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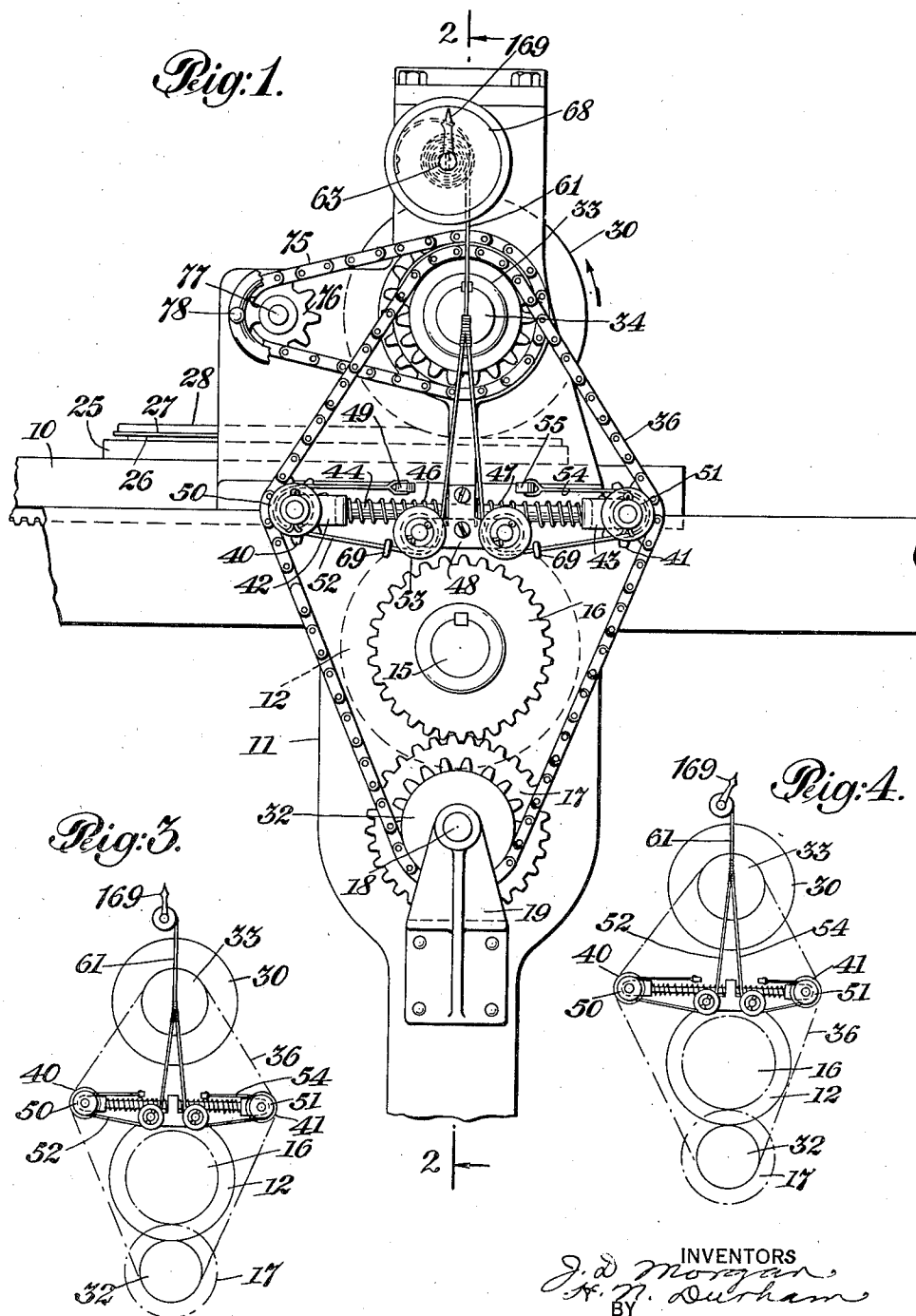
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2,070,293

MATRIX MAKING MACHINE

Filed May 13, 1935

2 Sheets-Sheet 1



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Fig. 2.

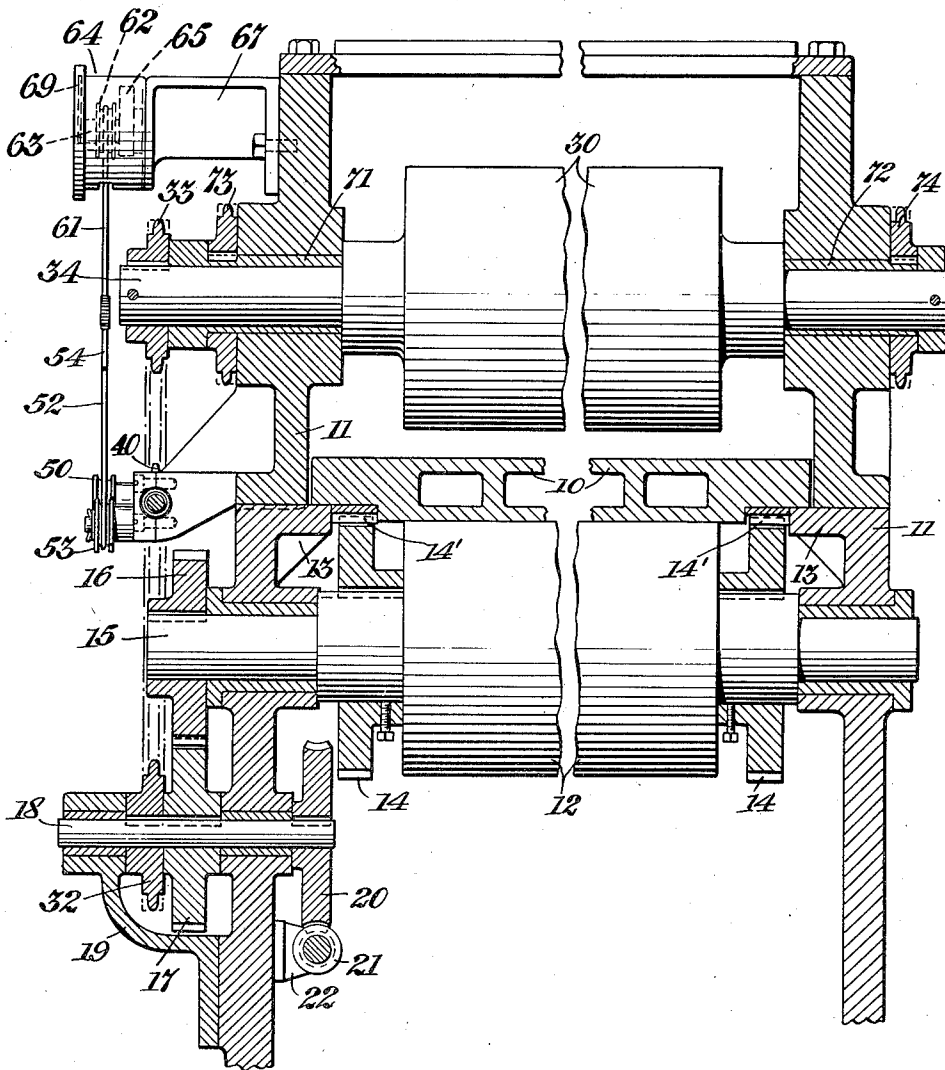
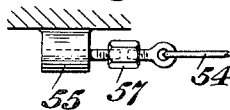


Fig. 5.



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MATRIX MAKING MACHINE

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Application May 13, 1935, Serial No. 21,102

5 Claims. (Cl. 101—12)

The invention relates to novel and useful improvements in matrix making machines, and more especially to novel and useful means for determining, controlling and indicating the pressures exerted during the making of the matrices.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:—

Fig. 1 is a fragmentary side elevation illustrating one embodiment of the invention.

Fig. 2 is a fragmentary vertical section taken on line 2—2 of Fig. 1;

Figs. 3 and 4 are diagrammatic views showing different positions of the flexible drive for the pressure cylinder; and

Fig. 5 is a detached view of a modified detail of the pressure indicator.

Objects of the invention are to provide for making matrices with the exertion of a predetermined pressure designed to give the best results, and to register, and indicate the pressure conditions in the machine at all times during the making of the matrices, including variation from any predetermined or normal pressure; and whether the pressure used on successive matrices is the same, and whether the pressure varies, or deviates from a predetermined normal, in different parts of the matrix as the bed passes along beneath the cylinder. In accordance with certain features of the invention the pressure conditions and variations in making the matrix are governed by variations in the torque exerted on the pressure cylinder, or by increments or decrements in the peripheral speed of the cylinder relatively to the bed, when a machine of that type is used.

The invention as illustratively embodied is applied to a matrix making machine the same or similar to that shown and described in application Ser. No. 709,925 of Curtis S. Crafts, filed February 6, 1934. The machine shown in that application has a positively driven form supporting bed, and a resiliently driven pressure cylinder normally having peripheral speed equal to the linear speed of the bed, but capable of speeding up or retarding slightly with variations in

the pressure exerted by the cylinder, this function being effected through a resilient drive having a movement due to variations in the torque caused by changes in the pressure exerted by the cylinder. More in detail, the drive onto the shaft of the pressure cylinder is through a sprocket chain running over spring balanced idlers, the reaches of the chain varying in length with changes in the pressure exerted by the cylinder and resultant slight and momentary increments and decrements in the speed of the cylinder and variations in the torque. In said embodiment the indicating means is governed and actuated by the movement of the idlers just described, and the indicating means may be set to a normal or zero position for any desired or predetermined cylinder pressure, and will indicate plus or minus variations therefrom for different parts of the matrix as the bed with the form and flong travels beneath the cylinder.

The foregoing general description and the following detailed description as well are illustrative and exemplary but are not restrictive of the invention.

Referring now in detail to the illustrative embodiment of the present invention shown in the accompanying drawings, the matrix rolling device comprises a bed 10 of relatively heavy and rigid metal which is adapted to be reciprocated in the frame 11 and is supported by means of a large cylinder 12 extending beneath the bed and transversely of its line of reciprocation, as well as by small rollers (not shown) on either side of the cylinder 12 and runways 13.

Cylinder 12 is preferably geared to bed 10, and for this purpose gears 14, one at either end of the cylinder, are keyed to the cylinder shaft 15, which is journaled in side frames 11, and mesh with the racks 14' secured to the under side of the bed 10.

Means are provided for driving the bed in either direction, and for this purpose a gear 16 is keyed to one end of the shaft 15 and meshes with a gear 17 keyed to shaft 18 which is journaled in the side frame 11 and also in the outboard bearing carried by bracket 19. At its inner end, shaft 18 is keyed to a worm gear 20 meshing with a reversible, motor-driven worm 21 which is rotatably mounted by means of its shaft in bearings carried by the brackets 22 on the inside of frame 11.

As is usual in the rolling of stereotype matrices, the form is supported in a chase 25 on the bed 10. The flong in a suitably moistened or otherwise plastic condition is laid over the surface of the type, plates, or other matter composing the form, and the flong 26 is then covered with some cushioning material such as a sheet of fibre 27 and rubber 28.

Means are provided for pressing the flong against and into the surface of the form so that

its surface receives an impression of the form and is thereby changed into a matrix. As embodied, a relatively large cylinder 30 is rotatably mounted above the bed 10, preferably in line with the cylinder 12, and is adapted to be rolled over the rear face of the flong 26 with considerable pressure. Cylinder 30 is rotatably mounted in the frame 11 in a manner which will be later more fully described.

Gearing is provided in accordance with the present invention for rotating the cylinder 30 as the bed 10 is reciprocated, the peripheral speed of the cylinder 30 being approximately the same as the linear speed of the bed 10 and form 25. As embodied, a sprocket 32 is keyed to shaft 18 so as to be driven proportionately to the rotation of cylinder 12, and cylinder 30 is provided with a similar sprocket 33 keyed to its shaft 34. For connecting the cylinders 12 and 30 together a chain 36 runs over the sprockets 32 and 33.

Means are provided for permitting slight variations in the speed of the cylinder 30 in reference to the speed of the bed 10, such variations arising from differences or variations in the pressure exerted on the matrix, arising from differences in character of various parts of the form, differences in the thickness or condition of blankets, or other causes. In the embodied form of said means, idler sprocket wheels 43 and 41 are journaled respectively in blocks 42 and 43, slidably mounted on a rod 44, supported on the machine frame, the two sprockets meshing with the two opposite reaches of sprocket chain 36. The journal blocks 42 and 43 are impelled resiliently outwardly by springs 46 and 47, coiled about the rod 44, and abutting on faces of a supporting bracket 48 for the rod. The sprocket wheels 43 and 41 are thus in resilient pressure against the reaches of the sprocket chain 36, and are adapted to move resiliently, with consequent variation in the tension of the springs 46 and 47, as the pull on the driving reach of the chain varies with variations in the pressure between cylinder 30 and the form.

The pressure indicating means as embodied is governed by the resilient drive for the pressure cylinder just described, and in said embodied form pulleys 50 and 51 are loosely journaled on the blocks 42 and 43. A cord 52 has one end fixed to the machine frame at 49, and runs thence over pulley 50 and over a pulley 53, journaled loosely on block 43. In like manner, a cord 54 is anchored to the frame at 55 and runs over pulley 51 and thence over a pulley 56, loosely journaled on block 48. The cords 52 and 54 at their other ends are both connected to a cord 61, which is wound on a drum 62, fixed on a shaft 63. Spring 65 is fixed to shaft 63 and housing 64, and places winding tension on shaft 63. Housing 64 is mounted on the frame by the bracket 67. Mounted on the end of housing 64 is a dial 68, and a hand 169 is fixed on shaft 63. Thus with the movement of sprockets 40 and 41, due to variations in the pressure placed on the matrix, the cords 52, 54, 61 will exert tension against, or yield to spring 65, with a consequent movement of hand 169 on dial 68. Any suitable or desired form of devices may be used to prevent slack in either cord causing it to leave the pulleys, and as shown guiding eyes 69 are utilized for this purpose. The dial 68 may be calibrated in whatever manner and with whatever units may be found convenient or desirable, and a normal or zero reading may be fixed corresponding to the desired and predetermined normal pressure to be exerted on the matrices, and in addition, as the machine operates, increments or decrements in

the pressure will be indicated. For example, the diagram of Fig. 3 may be taken as indicating a desired normal or usual pressure, and the diagram of Fig. 4 may be regarded as showing an increase or decrease therefrom, dependent upon the direction in which the bed is moving. In Fig. 5 a turn-buckle, or screw-adjustment 57, is shown for cords 52 and 54 whereby the indicator may be brought to exact zero or normal indication.

Means are also provided for varying the position of the cylinder 30 to govern the pressure exerted, and as embodied, its shaft 34 is journaled in eccentric sleeves 71 and 72, mounted in the machine frame. Fixed to said sleeves, respectively, are sprockets 73 and 74, over which run sprocket chains 75, said chains running also over sprocket wheels 76, fixed on a shaft 77 journaled in the side frames. A hand wheel 78 is fixed on shaft 76, and thereby the two sleeves 71 and 72 may be moved in unison to vary the pressure exerted by the cylinder 30.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What we claim is:

1. A matrix rolling machine including in combination a form supporting bed, means for supporting and progressing the bed, a cylinder for pressing a flong against the surface of a form on the bed, means for driving said cylinder, and means governed by said driving means for indicating variations in pressure exerted on the flong as it moves beneath said cylinder.

2. A matrix rolling machine including in combination a form supporting bed, means for supporting and progressing the bed, a cylinder for pressing a flong against the surface of a form on the bed, means for yieldingly rotating said cylinder, and means for indicating variations in the torque as the bed with the form and flong move beneath the cylinder.

3. A matrix rolling machine including in combination a form supporting bed, means for supporting and progressing the bed, a cylinder for pressing a flong against the surface of a form on the bed, means for driving said cylinder including a sprocket chain and a spring-pressed idler engaging said chain and indicating means governed by the movement of said idler.

4. A matrix rolling machine including in combination a form supporting bed, means for supporting and progressing the bed, a cylinder for pressing a flong against the surface of a form on the bed, means for driving said cylinder including a sprocket chain and spring-pressed idler engaging both reaches of the chain, and indicating means governed by the movement of said idlers.

5. A matrix rolling machine including in combination a form supporting bed, means for supporting and progressing the bed, a cylinder for pressing a flong against a form on the bed, means for driving the cylinder normally at a peripheral speed equal to the linear speed of the bed but permitting slight retardation and speeding up of the cylinder with variations in pressure exerted by the cylinder, and means cooperating with said driving means for indicating the pressure exerted by the cylinder.

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