R. F. WILSON.

LINOTYPE MACHINE.

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952,397.

Patented Mar. 15, 1910.

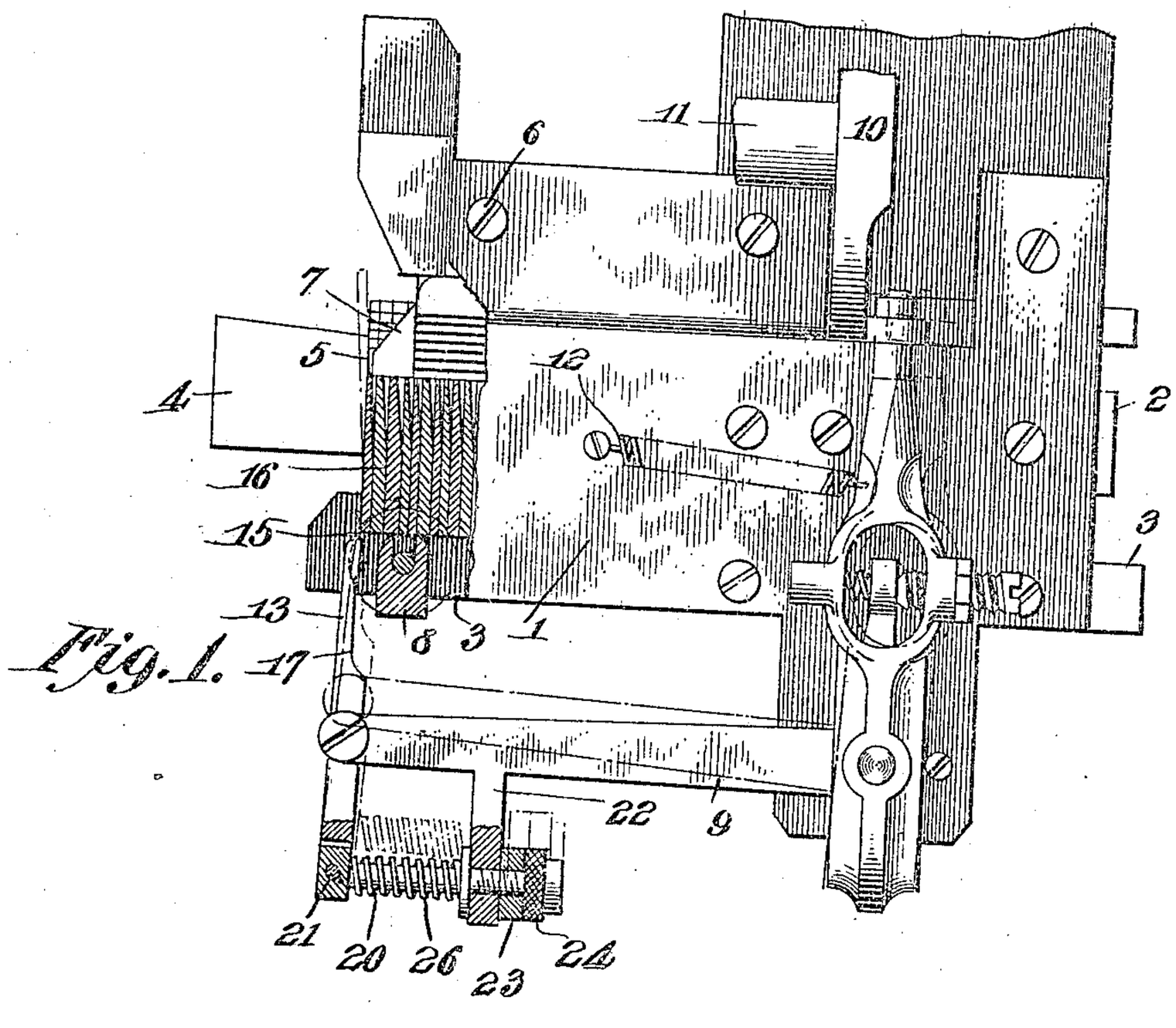

Fig. 1.

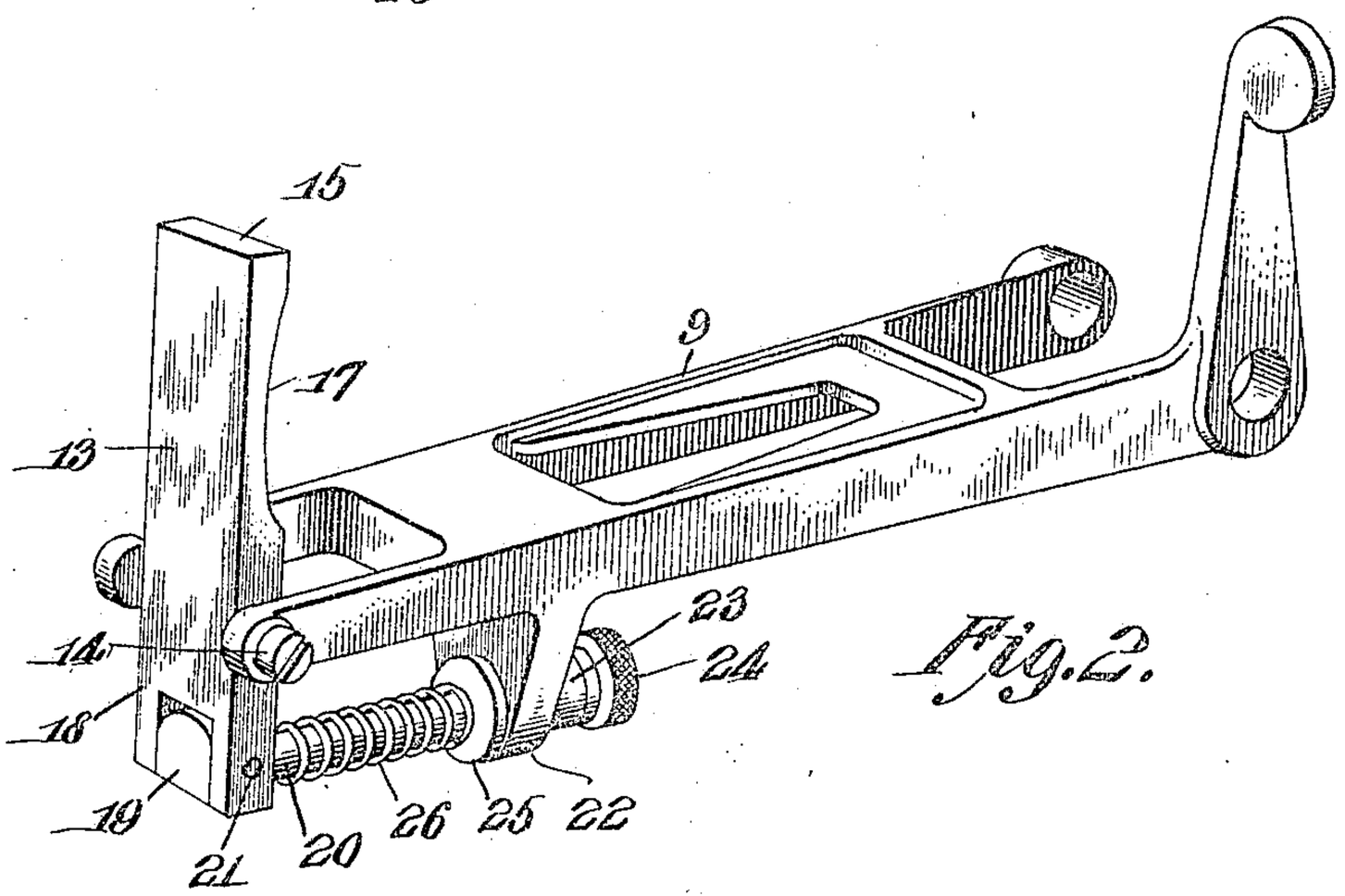

Fig. 2.

Witnesses

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LINOTYPE-MACHINE.

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To all whom it may concern:

Be it known that I, RICHARD F. WILSON, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented new and useful Improvements in Linotype-Machines, of which the following is a specification.

This invention relates to linotype machines, and particularly to the distributing mechanism thereof.

In the ordinary construction of linotype machine, the composed line of matrices, after removal from the mold, is elevated to a distributing box and operated upon by distributing mechanism through which the matrices are removed, one by one, from the line and brought into engagement with horizontal feed screws, whereby they are moved along a distributer bar toothed to engage the teeth of the matrices and hold them suspended until they arrive in line with their proper magazine channels.

The distributing mechanism includes guide and sustaining rails arranged within the distributing box, the upper rails being engaged by the ears of the matrices whereby the latter are suspended. The matrices are fed forward in the box by a pressure slide until the forward matrix engages stop shoulders upon the upper guide rails, the matrices being then successively engaged and lifted between the feed screws and into engagement with the toothed distributing bar by the action of a vertically reciprocating or vibrating lifting finger operated on its working stroke by a cam and on its return stroke by a retracting spring.

Ordinarily the lifting finger bears against a font distinguishing or separating block, which serves as a guide therefor, and is provided with a shoulder to engage the lower edges of the matrices. As the matrices vary in thickness, this shoulder must be a little less in width than the thickness of the thinnest matrix. This engaging shoulder of the lifting finger and the parts of the distributing mechanism, as well as the lower edges of the matrices, become worn by constant use, so that in the course of time the shoulder sometimes imperfectly engages the forward matrix and but imperfectly or partially lifts the same before returning and lifting the next succeeding matrix. This occurs from the fact that through wear on the parts the perfect alinement necessary to cause the lifting finger to engage matrices of different thicknesses is destroyed, and as a result an imperfect feed action ensues, whereby one or more partially lifted matrices are liable to be bent and broken by the action of the feed screws. Such faulty action of the distributing mechanism results in annoyances, inconveniences and more or less frequent stoppages of the machine for adjustment and repairs, and requires replacement of the parts at more or less frequent intervals.

The object of my invention is to provide a novel construction and mode of mounting the lifting finger, by which it is adapted to accommodate itself to matrices of different thicknesses, as well as to any imperfection in the alinement of the matrices resulting from wear, by which a certain and positive lifting movement of each matrix the proper distance to engage the feed screws will be secured.

A futher object of the invention is to provide a lifting finger which will lift and release the matrix without becoming engaged with and being carried forward by the feed screws, thus preventing strain upon the retracting spring, and further to provide a means by which the variable engaging action of the finger according to the thickness of the matrix may be regulated and controlled to a nicety.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a side elevation of the distributing box and associated parts, some of the elements being shown in section to better illustrate their construction and arrangement. Fig. 2 is a perspective view of the lifting finger and its actuating lever.

Referring to the drawing, 1 designates the distributer box; 2 and 3 the upper and lower sets of guide rails, the former having forwardly extending ends 4 provided with inclined upper edges to sustain the matrices as they are fed forward to the feed screws, and also provided with stop shoulders 5 against which the forward matrix is pressed by the pressure slide; 6, the toothed elevator bar or rail with which the recessed and toothed edges of the matrices are engaged and by which said matrices are

suspended on their passage through the box; 7, the guide or retaining lip upon the forward end of the elevator bar or rail terminating in rear of the shoulders 5 and which holds all except the forward matrix of the line against upward movement; 8, the font distinguisher or separating block; 9, the pivotally mounted vibrating lifting lever which is moved upwardly to project the lifting finger on its working stroke by the action of a cam 10 on the end of one of the feed screws 11 and which is moved downwardly or returned to normal position to retract the finger by the action of a retracting spring 12; and 13 the lifting finger mounted upon the free end of said lever 9.

The finger 13, in accordance with my invention, is mounted for pivotal movement in a direction longitudinally of the lever upon a pivot pin or screw 14 carried by the free end of the latter. Said finger is provided with a plane surfaced upper matrix engaging end 15 of a width to accord with the thickness of the largest matrix employed in any given machine. This engaging end 15 is normally held, in the manner hereinafter described, in its retracted position in advance of the font distinguisher block 8 and with its inner edge just in rear of the line of the outer face of the foremost matrix of the line of matrices 16 which is in position to be lifted upon the ensuing movement of the finger. The inner face of the finger is formed below its engaging edge with a concavity or recess 17 to accommodate and adapt it to clear the block 8 in its movements.

The finger has a lower end or extension 18 projecting below the lever 9 and bifurcated to receive a head 19 upon the forward end of a pin or bolt 20, to which head the lower end of the lever is pivotally connected by a transverse pin 21. Formed upon the forward end of the lever 9 in rear of the finger is a depending apertured guide ear or lug 22 through which the inner end of the bolt slidably extends, such end of the bolt being threaded and provided with an adjusting nut 23 and a jam or lock nut 24 for holding said nut 23 in adjusted position. These nuts are arranged to bear against the rear surface of the lug 22, and loosely mounted on the bolt to bear against the front face of said lug is a washer 25 between which and the head 19 is disposed a coiled spring 26 which incloses the intervening portion of the bolt. This spring is of the expansion type and normally tends to force the lower end of the finger forward and the upper or engaging end thereof inwardly and rearwardly, so that by means of the nut 23 the working condition of the engaging end 15 of the finger may be adjusted with relation to the matrices 16 or to the block 8 as a gage to set the finger for an effective action in accordance with the character of the matrices employed, which vary to greater extents of thickness in different fonts. The spring also mounts the finger for a yielding feed action, as hereinafter described.

Fig. 1 shows in full lines the normal position of the vibrating lifting lever 9 and lifting finger 13 prior to the lifting motion, from which it will be seen that the rear edge of the engaging surface 15 extends just under the forward portion of the lower edge of the foremost matrix of the line 16. On the lifting motion of the lever through the action of the cam 10, the finger will be swung bodily upwardly and rearwardly on an arc so that at the beginning of its lifting movement on the foremost matrix it will project partially under the lower edge thereof. This arcuate swing of the finger will continue on the lifting motion until it is fully projected beneath the matrix and contacts with the outer face of the succeeding matrix, which latter will serve as a guide in the remainder of the up motion of the finger, at which time the finger will swing on its yielding pivotal connection to a vertical position, and thus, riding in contact with the second matrix of the line as a guide, move in a straight path, thus sliding the forward matrix in a truly vertical position until it rides out of engagement with the shoulders 5 and into engagement with the toothed edge of the distributer bar and the feed screws, by which it is carried forward for distribution.

As the engaging end of the finger is devoid of a lip or projection, the finger will remain in contact with the succeeding matrix without becoming engaged with the threads of the feed screws, and hence any back snapping action of the finger and consequent strain on the spring 26 is avoided. On its downward motion the finger will yield to allow the remaining matrices to be fed up by the pressure slide bar, and when it is fully retracted by the action of the spring 12 will resume its normal position shown in full lines in Fig. 1, ready on the succeeding action of the cam 10 to engage the succeeding foremost matrix of the line which has been moved by the action of the pressure slide bar into engagement with the shoulders 5. It will thus be understood that on the up stroke of the lever 9 and finger 13, the movements of which are clearly indicated in dotted lines in Fig. 1, the end 15 of the finger will gradually increase its extent of bearing upon or engagement with the lower edge of the matrix until it is in full bearing contact with the same and the inner face of the finger bears against the succeeding matrix, by which edgewise motion of the finger a posi-

tive engagement between the same and the matrix and a positive full upward feed of the latter will be insured. As the engaging end 15 is of a width corresponding at least to the thickness of the largest matrix employed, and as the arcuate or edgewise movement of the finger is unrestricted except by engagement with the outer face of the succeeding matrix, it will be apparent that the finger will automatically adjust itself to the size of the matrix, from the thinnest to the thickest, by which an absolutely positive engagement and feed motion is secured, notwithstanding the fact that the matrix may be out of proper alinement from wear of the same or wear of the parts of the distributing mechanism or from other causes. The construction and mode of operation of the finger described thus overcome the objections mentioned in the use of fingers having engaging shoulders restricting their engaging action and adapt the finger for a positive and certain feed action upon matrices varying widely in thickness, thus rendering the device equally efficient for use upon single or double magazine machines.

In the movements of the finger 13, it will be apparent that the cavity or recess 17 will permit the arcuate or edgewise motion of the finger without contact with or interference from the block 8, and it will be understood that by regulating the tension or pressure of the spring 26 through the medium of the nuts 23 and 24 the range of edgewise motion of the finger may be varied at will to suit different fonts of matrices or to compensate for wear of the parts as occasion may require. As the finger does not come in contact with the block 8 or other parts of the distributing box or the threads of the feed screws, wear thereon from service is materially diminished and hence liability of the matrices being held out of alinement by excessive wear thereon or on the parts of the feed box is further decreased. The finger does not depend in action upon the block 8 in any way, and hence it may be employed upon the distributing mechanism of any machine, whether or not a font distinguisher or separator is employed. The advantages of my invention in adjusting itself to the thickness of the matrices and positively lifting the same under any and all conditions of service will accordingly be readily understood and appreciated.

I claim:—

1. In a matrix distributing mechanism, a vibrating lever, a lifting finger pivoted to the lever and extending above and below the same, and an expansion spring connecting the lever with the lower end of the finger and operating to permit the latter to yield from an arcuate into a straight line of travel and vice versa.

2. In a matrix distributing mechanism, a vibrating lever, a lifting finger having a flat upper matrix engaging end and formed on its inner face below the same with a recess, a vibrating lever on which the finger is pivotally mounted, and a compensating spring between the finger and lever operative to permit the finger to yield from an arcuate into a straight line of travel and vice versa.

3. In a matrix distributing mechanism, and in combination with means for supporting the line of matrices, a vibrating lever, a finger pivotally mounted upon the lever for swinging movement in a direction longitudinal thereof and transversely of the matrices, said finger having a plane engaging end to move laterally beneath the first matrix of the line and in contact with the outer face of the succeeding matrix of the line, whereby said finger is adapted to have movement from an arcuate into a straight line of travel and vice versa, and a compensating spring connecting the lever and finger to permit such movement thereof.

4. In a matrix distributing mechanism, a vibrating lever, a lifting finger pivoted to the lever and extending above and below the same, and a compensating spring connecting the lever with the lower end of the finger.

5. In a matrix distributing mechanism, a vibrating lever, a lifting finger intermediately pivoted to the lever to provide an upper matrix-engaging end and a lower extension below the lever, a compensating spring connecting the lever with said lower extension of the finger, and means for tensioning said spring.

6. In a matrix distributing mechanism, a vibrating lever, a lifting finger intermediately pivoted to the lever to provide an upper matrix engaging end and a lower extension below the lever, a threaded stem pivotally connected to the lower end of the finger and slidably connected with the lever, a spring surrounding the stem between the finger and lever, and adjusting means connected with the stem for tensioning the spring.

7. In a matrix distributing mechanism, a vibrating lever, a lifting finger pivoted to the lever and having an extension projecting below the same, a stem pivotally connected with the lower end of the finger and slidably engaging the lever, an expansion spring surrounding the stem between the finger and lever, and adjusting means connected with the stem for regulating the action of the spring.

8. In a matrix distributing mechanism, a vibrating lever, a finger having a plane matrix engaging end and pivotally mounted upon the lever to move in an arcuate path beneath the foremost matrix of a line and into engagement with the front face of the

succeeding matrix, and adapted by its pivotal connection to vary its movement from an arcuate to a straight vertical movement by its contact with said succeeding matrix, and a compensating spring connecting the finger with the lever to permit such pivotal motion thereof.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD F. WILSON.

Witnesses:
C. A. HOLLENBECH,
HARRY BRUSTEAD.