No. 795,969. PATENTED AUG. 1, 1905.

C. L. GROHMANN.

LINOTYPE MACHINE.

APPLICATION FILED JUNE 16, 1904.

4 SHEETS—SHEET 1.

Fig 1.

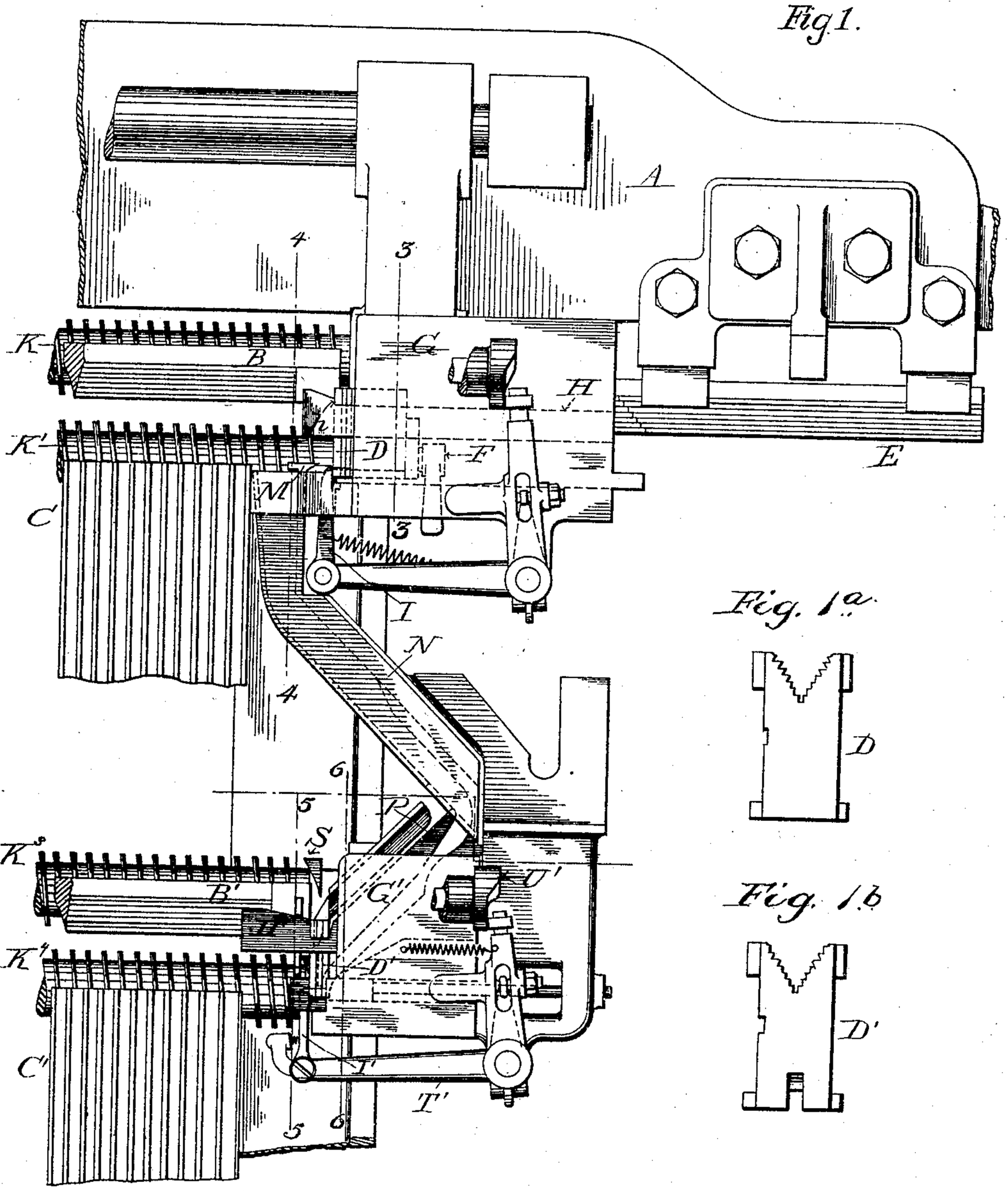

Fig. 1a.

Fig. 1.b

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Inventor:
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His Attorney.

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4 SHEETS—SHEET 2.

Fig 2.

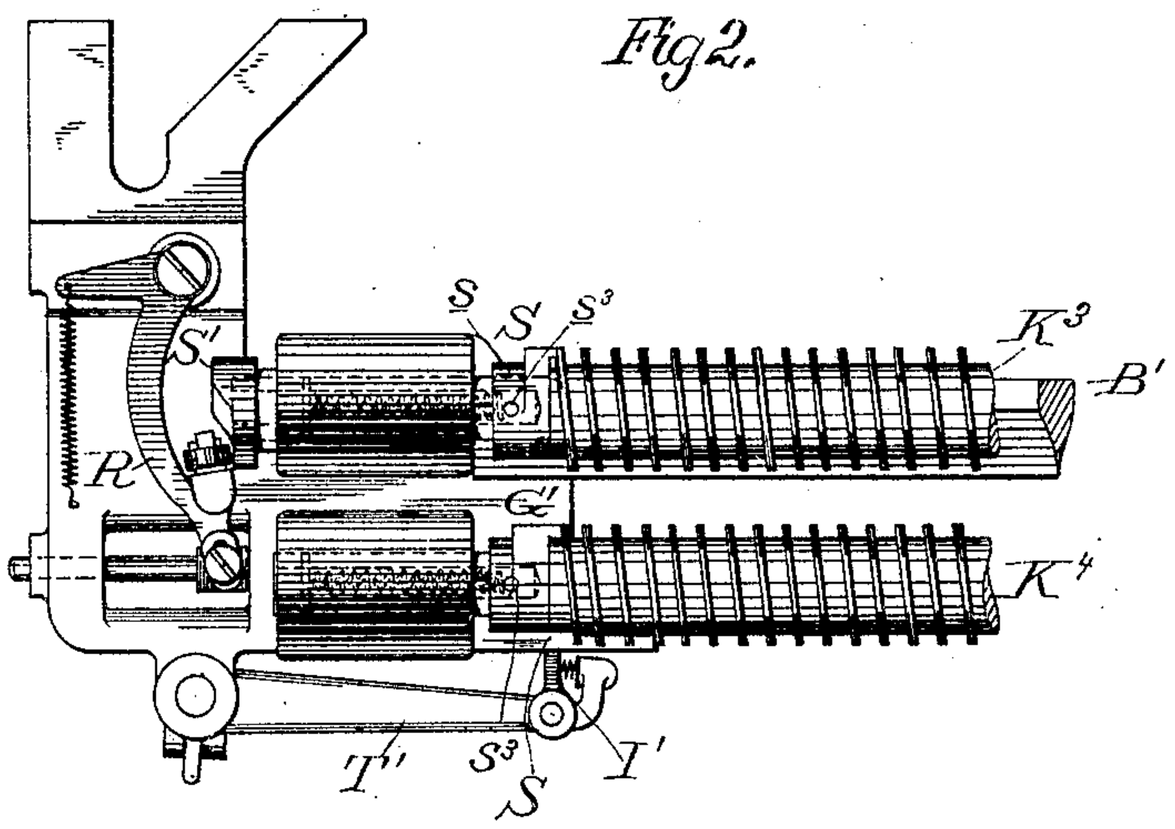


Fig 3.

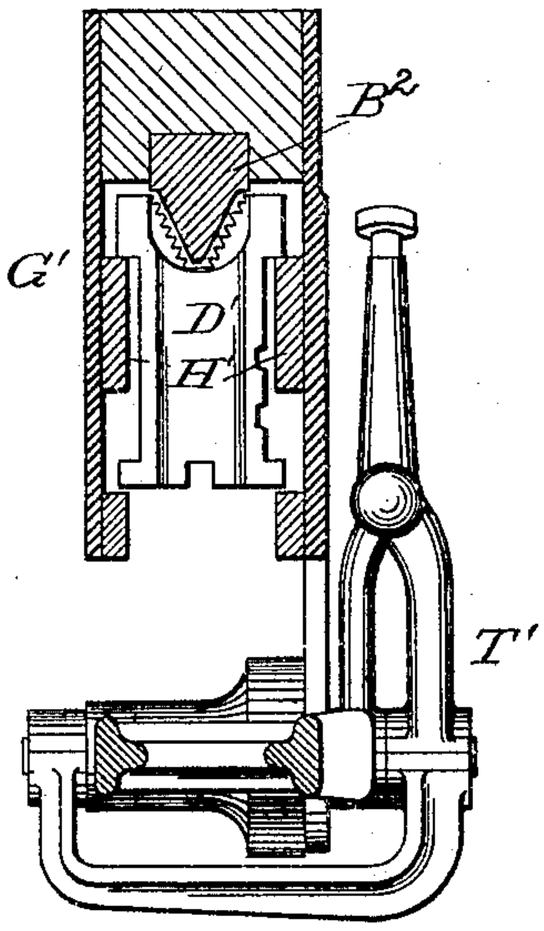
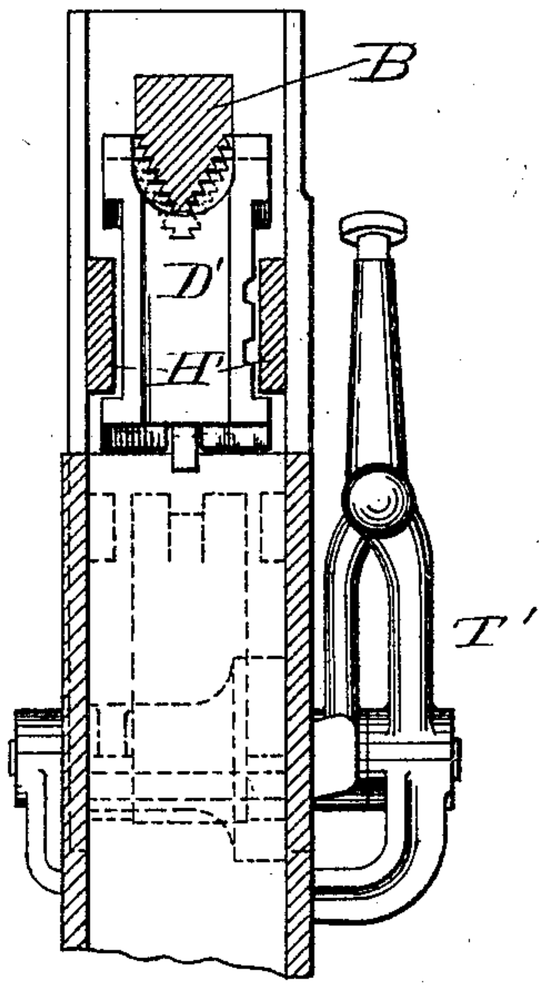


Fig 4.



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4 SHEETS—SHEET 3.

Fig.5.

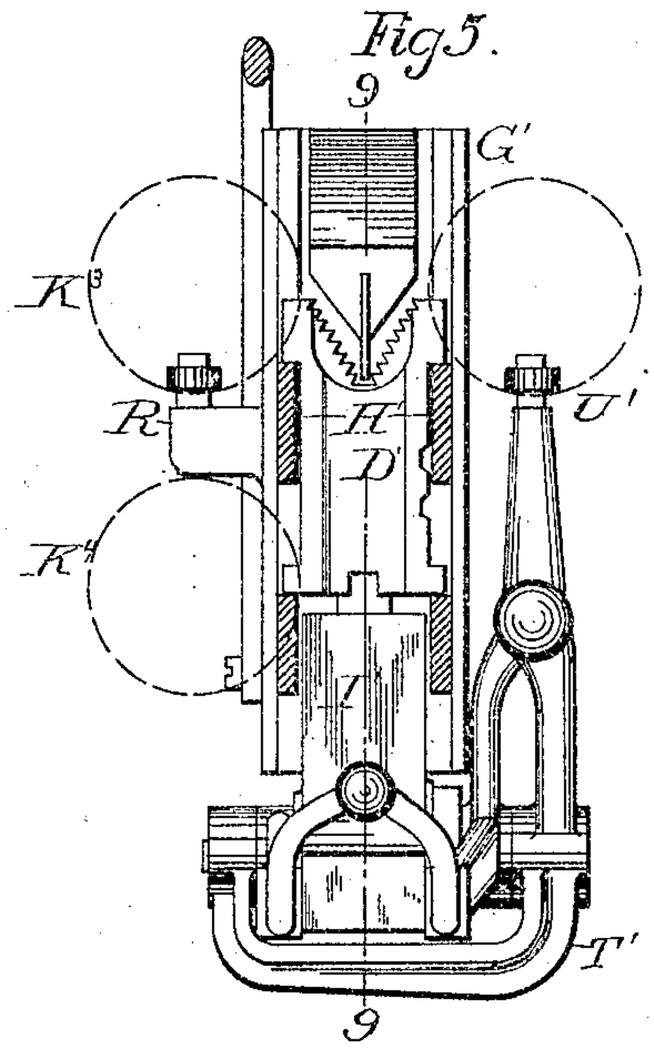


Fig.6.

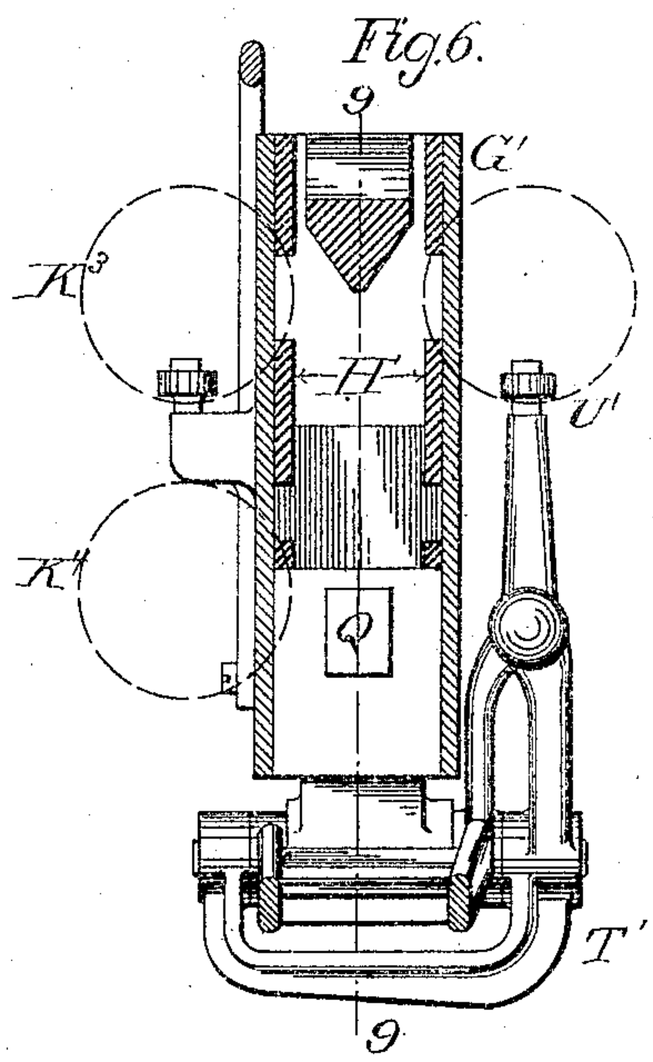


Fig.7.

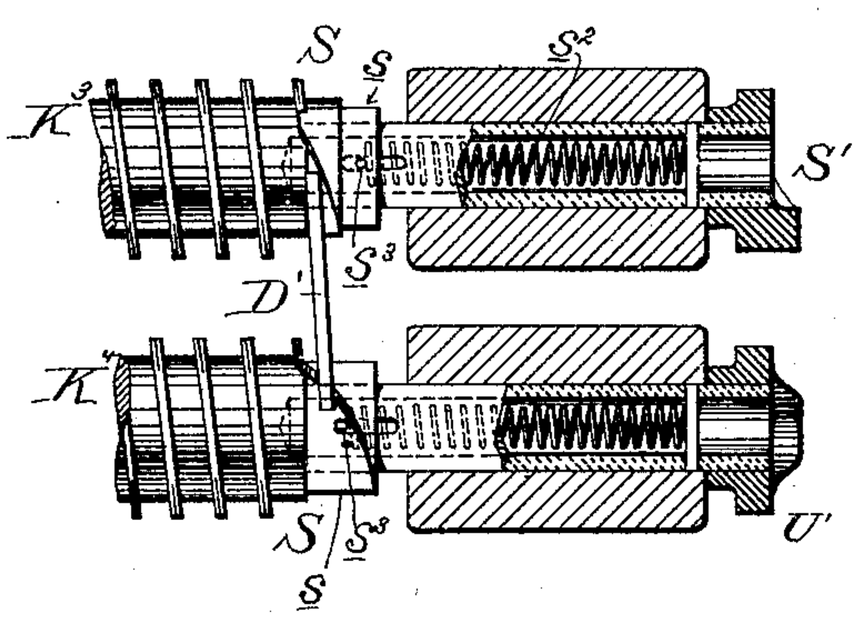
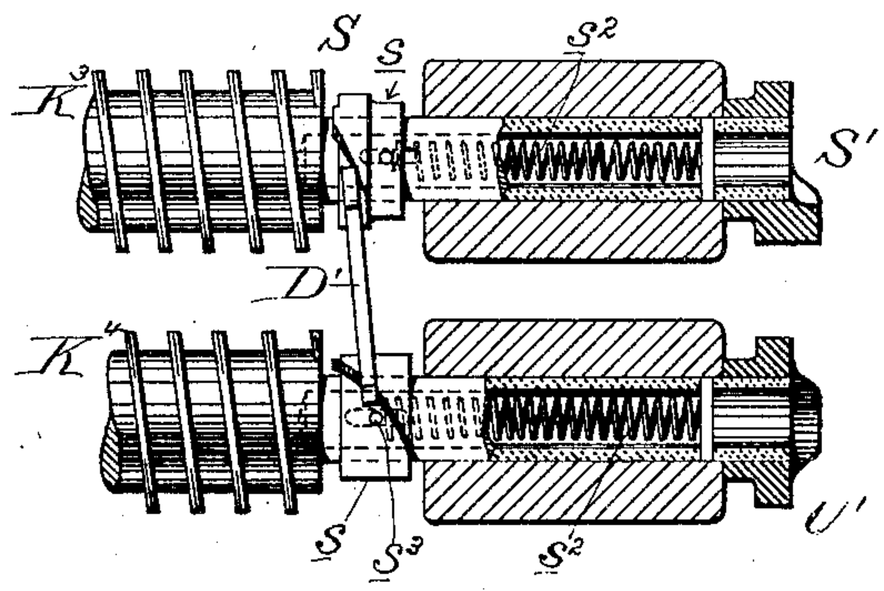


Fig.8.



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4 SHEETS—SHEET 4

Fig. 9.

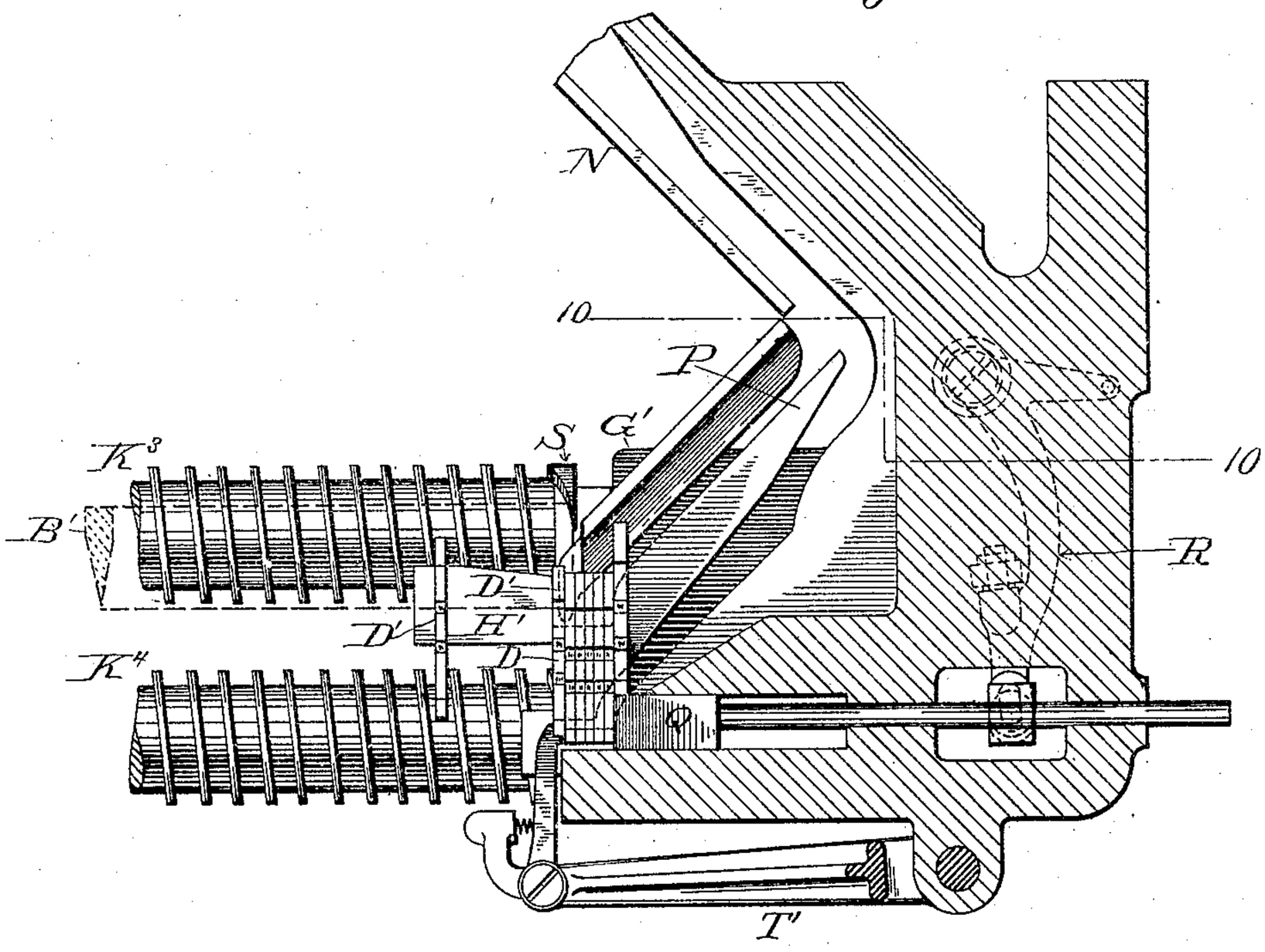
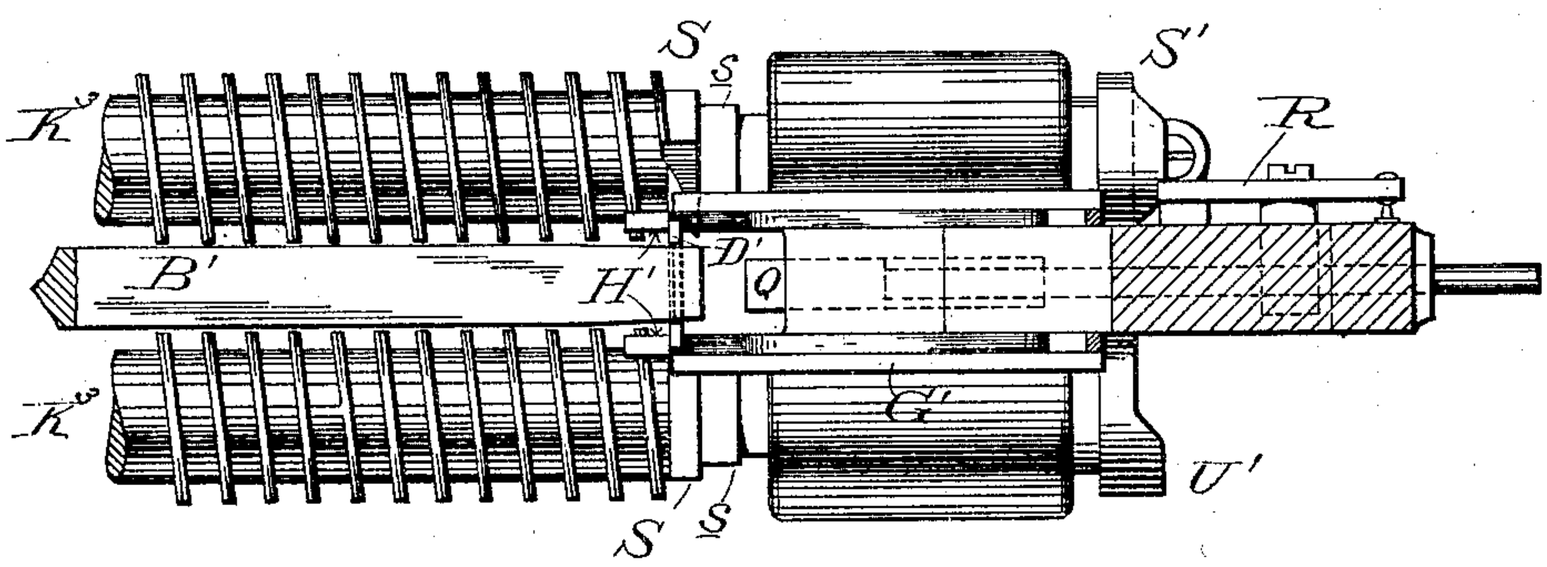


Fig. 10.



Witnesses:

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A. M. E. Kennedy.

Inventor:

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UNITED STATES PATENT OFFICE.

CARL L. GROHMANN, OF BROOKLYN, NEW YORK, ASSIGNOR TO MERGENTHALER LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

LINOTYPE-MACHINE.

No. 795,969. Specification of Letters Patent. Patented Aug. 1, 1905.

Application filed June 16, 1904. Serial No. 212,914.

To all whom it may concern:

Be it known that I, CARL L. GROHMANN, of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Linotype-Machines, of which the following is a specification.

My invention has reference to the distributing mechanism used in the Mergenthaler linotype-machine, wherein a stationary distributer-bar of V-section at the lower edge is provided with short longitudinal teeth for the purpose of sustaining the matrices, which are provided at their upper ends with V-shaped notches containing corresponding teeth, the teeth at different points in the length of the bar being permuted or arranged so that the matrices presented successively to the bar at one end are held in suspension while being carried along the same by feed-screws until they arrive over their respective channels in the magazine.

My improvement has reference more particularly to the means for presenting the matrices successively to the distributer-bar, and it is intended more particularly for use in connection with the lower distributer of a linotype having two magazines and two distributers, as shown in Letters Patent No. 640,033, although it is also applicable in connection with linotypes having single distributers, as shown in Letters Patent No. 436,531. In this class of distributing mechanism the composed line of matrices is pushed endwise horizontally toward the distributer-bar, and the matrices at the inner end of the line are lifted successively into engagement with the feed-screws and with the toothed end of the bar. It occasionally happens that the lifting devices will fail to act in a proper manner or that the rising matrices will slip out of position or for other reasons be improperly engaged with the screws or adjacent parts, the result being that the matrix fails to properly engage the distributer-bar, and it is sometimes twisted or bent out of shape.

The principal aim of my invention is to avoid this occurrence, to insure the proper lifting of the matrices, and to prevent them from being bent or mutilated if the lifting device fails in its action. To this end I give the threads of the screws an increased pitch or inclination at the receiving end, and I so arrange the parts as to reduce the time occupied by the screws in advancing the matrix horizontally to the distributer-bar. I also construct the feed-screws at the delivery end so that the receiving portion of the thread may yield in an axial direction in case the matrix with which they are engaged meets with undue resistance.

Figure 1 represents the receiving end of the two distributing mechanisms of the machine shown in Patent No. 640,033 with my improvement incorporated therein. Fig. 2 is a side view of the screws and attendant parts of the lower distributer looking from the opposite side. Fig. 3 is a vertical cross-section on the line 3 3 of Fig. 1 looking to the right. Fig. 4 is a vertical cross-section on the line 4 4 of Fig. 1, also looking toward the right. Figs. 5 and 6 are vertical sections on the correspondingly-numbered line of Fig. 1 looking toward the right. Figs. 7 and 8 are side elevations of the two feed-screws of the lower distributer with portions in section at one end, Fig. 7 showing the screws in their normal conditions, while Fig. 8 shows the yielding portion carried back by a resisting matrix. Fig. 9 is a longitudinal vertical section through the lower distributer on the line 9 9 of Figs. 5 and 6. Fig. 10 is a horizontal section on the line 10 10 of the preceding figure. Figs. 1^a and 1^b are side views illustrating the matrices of the upper and lower magazine, respectively.

Referring to the drawings, A A represent portions of the stationary main frame, B the upper distributer-bar for delivering matrices to the upper magazine C, and B′ the lower distributer-bar for delivering matrices to the lower magazine C′. The matrices D, made of the usual form and toothed in the upper end, as shown in Figs. 1^a and 1^b, are lifted in composed or assembled lines by the ordinary elevator-bar E, from which they are suspended. From this bar they are carried forward by a horizontal pusher F, as usual, into the upper distributer-box G, in which they are sustained by fixed side rails H, underlying their upper ears. A bar B^2 without teeth is located in the distributer-box, as usual, over the matrices to prevent the lifting of any except the end matrix, which stands beyond the end of this bar, as usual. These rails are provided at the inner end with shoulders *h* to arrest the foremost matrix in the line and with inclined upper edges to assist in lifting

the matrices to the distributer into engagement with the distributer-bar after they have been raised clear of the detaining-shoulders. The lifting of the matrices successively clear of the shoulders of the rails is effected by the usual vertically-reciprocating dog or lifter I. When thus lifted, the ears of the matrices enter between the threads of the feed-screws K and K′, which lie parallel with the distributer-bar and serve to carry the matrices forward horizontally along the bar. Beneath the path of the advancing matrices there is a fixed bridge or plate M. The matrices of the upper magazine are solid or unbroken at the lower end, as shown in Fig. 1ª, and they ride directly upon the bridge M, which sustains them until their teeth are engaged by the distributer-bar B. The matrices D′ of the lower magazine have a central notch in the lower end of sufficient width to admit the bridge M, so that these matrices as they advance descend astride of the bridge M at a lower level than the others, so that their teeth fail to engage the overlying bar B. As a consequence these notched matrices being carried over the bridge are free to descend by gravity through the conductor or chute N to the lower distributer-box G′, adjacent to the lower distributer-bar. The descending matrices pass between two fixed inclined rails P, which bearing beneath the ears of the matrices guide them downward between the fixed supporting-rails H′, which are notched and shouldered to support and arrest the matrices until they are transferred to the lower distributer-bar B′, the action of these lower rails being very similar to that of the rails H of the upper box. The matrices in the lower box are lifted successively by the vertical lifter or pusher I′, by which they are carried clear of the detaining-shoulders of the rails and into engagement with the feed-screws K³ K⁴, &c., which act to advance the shoulders of the matrices along the upper inclined ends of the rails H′ until the matrices engage the distributer-bar B′, the action in this regard being very similar to that which takes place in the upper distributer. As the matrices descend successively into the lower box one behind another it is necessary that they should be pressed forward and presented successively within the path of the lift I′. This is effected by a reciprocating pusher Q, guided horizontally in the box and actuated by an angular lever R, Figs. 9, 10; &c., one end of which is acted upon by a cam S′, fixed to the end of one of the feed-screws. The lift I′ is actuated in like manner by an elbow-lever T′, actuated by a cam U′ on one of the feed-screws. The cams are so formed and timed that the lifter acts to lift a matrix while the line is being pressed forward by the pusher Q. During the descent of the lift the pusher Q retreats to permit the ingress of an additional matrix or matrices. In practice it is found desirable to give the pusher and the lift the longest time possible to perform their action. Heretofore the feed-screws have been given a uniform pitch. The screws are required to turn through one hundred and eighty degrees in order to effect the advance of the lifted matrices over the elevated ends or shoulders of the supporting-rails. To overcome this difficulty and shorten the time required for the action of the screws, I construct them, as shown in Figs. 9 and 10, with an increased pitch at the receiving end, as shown at S, Figs. 7, 8, 9, and 10. In other words, the space between the first two threads at the receiving end of the screw is materially increased, so that at the receiving end the working face of the thread stands at a greater angle to the axis of the screw than the remaining portion of the threads. This affords an increased space within which to lift the ear of the matrix, so that it may be entered easily and certainly to its place and also causes the screw to delay its action on the matrix, but advance the matrix along the rail much more rapidly than heretofore after they are engaged. It will be understood that the essence of my invention in this regard consists in changing the angular position of the thread at the receiving end and that the details of construction may be modified at will provided this peculiarity is retained and whether the screws are constructed with threads rigid throughout their length or with the yielding portion, as hereinafter described.

If for any reason a matrix lifted or partly lifted is prematurely disengaged from the lifting device or for any other reason becomes turned or twisted out of its proper position and is at such time engaged by the threads of the screws, it is liable to be bent or twisted. In order to overcome this difficulty, I propose to construct the screws so that the receiving end of the thread may yield axially—in other words, horizontally—so that they may continue their revolutions without acting forcibly on the matrix. This improvement is applicable whether the receiving end of the thread is given the increased pitch hereinbefore described or a uniform pitch, as usual, and the details of construction may be modified at will, provided only the portion which first acts upon the matrix is permitted to yield.

In Figs. 2, 7, and 8 it will be seen that the receiving end S of the thread of each feed-screw is formed on a sleeve or collar *s*, fitting around the journal of the screw and pressed forward to its operative position by an internal spring s^2. The collar is held from rotating by a transverse pin s^3, passing through it and through a slot in the screw. With this arrangement of parts the receiving portion S is held normally in the position shown in Fig. 7, so that it operates in the same manner that

it would if formed integral with the remainder of the screw. When, however, the matrix meets with any abnormal resistance to its forward movement, the pressure against the end of the screws will overcome the resistance of the spring and cause it to yield and move backward, as shown in Fig. 8, thus preventing any excessive pressure and permitting the screw to continue its rotation without injuring the matrices.

It is preferred, as shown in Figs. 7 and 8, to give the receiving end of the lower screws, which engage the lower ears of the matrices, a greater or sharper inclination than the receiving ends of the upper screws, and it is also preferred to extend the receiving ends of the lower screws a greater distance to the right or toward the incoming matrices, as shown in said figures.

Having described my invention, what I claim is—

1. In a distributing mechanism, the combination of a distributer-bar, means for lifting the matrices toward the bar, and feed-screws having threads of increased pitch at the receiving end.

2. In a distributing mechanism, the combination of a distributer-bar, underlying shouldered rails to arrest the matrix-line and assist in guiding the successive matrices to the bar, means for lifting the matrices successively, and feed-screws to engage the lifted matrices and advance them along the distributer, said screws having their threads of increasing pitch at the receiving end.

3. In a distributer, the combination of the distributer-bar, means for raising the matrices toward the upper and lower bar, and screws for advancing the matrices individually and laterally along the bar, the lower screw having its thread of greater pitch at the receiving end than the thread of the upper screw.

4. In a distributing mechanism, a distributer-bar, means for advancing matrices individually toward the same, in combination with upper and lower feed-screws, the lower screw having its thread extended horizontally toward the incoming matrices beyond the end of the upper screw.

5. In a distributing mechanism, a feeding-screw having its thread constructed and arranged to yield in an axial direction at the receiving end.

6. In a distributing mechanism, feed-screws to engage a matrix at different points and advance the same laterally, said screws constructed with yielding spring-supported threads at the receiving end.

7. In a distributer, a feed-screw having at one end a sliding spring-supported collar *s*, with a portion of the thread thereon.

8. In a distributing mechanism, feed-screws having threads of increased pitch at the receiving end, in combination with means for presenting the matrices one at a time between the screws.

In testimony whereof I hereunto set my hand, this 3d day of June, 1904, in the presence of two attesting witnesses.

CARL L. GROHMANN.

Witnesses:
WM. C. O'BRIEN,
HERMAN F. VOSS.