No. 814,469. PATENTED MAR. 6, 1906.

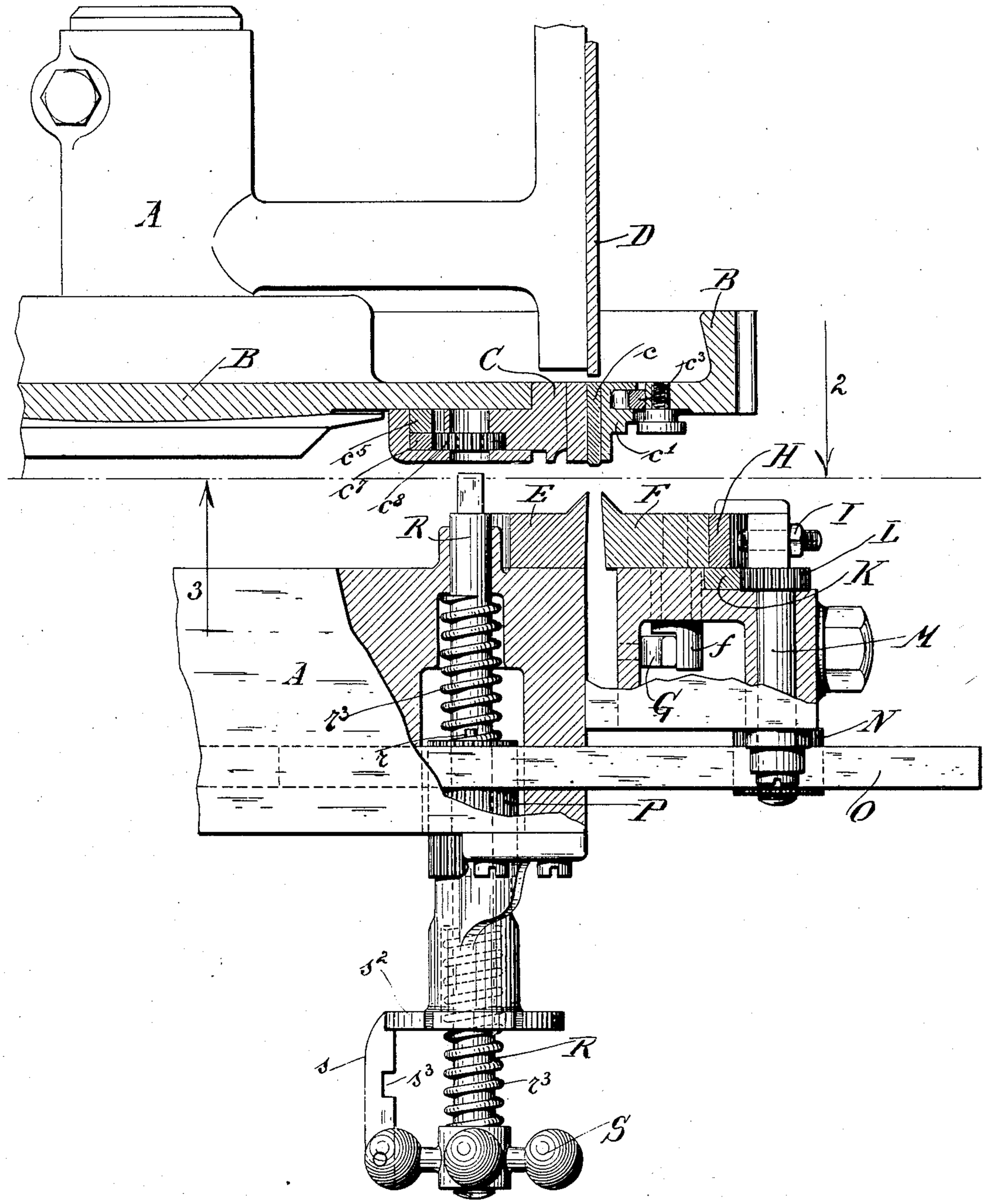
C. MUEHLEISEN.

LINOTYPE MACHINE.

APPLICATION FILED OCT. 20, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



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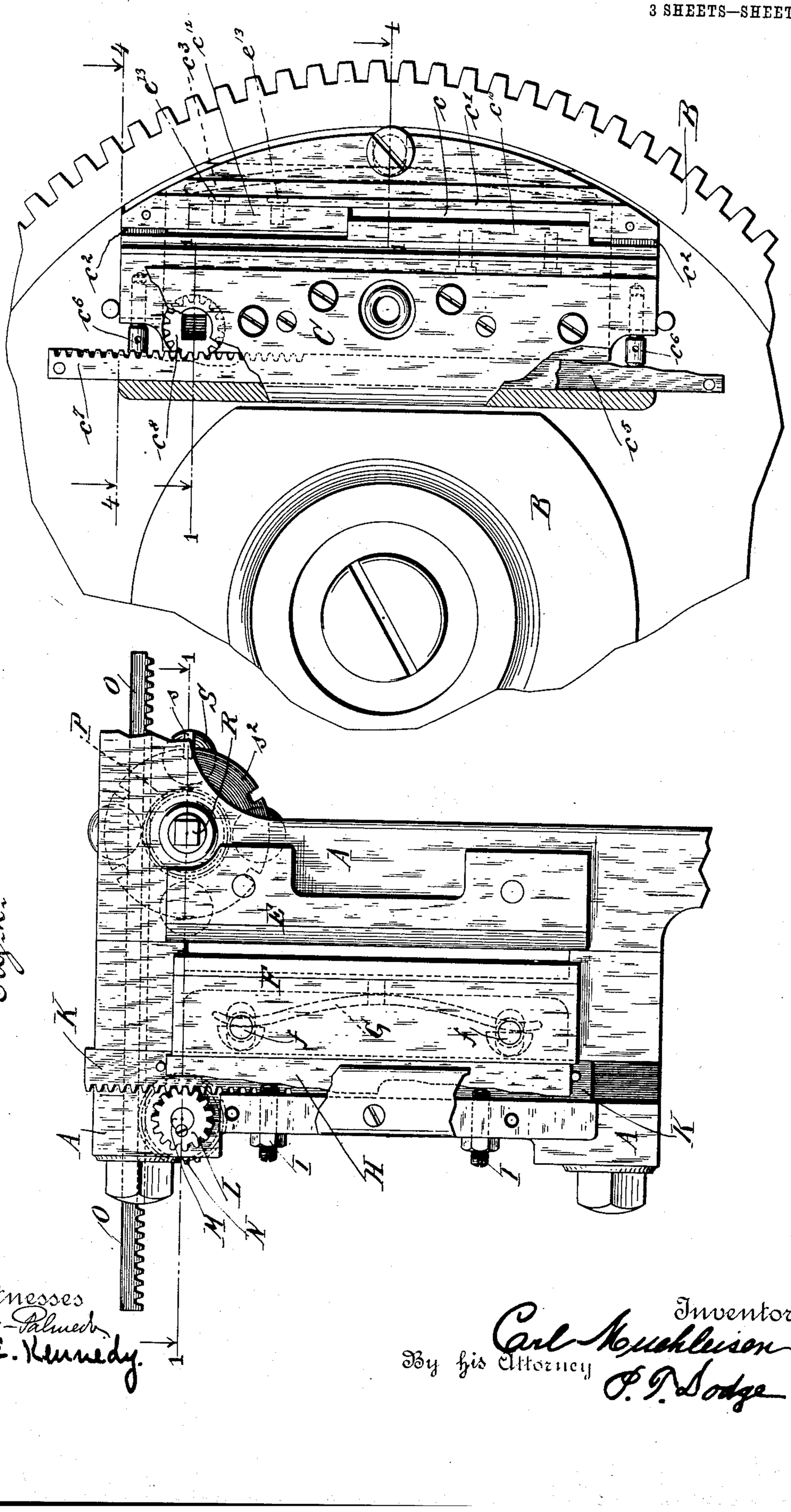
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 5.

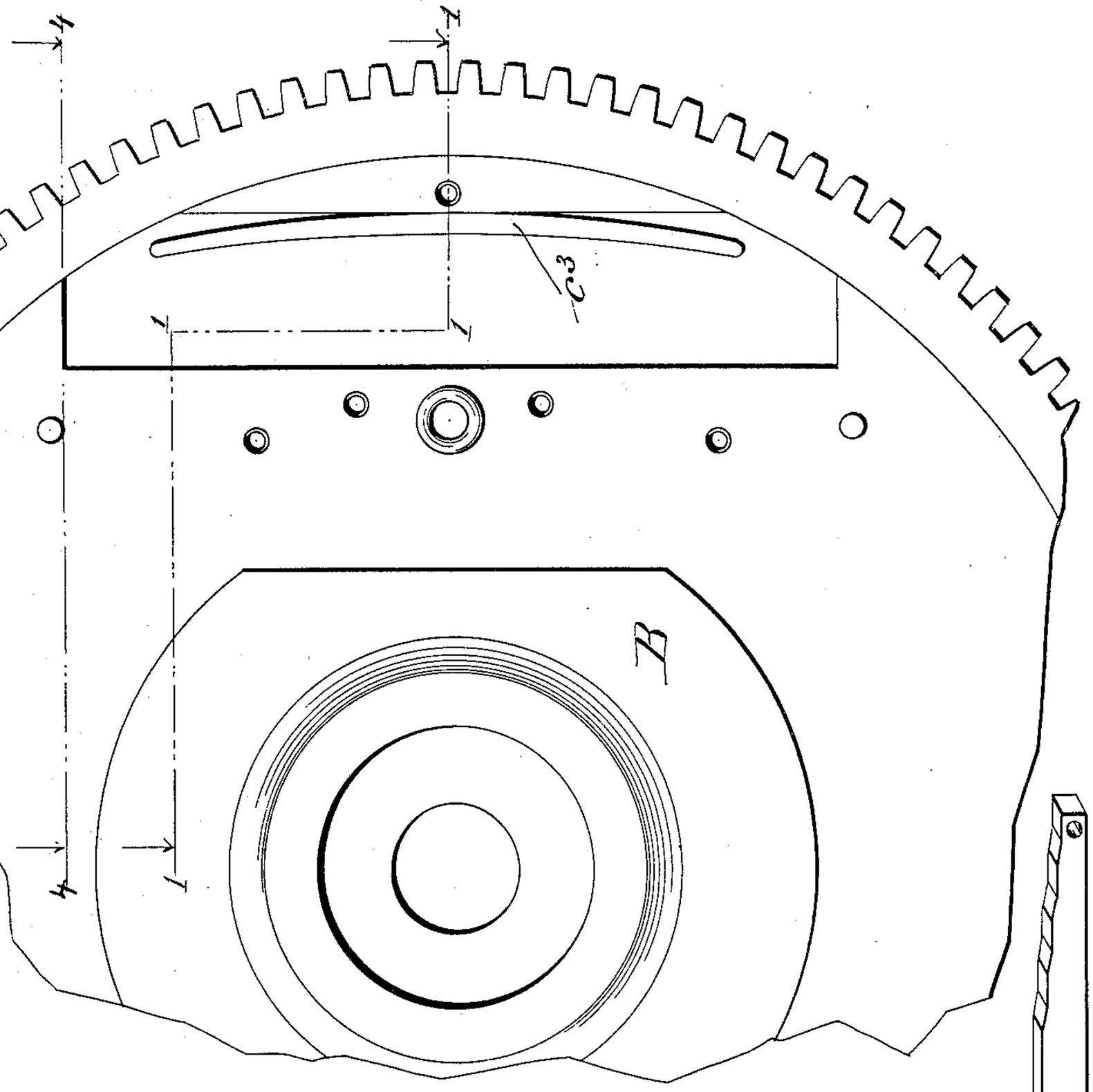


Fig. 4.

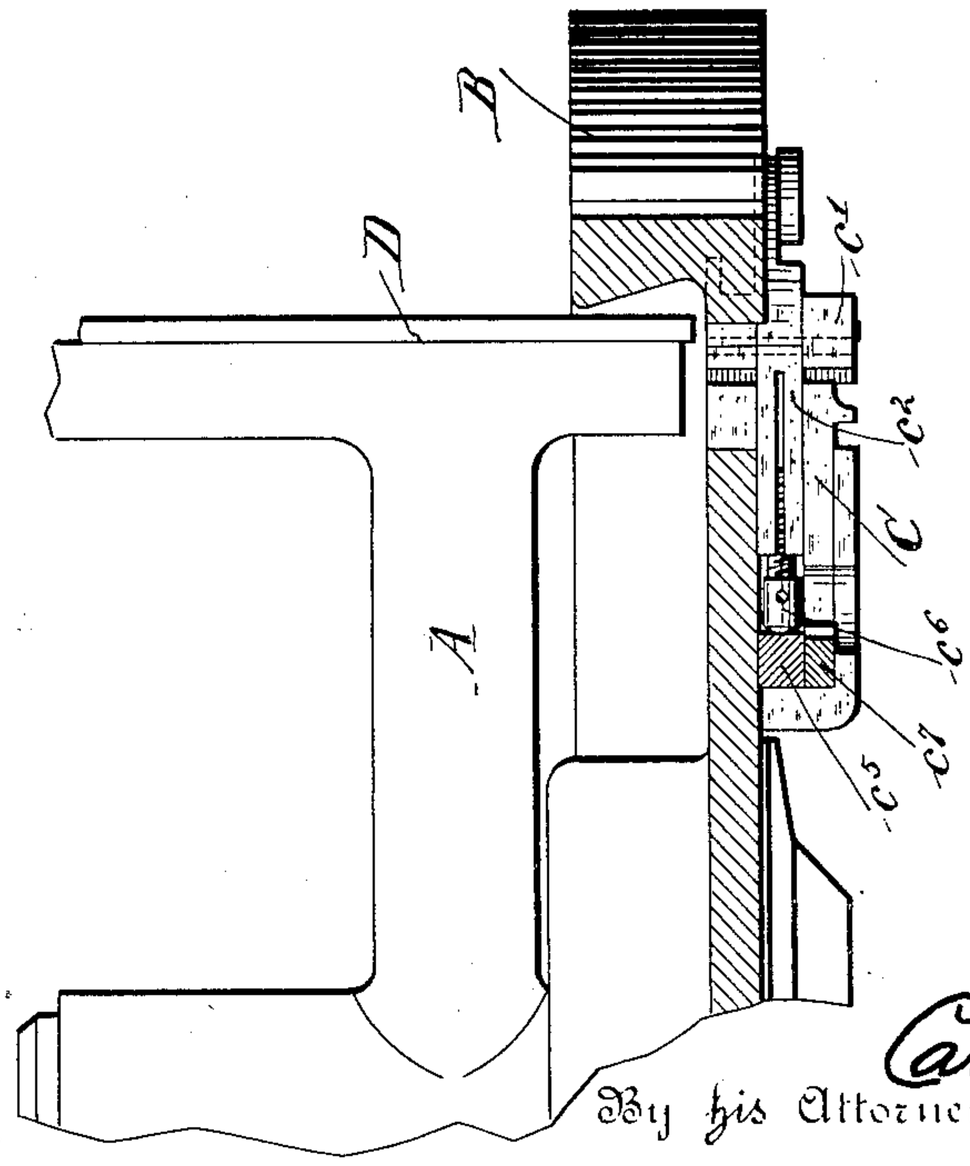
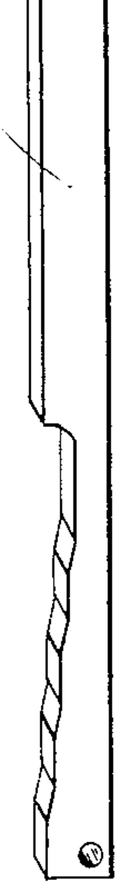


Fig. 6.



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UNITED STATES PATENT OFFICE.

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LINOTYPE-MACHINE.

No. 814,469. Specification of Letters Patent. Patented March 6, 1906.

Application filed October 20, 1905. Serial No. 283,602.

To all whom it may concern:

Be it known that I, CARL MUEHLEISEN, of the city of Berlin, in the Empire of Germany, have invented a new and useful Improvement in Linotype-Machines, of which the following is a specification.

My invention has reference to linotype-machines wherein linotypes or line-printing bars of type-metal are cast in a slotted mold against an assembled line of matrices by which the front of the mold is temporarily closed, as shown, for example, in Letters Patent of the United States No. 436,532. In this class of machines the ejector-blade advancing from the rear pushes the slug or linotype out of the mold and between two knives by which its side faces are trimmed and their parallelism insured. The mold is adjustable in order to change the thickness of the slugs cast therein, and when this change is effected the knives must be correspondingly adjusted to change the distance between them.

The present invention has in view the simultaneous adjustment of the mold and knives.

To this end it consists in means for adjusting one of the knives in relation to the other and means for effecting the adjustment of the mold as to the thickness of the slot therein combined with mechanism for effecting both adjustments.

I have illustrated my invention in a form applicable to the Mergenthaler machine described in Letters Patent above referred to, wherein the mold is mounted in an intermittingly-rotating wheel, whereby it is presented alternately at the casting and at the ejecting positions, and it is to be understood that except as to the details shown and specifically claimed herein the machine may be of any ordinary or suitable construction.

Referring to the drawings, Figure 1 is a horizontal section through the mold-knives and adjusting devices. Fig. 2 is an elevation of the knives and attendant parts looking against their inner faces in the direction indicated by the arrow 2, Fig. 1. Fig. 3 is a view of the mold looking rearward against its front face in the direction indicated by the arrow 3, Fig. 1. Fig. 4 is a cross-section on the line 4 4 of the preceding figure. Fig. 5 is a face view of the mold wheel or disk, showing the opening to receive the mold.

Referring to the drawings, A represents a rigid portion of the main frame.

B is a vertical intermittingly-rotated disk or wheel.

C is a slotted adjustable mold secured in and carried by the wheel, *c* being the slot in which the slug or linotype is cast and from which it is ejected in a forward direction.

D is the forward end of the reciprocating ejector-blade, by which the slug is driven from the mold.

E and F are two parallel upright knives, between which the slug leaving the mold is driven by the action of the ejector, the movement of the slug being continued until it arrives at the galley or receiver on the front of the machine. The knife E is bolted rigidly in place on the frame; but the knife F is movable to and from its companion in order to vary the distance between them, according to the thickness of the slugs to be delivered from the mold. The knife F is secured in place, as usual, by bolts *f*, passing through slots in the frame to admit of its adjustment. The knife F is urged constantly backward by a spring G, seated in the frame and acting against the bolts *f*. The forward movement of the knife is effected and its firm support in the operative position secured by a longitudinally-sliding wedge H, seated on one side against the back of the knife and at the opposite side against the ends of adjusting-screws I, seated in the frame. The wedge H increases in thickness step by step at each end, the difference in height of the successive steps being commonly equal to the difference in thickness between one size of type and the next. Between each step and the next there is an inclined connecting-surface to facilitate passage of the wedge over the supporting-screws I. When, therefore, the wedge is moved endwise, it causes the knife F to move forward or backward step by step and gives it support in definite or predetermined positions, so that the slugs may be trimmed to standard thicknesses. By adjusting the screws correction may be made of any want of parallelism between the edges of the knives, and the knives may be adjusted to trim slugs to special thicknesses different from the usual standards.

To effect the movement of the wedge H, I connect it with a vertical sliding rack-bar K,

having its teeth at one end in engagement with an actuating-pinion L on one end of a horizontal shaft M, seated in the frame, and provided at its forward end with a pinion N, engaging a second rack-bar O, lying horizontally and engaged by an actuating-pinion P, seated in the frame. Through this pinion P there passes a spindle R, connected thereto by a spline *r* or its equivalent, and provided in the outer end with an operating wheel or handle S. When the spindle R is turned, it causes the pinion P to move the rack-bar O, which in turn causes the rotation of the pinion N and its companion L, which latter effects the movement of the rack-bar K and the wedge H, so that the knife F is caused to advance or recede. The spindle R serves also to effect the adjustment of the mold, as will be presently described.

Referring to Fig. 3, C represents the inner or body portion of the mold fixed rigidly to the supporting-disk, while *c'* represents the upper portion or cap, movable to and from its companion and guided at the ends by arms c^2, attached thereto and extending inward through slots in the ends of the body portion. The cap and body portions surround or inclose the intermediate slot or mold proper, *c*. The length of this slot is determined by two removable liners or blocks c^{10} and c^{12}, overlapping each other at one end and secured, respectively, to the body and the cap by screws c^{13} or equivalent fastening devices. By removing these blocks or liners and substituting others of different length—one being lengthened as the other is shortened—the slot may be varied in length to produce a slug of any required length or measure. The mold extends rearward through a slot or opening in the disk, and the cap is urged constantly downward toward the body by a spring c^3, seated in the disk, as shown in Fig. 5, and bearing upon the cap, as shown in Fig. 4. The cap is raised and its distance from the body portion controlled by a sliding wedge c^5, seated longitudinally in the lower portion of the body and acting against screws c^6, seated in the lower ends of the cap-arms, or, if preferred, seated directly against the ends of these arms in the absence of the screws. As the wedge is moved in one direction it forces the arms upward and raises the cap against the downward pressure of the spring. When moved in the reverse direction, it permits the cap to fall under the influence of the springs. In this manner the slot or mold proper between the cap and the body portion may be varied to produce a slug of any required thickness. The wedge c^5 is constructed, as shown in Fig. 6, with a series of steps at its two ends and with inclined surfaces rising from each step to the next, the variations between the heights of the successive steps being the same as that between the steps of the wedge for adjusting the knives, as hereinbefore described, so that as the wedge is moved endwise the mold-slot is varied in thickness step by step to correspond with the standard thicknesses of the slugs or linotypes. The adjustment of the wedge c^5 is effected by a rack-bar c^7, secured to its side and moved endwise by a pinion c^8, seated in the body of the mold. This pinion is constructed with an angular opening to receive the end of the spindle R, already referred to as the means for adjusting the knives. It will be observed that the mold is self-contained, or, in other words, that the cap, body, the adjusting-wedge, and spring and the liners are so connected that they form a complete portable structure independent of the supporting-wheel. When the mold is presented by its supporting-wheel in the ejecting position opposite the trimming-knives, as shown in Fig. 1, the pinion c^8 stands in line with the spindle R, so that if the operator forces this spindle inward endwise it will enter the pinion c^8. If the spindle in this position be rotated, it will not only operate the parts for adjusting the knives, as before referred to, but will simultaneously turn the pinion c^8 and effect an adjustment of the mold corresponding to that of the knives. The spindle must of course be withdrawn from the pinion c^8 as soon as the adjustment is effected in order to permit the rotation of the mold-wheel. For the purpose of insuring its disconnection from the pinion and avoiding the possibility of accident a spiral spring r^3 is applied around the spindle for the purpose of urging it outward.

The steps of the wedges for adjusting the knives and the mold are of considerable length, so that accurate adjustment of the wedges endwise is unnecessary. Consequently play or lost motion between the racks pinions, and other connections is without effect on the accuracy of the adjustments.

In special cases it is desirable to adjust the knives to effect a material reduction in the thickness of the slugs after they leave the mold. It will be observed that this may be secured by the mechanism shown, as the spindle R may be used, as shown in Fig. 1, to adjust the knives without thrusting it rearward into engagement with the mold-adjusting pinion. In other words, the arrangement shown permits the knife and the mold to be adjusted jointly or the knife to be adjusted independently.

As a guide to the operator in turning the spindle R, so that the steps of the wedge may be stopped directly opposite their bearing-surfaces, I propose to provide a hand-wheel S with a finger *s*, arranged to enter notches in a stationary flange s^2, encircling the spindle. This finger is provided with a notch s^3 midway of its length, so that when the spindle is pushed inward to engage the pinion L the notch will stand opposite the flange and permit the rotation of the spindle. The notches in the flange are located in such positions that

the spindle can be drawn forward and disconnected only when the wedges are in proper operative positions.

The essence of my invention lies in the employment of a single means for effecting the adjustment of both the mold and the knives.

While I have represented herein a construction and arrangement of parts which will give good results in practice, it is to be understood that the connections may be variously modified within the range of mechanical skill without passing beyond the scope of my invention.

Having described my invention, what I claim is—

1. In a linotype-machine, the combination of an adjustable mold, an adjustable slug-trimming knife, and a common means for effecting the adjustment of the mold and knife.

2. In a linotype-machine, the combination of a mold, a trimming-knife, and means for simultaneously adjusting the knife and mold.

3. In a linotype-machine, the combination of an adjustable mold, an adjustable knife, and operating means adapted to adjust said parts jointly or to adjust the knife separately, at will.

4. In a linotype-machine, the combination with the fixed knife, the opposing movable knife, the stepped wedge acting between a fixed support and the movable knife to advance the latter definite distances toward its companion, a spring urging the knife backward against the wedge, and means for moving the wedge endwise; whereby the distance between the knives may be varied instantly and definitely by a single action.

5. In a linotype-machine, the knife and its adjusting wedge and pinion, and the mold and its adjusting wedge and pinion, and connections between the pinions to cause their movement in unison.

6. A linotype-mold comprising a body portion and a cap portion fitted together to inclose the intermediate slot or mold proper, and movable one in relation to the other to vary the height of the slot, a spring tending to change the distance between the cap and body, and a stepped wedge acting in opposition to the spring to adjust the movable member definite distances, said elements combined in an integral structure, substantially as described.

7. In a linotype-machine, and in combination with means for adjusting the mold and knife, means to arrest the adjusting device positively at definite points, whereby the adjustment of the parts in the exact positions required is insured.

8. In a linotype-mold, in combination with the cap and body portions and means for changing the distance between them, removable overlapping liners c^{10} and c^{12} attached to the cap and body respectively, and serving to determine the length of the mold slot or cell.

In testimony whereof I hereunto set my hand, this 27th day of September, 1905, in the presence of two attesting witnesses.

CARL MUEHLEISEN.

Witnesses:
HENRY HASPER,
WOLDEMAR HAUPT.