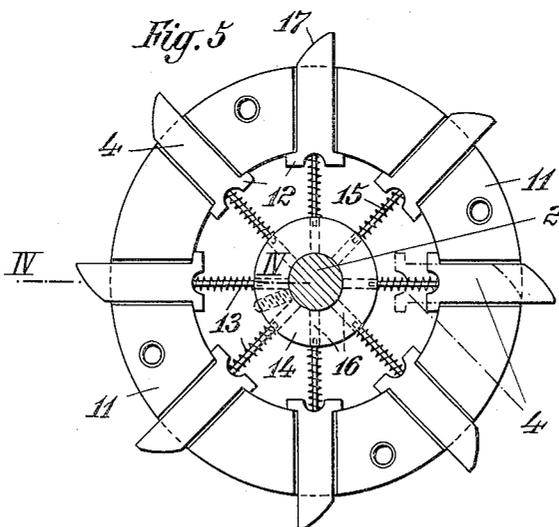


Fig. 5



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UNITED STATES PATENT OFFICE

1,925,170

MATRIX-SETTING AND TYPE-LINE-CASTING MACHINE

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9 Claims. (Cl. 199—3)

This invention relates to an arrangement for matrix-setting and type-line casting machines with matrix bars guided in a circuit on wires, which enables each individual released matrix bar to be automatically pushed-in by the machine and in vertical position into the collecting place, immediately after it has reached the lowermost point of the inclined guide wire carrying it. This is required in order to avoid faults or defects in the matter set, and the matrix bars from both halves of the case pass in the correct sequence into the collecting place, without any possibility of the matrix bar canting or being bent during the pushing-in.

In existing machines which are not equipped with a matrix circuit, the guide wires for the matrix bars extend from the points of rest direct to the end of the casting point in an inclined direction so that each released matrix bar slides to the end of the oblique path merely by gravity, and engages directly with the previously released matrix or ring space. On the contrary, in setting machines equipped with a matrix circuit, the circuit of which is broken by the conveying device bringing the cast matrix bars from the casting point to the distributing wires there has to be provided in front of the mostly horizontally built casting point a separate also horizontally extending collecting place for the matrices set, for the purpose of enabling the next line to be set during the casting and distribution of the previously set matrices, even though the conveying device is not yet ready to receive new matrices, that is to say is not yet at the casting point.

Experiments have been already made with several star wheels mounted on shafts rotating about vertical axes near the collecting place, the teeth of which are engaged between the guide wires and projected into the collecting trough. As however the matrix bars arriving at the collecting place always make oscillating movements, they practically never reach the collecting place in a strictly vertical position and must be seized in an oblique position by the teeth of the star wheels. With the arrangements just mentioned it was however impossible to ensure in practice that the teeth of the star wheels, situated above one another, simultaneously seized at different points a matrix bar dropping into the collecting place, so that jamming, bending, canting and sticking of the matrices could not be avoided.

The problem therefore set up is solved by the invention in a simple and rational manner without the drawbacks inherent in the known arrangements. The star wheels mounted on two ro-

tatable vertical shafts arranged at both sides of a collecting place comprising two symmetrical halves, engage by means of their teeth between each two guide wires. Any desired number of star wheels may be arranged on one shaft in order that each matrix bar arriving at the collecting place is seized simultaneously at several points. According to the invention, the star wheels, unlike the known arrangements used for similar purposes are provided with radially adjustable teeth. Owing to the easy mobility and to the peculiar shape of these teeth engaging between the guide wires, each incoming matrix bar is seized in a reliable manner on the whole of its length by several teeth and pushed forward or advanced, whilst at the same time all the teeth which may have met an obstacle or cannot properly seize the matrix-bar to be pushed-in, move radially inwards and slide past the matrix bar without damaging or bending it. Any canting or sticking as well as all trouble combined therewith are avoided therefore by the arrangement and construction of the advance device according to the invention.

A construction according to the invention is diagrammatically illustrated by way of example in the accompanying drawings, in which:—

Figure 1 is a side elevation of the collecting place with the advance or pushing forward arrangement.

Figure 2 is a front elevation of Figure 1, in which however the guide wires carried round the device and extending obliquely upwards to the points of rest have been omitted for the sake of clearness.

Figure 3 is a plan of Figure 2.

Figure 4 is a front elevation of a star wheel secured to its shaft, partly in section on line IV—IV of Figure 5 and

Figure 5 is a view seen from the top of the star wheel shown in Figure 4 with the top part removed for the purpose of showing its internal construction.

The guide wires 1 leading obliquely downwards from the points of rest (not shown) are bent in a horizontal direction at their lowermost ends to form the collecting place A (see Figure 1).

The machine comprises two equal and symmetrically arranged points of rest, and two oppositely situated rows of suspension wires (see Figure 2) completely equal and parallel to each other are produced at the collecting place A.

At the front end of the collecting place A where the wires 1 pass from their inclined into a horizontal direction, is arranged the advance device

driven by the machine. This device comprises two shafts 2 vertically arranged next to the guide wires, and supported in the machine bed and constantly rotating at the same speed. The shafts 2 are each located in one half of the collecting place A, that is to say in one half of the casing.

On each of the shafts 2 is mounted a number of star wheels 3, the teeth 4 of which engage between two guide wires 1 situated above one another in the collecting place A and project into the space enclosed by the two rows of wires constituting the collecting place A, the said space forming a collecting trough for the matrix bars 5 to be pushed-in. In order to facilitate parallel introduction of the matrix bars 5 reaching the collecting place A, the star wheels 3 secured to one and the same shaft 2 are so arranged that their corresponding teeth 4 situated above one another form one plane. Owing to this space coincidence of the teeth 4 and of the gaps between them, the star wheels 3 arranged above one another on one shaft 2, act as a single star wheel with correspondingly wide teeth. In the construction shown in the drawings, the number of star wheels arranged at each side of the collecting place, corresponds to the number of the intermediate spaces formed by the wires 1, but the number of star wheels required for the automatic driving could also be reduced without departing from the scope of the invention.

To the bottom end of each shaft 2 is also secured a star wheel 3a at such a level that the teeth 4 seize the incoming matrix bars 5 at a point situated as low down as possible but still above the type faces stamped out in the matrix bars, in order that the type-faces of the matrix bars 5 should not be damaged in case of the star wheels 3a being situated too low. The star wheels 3 and 3a are all rigidly secured to the shafts 2, and the latter are rotated from the drive of the machine by any desired means.

In the construction shown, the shafts 2 are supported in an easily rotatable manner in the machine bed by means of ball bearings 6, and one of the shafts 2 is rotated for instance by means of a flexible shaft 7 connected to the drive of the machine. This rotation of the driven shaft is transmitted to the other shaft by spur wheels 8, 9 of equal size secured to the upper ends of the shafts 2 and meshing with each other, so that an equal speed of rotation is ensured for both shafts 2 of the device.

With the described arrangement of star wheels 3 engaging between the superposed wires 1 of the collecting place A, and of the star wheels 3a seizing the matrix bars 5 at their parts 10 carrying the type faces, each matrix bar 5 reaching the collecting place A is seized in a reliable manner simultaneously at several places, at least however at two places situated sufficiently far apart, by the teeth 4 of the star wheels 3 and 3a. According to the invention the teeth 4 of the star wheels 3 and 3a are arranged so as to be movable in the radial direction in recesses 11 of the wheel rim, so that they can easily slide past an obstacle, such an obliquely standing or canting matrix bar that cannot be seized, without damaging or bending the bar. The outward movement of the teeth 4 is limited by means of collar-like projections 12 (see Figure 5). The teeth 4 are controlled by the action of pressure springs 13, such as helical springs, which engage at one end with the teeth 4 and at the other end with the hubs 14 of the star wheels 3 and 3a. The springs 13 are further guided on pins 15 which are se-

cured to the teeth 4 and arranged in a longitudinally adjustable manner in bores 16 of the hubs 14 (see Figure 5), owing to which perfect rectilinear movement of the teeth 4 is ensured. Figure 5 shows at one point in chain dotted-lines a tooth 4 in its inner position. The teeth 4 are provided at their side facing the matrix bars 5 with an oblique or cam face 17 which is preferably slightly rounded-off in order to facilitate their inward movement or sliding past an obstacle in the event of their meeting a resistance.

Any desired material may be used for the star wheels 3 and 3a, for instance vulcanized fibre, compressed material, metal, more particularly light metal, but it is advisable to make the teeth 4 of a tough material not subject to wear and softer than the type face parts 10 of the matrix bars 5, in order to avoid their wear at the point of engagement. In practice vulcanized fibre has proved suitable for the manufacture of the teeth 4. For the remaining parts of the star wheels 3 and 3a is preferably chosen aluminium or some other light metal.

Having thus fully described the invention what is claimed as new and desired to be secured by Letters Patent is:—

1. A collecting device for matrix-setting and type-line-casting machines of the type having matrix bars guided on wires in a circuit and having a horizontal collecting place at the lower ends of the wires, gripping means for seizing the matrix bars at the side and for pushing them forward into the horizontal collecting place, including a pair of constantly driven opposed vertical shafts situated outside the collecting place, a group of gripping wheels on each shaft in the form of star wheels including radially adjustable teeth which engage between the guide wires of the collecting place, and other star wheels secured near the lower ends of the shafts and including radially adjustable teeth so that each individual matrix bar arriving in front of the collecting place is simultaneously seized at several points of its steel part as well as at its brass part carrying the type face, by the teeth of the star wheels and pushed in vertical position into the collecting place.

2. A device as claimed in claim 1, wherein for the purpose of facilitating parallel pushing-in of the matrix bars, the teeth of all the star wheels secured to one and the same shaft, form one plane, so that owing to this coincidence in space of the teeth and of the gaps between them, all the star wheels arranged on one shaft act as a single star wheel with correspondingly wide teeth.

3. A device as claimed in claim 1, wherein the bottom star wheels seizing the type face part of the matrix bars to be pushed-in, are secured to the shafts at such a level that they seize with their teeth the matrices arriving at the collection place, at a point immediately above the type faces stamped out in them.

4. A device as claimed in claim 1, wherein each star wheel includes a slotted rim for accommodating the teeth for radial adjustment, and a hub having bores, pins carrying the teeth and slidable in the bores, projections on the teeth for engaging the inner periphery of the rim, and helical springs which are guided on the pins for normally exerting pressure on the teeth to hold them extended.

5. A device as claimed in claim 1, wherein the teeth of the star wheels are provided for the purpose of limiting their radially directed movement

outwards, with collar-like projections engaging with the rim of the star wheels.

6. A device as claimed in claim 1, wherein the engagement surfaces of the adjustable star wheel
5 teeth are bevelled, so that they can easily yield to obstacles.

7. A device as claimed in claim 1, wherein the star wheels are made of light metal.

8. A device as claimed in claim 1, wherein the
10 teeth of the star wheels are made of a tough material in the form of vulcanized fibre which is softer than the material of the matrix bars or

of the type face part and is subject only to a slight wear.

9. A device as claimed in claim 1, wherein means is provided for driving the wheels simulta-
neously and includes a flexible shaft operable
80 from the driving gear of the machine and connected to one of the shafts, and spur wheels secured to the upper ends of the shafts and of the same size and meshing with each other so that
85 both shafts rotate at the same speed.

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