J. DORNETH.

TYPOGRAPH MACHINE.

APPLICATION FILED MAR. 18, 1911.

1,021,828.

Patented Apr. 2, 1912.

7 SHEETS—SHEET 1.

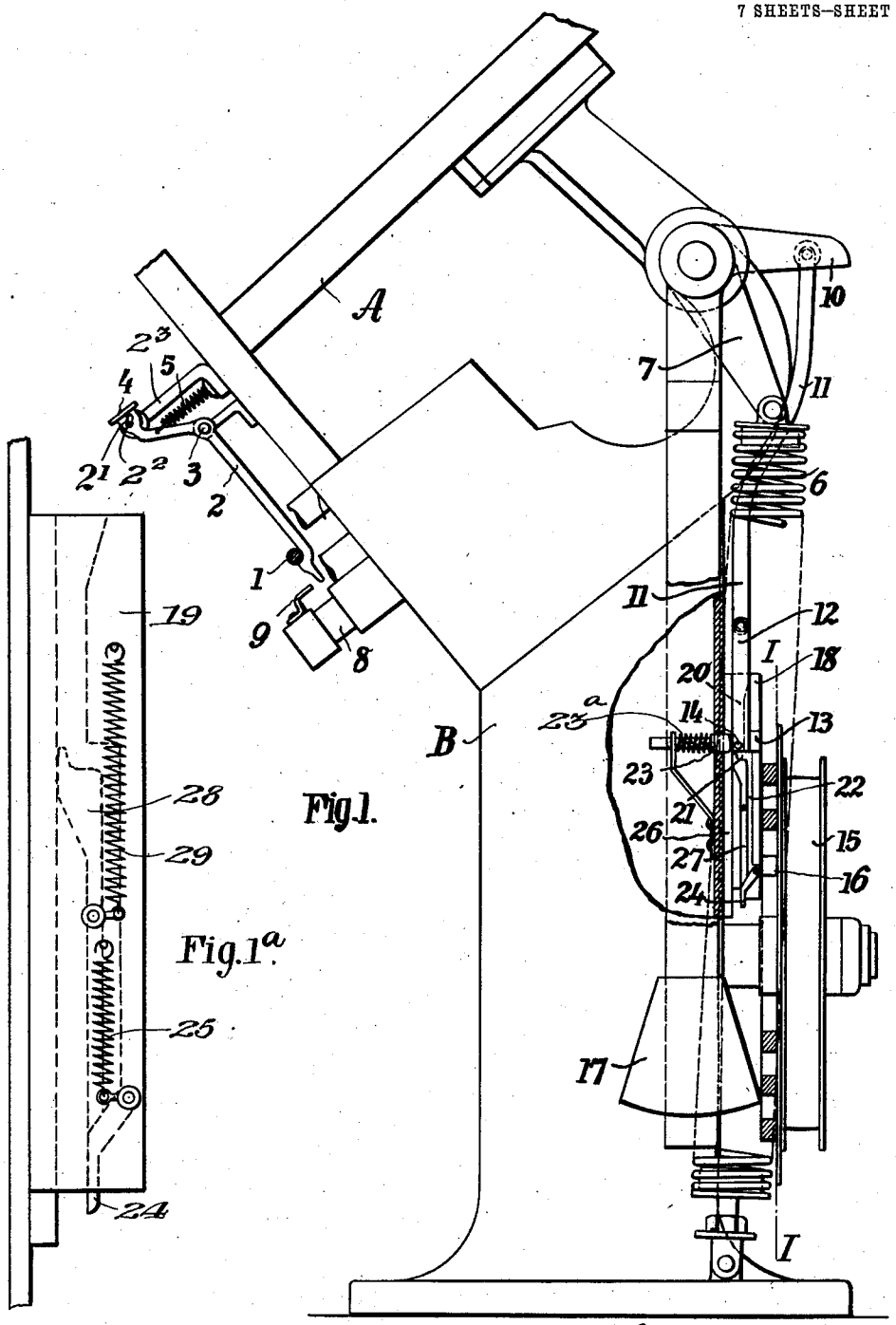

Fig.1.

Fig.1ª.

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7 SHEETS—SHEET 2.

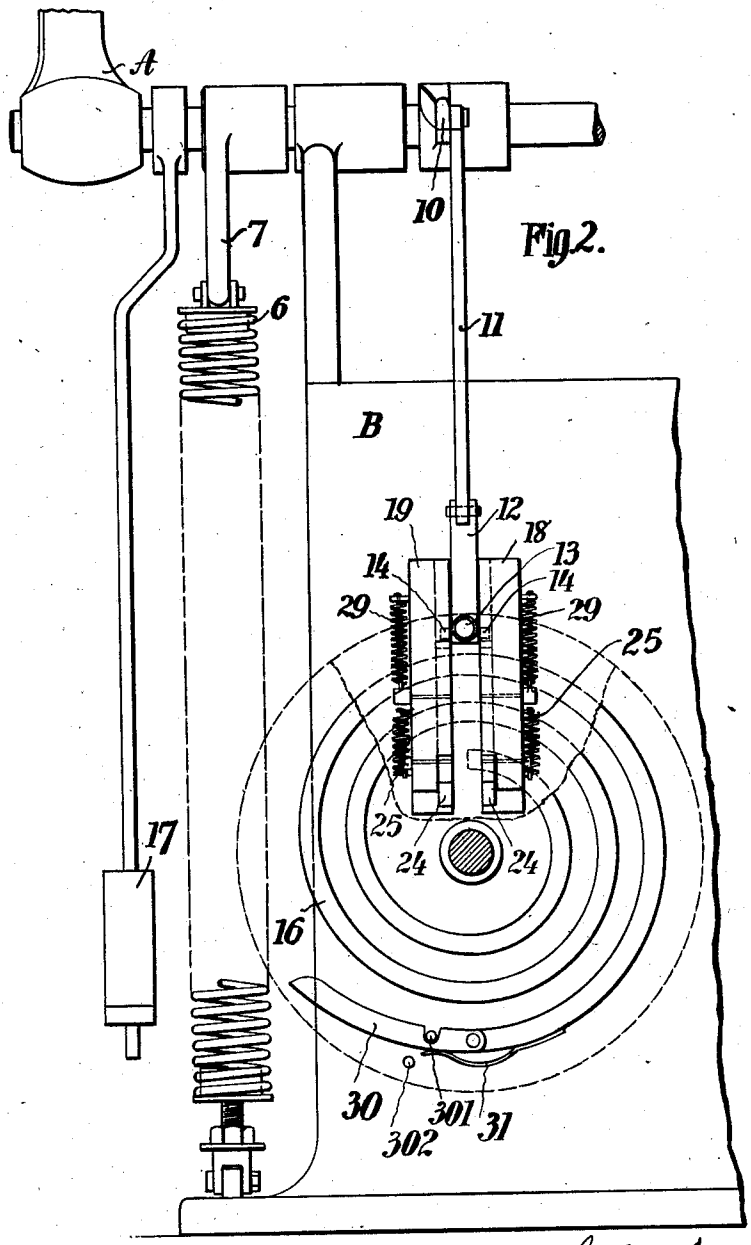

Fig. 2.

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7 SHEETS—SHEET 3.

Fig. 3.

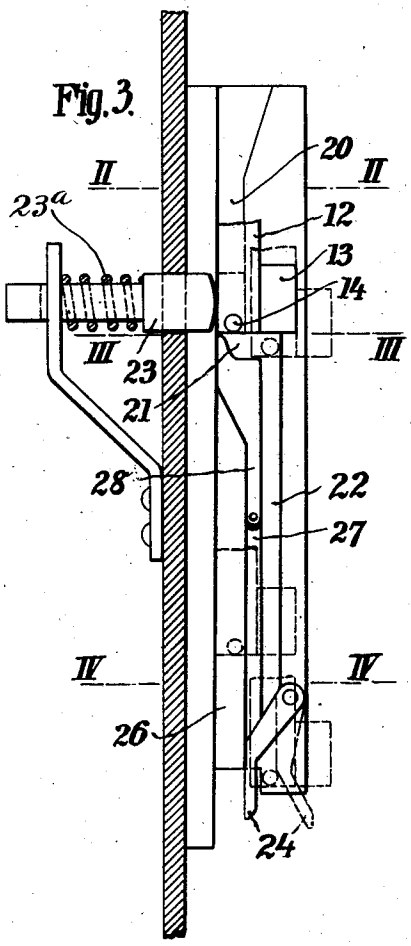


Fig. 4.

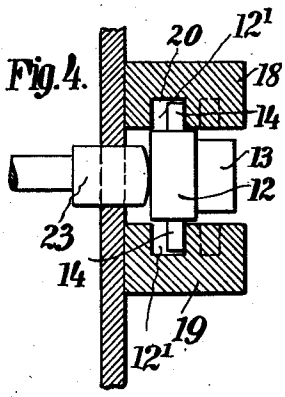


Fig. 5.

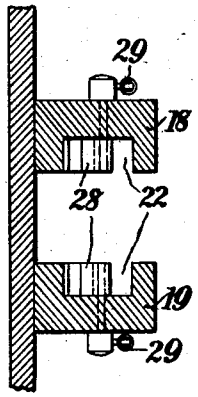
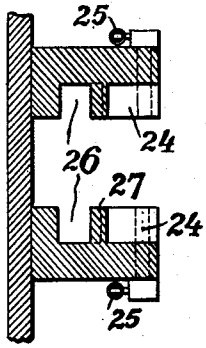


Fig. 6.



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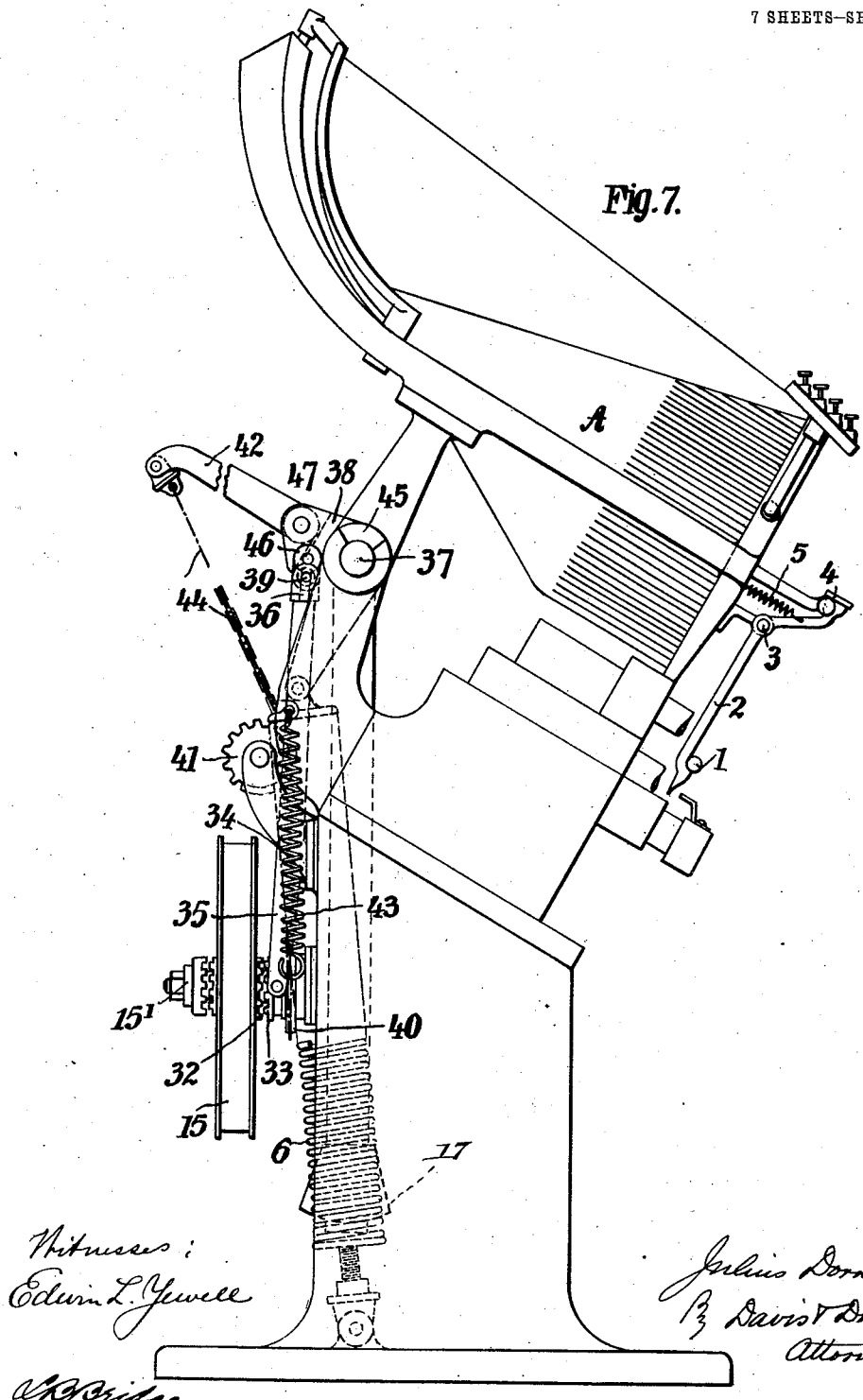
7 SHEETS—SHEET 4.

Fig. 7.



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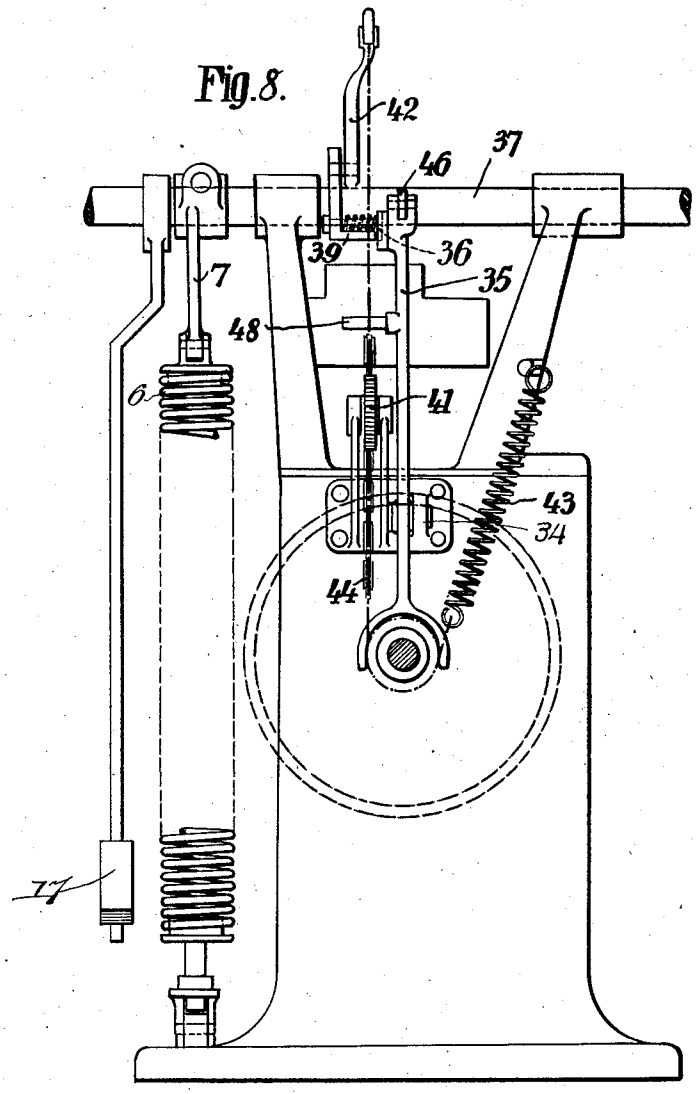
7 SHEETS—SHEET 5.

Fig. 8.



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7 SHEETS—SHEET 6.

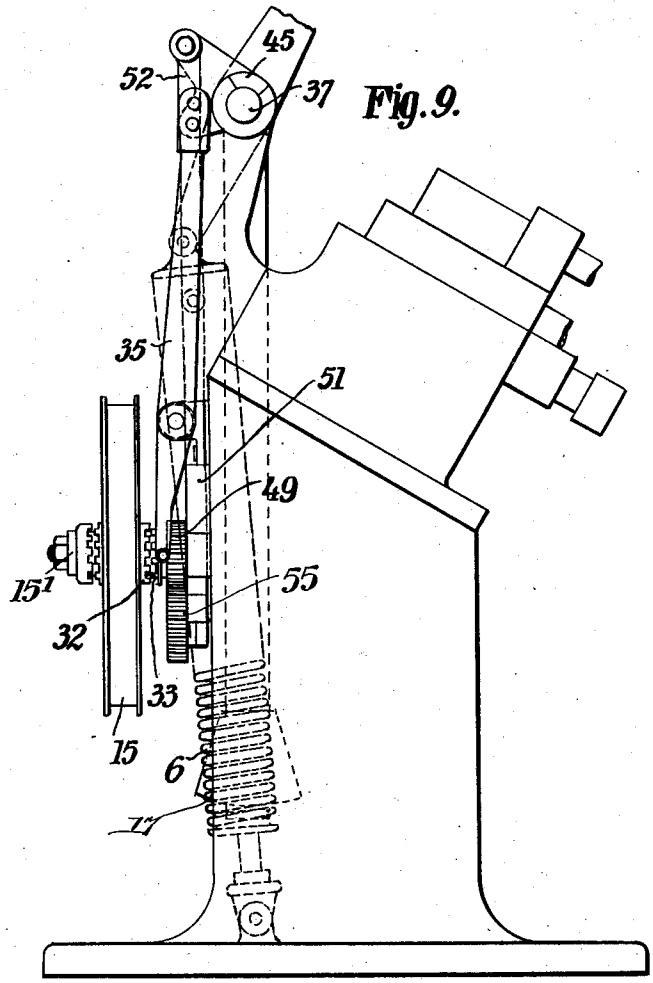

Fig. 9.

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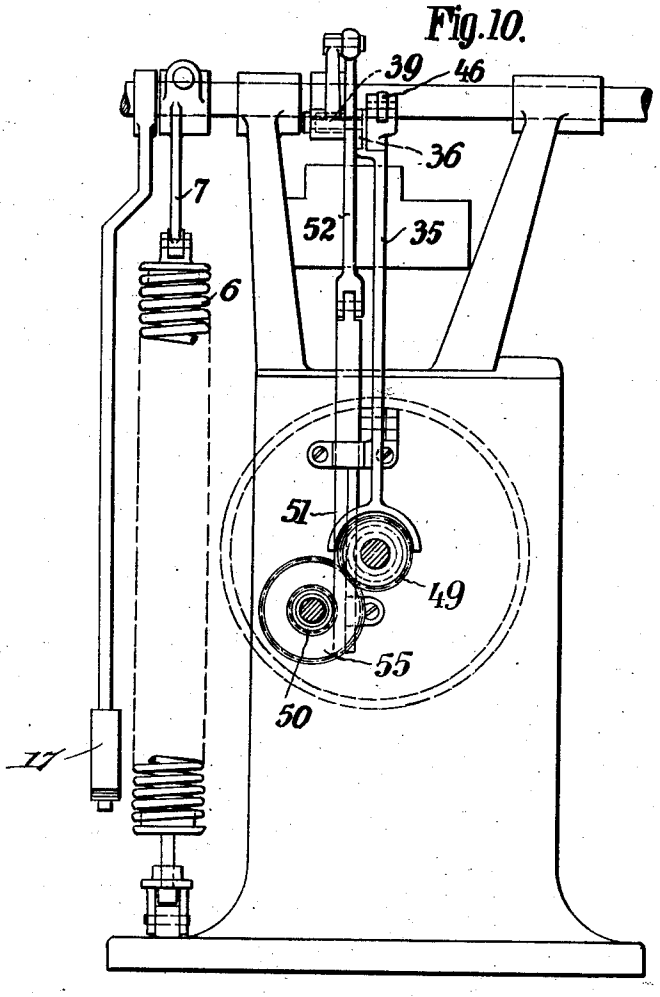
7 SHEETS—SHEET 7.

Fig. 10.



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UNITED STATES PATENT OFFICE.

JULIUS DORNETH, OF BERLIN, GERMANY, ASSIGNOR TO TYPOGRAPH G. M. B. H., OF BERLIN, GERMANY.

TYPOGRAPH-MACHINE.

1,021,828. Specification of Letters Patent. Patented Apr. 2, 1912.

Application filed March 18, 1911. Serial No. 615,205.

To all whom it may concern:

Be it known that I, JULIUS DORNETH, a subject of the German Emperor, and residing at Berlin, Germany, have invented certain new and useful Improvements in or Relating to Typograph-Machines, of which the following is a specification.

My invention relates to improvements in the class of linotype machines known as the typograph, and more particularly to improvements in the apparatus for distributing the matrices, and generally stated my invention is an improvement on the apparatus described and shown in my copending application for typograph machines, Serial Number 423,954, filed March 2, 1909.

When the line is cast the pump dashes lead into the matrices under a high pressure. During this operation small drops of lead sometimes are spattered about the line holding means, and these lead spatters, as they are called, sometimes interfere with the operation of returning the matrices to their positions in the magazine. This results in the breaking of the matrix bars, or other damage to the machine.

The object of the improvements is, in case of these lead spatters, to prevent the distributing mechanism from being thrown into operation, whereby the matrices or other parts of the machine would be injured. For this purpose my apparatus is constructed in such a way, that the matrix carrier is under the influence of a constantly operative force which tends to slightly rock the same, while it is normally prevented from being rocked by a suitable locking device. The distributing mechanism can not come into operation, unless the matrix carrier has been unlocked and slightly rocked by the constantly acting force.

For the purpose of explaining the invention several examples embodying the same have been shown in the accompanying drawings in which the same letters of reference have been used in all the views to indicate corresponding parts.

In said drawings—Figure 1, is a side view of the machine seen from the right in Fig. 2, Fig. 1^a is a detail side elevation of the switch block, Fig. 2, is a front view of the machine, partly in section, and seen from the right in Fig. 1, Fig. 3, is an enlarged view of a detail, Figs. 4, 5 and 6, are sections of the detail shown in Fig. 3 taken on the lines II—II, III—III, and IV—IV respectively, Fig. 7, is a side view of a modified form of the machine seen from the left, Fig. 8, is a side view of Fig. 7 seen from the left, and Figs. 9 and 10, are respectively a front view and a side view of a further modification of the invention.

Referring particularly to the example illustrated in Figs. 1 to 6 of the drawings, the frame or matrix carrier A is mounted on a supporting or main frame B, whereon it is automatically tilted at intervals, as is usual in machines of this class. To the front side of the machine a rod 1 is secured which is adapted to be engaged by a hooked lever 2. The latter has its fulcrum on the matrix carrier A at 3, and at its end opposite the hooked portion it carries a key 4. Through a slit 2^1 of the lever 2 there projects a pin 2^2 secured to a bracket 2^3 mounted on the matrix carrier A. By means of the slit 2^1 and the relatively stationary pin 2^2 the extent of the movement of the lever 2 when depressing the key 4 is limited. A spring 5 secured with one end to the matrix carrier A and with its opposite end to the lever 2 has the tendency to hold the latter with its hooked end in engagement with the rod 1. When the hooked portion of the lever 2 is thus in engagement with the rod 1, the matrix carrier A can not be rocked. By depressing the key 4 the lever 2 is disengaged from the rod 1, so that the matrix carrier can be rocked. A spring 6 is secured with one end to the main frame B and with the opposite end to an arm 7 secured to the matrix carrier, and the said spring has the tendency to rock the carrier A out of its normal position shown in Fig. 1. When the lever 2 has been thrown out of engagement with the rod 1, the spring 6 rocks the matrix carrier A slightly upward. In the operation of the machine the lever 2 and rod 1 are automatically thrown out of operation, after a line of type has been cast, and in the example shown this is done by means of the shaft 8 of the line compressing arm which in the usual way is shifted upward after the casting operation and strikes with finger piece 9 against the hooked end of the lever 2. If it is desired to take several casts from a line, the matrix carrier is

slightly held downward by the hand of the operator, so that the spring 6 can not come into action, and rocking of the matrix carrier is prevented. As soon as the matrix carrier has been slightly rocked by the spring 6 the matrix distributing apparatus comes into action. For this purpose an arm 10 projecting from the matrix carrier is connected by a link 11 to a slide bar 12 which at its lower end carries a roller 13 and two laterally projecting pins 14, as is shown in detail in Figs. 4 to 6. The said pins slide within vertical guide ways 20 which are formed in blocks 18 and 19 disposed adjacent to a constantly rotating disk 15 which, in the example illustrated, is the main driving disk of the machine. On its face the said disk is formed with a spiral cam groove 16, as is shown in Fig. 2. After the carrier A has been slightly lifted by the spring 6, and moved the slide bar 12 downward, the roller 13 is engaged by the outer end of the cam groove 16. Therefore upon the further rotation of the disk 15 the slide bar is pulled downward, and the matrix carrier A is tilted, until the roller 13 is again disengaged from the cam groove 16 at the inner end thereof, and the carrier is released. To the carrier a weighted lever 17 is secured which by the rocking movement of the carrier is rocked out of its vertical position, so that it rocks the carrier backward into its normal position, in which it is again locked by the hooked lever 2 engaging the rod 1. At their lower ends the guide ways 20 merge into branches 21 disposed at right angles thereto, and from which guide ways 22 extend vertically downward. When by lifting the matrix carrier A the slide bar 12 is shifted downward the pins 14 slide within their guide ways 20 downward, until they are engaged within the branches 21. Now the slide bar 12 is forced forward and into the position shown in dotted lines in Fig. 3 by a spring 23^a actuating pin 23. Thereby the roller 13 is forced into the cam groove 16 which carries the roller and the slide bar connected therewith downward, while the pins 14 slide within the portion 22 of the guide way. At the lower end of the guide ways 22 switch arms 24 are provided, and springs 25 normally hold the arms in a position in which the guide ways 22 are closed. By the pins 14 the said switch levers are pressed backward against the pressure of the springs 25, until the slide bar 12 arrives in its lowermost position. At this moment the rollers 13 are disengaged from the cam groove 16, and the springs 25 and switch levers 24 force the slide bar 12 and the roller carried thereby backward into their normal positions in which the pins can pass through the guide ways 26 and into the portions 20. In order to prevent the pins 14 from directly passing from the guide ways 20 into the guide ways 26 when the slide bar 12 is moving downward, a switch mechanism is provided as follows: The upper part of the partition wall 27 provided between the guide ways 22 and 26 on each side of the slide bar 12 is formed by a rocker 28 which is normally pressed into the position shown in Fig. 3 by a spring 29 and which at its upper end provides the lower wall of the branch 21 of the guide way. These rockers prevent the pins 14 from passing from the guide ways 20 into the guide ways 26, while they permit the same to pass from the guide ways 26 into the guide ways 20. In order that the roller 13 may securely pass into the cam grooves 16 of the disk 15 the wall of the said cam groove is formed at its inlet end of a rocker 30 which is yieldingly pressed into the position shown in Fig. 2 by a spring 31. The rocking movements of the said rocker are limited by two pins 301 and 302.

In the example shown in Figs. 7 to 10 the matrix carrier and its rocking mechanism are so constructed, that the distribution of the matrices can not be effected, before the matrix carrier has been released by its locking mechanism provided by the lever 2 and the rod 1. For this purpose the mechanism for rocking the carrier out of its normal position is normally disconnected from the said carrier, and it is connected therewith by means of a clutch. This construction is better than the one described with reference to Figs. 1 to 6, because in the said example there resides some difficulty in inserting the roller into the cam groove 16 and removing the same from the said cam groove. The clutch is located on the shaft 15^1 which carries the main driving disk 15, and it consists of two clutch members 32 and 33, the member 32 being rigidly secured to the said disk and the member 33 being shiftable on the shaft 15^1 by means of a lever 35 fulcrumed at 34. At its upper end the said lever is formed with an enlarged portion formed with a groove 36. On a shaft 37 secured to the matrix carrier A an arm 38 is mounted which carries a spring actuated pin 39. When the lever 2 is disengaged from the rod 1, and the carrier A is slightly rocked upward by the spring 6 the spring actuated pin 39 is forced into the groove 36 at the upper end thereof, and upon the further movement of the carrier it rocks the clutch lever 35, until the clutch members 32 and 33 are in engagement with each other, whereupon the pin 39 leaves the groove 36 at the lower end of the same. The clutch member 33 is connected with a sprocket wheel 40, and if the clutch members are in their coupling position the said chain wheel is rotated by the disk 15. By such rotation of the sprocket wheel a chain 4

which is guided on the latter and on a pulley 41 is wound up. At one end the said chain is secured to the arm 42 and at the opposite end to a tension spring 43. The rocking movement of the matrix carrier which was started by the spring 6 is therefore completed by the disk 15 through the intermediary of the clutch 32, 33 the sprocket wheel 40, and the chain 44, until a lug 45 provided on the lever 38 strikes against a roller 46 mounted on the clutch lever 35 and brings the clutch 32, 33 into its inoperative position. However, the matrix carrier is not directly arrested upon the disconnection of the said clutch members, but is rocked further by its weight and its impact, and it puts the spring 6 under tension which now acts as a brake. When the carrier has come to a stand still, it is immediately pulled backward by the tension of the spring 6, which spring again acts as a brake near the end of the rocking movement of the matrix carrier. It is manifest that when the main frame A swings downwardly to its setting position the arm 7 extends the spring 6, and that, therefore, the said spring while under tension will serve as a brake to gradually stop the downward swinging movement of the frame A. This spring is so proportioned and tensioned that it brings the carrier to rest with the smallest amount of jar possible. When the matrix carrier is thrown to its upper or distributing position the arm 7 swings across the line between the center of the matrix carrier shaft and the lower pivotal connection of the spring 6. After the said arm passes said line it extends the spring 6 and then the tension of said spring serves to retard the movement of the carrier and the spring is then acting as a brake. The momentum of the matrix carrier and the weight 17 is sufficient to move the carrier to its distributing position, but as soon as its movement is arrested the spring 6 will be under sufficient tension to return the carrier to its normal setting position. The weight of the carrier and of the weight 17 will be sufficient to extend the spring 6 upon the return movement of the carrier to its setting position, and the latch lever 2 will engage the bar 1 and thereby hold the spring 6 under considerable tension, so that when said latch lever is released the spring 6 will start the carrier on its upward movement and move it sufficiently to bring the roller 13 into the path of the pivoted rocker 30 of the cam groove 16. To prevent the lever 42 from striking on the driving disk 15 when the matrix carrier A is rocked it is jointed to the lever 38 at 47, so that it can rock upward independently of the lever 38. The clutch lever 35 carries a pin 48 which provides a support for the lever 42 before the latter comes in contact with the driving disk 15. Instead of the connecting means a part of which is formed by the chain other means may obviously be provided.

In the example shown in Figs. 9 and 10 the mechanism for throwing the clutch members 32 and 33 into coöperation is the same as that described with reference to Figs. 7 and 8. However, the clutch member 33 is not connected with a sprocket wheel, but with a spur gear 49 which is in mesh with a spur gear 55 of larger diameter. To the latter a driving wheel 50 is secured which is in engagement with a toothed rack 51 connected with the matrix carrier through a link 52. By throwing the clutch member 33 into operative position the matrix carrier is rocked through the intermediary of the toothed rack 51 during the downward stroke thereof. The clutch is thrown out of operation by means of the lug 45, engaging the upper end of the lever 35 and disconnecting the members 32 and 33 of the clutch, whereupon the carrier completes its movement independently of its driving mechanism, and it is rocked backward into its initial position in the manner described with reference to Figs. 7 and 8.

I claim herein as my invention:

1. A machine of the character described having normally locked matrix supporting means capable of movement into and out of position to distribute the matrices supported thereby, means operative after the casting operation to unlock said supporting means, means to move said supporting means into distributing position, and means to return said supporting means into normal position.

2. A machine of the character described having normally locked tilting matrix supporting means capable of operation, when tilted, to distribute the matrices supported thereby, means operative after the casting operation to unlock said supporting means, means to tilt said supporting means into distributing position, and means to return said supporting means into normal position.

3. A machine of the character described having matrix supporting means capable of movement into and out of position to distribute the matrices supported thereby, hand controlled locking means for said supporting means, automatic means operative after the casting operation to unlock said supporting means, means to move said supporting means into distributing position, and means to return said supporting means into normal position.

4. A machine of the character described having tilting matrix supporting means capable of operation, when tilted, to distribute the matrices supported thereby, hand controlled locking means for said supporting means, automatic means operative after the casting operation to unlock said supporting means, means to tilt said support-

ing means into distributing position, and means to return said supporting means into normal position.

5. A machine of the character described having matrix supporting means capable of movement into and out of position to distribute the matrices supported thereby, means for starting the movement of said matrix supporting means into distributing position, means independent of said starting means to complete the movement of said supporting means, and means to return said supporting means into normal position.

6. A machine of the character described having tilting matrix supporting means capable of operation, when tilted, to distribute the matrices supported thereby, means for partly tilting said supporting means, means independent of said partly tilting means for completing the tilting operation, and means to return said supporting means into non-tilted position.

7. A machine of the character described having normally locked matrix supporting means capable of movement into and out of position to distribute the matrices supported thereby, constantly operative means for starting the movement of said matrix supporting means into distributing position, means to unlock said supporting means, means independent of said starting means to complete the movement of said support-means, and means to return said supporting means into normal position.

8. A machine of the character described having normally locked tilting matrix supporting means capable of operation, when tilted, to distribute the matrices supported thereby, constantly operative means for partly tilting said supporting means, means to unlock said supporting means, means independent of said partly tilting means to complete the tilting operation, and means to return said supporting means into non-tilted position.

9. A machine of the character described having normally locked matrix supporting means capable of movement into and out of position to distribute the matrices supported thereby, a spring adapted to start the movement of said matrix supporting means into distributing position, means to unlock said supporting means, means independent of said spring to complete the movement of said supporting means, and means to return said supporting means into normal position.

10. A machine of the character described having normally locked tilting matrix supporting means capable of operation, when tilted, to distribute the matrices supported thereby, a spring adapted to partly tilt said supporting means, means to unlock said supporting means, means independent of said spring to complete the tilting operation, and means to return said supporting means into non-tilted position.

11. A machine of the character described having matrix supporting means capable of movement into and out of position to distribute the matrices supported thereby, means operative after the casting operation for starting the movement of said matrix supporting means into distributing position, means independent of said starting means to complete the movement of said supporting means, and means to return said supporting means into normal position.

12. A machine of the character described having tilting matrix supporting means capable of operation, when tilted, to distribute the matrices supported thereby, means operative after the casting operation for partly tilting said supporting means, means independent of said partly tilting means for completing the tilting operation, and means to return said supporting means into non-tilted position.

13. A machine of the character described having matrix supporting means capable of movement into and out of position to distribute the matrices supported thereby, means operative by hand and after the casting operation automatically for starting the movement of said matrix supporting means into distributing position, means independent of said starting means to complete the movement of said supporting means, and means to return said supporting means into normal position.

14. A machine of the character described having tilting matrix supporting means capable of operation, when tilted, to distribute the matrices supported thereby, means operative by hand and after the casting operation automatically for partly tilting said supporting means, means independent of said partly tilting means for completing the tilting operation, and means to return said supporting means into non-tilted position.

15. A machine of the character described having normally locked matrix supporting means capable of movement into and out of position to distribute the matrices supported thereby, automatically operating means to unlock said supporting means, means to move said supporting means into distributing position after it is unlocked and means to return said supporting means to its normal position.

16. A machine of the character described having normally locked tilting matrix supporting means capable of operation, when tilted, to distribute the matrices supported thereby, automatically operating means to unlock said supporting means, means to tilt said supporting means into distributing position and means to return said tilting means into its normal position.

17. In a machine of the character described, a tilting matrix supporting means, means to lock said supporting means in its setting position, yieldable means to give said supporting means its initial movement toward its distributing position, means for completing the upward tilting movement of the support, said means being normally inoperative, and means whereby the initial movement of the support will render the said tilting means operative.

18. A machine of the character described having a tilting matrix supporting means, means to lock said supporting means in its setting position, yieldable means for giving said supporting means its initial upward movement toward its distributing position, means to release said locking means, means to complete the upward movement of the support, and means whereby the support will be returned to its normal setting position by the yieldable means which gave it its initial upward movement.

19. In a machine of the character described, a tiltable matrix supporting means, means for locking said supporting means in its normal setting position, a spring connected to said supporting means and arranged to give said means its initial upward movement, said spring being so arranged that it will be under tension when the supporting means has completed its upward movement, whereby said spring will serve to return said supporting means to its normal setting position, means to complete the upward tilting movement of the supporting means, said means being normally inoperative, and means whereby the initial upward movement of the supporting means will render the tilting means operative.

20. A machine of the character described comprising a tiltable matrix supporting means, means for normally locking said supporting means in its setting position, yieldable means for giving said supporting means its initial upward movement, means for completing the upward tilting movement of said supporting means, said means being normally inoperative, means whereby the initial upward movement of the supporting means will render the tilting means operative and means operated through the line compressing means to release the matrix supporting means when the line compressing means is released.

21. A machine of the character described comprising a tiltable matrix supporting means, said supporting means being provided with an arm at its pivotal point, a spring connected to said arm and to a rigid part, said spring being so arranged as to be on one side of the pivotal point and under tension when the matrix supporting means is in its distributing position and to be on the other side of the said pivotal support and under tension when the matrix supporting means is swung to its setting position, whereby said spring will serve as a brake to retard the movement of the supporting means in both directions and will also serve to give said supporting means its initial movement toward its distributing position.

22. A machine of the character described comprising a tiltable matrix supporting means, means to normally lock said supporting means in its setting position, a spring connected to said supporting means, said spring being held under tension when the supporting means is locked, means for releasing said locking means, means whereby the spring will give said supporting means its initial upward movement, means for completing the upward tilting movement of the supporting means, said means being normally inoperative, means whereby the initial upward movement of the supporting means will render said means operative, said spring being so connected to the supporting means that it will be under tension when said supporting means has completed its upward movement, means to release the tilting means from the supporting means near the limit of the upward movement of the supporting means whereby the spring will stop the upward movement of said supporting means and return it to its normal setting position.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JULIUS DORNETH.

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HENRY HASPER.