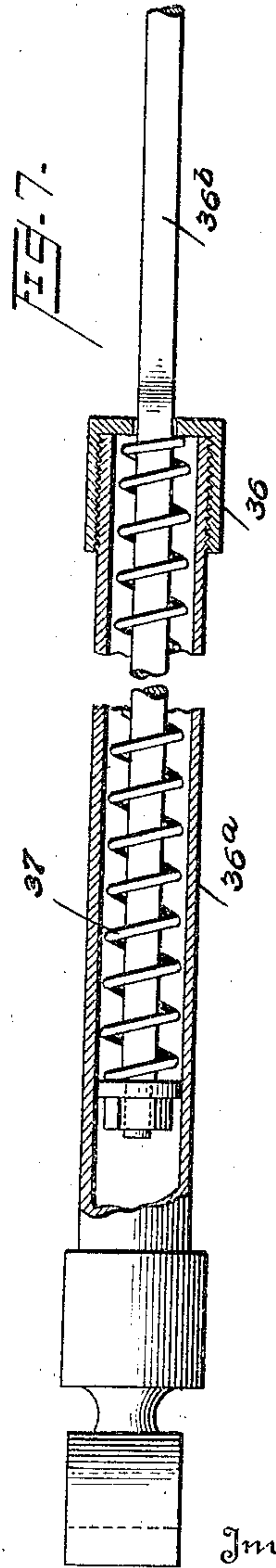
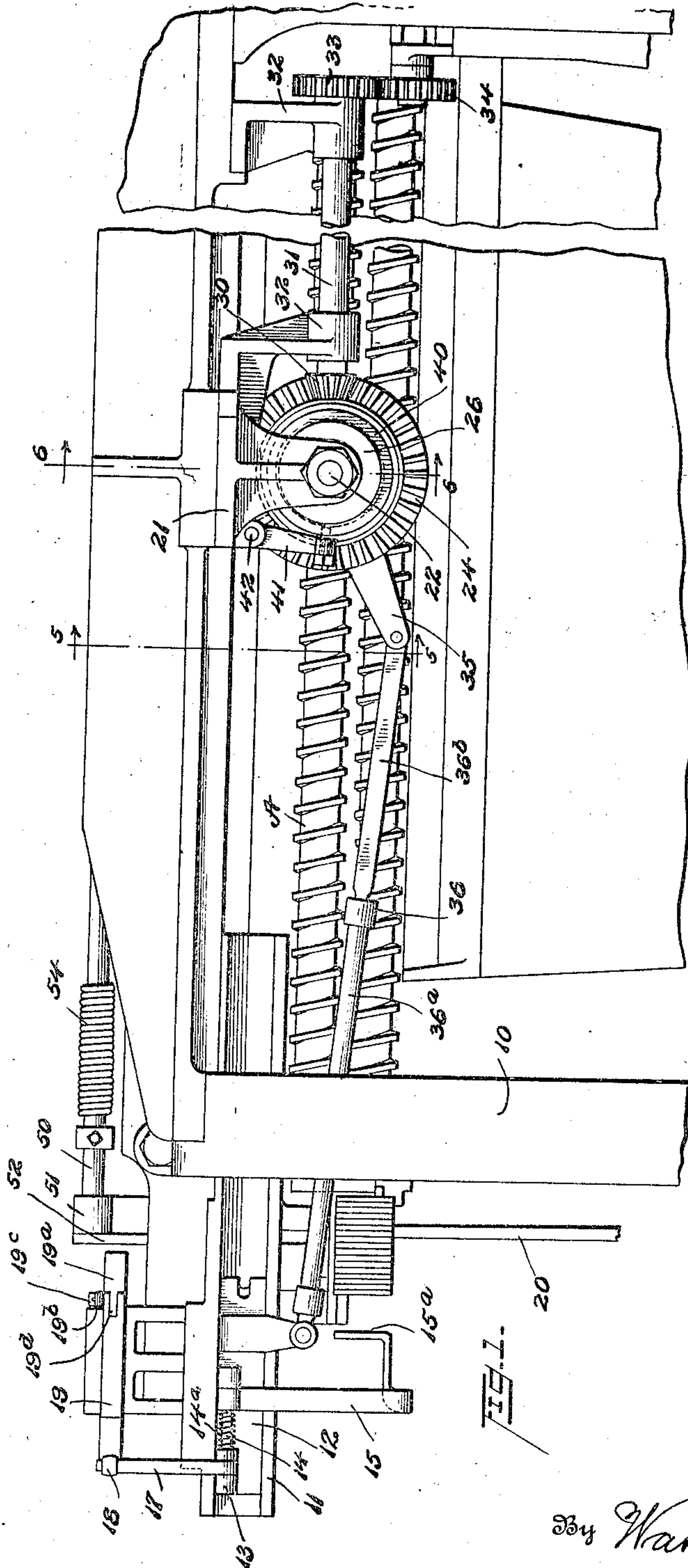


Jan. 2, 1923.

1,441,101

F. W. LETSCH.  
DISTRIBUTING MECHANISM FOR TYPOGRAPHIC MACHINES.  
FILED APR. 28, 1920.

3 SHEETS-SHEET 1



Inventor

F. W. Letsch,

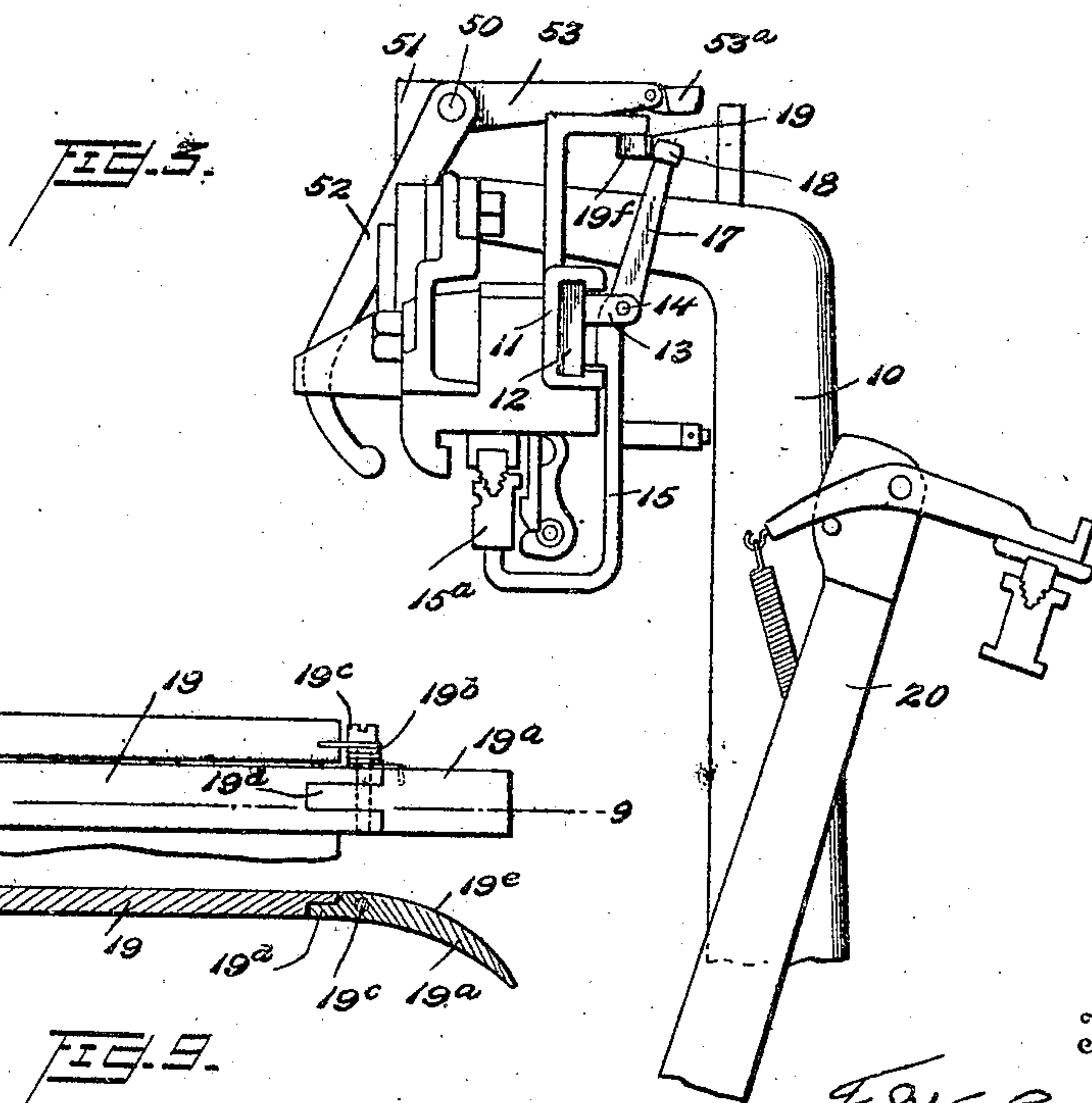
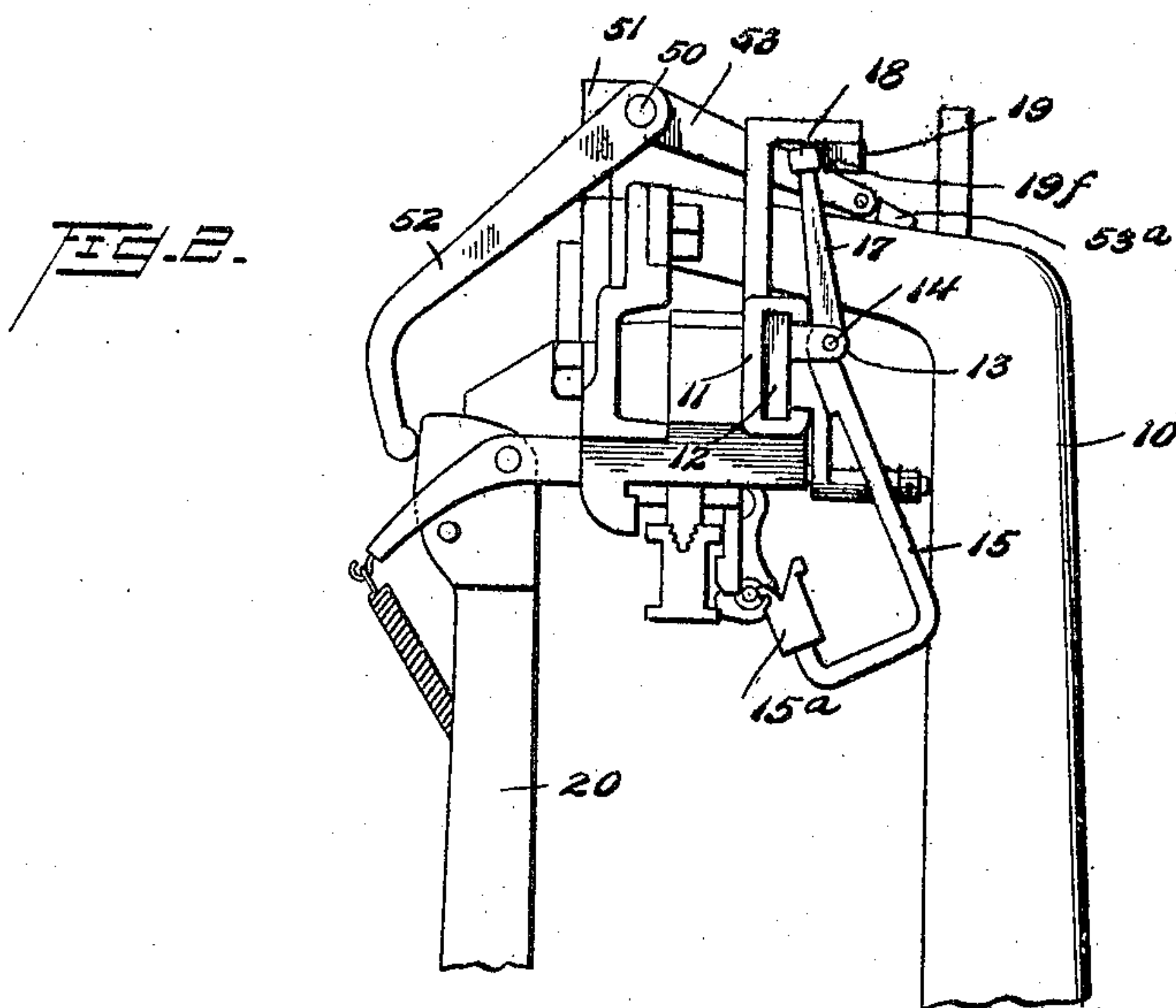
By Watson, Cox, Morse & Grindle,  
Attorneys.

Jan. 2, 1923.

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3 SHEETS-SHEET 2



Inventor

F. W. Lelsch,

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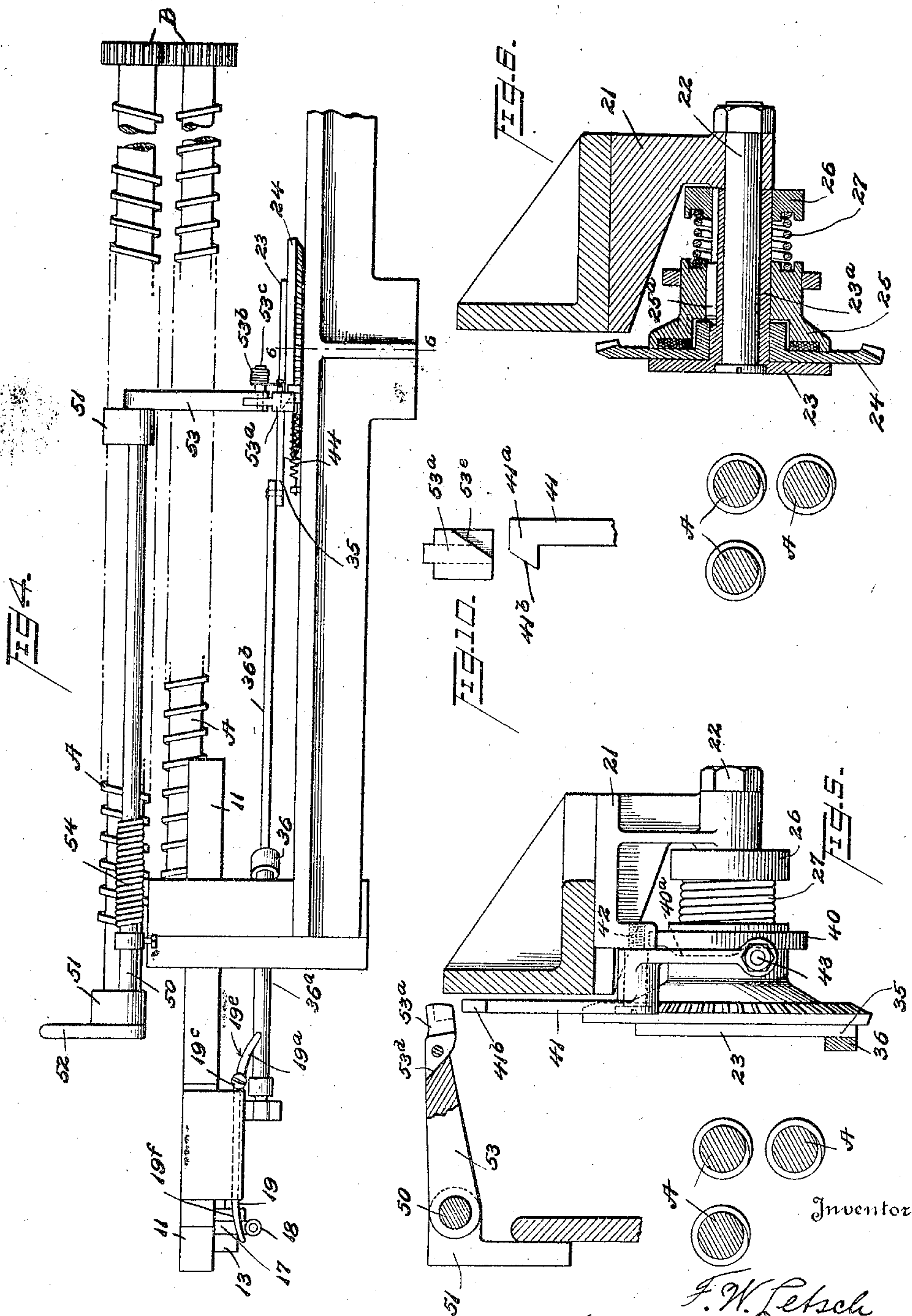
Attorneys.

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FILED APR. 28, 1920.

3 SHEETS-SHEET 3



Inventor

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Attorneys.



## UNITED STATES PATENT OFFICE.

FREDERICK W. LETSCH, OF BALTIMORE, MARYLAND.

DISTRIBUTING MECHANISM FOR TYPOGRAPHIC MACHINES.

Application filed April 28, 1920. Serial No. 377,252.

*To all whom it may concern:*

Be it known that I, FREDERICK W. LETSCH, a citizen of the United States, and residing at Baltimore city, Maryland, have invented certain new and useful Improvements in Distributing Mechanism for Typographic Machines, of which the following is a specification.

This invention relates to distributing mechanism for typographic machines and particularly to what is known as linotype machines. In machines of this character means are employed for elevating matrices and holding them adjacent the distributing mechanism. This is generally known as the second elevator bar. Mechanism is also employed for transferring the matrices from the elevator bar to the distributing mechanism. The present invention relates particularly to certain improvements in such transfer mechanism.

In machines of this kind as now generally constructed, the transfer mechanism is operated from the main shaft of the machine by means of a long arm to which the transfer mechanism is attached. This arm has a long sweeping movement which is more or less undesirable as it is apt to be somewhat abrupt and irregular. Furthermore, it is necessary for the parts to be so arranged that this arm may be moved away from a position adjacent the distributing mechanism before the elevator bar is lifted since otherwise the parts will interfere.

By the present invention the means for operating the transfer mechanism is mounted on the frame of the machine adjacent the distributing mechanism with the result that a lighter, smoother movement of the transfer mechanism can be obtained. An additional advantage of the present arrangement also lies in the fact that after a collection of matrices has been moved from the elevator bar the transfer mechanism need not be returned to position to move the next collection of matrices from the bar until after such bar has moved downwardly, received a new supply of matrices and again reached its uppermost position. The result is that more time is allowed for transferring the matrices into the distributing mechanism which fact admits of a slower, easier movement of the transfer mechanism and thus the danger of bending or breaking the thin matrices is more effectively obviated.

The invention in one specific form is set

forth in the following specification and illustrated in the accompanying drawings, but it is apparent that various modifications in the details of this specific construction may be made without departing from the true spirit or scope of the invention.

In the drawings forming part of this specification:

Figure 1 is a front elevation of a portion of a linotype machine with the present invention applied thereto, certain parts being broken away and other well known parts being omitted;

Figure 2 is an end view of the mechanism illustrated in Figure 1 showing the parts as they appear when viewed from the left in said figure, this view also omitting old and well known features of the machine;

Figure 3 is an end view similar to that shown in Figure 2 with certain of the parts illustrated in different positions;

Figure 4 is a plan view of the mechanism shown in Figure 1, various parts being broken away and others being omitted for the sake of clearness;

Figure 5 is a sectional view on the line 5—5 of Figure 1, certain of the parts appearing in elevation;

Figure 6 is a sectional view on the line 6—6 of Figures 1 and 4;

Figure 7 is a detailed sectional view showing the construction of the link employed for operating the transfer mechanism;

Figure 8 is a side elevation of the cam bar employed for swinging the matrix pusher arm at certain points in its travel;

Figure 9 is a longitudinal sectional view on the line 9—9 of Figure 8;

Figure 10 is an elevational view showing the detailed construction of certain parts of the mechanism for controlling the movements of the transfer mechanism.

Referring to the drawings in detail 10 represents a part of the frame of the machine which supports the mechanism to which the present invention relates. Supported on this frame is a slideway 11 in which a slide 12 is adapted to reciprocate. Mounted on the slide 12 are brackets 13 and a shaft 14 is rotatably mounted in these brackets. A pusher arm 15 is keyed to the shaft 14, this arm carrying at its lower end a part 15<sup>a</sup> which is adapted to contact with and move the matrices from the elevator bar into the distributing mechanism. An arm 17 is also rigidly secured to the shaft



14, this arm carrying at its upper end a roller 18 which at certain times is caused to contact with and bear against a cam bar 19 secured to the upper portion of the slideway 11 of the machine. A coiled spring 14<sup>a</sup> is mounted on the shaft 14 which spring is so arranged as to hold the pusher arm 15 normally in position to contact with matrices held on the elevator bar.

Referring particularly to Figures 8 and 9, it will be observed that the cam bar 19 is provided with a pivoted member 19<sup>a</sup> which is normally held in the position shown in Figure 9 by means of a coiled spring 19<sup>b</sup> which surrounds the pivot pin 19<sup>c</sup> on which the pivoted member 19<sup>a</sup> is mounted. The pivoted member 19<sup>a</sup> is held from movement in one direction by means of a projection 19<sup>d</sup> which in one position contacts with the main portion of the bar 19 and holds such member against movement.

It will be understood that the cam bar 19 is so positioned that as the slide 12 carrying the arm 17 is moved toward the right, that is, toward the distributing mechanism, the roller 18 will be out of contact with such bar until the slide approaches the end of its movement in that direction. On nearing the end of such movement the roller 18 of the arm 17 will contact with the pivot member 19<sup>a</sup> of the cam bar and move the same about the pivot pin 19<sup>c</sup>. After the arm 17 with the roller 18 passes the pivoted member 19<sup>a</sup> such member will be returned to its former position under the influence of the spring 19<sup>b</sup>. When the slide carrying the arm 17 and the roller 18 begins its movement in the opposite direction i. e., away from the distributing mechanism, the roller 18 will contact with the rear curved portion 19<sup>e</sup> of the pivot member 19<sup>a</sup> with the result that the roller will be compelled to follow along the rear portion of the cam bar and it will be understood that when the roller 18 is in contact with such rear portion of the cam bar 19 the pusher arm 15 will be swung to the position illustrated in Figure 2 of the drawing. When the slide 12 approaches the limit of its movement toward the left the roller 18 will pass along the inclined portion 19<sup>f</sup> of the cam bar and will finally reach a position so that it will be again free to move toward the right without interfering with the cam bar.

The elevator bar designated by the numeral 20 is adapted to lift matrices from another part of the machine and hold them in position adjacent the distributing mechanism. The elevator bar 20 is operated from the main shaft of the machine in a manner which is well known and a description or illustration of such operating mechanism is unnecessary.

The means for reciprocating the slide 12 will now be described. A bracket 21 is ar-

ranged on the upper part of the frame 10 adjacent the distributing mechanism. A bearing pin 22 is mounted in this bracket 21 and a rotary member 23 is journaled on said pin. The member 23 is provided with a hub portion 23<sup>a</sup> on which a beveled gear wheel 24 is rotatably mounted. A clutch member 25 is also mounted on the hub of the rotary member 23, these parts being keyed together by means of a key 25<sup>a</sup> so that the clutch member 25 can move longitudinally of the hub of the member 23 but relative rotation between such parts is prevented. A member 26 is also secured to the hub of the rotary member 23 and a coiled spring 27 surrounds the hub of member 23 and bears against the clutch member 25 and the member 26. This spring tends to constantly urge the clutch member 25 into contact with the surface of the gear wheel 24. The gear wheel 24 is constantly driven through the medium of a beveled pinion 30 mounted on a shaft 31 rotatably supported in brackets 32 and 21 secured to the frame 10 of the machine. The shaft 31 carries at its end a spur gear 33 which cooperates with an idler gear 34, which meshes with one of the gears B, B, employed for driving the distributing screws A constituting part of the distributing mechanism.

The rotary member 23 carries an arm 35 which arm is connected to the slide 12 heretofore referred to through the medium of a spring link 36. This link, as shown in Figure 7 of the drawing, consists of two telescoping parts 36<sup>a</sup> and 36<sup>b</sup> between which a coiled spring 37 is arranged, it being understood that this spring constitutes a yielding means by which the slide 12 is operated as the rotary member 23 is caused to rotate.

Means are provided for producing an intermittent rotary motion of the member 23 and such means will now be described. Mounted upon the clutch member 25 is a cam 40. A lever 41 is pivoted to the bracket 21 or any suitable part of the frame 10 through the medium of a fulcrum pin 42. At its upper end the lever 41 is provided with a laterally projecting portion 41<sup>a</sup> having an inclined surface 41<sup>b</sup> for a purpose hereinafter described. At its lower end said lever carries a pin 43 which is positioned to cooperate with the cam 40 heretofore referred to. A spring 44 holds the lever 41 normally in such position that the cam 40 will contact with the pin 43 secured thereto. The cam 40 is provided with a high portion 40<sup>a</sup> and it will be understood that when such high portion of the cam comes in contact with the pin 43 of the lever 41 the clutch member 25 will be caused to move away from the gear wheel 24 at which time rotation of the clutch member 25 and the rotary member 23 driven thereby will cease.

The lever 41 at certain intervals is caused



to move about its fulcrum pin 42 so as to disengage the pin 43 from the high portion of the cam, such movement of the lever 41 being brought about by the following mechanism. A shaft 50 is rotatably mounted in suitable brackets 51 secured to the frame 10 which shaft carries at one end a thrust arm 52 and at the other end an operating arm 53. A coiled spring 54 is mounted on the shaft 50 which spring tends to hold the shaft in such position that the thrust arm 52 will normally occupy the position shown in Figure 3. The thrust arm 52 is so positioned that it will be struck and moved by the elevator bar 20 as the latter approaches its uppermost position. When the elevator bar contacts with the thrust arm 52 the latter is moved into the position shown in Figure 2.

The operating arm 53 carries at its end a pivoted trigger 53<sup>a</sup> which is normally held in a horizontal position by means of a coiled spring 53<sup>b</sup> mounted on the pivot pin 53<sup>c</sup> by which the trigger 53<sup>a</sup> is pivoted to the arm 53. The trigger 53<sup>a</sup> has a projection 53<sup>d</sup> which is normally held in contact with a part of the arm 53 by means of the spring 53<sup>b</sup>, heretofore referred to. The trigger 53<sup>a</sup> is also provided with an inclined face 53<sup>e</sup> which cooperates with the inclined face 41<sup>b</sup> on the lever 41 (see Figure 10). It will be understood that as the operating lever is caused to move downwardly the face 53<sup>e</sup> of the trigger 53 will contact with the face 41<sup>b</sup> of the lever 41 with the result that said last named lever will be caused to swing about its fulcrum pin 42. After the trigger passes the laterally projecting portion 41<sup>a</sup> of the lever 41, this lever will be restored to normal position under the influence of the spring 44. As the lever 53 moves upwardly the trigger 53<sup>a</sup> will yield and move past the projecting portion 41<sup>a</sup> of the lever 41.

The operation of the various parts of the mechanism have already been described to some extent and a brief general statement of the operation will suffice. When the elevator bar 20 carrying the supply of matrices approaches its uppermost position it will contact with and move the thrust arm 52 from the position shown in Figure 3 to that shown in Figure 2, such movement of the thrust arm causing rotation of the shaft 50 and movement of the operating arm 53. As this latter arm is caused to move downwardly the trigger 53<sup>a</sup> pivoted to the end of the same will contact with and move the lever 41 about the fulcrum 42, such movement of the lever 41 causing the pin 43 carried by such lever to be withdrawn from contact with the cam 40 secured to the clutch member 25. The clutch member under the influence of the spring 27 then moves into contact with the gear wheel 24 which is constantly rotated through the medium of the

spur gear 30, shaft 31 and driving mechanism heretofore referred to. When the clutch member 25 contacts with the gear 24 such clutch member is caused to rotate and in doing so causes rotation of the rotary member 23 to which the arm 35 is secured. Movement of this arm through the medium of the connecting link 36 causes movement of the slide 12 first toward the left and then toward the right. This slide when at rest is positioned near the frame 10 and adjacent the end of the distributing screws A. As the slide moves toward the left the arm 15 pivotally secured thereto is swung to the position shown in Figure 2, by reason of the contact of roller 18 with the rear of the cam bar 19. When the slide reaches the limit of its movement to the left the arm 15 under the influence of the spring 14<sup>a</sup> assumes a vertical position, as shown in Figure 3 of the drawing, the roller 18 at such time being free from the cam bar 19 and the member 15<sup>a</sup> being in position to move the matrices from the elevator bar 20 as the slide 12 and arm 15 moves to the right. It will be understood that after the arm 15 pushes the matrices from the elevator bar the matrices will be halted and fed one by one into the distributing mechanism in the usual way. Since the arm 35 does not stop until a complete rotation is made, it follows that when the matrices are stopped adjacent the distributing mechanism the spring 37 will be compressed between parts 36<sup>b</sup> and 36<sup>a</sup> of the link 36. The matrices will thus be fed or pushed into the distributing mechanism by the arm 15 acting under the influence of the compressed spring 37. It will also be understood that the parts of the mechanism are so timed that when a supply of matrices carried by the elevator bar have been pushed from said bar by the arm 15 and while this arm is still pressing the matrices toward the distributing screws A the elevator bar will be free to move downwardly and when this takes place the thrust arm 52 will assume the position shown in Figure 3 and the operating arm 53 will be moved to its original position above the lever 41. When the lever 41 is free from the influence of the operating arm 53 the spring 44 will move said lever 41 so that the pin 43 will again be in position to contact with the high portion 40<sup>a</sup> of the cam 40, the result being that as the clutch member 25 continues to rotate the high portion of the cam 40<sup>a</sup> contacts with said pin 43 and withdraws the clutch member from contact with the gear wheel 24 whereupon rotation of the member 23 ceases and the movement of the slide 12 toward the left will not occur again until the elevator bar again contacts with the thrust member 52 and moves the various parts so as to cause the operation to be repeated.



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

1. The combination with matrix distributing mechanism of means for elevating matrices and holding the same adjacent said mechanism, a pusher-arm, pivotally supported intermediate its ends, means for moving the same toward and from one end of said mechanism, said pusher-arm being normally positioned to contact with and move matrices from said elevating means to said distributing mechanism during its travel toward said mechanism, and means cooperating with the other end of said pusher arm for holding the first named end thereof out of its normal position during travel in the opposite direction.

2. The combination with matrix distributing mechanism of means for holding matrices adjacent thereto, a slide, a pusher-arm pivotally mounted thereon intermediate its ends, means for moving said slide toward and from said distributing mechanism, means for holding one end of said pusher-arm normally in position to contact with and move matrices from said holding means to said distributing mechanism as said slide travels toward said mechanism, and means for contacting with the other end of said arm for moving and holding the first named end of said pusher-arm out of such normal position as said slide travels in the opposite direction.

3. In a mechanism of the kind described, a slide, means for reciprocating the same, a shaft rotatably mounted on said slide, a pusher-arm having one end secured to said shaft, a second arm also secured to said shaft, yielding means for holding said shaft in one position, a cam bar, said second arm being positioned to move free of said cam bar when said slide moves in one direction, and means for causing said second arm to engage said cam bar during movement of said slide in the opposite direction.

4. The combination with matrix distributing mechanism of means for holding matrices in position adjacent said distributor mechanism, a slide, means for reciprocating the slide, a shaft rotatably mounted on said slide, a pusher-arm secured at one end to said shaft and having the other end thereof normally positioned to move the matrices from said holding means to said distributing mechanism when said slide travels toward said distributing mechanism, a second arm secured to said shaft, a cam positioned to contact with and move said second arm when said slide moves away from said distributing mechanism, whereby during such last named movement said shaft is caused to rotate and said pusher-arm is moved out of its normal position.

5. The combination with matrix distribut-

ing mechanism of means for holding matrices in position adjacent said distributing mechanism, a slide, means for reciprocating the same toward and from said distributing mechanism, a shaft rotatably mounted on said slide, a pusher-arm secured at one end to said shaft, means for holding the other end of said pusher-arm normally in position to contact with matrices held by said matrix holding means, a second arm secured to said shaft, and means cooperating with said second arm for moving the same to rotate said shaft and move said pusher-arm out of its normal position while the slide is moving away from said distributing mechanism.

6. The combination with a distributing mechanism of an arm for pushing matrices into said mechanism, means for moving said arm toward and from said mechanism, means for holding the arm in one position as the same is moved toward the distributing mechanism and stationary cam means for swinging the arm out of such position as it moves in the opposite direction.

7. The combination with matrix distributing mechanism of movable means for elevating matrices and holding the same adjacent said mechanism, a movable pusher-arm adapted to contact with and move the matrices from said elevating means to said distributing mechanism, a rotatable member, a connecting rod between said member and said pusher-arm, mechanism for intermittently rotating said rotatable member, and means controlled by the movements of said elevating means for controlling the action of said last named mechanism.

8. The combination with matrix distributing mechanism of means for elevating matrices and holding the same in desired position, a slide, a pusher-arm mounted on said slide and adapted to contact with and move the matrices from said lifting means to said distributing mechanism, means for moving said slide, and rotatable means controlled by the movements of said elevating means for operating said slide moving means.

9. The combination with matrix distributing mechanism of means for elevating matrices and holding the same adjacent said mechanism, a slide, a pusher-arm mounted thereon and positioned to move the matrices from said elevating means to said distributing mechanism, means for reciprocating said slide including an intermittently rotatable member, and means operable by the movements of said elevating means for controlling the operation of said rotating member.

10. The combination with matrix distributing mechanism of means for elevating matrices and holding the same adjacent said mechanism, a slide, a pusher-arm mounted thereon and adapted to move matrices from



said elevating means to said distributing means, intermittently operating mechanism for moving said slide including a rotatable member, and means operated by the movements of said elevating means for initiating the movements of said rotating member.

11. The combination with matrix distributing mechanism, of means for elevating matrices and holding the same adjacent said mechanism, a pusher-arm for moving matrices from said elevating means to said distributing mechanism, means for causing said pusher-arm to intermittently move toward said distributing mechanism and return to its initial position including a rotatable member, a movable thrust member positioned in the path of movement of said elevating means, and means operable by the movements of said thrust member for initiating the movements of rotatable member.

12. The combination with matrix distributing mechanism of means of elevating matrices and holding the same adjacent said mechanism, a slide, a pusher-arm mounted thereon and adapted to move matrices from said elevating means to said distributing mechanism, a rotatable element and means for constantly rotating the same, a clutch member adapted to contact with and be rotated by said rotatable element, means operated by the rotation of said clutch member for moving said slide, means for separating said clutch member from said rotatable element at a predetermined point in the movement of the former, and means operable by said elevating means as the same approaches its uppermost position for causing said clutch member to contact with said rotatable element.

13. The combination with matrix distributing mechanism of means for elevating matrices and holding the same adjacent said mechanism, a pusher-arm for moving the matrices from said elevating means to said mechanism, a wheel, and means for constantly rotating the same, a rotatable clutch member arranged to move into and out of contact with said wheel to rotate therewith, means operatively connected to said clutch member for moving said pusher-arm, means for separating said clutch member from said wheel at a predetermined point in the movement of the former, and means for causing said member to again contact with said gear wheel when said elevating means reaches a position adjacent said distributing mechanism.

14. The combination with matrix distributing mechanism of means for elevating matrices and holding the same adjacent said mechanism, a slide, a pusher-arm mounted thereon and positioned to move matrices from said elevating means to said distributing mechanism, a gear wheel and means for constantly rotating the same, a clutch mem-

ber arranged to move into and out of contact with said gear wheel and to rotate therewith, means operatively connected to said clutch member for moving said slide, means for causing said clutch member to move out of contact with the said gear wheel when said member has completed substantially one revolution, a thrust member positioned in the path of movement of said elevating means, and means controlled by the movements of said thrust member for causing said clutch member to contact with said gear wheel.

15. The combination with matrix distributing mechanism of means for elevating matrices and holding the same adjacent said mechanism, a slide, a pusher-arm mounted thereon, a gear wheel, a rotatable member having a hub on which said gear wheel is rotatably mounted, means connected to said rotatable member and said slide for reciprocating the latter, a clutch member slidably secured to said hub, means for yieldingly holding said clutch member in contact with said gear wheel, a cam on said clutch member, a pivoted lever provided at one end with a pin normally positioned to contact with said cam and move said clutch member away from said gear wheel, and means for moving said lever to withdraw said pin from said cam when the elevating means reaches its uppermost position.

16. The combination with distributing mechanism of an elevator for lifting matrices and holding the same adjacent said mechanism, a continuously rotating wheel arranged adjacent said distributing mechanism, a clutch member arranged concentric with said wheel, a pusher arm adapted to push matrices from said elevator toward said distributing mechanism, means controlled by the movements of said elevator for causing said clutch member to engage said wheel, means for stopping rotation of said clutch member after the same has completed one revolution and means connected to said pusher arm and said clutch member whereby rotation of the latter will move the former.

17. In a mechanism of the kind described, a frame, matrix distributing means mounted thereon, an elevator bar adapted to lift matrices and hold the same adjacent said distributing means, a constantly rotating wheel mounted on said frame, a clutch arranged adjacent said wheel and adapted to rotate therewith, means controlled by the movement of said elevator bar for causing said clutch to be connected with and disconnected from said wheel and means connected to said clutch for moving matrices from said elevator bar to said distributing mechanism.

18. In a mechanism of the kind described, a frame, matrix distributing means mounted therein, said means including a plurality of distributing screws and gears for driving the



same, an elevator adapted to lift matrices and hold the same adjacent said distributing means, a pusher-arm for moving the matrices from said elevator to said distributing means, a gear wheel mounted on said frame and operatively connected to one of said first mentioned gears, and means operated by said gear wheel for moving said pusher-arm, said means including a member adapted to contact with said gear wheel and rotate therewith during one revolution of said wheel and means for automatically disconnecting said member from said gear wheel after the same has completed substantially one revolution.

19. In a device of the kind described, a frame, matrix distributing mechanism mounted thereon, an elevator adapted to lift matrices and hold the same adjacent said mechanism, a slide, a pusher-arm positioned to contact with and move matrices from said elevator to said distributing mechanism, a shaft rotatably mounted on said frame, a thrust member secured to said shaft and normally positioned in the path of movement of said elevator, means mounted on said frame for moving said slide, said last named means comprising a rotatable member, a spring link connecting said member and said slide, a constantly rotating gear wheel, a clutch member operatively connected to said rotatable member and movable into and out of contact with said gear wheel, a spring positioned to bear against said clutch member and tending to move the same toward said gear wheel, a cam on said clutch member, a lever having a pin adapted to engage said cam and move said clutch member away from said cam, and an arm on said shaft adapted to contact with said lever and withdraw said pin from said cam.

20. In a device of the kind described, a frame, matrix distributing mechanism mounted thereon, an elevator for lifting

matrices and holding the same adjacent said mechanism, a slide, a pusher-arm on said slide adapted to move matrices from said elevator to said distributing mechanism, a rotatable member on said frame, a spring link connection between said member and said slide, a constantly rotating gear wheel on said frame, and means controlled by movements of said elevator for causing said gear wheel to intermittently impart a complete rotation to said rotatable member.

21. The combination with matrix distributing mechanism, of means for elevating and holding matrices in position adjacent said distributing mechanism, a slide, means for reciprocating the same, a pusher arm pivotally mounted intermediate its ends on said slide, means for holding one end of said pusher arm normally in position to contact with matrices held by said matrix holding means, a cam positioned adjacent the path of movement of said slide for contacting with the other end of said pusher arm, means for causing the last named end of said arm to engage and travel along said cam in moving away from said distributing mechanism, said last named end of said arm being free from said cam when moving in the opposite direction.

22. In a device of the kind described, a frame, matrix distributing mechanism mounted thereon, elevating means for lifting matrices and holding the same adjacent said mechanism, a slide, a pusher arm on said slide adapted to move matrices from said elevating means to said distributing mechanism, a rotatable member on said frame, a spring link connection between said member and said slide, and means for intermittently rotating said member whereby said slide and pusher arm are caused to move toward and from said distributing mechanism.

In testimony whereof I affix my signature.

FREDERICK W. LETSCH