

No. 843,304.

PATENTED FEB. 5, 1907.

L. SCHMIDT.  
SINGLE TYPE CASTING MACHINE.

APPLICATION FILED APR. 3, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

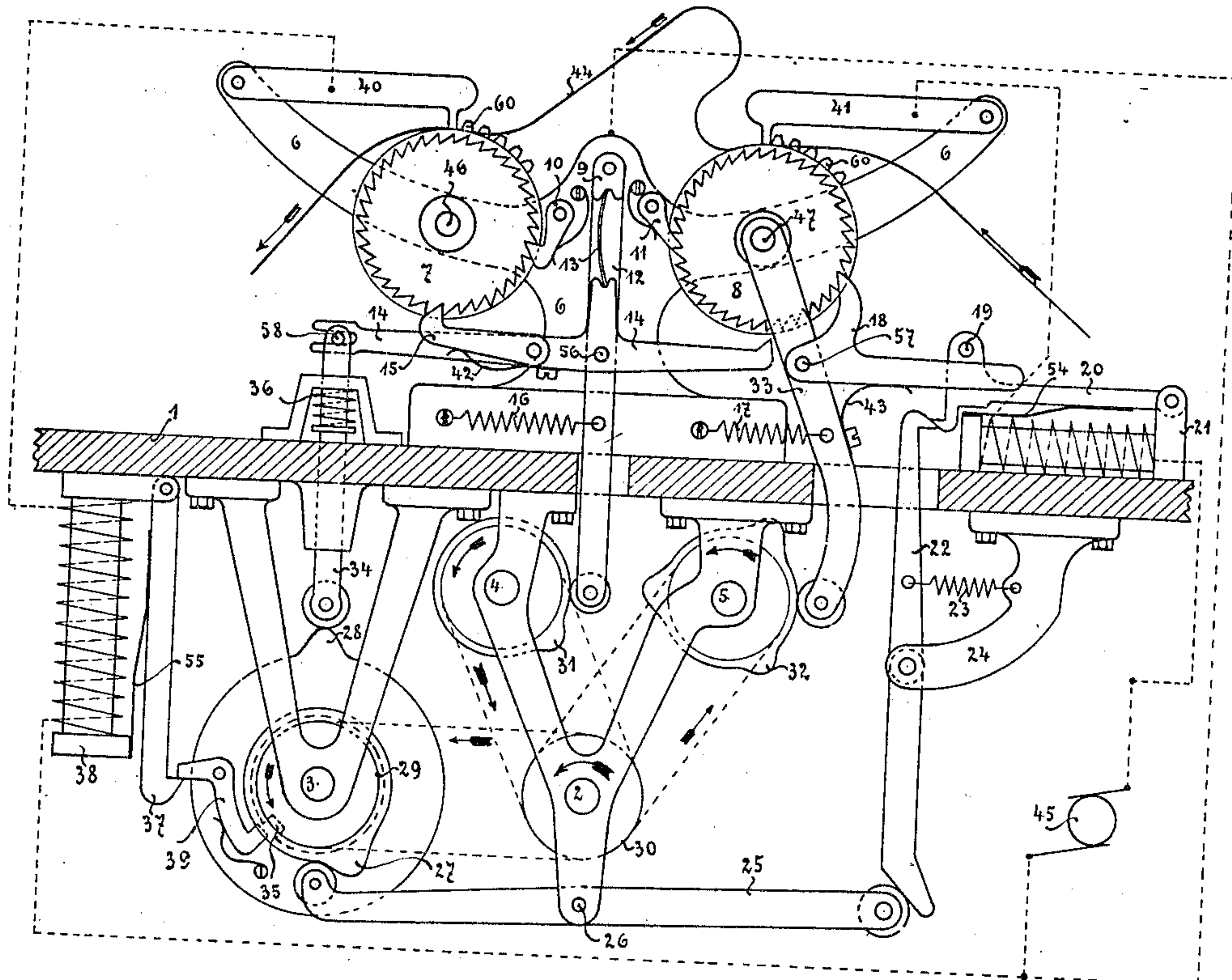
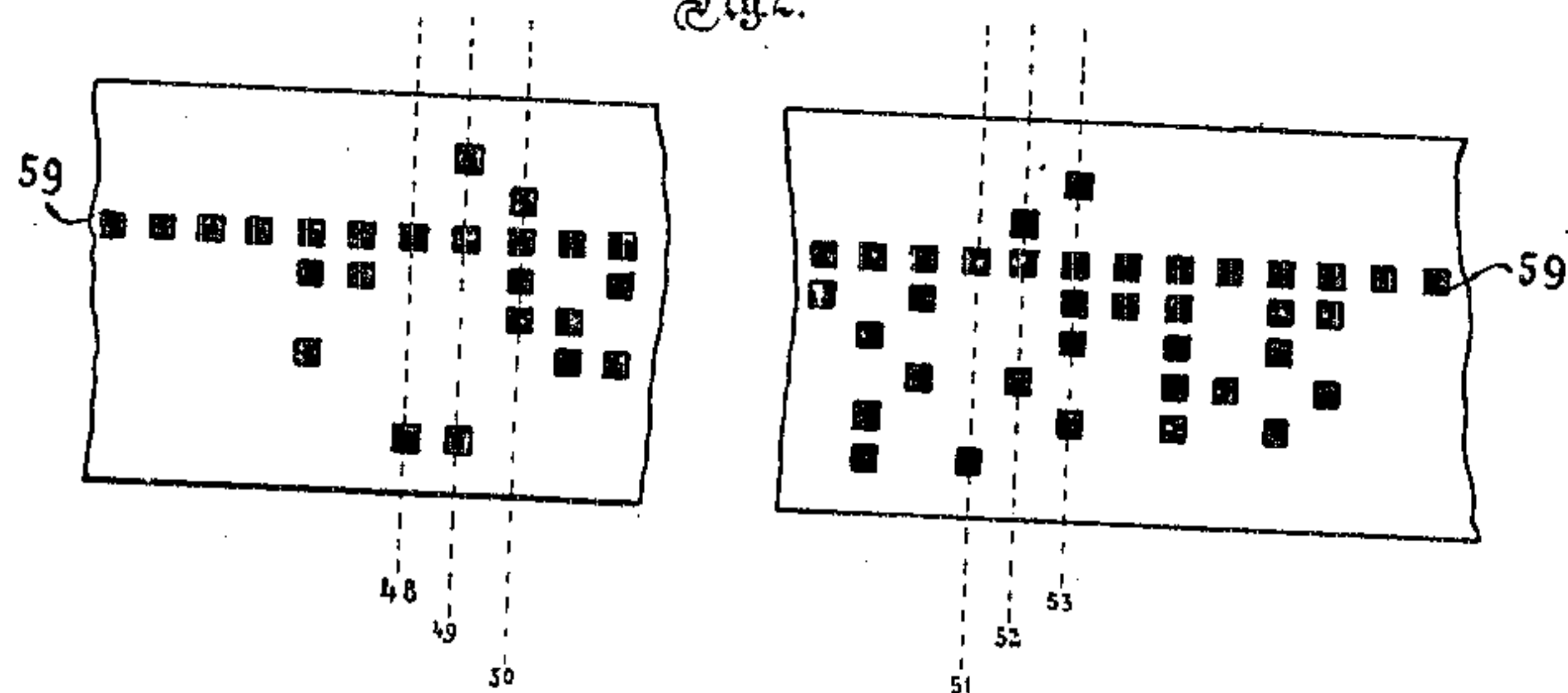


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

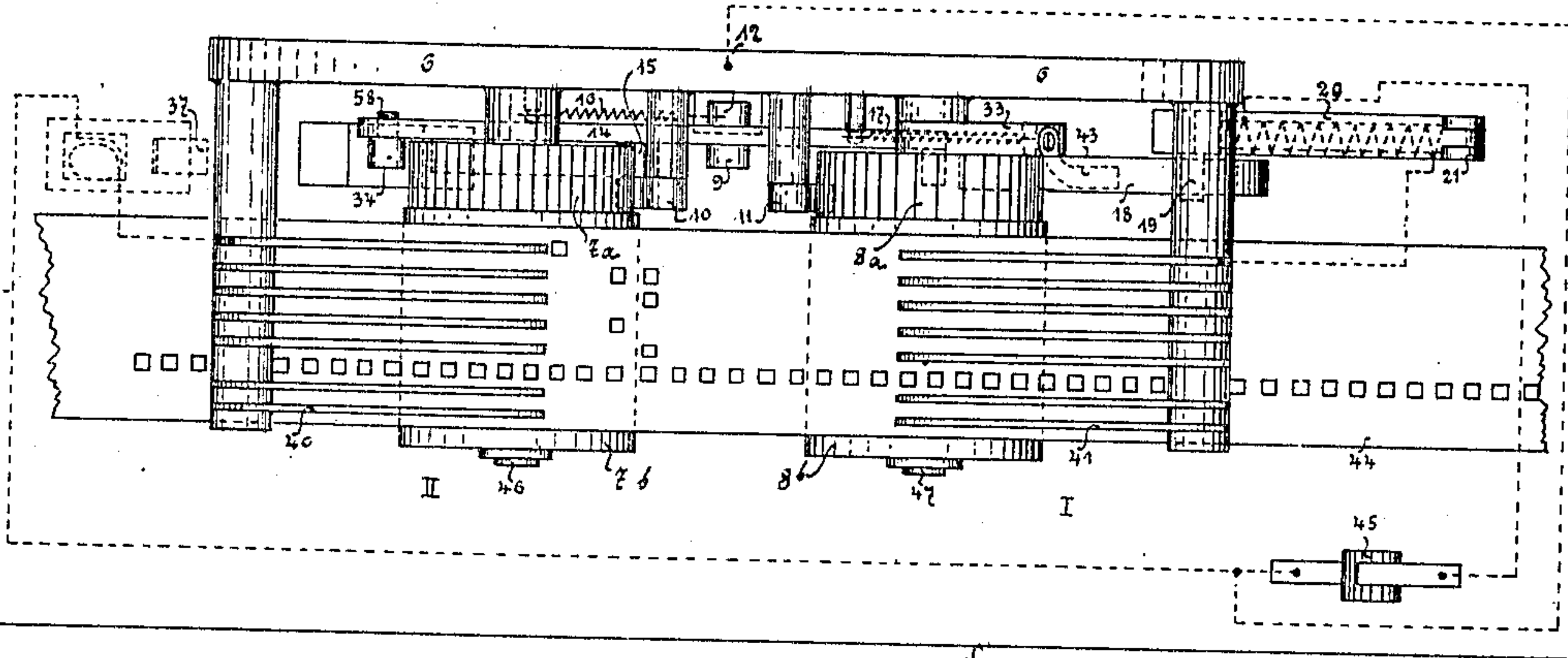
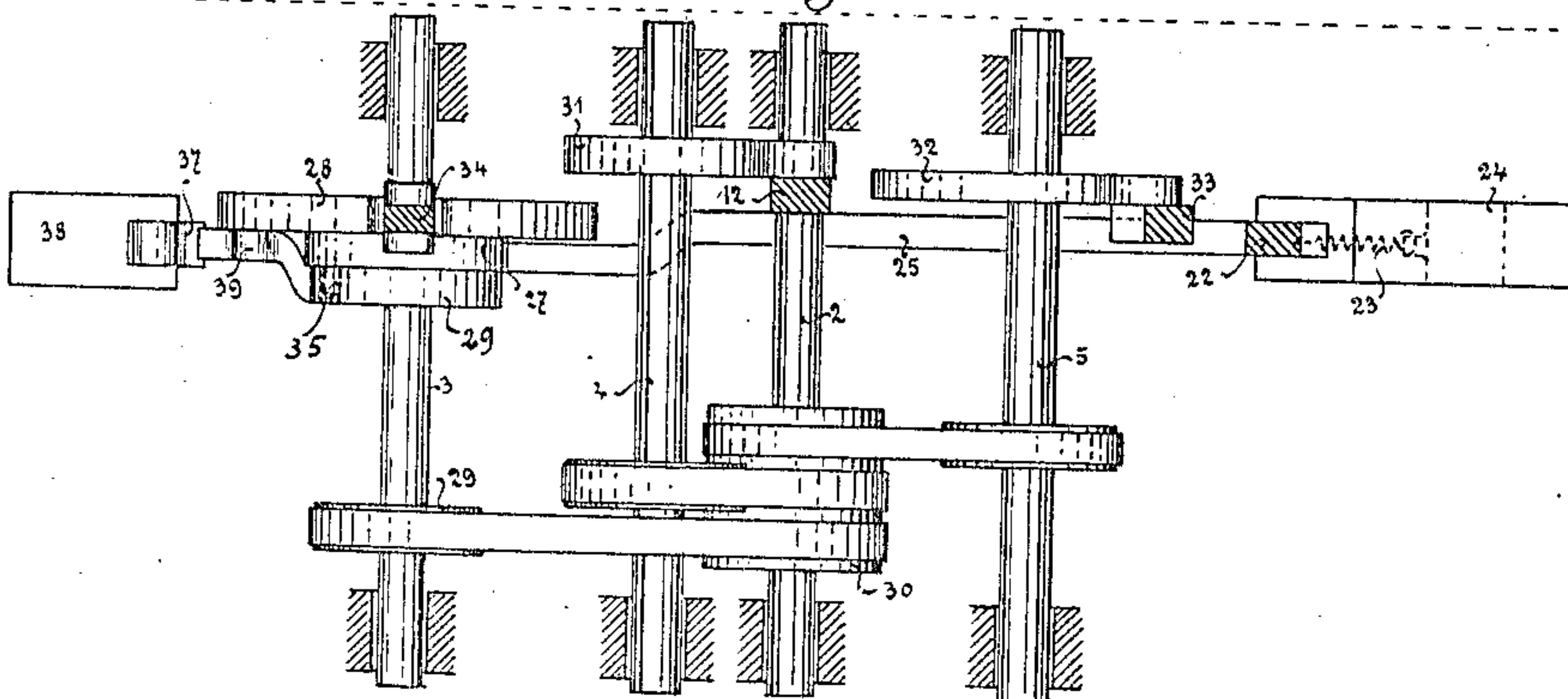


Fig. 4.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## SINGLE-TYPE-CASTING MACHINE.

No. 843,304.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed April 3, 1906. Serial No. 309,724.

*To all whom it may concern:*

Be it known that I, LUDWIG SCHMIDT, mechanical engineer, a subject of the German Emperor, residing at Nuremberg, in the Kingdom of Bavaria, German Empire, have invented a new and useful Single-Type-Casting Machine, of which the following is a specification.

In movable type-casting and composing machines such as known heretofore, where the symbols for adjusting the thickness of the spaces are not determined until after the entire line is completed, the perforated registering-strip must be reeled off backward when passing through the casting-machine, in order to set first the space mechanism, after which the casting of the characters will follow. The consequence of this arrangement is that the composition thus produced leaves the casting-machine in the reverse way—that is, the last line of the manuscript comes first out of the casting-machine. This involves a great loss of time in printing-offices, especially when producing a composition for newspapers, since one is compelled to have the writing of the whole article done on the keyboard before one can begin its casting. Another consequence is that the whole casting must be finished before one can “make up” the composition. For doing away with these inconveniences in connection with single-type-casting and setting machines registering-strips have been used having the justification symbols at the beginning of each line; but strips of this kind premise a keyboard-machine with two separate punching devices, this permitting the strips to be conveyed directly from the keyboard into the casting-machine when both machines are used in conjunction with one another.

My invention relates to another means for removing said inconveniences, and is especially of great advantage in case the keyboard and casting-machines are mounted at distant places.

The principal features of my invention are two combined deciphering devices on the casting-machine, permitting to begin with the deciphering of the justification symbols punched as hitherto at the end of the line. With this arrangement the casting of the letters is done in the same order as the keys of the keyboard have been fingered.

In the accompanying drawings, Figure 1 is a side elevation of the combined device for deciphering the registering-strips for casting and setting justified lines. Fig. 2 represents a part of the perforated registering-strip 44, showing the line-lifting holes 48 and the justification symbols 49 50 for the line just cast before and line-lifting holes 51 with justification symbols 52 53 of the ensuing line. Fig. 3 represents a plan view of the apparatus. Fig. 4 represents a plan view of the lower half of the apparatus after the base-plate 1 in Fig. 1 has been removed.

The apparatus is constructed as follows:

On a base-plate 1 are fixed the bearings for axles 2, 3, 4, and 5. On the main axle 2 is mounted the treble pulley 30, driving, by suitable means, cam-wheels 31 and 32, fastened on axles 4 and 5, respectively, and a coupling-disk 29, fastened on axle 3. Cam-wheel 31 is fitted with one and cam-wheel 32 with three cams. Pillar 6, which is also fixed on base-plate 1, carries the two deciphering devices 7 and 8 with their transporting ratchet-wheels and contact-levers 40 and 41. Ratchet-wheels 7<sup>a</sup> and 8<sup>a</sup>, which are driven by levers 12 and 33, pivoted on axles 9 and 47, fixed on pillar 6, effect the motion of the deciphering devices controlled by registering-strip 44. Said levers 12 and 33 are provided at their lower ends with casters pressing against cam-wheels 31 and 32 by spiral springs 16 and 17. Lever 12 bears the double-armed latch-lever 14, fixed on pivot 56. One arm of this lever 14 is provided with a pawl 15, engaging, by pressure of spring 42, in ratchet-wheel 7<sup>a</sup>. Pawl 18 is pivotally fixed on lever 33 by pin 57 and engages in ratchet-wheel 8<sup>a</sup>. Pawls 10 and 11 prevent wheels 7<sup>a</sup> and 8<sup>a</sup> from moving backward. Cam-wheels 27 and 28 are fastened together by screws and revolving loosely on their common axle 3. On the same axle 3 is mounted also coupling-disk 29, driven by pulley 30. The function of this coupling-disk 29, generally running loose, is to take along cam-wheels 27 and 28 at a certain given time—viz., to cause same to make one revolution as soon as coupling-latch 39, fixed on cam-wheels 27 28, catches into recess 35 of coupling-disk 29.

The cam of cam-wheel 28 has the purpose of lifting rod 34, so that the pin 58, fixed at its upper end, forces lever 14 to disengage from



ratchet-wheel 8, kept in motion by the right-hand arm of lever 14 and lever 12.

When cam-wheel 28 is by latch 39 coupled with disk 29 and begins to revolve around  
5 axle 3 and its cam ceases to press against rod 34, the latter is pushed downward by spring 36 and in drawing the left-hand arm of lever 14 downward engages there by its right-hand arm again into ratchet-wheel 8.

10 Cam-wheel 27 when revolving presses with its cam against the double-armed lever 25, pivoted on pin 26, thereby causing lever 25 to push lever 22 out of the position in which it was kept by spring 23. Thus armature 20,  
15 previously attracted by electromagnet 21 and held in place by the nose on the upper end of lever 22, is released and now forced upward by spring 54, allowing pawl 18, which was kept down by pin 19 of the armature, to reengage in ratchet-wheel 8, effecting  
20 thereby its motion by means of lever 33.

When a current is passing through the windings of electromagnet 38, the latter attracts the armature-piece 37, ordinarily kept  
25 off by spring 55. As soon as armature 37 is attracted its nose-like end releases latch 39, which will be pressed by its spring against disk 29 until it is engaged in recess 35 on disk 29, whereby cam-wheels 27 and 28 are coupled with disk 29, and, taken along with same,  
30 revolve on axle 3. However, they remain coupled with disk 29 during one revolution only, since the circuit of the electromagnet 38 is interrupted shortly after the armature 37 has been attracted. As soon as current  
35 ceases to run through electromagnet 38 armature 37 is pulled off by spring 55 and comes in the way of latch 39, thereby disconnecting cam-wheels 27 and 28 from coupling-disk 29. The latter continues rotating loosely  
40 while the former are locked.

Both deciphering devices 7 and 8 are provided with transporting-rolls 7<sup>b</sup> and 8<sup>b</sup>, with projecting teeth 60, engaging into the trans-  
45 port-holes 59 of the registering-strip 44, Fig. 2, thus forcing the latter to follow the motion of devices 7 and 8. During the passing by of the registering-strip 44 contact-levers 40 and 41, of which there is one for each of the  
50 eight longitudinal rows of holes and which are electrically insulated and pivoted on pillar 6 and connected with one pole of the current source 45, fall into the holes of the registering-strip, and in forming contact with  
55 the other pole of the current source 45 close as many electrical circuits as there are transversal holes at one time in the strip. These circuits effect the selection of the matrices and the regulating of the space-casting mechanism. Device 7 reads the "text," while device 8 is provided for the reading of the justification symbols only.

It must be stated yet that axles 4 and 5 revolve at the same speed as main axle 2, which  
65 is driving same, while axle 3 with the disk 29

is arranged so as to revolve only with half the speed of the axle 2.

The purpose of transversal holes (rows 48 and 51 on the registering-strip, Fig. 2) is to set in motion alternately both transporting  
70 devices 7 and 8, and also to lift the lines as soon as their casting is completed. The holes in transversal lines 49, 50, 52, and 53, Fig. 2, are space symbols punched into the registering-strip at the end of each line in  
75 order to give the necessary justification for said line.

When making the registering-strips at the end of each line written, first the holes for the lifting of the cast lines and afterward the  
80 space symbols are punched by the key-board machine.

The function of the deciphering device of the present invention is as follows: The registering-strip 44, Fig. 1, moves in the direc-  
85 tion of the arrows from deciphering device 8 to deciphering device 7. Owing to the fact that cam-wheels 31 and 32 are rotating with the same speed, but possess a different number of cams, (wheel 31 one and wheel 32  
90 three cams,) the transport-roll 8<sup>b</sup> will, by means of lever 33 and latch 18, convey the registering-strip 44 three times as fast as transport-roll 7<sup>b</sup>. The consequence is that the line-lifting holes 48, 51, &c., arrive at con-  
95 tact-lever 41 in one-third of the time which they would need to arrive under contact-lever 40. When any line-lifting hole—for instance, 51, Fig. 2—comes under contact-lever 41, the latter will close the circuit of elec-  
100 tromagnet 21, whereby armature 20 of same is attracted, pin 19 of the latter drawing back pawl 18 from ratchet-wheel 8<sup>a</sup> thus causes transport-roll 8<sup>b</sup> and registering-strip 44 to stop under lever 41. When armature  
105 20 is attracted in the manner explained already, its nose pushes aside lever 22, locking it at the same time by means of its nose and spring 23. Meanwhile transport-roll 7<sup>b</sup> is moving on slowly registering-strip 44.  
110 As soon as line-lifting hole 48, Fig. 2, reaches in turn contact-lever 40 the latter closes the circuit of electromagnet 38, which will attract armature 37 and release latch 39. Latch 39 is pressed by its spring into recess  
115 35 of the coupling-disk 29, whereby cam-wheels 27 and 28 will be caught and forced to turn with the same speed as disk 29. Rod 34 now being held no longer in its uppermost position by the cam of wheel 29 will be  
120 pressed down by spring 36 and will cause the right arm of lever 14 to catch into ratchet-wheel 8<sup>a</sup>, in which position it is kept by spring 13, while pawl 15, fixed on left arm of lever 14, will still remain engaged in  
125 wheel 7<sup>a</sup> by spring 42. At this moment lever 12, being moved to and fro by disk 31 and spring 16, will transport, by pawls 14 and 15, both ratchet-wheels 7<sup>a</sup> and 8<sup>a</sup>, and consequently also strip 44 simultaneously and  
130



with equal speed; but the circuit of electromagnet 38 is interrupted again as soon as by progressive motion of strip 44 the line-lifting holes 48 come without the reach of contact-lever 40. Then the armature 37 being released and pulled off by spring 55 strikes with its nose against latch 39. This latter being lifted from recess 35, disconnects coupling-disk 29 from cam-wheels 27 and 28, whereby the latter are stopped. Immediately before their stopping the cam of wheel 27 presses down lever 25, which pushes aside lever 22 and releases by its nose armature 20, arrested during the simultaneous motion of ratchet-wheels 7<sup>a</sup> and 8<sup>a</sup>. After this rod 34 is again pressed upward by the cam of cam-wheel 28, which causes the right-hand arm of latch-lever 14 to be disengaged from ratchet-wheel 8<sup>a</sup>. Pawl 18, caused to engage again in ratchet-wheel 8<sup>a</sup>, as explained already, begins to convey registering-strip 44 again with threefold speed at deciphering device 8 until the next line-lifting hole approaching will cause pawl 18 again to be disengaged by closing the electric circuit.

As already set forth above, cam-wheels 27 and 28 move only with half the speed of main axle 2. The reason for this is that during their slow motion in one revolution and during the simultaneous motion of devices 7 and 8 the justification symbols 52 53 are read by lever 41 of deciphering device 8 and the space mechanism is adapted according to methods already known in order to produce justified lines. It must be further stated that the deciphering-feelers 40 of device 7 are switched off by suitable means, while the reading of the spacing symbols is attended to by deciphering device 8 and contact-lever 41, so that the holes passing under the feelers 40 have at that moment no effect whatever on the casting-machine.

I claim—

1. In a single-type-casting machine, the combination with a space and a type deciphering drum and a symbol-bearing strip having the spacing symbols on the end of each line and controlling the deciphering operated by said drums, of means for regulating the movement of said drums, said means causing the strip to decipher the spacing symbols for one line before the type symbols of said line are deciphered.

2. In a single-type-casting machine, the combination with a space and a type deciphering drum and a symbol-bearing strip having the spacing symbols on the end of

each line and controlling the deciphering operated by said drums and levers operating said drums, of means for regulating the engagement of said levers with said strip-bearing drums, causing the strip to decipher the spacing symbols for one line before the type symbols of said line are deciphered.

3. In a single-type-casting machine, the combination with a space and a type deciphering drum, and a symbol-bearing strip, having the spacing symbols on the end of each line and controlling the deciphering, cam-wheel-operated levers operating said strip-bearing drums and pawls on said levers, engaging said drums, of electromagnetic means for regulating the engagement of said pawls with said strip-bearing drums, causing the strip to decipher the spacing symbols for one line before the type symbols of said line are deciphered.

4. In a single-type-casting machine, the combination with a space and a type deciphering drum, ratchet-wheels on said drums, pawls adapted to engage in said ratchet-wheels, levers operating said pawls, cam-wheels operating said pawl-operating levers and a symbol-bearing strip, having the spacing symbols on the end of each line and controlling the deciphering operated by said drums, of means controlled by said symbol-bearing strip for controlling the engagement of said lever-operated pawls with said ratchet-wheels, causing said symbol-bearing strip to decipher the spacing symbols for one line before the type symbols of said line are deciphered.

5. In a single-type-casting machine, the combination with a space and a type deciphering drum, ratchet-wheels on said drums, pawls adapted to engage in said ratchet-wheels, levers operating said pawls, cam-wheels operating said pawl-operated levers and a symbol-bearing strip, having the spacing symbols on the end of each line and controlling the deciphering operated by said drums, of electromagnetic means controlled by said symbol-bearing strip for controlling the engagement of said lever-operated pawls with said ratchet-wheels, causing said symbol-bearing strip to decipher the spacing symbols for one line before the type symbols of said line are deciphered.

Signed at Nuremberg, in the Kingdom of Bavaria, this 20th day of March, 1906.

LUDWIG SCHMIDT.

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MAX TAUSOW.